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PLANKTON SYMPOSIUM IV
&
CONGRESSO BRASILEIRO DE PLÂNCTON

ABSTRACTS

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The present volume is a compilation of abstracts from the A*f*PR - Plankton Symposium IV (João Pessoa, Brazil, 01 – 05 April 2007.
This 4th edition follows the Plankton Symposium I (PS I) that took place in Espinho, Portugal (20 – 22 September 2001), PS II that took place in Vigo, Spain (16 – 19 October 2003) and the PS III that took place in Figueira da Foz, Portugal (17 – 20 March 2005). This 4th edition hosts the Congresso Brasileiro de Plâncton.
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28 February 2007

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Authors: Andréa Green Koettker, Paulo Yukio Gomes Sumida and Andrea Santarosa Freire

DECAPOD AND STOMATOPOD CRUSTACEANS OF THE ARCHIPELAGO OF SÃO PEDRO AND SÃO PAULO (ASPSP), BRAZIL: INTEGRATION OF LARVAL AND ADULT IDENTIFICATION

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ABSTRACT
The majority of marine decapods and stomatopods have a pelagic phase in their life cycle. The increasing number of studies on the free-living larval phases of crustaceans and other invertebrate groups has shown that description of larval and adult phases yield different but complementary results. The present work aimed to describe the occurrence of decapod and stomatopod larvae collected in the ASPSP (00º56'N and 29º22'W) on April, August and November of 2003. In addition, a comparison of the larval identification with the adult individuals described previously in the same area was employed.
Plankton samples were collected in different distances around ASPSP, during the dusk and dawn using a conical cylindrical plankton net with 200 µm mesh size equipped with a flowmeter. At each site, horizontal tows were made in the surface for five minutes.
A total of 3733 larvae were observed resulting in the identification of forty-tree taxonomic units, 39 decapods and 4 stomatopods. Until now, 20 adults' species of those two groups were found in the ASPSP, and among them just four species and three genera had their larvae identified in the present study. Five species and 2 genera were described as new occurrences to the area.
Therefore, benthos and plankton investigations are complementary, reinforcing that ecology and management studies should include larval and adult biology. Besides, this knowledge allows understanding the degree of connectivity among separate habitats.

Keywords: Crustaceans, meroplankton, oceanic island.

2007 BDUA – Journal of Biology, 2: 04. T0102FrancyKakkassery16012007
Title: **Species diversity of rotifers from various freshwater ecosystems of Kerala State of India, with comments on New records**
Authors: Francy K. Kakkassery & C.K.G. Nayar

SPECIES DIVERSITY OF ROTIFERS FROM VARIOUS FRESHWATER ECOSYSTEMS OF KERALA STATE OF INDIA, WITH COMMENTS ON NEW RECORDS

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ABSTRACT
The present study is based on 314 plankton samples collected from various freshwater ecosystems, 110 localities of Kerala State, India.
It has revealed the occurrence of 108 species of Rotifera under 16 families, belonging to 30 genera from Kerala State, India. Of these, 64 are new records of rotifers from Kerala State, 40 are new records from South India and 5 species, viz. *Keratella tecta* (Gosse, 1851), *Lecane tenuista* Harring, 1914*, Macrochaetus danneli* Koste & Sheil, 1983, *Filinia camascela* Myers, 1938 and *Brachionus bidentatus* f. *inermis* (Rousselet, 1906) are reported first time in India. The major species were represented in the family Lecanidae by 30 species, Brachionidae by 22 species and Colurellidae by 13 species. Genera wise *Lecane*, *Brachionus* and *Lepadella* were the most abundant groups.

Keywords: Rotifers, diversity, new records, Kerala, India.

2007 BDUA – Journal of Biology, 2: 05. T0103GilmarNeves28012007

Title: **Comparison of some morphological structures of *Thermocyclops decipiens* Kiefer 1929 (Copepoda Cyclopoida) from different southern-south Brazilian river basins (Paraná, Paranapanema, Iguaçu and Uruguai)**

Authors: Gilmar Perbiche-Neves, William Marcos da Silva, Moacyr Serafim Júnior & Marcos Gomes Nogueira

COMPARISON OF SOME MORPHOLOGICAL STRUCTURES OF *Thermocyclops decipiens* KIEFER 1929 (COPEPODA CYCLOPOIDA) FROM DIFFERENT SOUTHERN-SOUTH BRAZILIAN RIVER BASINS (PARANÁ, PARANAPANEMA, IGUAÇU AND URUGUAI)

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ABSTRACT

Polimorfism in microcrustaceans can be an adaptative response to different environmental factors (e.g. predation, competition, temperature, density, etc.) being more evident and well studied for cladocerans and almost unknown for copepods. This study compares the measurement of 20 structures of *Thermocyclops decipiens* (adult females), an important neotropical bioindicator species, from four Brazilian river basins: Paraná, Paranapanema, Iguaçu (River Jordão) and Uruguai.

The analyzed structures were the length of: total body (BTL), caudal setae - median extern (MESL), median intern (MISL), intern (ISL), and apical thorn of P4 endopod (ATL); the width of: cefalotorax (CF1W, CF2W, CF3W, CF4W), genital segment (GSW), basis of setae - caudal median extern (MESW), median intern (MISW), intern (ISW) and apical thorn of P4 endopod (ATW), coxopodit (CoxW) and intercoxal sclerites of P4 (ISW), and two measures of furca (FL and FW) and P4 endopod (P4L and P4W).

Differences for all structures were significant ($p < 0.05$) among the basins (Manova analysis). Principal component analysis for data ordination explained 58% of total variance (first and second components). The first component was positively associated with P4W, ATW and P4L, and with Paranapanema River, and negatively associated with MISL, ISL, MESL, MESW, CF1W, CF2W, ATL, CF4W, ISW and CoxW, and with the other rivers. The second component was positively correlated with MISW, ISW, P4W, MISL, CoxW, BTL and Uruguai and Paraná Rivers; and inversely with CF3W, CF2W, CF1W, P4L and Jordão River. The morphology of *T. decipiens*, and possible its ecological role, varied when compared the different rivers.

Keywords: *Thermocyclops decipiens*, Brazilian rivers.

2007 BDUA – Journal of Biology, 2: 06. T0104HaydeePizarro29012007
Title: **Diversity of basic morphological unities of Xanthophyceae from Argentina** Authors: Haydée Pizarro, Yolanda Zalocar de Domitrovic & Guillermo Tell

DIVERSITY OF BASIC MORPHOLOGICAL UNITIES OF XANTHOPHYCEAE FROM ARGENTINA

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ABSTRACT
This work deals with the morphological diversity of coccoid Xanthophyceae from North East Argentina's large wetlands. Phytoplankton communities from shallow lakes, lagoons, relictual oxbow lakes and other water bodies of humic characteristics were analyzed from samples taken over 20 years. Microscopic algal species may be mainly classified following three concepts: morphological, biological and molecular species. It is not always possible to apply the three concepts together, and frequently taxonomist select only one technique. Due to the long period of sampling and the few individuals of each form found, only morphological studies are possible to apply in our samples. Moreover, sexual reproduction is unknown in coccoid Xanthophyceae, therefore biological methods are impossible to use. The term Basic Morphological Unities (BMU) for defining each one of the different observed morphological type is proposed.
Only 18 forms from the 74 recognized BMU match with previously described *taxa* (species belonging to the genus *Tetraedriella*, *Tetraplektron*, *Goniochloris*, *Isthmochloron* and *Psedostaurastrum*). We consider that it is impossible to create new *taxa* for each one of these morphological type because the limits of the morphological variability are unknown.
The value of the term BMU from the taxonomical and ecological point of view is discussed.

Keywords: Basic Morphological Units, Xanthophyceae, Argentina.

2007 BDUA – Journal of Biology, 2: 07. T0105SergioLourenco29012007
Title: **Studies on marine phytoplankton in Brazil: a review**
Authors: Victor A. Marques & Sergio O. Lourenço

STUDIES ON MARINE PHYTOPLANKTON IN BRAZIL: A REVIEW

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ABSTRACT
Studies on phytoplankton have a history of ca. 140 years and followed the development of environmental sciences. In Brazil, the first studies were carried out at the end of the 19th century, as isolated surveys run by foreign institutions. After more than 50 years of negligible progress, in mid 1950's the scenario started to change due the foundation of the first Brazilian oceanographic institutions (*e.g.* USP, UFPE). Later, more institutions were founded in other regions (e.g. FURG, UFPR). More recently, the creation of graduate programs on Oceanography, Marine Biology and related areas has been contributing to increase the number of active researchers. Despite this growth, especially in the last two decades, studies on marine phytoplankton still experience many constraints, such as the small number of institutions, the rare researches in oceanic waters, the scarceness of experimental studies, the absence of field studies in some key areas, and the lack of suitable research vessels in almost all institutions. Currently, there is a concentration of studies in coastal areas located within short distances from the main research institutions. Modern methods and approaches are not accessible to most of the scientific community. Most of the main problems are consequences of the general scarceness of funds, which affects the entire Brazilian scientific system. Coordinate efforts must be done to get a better development in this field. The re-foundation of the Brazilian Society of Plankton is a very welcome initiative, since the society may play an important role in this context.

Keywords: Marine phytoplankton, Brazil, historical data, Oceanography, Marine Biology.

2007 BDUA – Journal of Biology, 2: 08. T0106TakakoMatsumura30012007
Title: **Revision of *Notodiaptomus deitersi* (Poppe, 1891) and *Notodiaptomus spinuliferus* (Dussart & Matsumura-Tundisi) with description of a new *Notodiaptomus* species**
Authors: T. Matsumura-Tundisi & W.M. Silva

REVISION OF *Notodiaptomus deitersi* (POPPE, 1891) AND *Notodiaptomus spinuliferus* (DUSSART & MATSUMURA-TUNDISI) WITH DESCRIPTION OF A NEW *Notodiaptomus* SPECIES

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ABSTRACT
The aim of this work is to solve the mistake committed in the Dussart & Matsumura-Tundisi (1986), where the authors described three new species from Brazilian water bodies. Nevertheless, one of them nominated as *Notodiaptomus spinuliferus* was not new specie but is a synonymy of *Notodiaptomus deitersi*. The morphological characteristics of *N. deitersi* and its distribution in the Brazil is presented and also the description of a new species from Ilha Solteira Reservoir in São Paulo State nominated *Notodiaptomus ilhensis* sp. nov.

Keywords: Copepoda Calanoida, *Notodiaptomus*, taxonomy, Pantanal, São Paulo reservoirs.

2007 BDUA – Journal of Biology, 2: 09. T0107AndreaAzevedo30012007
Title: **Structure of the Phytoplankton community in the estuary of Tibiri river – São Luís Island – Maranhão State – Brazil**
Authors: Andrea Christina Gomes de Azevedo, Sue Ellen F. Costa e Silva & Geylene A. Ribeiro

STRUCTURE OF THE PHYTOPLANKTONIC COMMUNITY IN ESTUARY OF TIBIRI RIVER – SÃO LUÍS ISLAND – MARANHÃO STATE – BRAZIL

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ABSTRACT
The estuarine ecosystems are considered environments of high productivity, because they are favored by the nutrients carried by the rivers, receiving so much periodic influence from fresh and sea water.
This work was accomplished in the estuary of Tibiri River during the period from February/2005 to September/2006 and consisted in five collections with measurements of a series of environmental variables, such as: temperature, water transparency, salinity and dissolved oxygen. For the qualitative study, horizontal samples parallels to water surface were performed and microscope slides were prepared with 4% formalin fixed material; for the quantitative study, the samples were collected directly with Niskin bottle; for determination of the cell density, an inverted microscope was used, following the systematized field technique in cross in sedimentation chambers.
This work identified 92 *taxa* and the results indicate that the division Bacillariophyta was the most representative, with 28 families. The most representative family was Bacillariaceae (11 species), followed by Chaetocerotaceae (10 species) and the most representative genera were *Chaetoceros* and *Nitzschia,* both with eight species. The relative abundance demonstrates that their aren´t the dominant species and points as abundant species *Thalassiosira subtilis* (45.23% - February/2005; 32.35% - September/2005) and *Odontella regia* (43.50% - September/2006). Regarding the cell density, the lowest rate was registered in March/2006 (23,696 cells L) and the biggest rate was registered in September/2005 (134,771 cells L), rainy and dry period respectively.

Keywords: Phytoplankton, structure, estuary, cell density.

2007 BDUA – Journal of Biology, 2: 10. T0108GiulliariLirall29012007
Title: **Phytoplanktonic diversity in aquatic ecosystems along São Francisco River: Sobradinho Reservoir and marginal Ponds, Northeast Region, Brazil**
Authors: Ariadne do Nascimento Moura, William Severi, Ênio Wocyli Dantas, Giulliari Alan da Silva Tavares de Lira, Paulo Jaude, Viviane Piccin dos Santos, Maria do Carmo Bittencourt-Oliveira

PHYTOPLANKTONIC DIVERSITY IN AQUATIC ECOSYSTEMS ALONG SÃO FRANCISCO RIVER: SOBRADINHO RESERVOIR AND MARGINAL PONDS, NORTHEAST REGION, BRAZIL

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ABSTRACT
The objective of this work was to carry out the floristic survey and verify the phytoplanktonic diversity and distribution in the Sobradinho reservoir, São Francisco damming, and ponds marginal the reservoir.
Samplings were performed in the dry period (September-December, 2006), at 30 stations previously established along the reservoir and in seven marginal ponds. Material was collected through integrate vertical drags along the euphotic zone, using a conic-cylindrical net with 25 µm mesh. Samples were fixed with formalin (4% v/v). Permanent and semi-permanent slides, photomicrography, drawings, measures and cytological observations (such as: form and chloroplasts number, cells form, pirenoid presence, sheaths, spines and processes) were done for microalgae identification. Subsequently, specialized bibliography was also used.
Algal flora was represented by 221 infrageneric *taxa*, being Chlorophyta, Bacillariophyta and Cyanophyta the most representative divisions concerning species number, with 90, 60 and 29 infrageneric *taxa* respectively. Specific richness was higher in the ponds (190 spp.) than in the reservoir (138 spp.). A total of forty-eight percent species occurred both in the ponds and reservoir, with 38% occurring in the ponds and 14% only in the reservoir. Among the most restrict ponds' groups; Bacillariophyta stands out, while Cyanophyta were found both in the ponds and at different points from the reservoir. Xanthophyta species were only registered in the ponds.

Keywords: Algal diversity, Sobradinho reservoir, Brazilian Northeast.

2007 BDUA – Journal of Biology, 2: 11. T0109LohengrinFernandes29012007
Title: **Larval stages of Pasiphaeidae, Oplophoridae and Disciadidae from the plankton of Southwest Atlantic Ocean (12°S – 22°S)**
Authors: Lohengrin D. de A. Fernandes, Marcelo F. de Souza & Sérgio L. C. Bonecker

LARVAL STAGES OF PASIPHAEIDAE, OPLOPHORIDAE AND DISCIADIDAE FROM THE PLANKTON OF SOUTHWEST ATLANTIC OCEAN (12°S – 22°S).

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ABSTRACT
The great majority of the waters included in the southwest Atlantic Ocean (SAO) are adjacent to just three countries of South America: Brazil, Uruguay and Argentina. The tropical boundaries of SAO, which comprise a highly diverse area, include about 110 species of caridean shrimps.
In order to study larval morphology and spatial distribution of caridean larvae in SAO, plankton samples were collected by the R.V. Thalassa in 114 stations between Rio Real (12°) and Cabo de São Tomé (22°) from May to July, 1999.
Three families were chosen to be first analyzed because of their high abundance and poor knowledge: Pasiphaeidae, Oplophoridae and Disciadidae. In laboratory, the larvae were identified, dissected and drawn under optical microscope equipped with camera lucida. The families Pasiphaeidae and Disciadidae were represented each one by a single specie of *Leptochela* and *Discias*, respectively. The Oplophoridae were represented by two genus – *Acanthephyra* and *Janicella* – and five species.
The larvae of *Leptochela* sp. can be identified by its general shape and broader telsum. The larvae of *Discias* sp. can be confused with those of *Acanthephyra* spp. because the great similarity of the whole body, although the former has a strongly modified chelae on the first pereopods. The larvae of *Janicella*, a genus that comprises only *Janicella spinicauda*, can be recognized by the long rostrum with spines on both the ventral and dorsal margins. All the described larvae are abundant in the area, mainly near the coralline area of Abrolhos (Bahia State).

Keywords: Larval morphology, Decapod larvae, Pasiphaeidae, Oplophoridae, Disciadidae.

2007 BDUA – Journal of Biology, 2: 12. T0110MarcoCutrim30012007

Title: **Structure of the phytoplankton community in three estuarine areas from the Brazilian North coast**

Authors: Marco Valério Jansen Cutrim, Eliesé Idalino Rodrigues, Nágela G.R. dos Santos, Francisca Ires M.S.B. Ribeiro & Andrea C.G. Azevedo

STRUCTURE OF THE PHYTOPLANKTON COMMUNITY IN THREE ESTUARINE AREAS THE BRAZILIAN NORTH COAST

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ABSTRACT

The estuarine areas in São José, São Marcos and Cumã's Bay are located between 2° and 3° and 44° and 45°. Six collections were carried out during the period from May/2005 to April/2006 for each sample station to record the phytoplanktonic community structure and biomass.

It had been identified 124 *taxa*, mainly diatoms, composing 87.1% of the total *taxa*. In relation to frequency of occurrence the most important were the diatoms *Cyclotella stylorum, Dithylum brightwelli, Thalassionema frauenfeldii* and *Thalassiosira subtilis,* with 94% of occurrence. The dinoflagelates constituted the second flora group, followed by Chlorophyceae, Cyanophyceae and Euglenophyceae. The genera most representative were *Chaetoceros* with ten species and *Coscinodiscus* with eight species. The phytoplanktonic biomass (total and size-fractioned) was measured through chlorophyll *a* concentrations and varied from 2.40 to 16.56 $mg.m^{-3}$ introducing a light seasonality with smaller concentrations in the rainy period. Shannon diversity index (H') characterizes the environments with medium and high specific diversity degrees.

Keywords: Estuary, Brazilian north, phytoplankton community, biomass.

2007 BDUA – Journal of Biology, 2: 13. T0111Pedrofreitas30012007
Title: **Spatial and temporal variability of Appendicularia in the estuarine region of the Caravelas river (17°44' - 17°53'S and 39°04' - 39°12' W)**
Authors: Pedro Freitas de Carvalho & Sérgio Luiz Costa Bonecker

SPATIAL AND TEMPORAL VARIABILITY OF APPENDICULARIA IN THE ESTUARINE REGION OF THE CARAVELAS RIVER (17°44' - 17°53' S AND 39°04' - 39°12' W)

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ABSTRACT
The composition, spatial and temporal variation of Appendicularia (Urochordata) in the coastal region of Caravelas (17°43'55''S - 39°15'57''W), located in southern Bahia state, were described.
Zooplankton samples were obtained in horizontal hauls, using a cylindrical-conical net with 200 µm mesh, fitted with a flowmeter. Three hauls were made at each station. Twelve surveys were done during 2001, 2003, 2004, 2005 and 2006, at seven stations located in the estuarine and adjacent coastal region of the Caravelas River.
Ten species of the families Oikopleuridae and Fritillaridae were identified: *Oikopleura longicauda, Oikopleura dioica, Oikopleura rufescens, Oikopleura albicans, Oikopleura cornutogastra, Appendicularia sicula* and *Fritillaria borealis. Oikopleura longicauda, Oikopleura dioica* and *Oikopleura rufescens* were the most abundant species. Non-parametric multidimensional scaling indicated no spatial and temporal variation in appendicularian density between the sampling stations or periods.
This is the first report on the community composition of Appendicularia in northeaster Brazil. The species in the Caravelas River and estuary are similar to those in other coastal regions of Brazil.

Keywords: Oikopleuridae, Fritillaridae, Tropical estuary, Brazil.

2007 BDUA – Journal of Biology, 2: 14. T0112RauquirioCosta30012007
Title: **Seasonal dynamics of the microphytoplankton in Caéte river estuary bay (Amazon region, North of Brazil)**
Authors: Darlan de Jesus de Brito Simith, Luci Cajueiro Carneiro Pereira & Rauquírio Marinho da Costa

SEASONAL DYNAMICS OF THE MICROPHYTOPLANKTON IN CAETÉ RIVER ESTUARY BAY (AMAZON REGION, NORTH OF BRAZIL)

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ABSTRACT
The objective of this study was to determine the composition of the microphytoplankton in Caeté River estuary bay, in the Northeast of Pará State, Brazil, and verify the seasonal variation effects of the environmental parameters on the structure and dynamics of these communities during three expeditions carried out along a seasonal cycle.
Physical-chemical parameters (temperature, salinity, pH, water transparency and seston) and the microphytoplankton were monitored each two hours, during a 24 hour period at a fixed station. Microphytoplankton samples were quantitatively and qualitatively analyzed following Uthermol sedimentation method.
Physical-chemical parameters oscillated significantly among the seasonal periods. In total, 82 *taxa* were identified, belonging to 42 genera distributed among four divisions: Cyanophyta (2 spp.), Chrysophyta (1 sp.), Bacillariophyta (71 spp.) and Dinophyta (8 spp.). The diatoms were the most representative group, constituting over 85% of total floristic composition registered in Caeté River estuary bay. Cell densities varied between 24,850.00 and 195,183.33 cells.L^{-1}. Diversity oscillated from low to medium, with values around 2.5 bits.$cell^{-1}$.
The microphytoplankton of Caeté River estuary bay was represented mainly by diatoms, whose density was strongly influenced by environmental parameters and seasonal annual cycle.

Keywords: Composition, phytoplankton, physical-chemical parameters, seasonal variation.

2007 BDUA – Journal of Biology, 2: 15. T0113AndreaGreen30012007

Title: **Spatial and dial variation of zooplankton in the Archipelago of São Pedro and São Paulo (ASPSP)**

Authors: Andréa Green Koettker, Mariana Martinago Aguiar, Manoela Costa Brandão, Larissa Bunese Juk, Barbara Santos Menezes, Rodrigo C.C.B. Merege, Luis Carlos Pinto de Macedo Soares & Andrea Santarosa Freire

SPATIAL AND DIAL VARIATION OF ZOOPLANKTON IN THE ARCHIPELAGO OF SÃO PEDRO AND SÃO PAULO (ASPSP)

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ABSTRACT

Marine zooplankton represents a link between primary production and the highest levels of the trophic web. It is composed by holoplanktonic organisms, eggs and larval forms of many animal species, including some of commercial interest such as crustacean decapods and fishes. This study aimed to describe the spatial and diel variations of zooplankton abundance in the Archipelago of São Pedro and São Paulo (00º55'01"N – 29º20'44"W). In addition, we sought to investigate the presence of the "island-mass effect" as a consequence of an increase in zooplankton abundance near the ASPSP.

Surface plankton samples were collected on March 2004 at different distances around ASPSP (approximately 100, 500 and 1000 m from the coast) and inside the inlet, during the dusk and dawn, using a conical cylindrical plankton net with 200 µm mesh size equipped with a flowmeter.

The mean temperature was 28.3 ºC and the salinity was 37.6. Zooplankton mean abundance ranged from 25,3 to 35,2 ind.100 m^{-3}. The dominant group was Copepoda (88%), followed by Gastropoda larvae, brachyuran zoea, Larvacea, Euphausiacea and Chaetognatha. Fish eggs were also found in the samples. There was a trend of higher zooplankton abundance at night, suggesting spawning and larval hatching during this period and vertical migration. Planktonic organisms were concentrated near the archipelago only at night, with a homogeneous spatial distribution during the morning.

Keywords: Oceanic Island, distribution, zooplankton.

2007 BDUA – Journal of Biology, 2: 16. T0114JoseMonteiro30012007
Title: **Occurrence of *Trichodesmium thiebautii* Gomont ex Gomont (Cyanophyta) in tropical waters of Northeastern Brazil**
Authors: José Juarez Ferreira Monteiro, Enide Eskinazi-Leça, Maria Luise Koening, Maria da Glória Gonçalves da Silva-Cunha & Maristela Silva de Oliveira

OCCURRENCE OF *Trichodesmium thiebautii* GOMONT EX GOMONT (CYANOPHYTA) IN TROPICAL WATERS OF NORTHEASTERN BRAZIL

José Juarez Ferreira Monteiro, **Enide Eskinazi-Leça, Maria Luise Koening, Maria da Glória Gonçalves da Silva-Cunha & Maristela Silva de Oliveira**

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ABSTRACT
Trichodesmium is a cyanobacteria of Oscillatoriales order, very common in plankton of tropical and subtropical oceans. Their colonies consist in aggregated filaments that can be seen by the naked eye during the flowering period. This genus is composed by 11 species, among which only *T. erythraeum* Ehrenberg ex Gomont has been observed in the continental platform of northeaster Brazil, which sometimes occurs in dense florescence. This study points out the occurrence of *T. thiebautii* Gomont ex Gomont in the tropical waters of Pernambuco State, expanding its distribution to the Brazilian northeast region.
T. thiebautii was found in plankton samples collected during the month of July 2005, at six stations spread along two profiles transversal to the coast: one at Gaibu Beach (8º18'S and 34º56'W) e one at Serrambi (8º32'S and 35º00'W). Three stations were plotted in each profile, keeping a ten-mile distance between one station and another. The collections were performed using 20 µm mesh nets, hauled on the water surface for 10 minutes.
The species, always planktonic, forming bundles or radially arranged in round-shaped colonies, sheathless, cylindrical or straight trichomes, quadratic or slightly longer cells, presenting width of 7-16 µm and height of 8-26 µm. There were no significant differences regarding the size of the cells when comparing the trichomes of the same colony. The species occurred irregularly, being more abundant at the most distant stations from the coast, showing a preference for the oceanic region.

Keyword: *Trichodesmium thiebautii*, northeastern Brazil, distribution.

2007 BDUA – Journal of Biology, 2: 17. T0114PaulaNepomuceno30012007
Title: **Carangidae larvae (Teleostei, Perciformes) from the Southwest Atlantic Ocean, Brazil (12º S – 22º S)**
Authors: Paula Nepomuceno Campos, Ana Cristina Teixeira Bonecker & Márcia Salustiano de Castro

CARANGIDAE LARVAE (TELEOSTEI, PERCIFORMES) FROM THE SOUTHWEST ATLANTIC OCEAN, BRAZIL (12° S – 22° S)

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ABSTRACT
The family Carangidae comprises 32 genera and 140 species, of which 15 occur along the Brazilian coast. Few studies about this family were done in Brazil, although some species represent an important fishery resource, especially of the genus *Trachurus, Caranx, Decapterus* and *Trachinotus.*
Carangidae larvae were collected during three oceanographic cruises: spring 1998 (Central III), winter 1999 (Bahia 1) and autumn 2000 (Central IV). The hauls were conducted obliquely from the maximum depth of 200 m, during day and night, using a bongo net with 330 and 500 µm mesh size.
A total of 1,186 carangids larvae were identified representing 10 species: *Selar crumenophthalmus, Trachurus lathami, Chloroscombrus chrysurus, Decapterus punctatus, Selene setapinnis, Selene vomer, Caranx crysos*, *Caranx latus*, *Caranx bartholomei* and *Oligoplites* sp. The species *D. punctatus* and *C. chrysurus* were the most abundant in the three cruises. Another study on larval fish developed in the Brazilian north coast recorded nine species of Carangidae, being *Chloroscombrus chrysurus, Selar crumenophthalmus* and *Decapterus punctatus* the most abundant. Along the southeaster coast five species and four genera were identified being *T. lathami* the most representative. Among the species identified in the north and in the southeastern regions only *Seriola dumerilli* and *Seriola* spp. and *Trachinotus* spp., respectively, weren't recorded in the present study.

Keywords: Larval fish, Carangidae, Brazil, South Atlantic Ocean.

2007 BDUA – Journal of Biology, 2: 18. T0115CarmenMaizonave30012007
Title: **First record of *Spermatozopsis exsultans* Koršikov (Volvocales, Chlorophyta) to the Guaíba Lake, Southern Brazil**
Authors: Carmem Rosalia Marodin Maizonave, Rodrigo da Rocha Andrade & Sílvia Letícia Bridi

FIRST RECORD OF *Spermatozopsis exsultans* KORŠIKOV (VOLVOCALES, CHLOROPHYTA) TO THE GUAÍBA LAKE, SOUTHERN BRAZIL

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ABSTRACT
Spermatozopsis exsultans Koršikov 1913 is a rarely registered species in the literature. In Brazil, its occurrence was recorded to the Carapebus Lagoon, Rio de Janeiro by Bicudo (2005) and to the Paraná River by Train and collaborators (2005). The last Chlorophyta Checklist to Rio Grande do Sul State (Torgan *et al.,* 2001) did not indicate any work with records of *S. exsultans.* This work provides its first record to the Guaíba Lake, Rio Grande do Sul State, Brazil.
Monthly sampling in bottles occurred in the period from June 2005 to October 2006 in thirty different points of the lake: Jacuí Delta State Park (6), navigation channel (8), right margin (5) and left margin (11). The analyses were processed in the Research Division of Water and Wastewater Municipal Department (DMAE), Porto Alegre. Specimens were measured and quantified. Photographic records were made. The abiotic, physical and chemical characteristics analyzed were temperature (water and air), depth, Secchi disk, pH, conductivity, dissolved oxygen, biochemical oxygen demand, total nitrogen and total phosphorous according with standard protocols (APHA, 1998). The naked cells presented curved or twisted shapes and their dimensions were 1-2 µm width, 7-11 µm length. One parietal chloroplast was observed. The flagella (2-4 per cells) presented the same dimensions, 10-15 µm length. The density of *S. exsultans* varied from <1 ind.mL^{-1} in the 86A point (Jacuí Delta Park) in July/2005 to 15,054 ind.mL^{-1}in the L2 point (left margin) in August/2006.
According to the results *S. exsultans* has been associated to eutrophic conditions and mild temperatures.

Keywords: *Spermatozopsis exsultans*, phytoplankton; Guaíba Lake.

2007 BDUA – Journal of Biology, 2: 19. T0116MarinesGarcia30012007
Title: **Taxonomy, morphology and ecology of uncommon *Thalassiosira* species (Bacillariophyta) in Brazilian coastal waters (32^{0}S)**
Authors: Marinês Garcia & Clarisse Odebrecht

TAXONOMY, MORPHOLOGY AND ECOLOGY OF UNCOMMON *THALASSIOSIRA* SPECIES (BACILLARIOPHYTA) IN BRAZILIAN COASTAL WATERS (32º S)

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ABSTRACT
Thalassiosira is an important marine diatom genus with at least 100 species. Up to present, 38 species have been reported in Brazilian water. In the present study, unreported or uncommon *Thalassiosira* species in the southernmost Brazilian coastal waters, the Patos Lagoon inner estuary and main channel, and Cassino Beach, were observed in monthly samples (1995 to 2006).
A total of 14 *Thalassiosira* species were found. In the present work, morphological details of 6 species, based on light and scanning electron microscopy analysis, were described. Abiotic environmental factors are also presented.
Both *T. hendeyi* and *T. minuscula* were previously known only from the latitude 38° S at the Uruguayan border. *Thalassiosira hendeyi* was observed all months while *T. minuscula* was more frequent in summer samples. *T. wongii* is reported for the first time after its description in 1986, San Francisco Bay. This species were observed the year round in the studied samples from the inner estuary station. The presence of *Thalassiosira oceanica*, which was common during summer at the main channel and inner estuary of Patos Lagoon, is reported for the first time in the Southwest Atlantic. *Thalassiosira endoseriata* and *T. lundiana* were cited the first time in Brazil although they are known in Argentinean water; both were found the year round.
It's showed that even in relative studied geographical areas, the knowledge on species composition is far from complete and reinforces the necessity of studies aiming the assessment of the Brazilian marine biodiversity.

Keywords: Rio Grande do Sul, Biodiversity, ultra-structure, diatoms.

2007 BDUA – Journal of Biology, 2: 20. T0117ClarisseOdebrecht30012007
Title: **Loricate Choanoflagellates from the South Atlantic coastal zone (~32°S) including the description of *Diplotheca tricyclica* sp. nov.**
Authors: Marli Bergesch, Clarisse Odebrecht & Øjvind Moestrup

LORICATE CHOANOFLAGELLATES FROM THE SOUTH ATLANTIC COASTAL ZONE (~32°S) INCLUDING THE DESCRIPTION OF *Diplotheca tricyclica* sp. nov.

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ABSTRACT
The biodiversity of marine heterotroph protists is poorly known in the South Atlantic coastal zone (~32°S) especially of the nanoflagellates. It was reported, for the first time, the presence of loricate choanoflagellates in the Patos Lagoon estuary and adjacent coastal zone.
Seventeen species of eleven genera of loricate choanoflagellates were observed between October 1998 and May 2000 based on the examination of fixed water samples (lugol's solution + glutaraldehyde) in a JEM 100-SX transmission electron microscope.
Most species were recorded in euhaline and mixopolihaline waters during the spring and summer, none in autumn and a few in the winter. Most choanoflagellates were observed in high salinity waters during spring and summer. The absence of choanoflagellates at the more sheltered inshore stations is due the freshwater influence, and at the beach station, probably due the action of waves. The probably cosmopolitan species *Pleurasiga minima*, *Cosmoeca norvegica*, *C. ventricosa* and *Parvicorbicula circularis* were present in spring and/or summer in the estuary channel and coastal area, while *Stephanoeca diplocostata* was recorded in winter and apparently prefers lower temperature. *Calotheca alata* and *Campyloacantha spinifera*, present in spring, are mainly temperate species. The new species *Diplotheca tricyclica* was recorded at the estuary channel in the summer 2000, in high salinity water. At that time the phytoplankton was composed mainly by marine diatoms indicating the importance of advection of marine water for the distribution of choanoflagellates in the Patos Lagoon estuary.

Keywords: Choanoflagellates, taxonomy, Southwest Atlantic Ocean.

2007 BDUA – Journal of Biology, 2: 21. T0118EnioDantas30012007

Title: **Floristic and dynamic of Phytoplanktonic community in a reservoir of hydroelectric potential in Brazilian Northeast**

Authors: Enio Wocyli Dantas, Helton Soriano Bezerra de Oliveira, Emanuel Cardoso do Nascimento, William Severi, Rejane Pimentel & Ariadne do Nascimento Moura

FLORISTIC AND DYNAMIC OF PHYTOPLANKTONIC COMMUNITY IN A RESERVOIR OF HYDROELECTRIC POTENTIAL IN BRAZILIAN NORTHEAST

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ABSTRACT

This work aimed to carry out a survey of phytoplanktonic biodiversity in the Funil Hydroelectric Plant, Bahia State, in Brazilian Northeast and to connect them with strategies of use and management of the system.

The sampling was carried out from November 2005 to August 2006 in 10 stations. The sample was collected through vertical dragging integrated along the euphotic zone, using a net cylindrical-conical, with mesh of 40 µm and preserved with 4% formalin. The identification of phytoplanktonic community was made using specialized bibliography. The density was determined through the sedimentation method, and it was counted in an inverted microscope.

The algal composition showed 173 *taxa*, especially Bacillariophyta, Chlorophyta, Cyanophyta and Euglenophyta. The density varied from 86 org.L^{-1} in station 9 in November 2005 to 61286 org.L^{-1} in station 1 in August 2006. In spite of seasonal differences of density, horizontal differences were more accented with greater densities in lotic passages in the upstream of the dam. In upstream stations, in general, the dominance was of cyanobacteria that were substituted by diatoms and chlorophytes in stations near the dam. *Anabaena constricta, Pleurosira laevis*, *Cyclotella meneghiniana* and *Oocystis lacustris* are quantitatively highlighted.

Keywords: Phytoplankton, diversity, Brazilian Northeastern, reservoir.

2007 BDUA – Journal of Biology, 2: 22. T0119XiomaraGarcia30012007
Title: **Planktonic Cnidaria of the Neritic and Oceanic Provinces of Pernambuco State**
Authors: Lúcia Maria de Oliveira Gusmão, Xiomara Franchesca García Díaz, Sigrid Neumann Leitão & Elaine Melo

PLANKTONIC CNIDARIA OF THE NERITIC AND OCEANIC PROVINCES OF PERNAMBUCO STATE

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ABSTRACT
Studies about the medusa in neritic and oceanic waters of Pernambuco State were carried out to: (1) assess the biodiversity and (2) evaluate the distribution gradient.
The samples were obtained in 34 stations, distributed in 7 profile perpendicular to the coast, during the Joint Oceanographic Projects (JOPS) II, leg 5, from February 25 to March 04, 1995. The collections were made with a Bongo net, with a net 300 micrometers mesh size, in oblique hauls.
It was identified 21 species belonging to the Hydroidomedusae (11 species), Siphonophora (9 species) and Scyphomedusae (1 species). *Chelophyes appendiculata* (Eschholtz, 1829) was the most frequent with 76%, outranking in oceanic samples. It was also frequent (>40%) *Abylopsis eschscholtzi* (Huxley, 1859) occurring in oceanic samples and *Aglaura hemistoma* (Perón e Lesueur, 1810) registered at the neritic region. The density was low with a minimum of 1.41 ind.m^{-3} and a maximum 23.52 ind.m^{-3}. The Mann-Whitney U test showed no significant differences ($p < 0.05$) between neritic and oceanic regions, with higher species number at the oceanic province and higher density at the neritic province. Higher density was also registered at the north of Pernambuco state.

Keywords: Cnidaria, planktonic, neritic, oceanic, Pernambuco.

2007 BDUA – Journal of Biology, 2: 23. T0120CarlosBicudo31012007
Title: **São Paulo State Algal flora: Zygnemaphyceae (smooth-walled *Cosmaria*)**
Authors: Andréa de Araújo & Carlos E. de M. Bicudo

SÃO PAULO STATE ALGAL FLORA: ZYGNEMAPHYCEAE (SMOOTH-WALLED *COSMARIA*)

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ABSTRACT
The "Algal Flora of the State of São Paulo", including freshwater and marine forms, is based on 40 years of collection. Volume on Charophyceae (volume 5 of the series) was already published. *Cosmarium* Corda *ex* Ralfs is, with about 1,500 species described, one of the freshwater algal genera presenting greatest taxonomic diversity. Its taxonomy is today entirely based on morphological features. Recent approaches (molecular biology) proved the already known artificiality of the morphological one.
Sixty four *taxa* of smooth-walled forms of *Cosmarium* distributed in 38 species, 21 varieties that are not the typical of their respective species, and five taxonomical formae that are also not typical, but of their respective varieties, were identified. Taxonomical identification of all 64 *taxa* was made on the basis of characteristics exclusive of the vegetative part of their life cycle. Such characteristics were: (1) linear dimensions of the maximum cell length and breadth and of the isthmus breadth, (2) shape of semicells, (3) number and situation of the chloroplasts in the cell, and (4) number and location of pyrenoids in the plastid.
Many of the species proposed for the genus as well as their varieties and taxonomical formae have ill-defined limits with consequent overlapping of their circumscriptions. It is suggested a thorough taxonomical revision of the genus *Cosmarium* and that, to start this process clearly define which morphological characteristics (diacritic, metric or meristic) must be used as diagnostic ones and at which taxonomic level should they be used.

Keywords: Algal flora, *Cosmarium*, desmid, freshwater, phytoplankton, taxonomy.

2007 BDUA – Journal of Biology, 2: 24. T0121FredericoKurtz11022007
Title: **Abundance and distribution of Carangidae fish larvae of the Potiguar basin, Northeast Brazil**
Authors: N.D. Lima, F.W. Kurtz & M.F. Rocha

ABUNDANCE AND DISTRIBUTION OF CARANGIDAE FISH LARVAE OF THE POTIGUAR BASIN, NORTHEAST BRAZIL

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ABSTRACT
The aim of this study was to characterize the Carangidae fish larvae community at Potiguar basin, Rio Grande do Norte State, Brazil.
Four oceanographic surveys were performed in the study area, as followed: in July 2002 (23 stations), in May 2003 (43 stations), in November 2003 (43 stations) and in May 2004 (43 stations). Ichthyoplankton sampling was performed using a cylindrical-conical net, 0.60 m in mouth diameter, 2.1 m in total length and 500 µm mesh. Hauls were oblique, from the surface to near to the bottom and again towards the surface.
A total amount of 227.18 larvae 100m^3 of Carangidae fish larvae was obtained at the Potiguar basin. These larvae belong to *Carangoides* spp. (Yellow jack), *Chloroscombrus chrysurus* (Atlantic bumper), *Decapterus* spp. (Round scad), *Naucrates ductor* (Pilotfish), *Oligoplites* spp. (Leatherjack) and *Selene* spp. (Lookdown). Carangidae fish larvae occurred on all cruises. *Decapterus* was the dominant genus (52.9%), occurring mainly upon the continental shelf, at a depth around 50 m. The higher abundance was registered during July 2002 and May 2003. *Carangoides* genus also has a remarkable dominance (41.0%).This genus also occurred upon the continental shelf mainly, at an average depth of 50 m, in particular during the months of November 2003 and May 2004. This genus was the most frequent along all the cruises, occurring at 29.5% of the sampling stations.

Keywords: Carangidae, ichthyoplankton, fish larvae, environmental assessment, Northeastern Brazil.

This work is part of the "Potiguar Basin Environmental Assessment Project", coordinated by CENPES-PETROBRAS.

2007 BDUA – Journal of Biology, 2: 25. T0122RibeiroCrispim10022007
Title: **Longo-term investigations on the zooplankton community in Taperoá II Dam, Taperoá – PB, Brazil**
Authors: Leonardo Leoncio Ribeiro & Maria Cristina Crispim

LONGO-TERM INVESTIGATIONS ON THE ZOOPLANKTON COMMUNITY IN TAPEROÁ II DAM, TAPEROÁ – PB, BRAZIL

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ABSTRACT
Aquatic environments undergo several changes with time, due mainly to climatic conditions, which are not the same every year. In Caatinga, the Northeast Brazilian semi arid zone, superficial reservoirs show rapid changes in volume and water quality in a short period of time. They may dry out completely when there is not enough rain for a few years. The goal of this work was to study the zooplankton community of Taperoá II Dam (Taperoá – PB, Brazil) over five years (2002-2006). This 15,48,900 m³ dam was completely drought out in November 2003, when rainfalls were 26% below the historic average, but recovered its maximum capacity in January 2004 when rainfalls came. From 2004 to 2006 rainy seasons were enough to keep water in the dam.
There were 42 species of rotifers, 14 species of cladocerans, but only seven species were constant ($f > 0.5$) and 12 were accessories ($0.25 < f \leq 0.50$). The pre-drought period was characterized by a high tropic degree and high abundance of *Brachionus angularis*, *B. caudatus*, *Polyarthra dolichoptera* (Rotifera) and *Moina minuta* (Cladocera). While the post-drought period registered a low trophic degree with highest densities of *Keratella tropica*, *K. Americana*, *Filinia opoliensis*, *Pompholyx triloba* (Rotifera), *Diaphanosoma spinulosum*, *Ceriodaphnia cornuta* and *Macrothrix* sp. (Cladocera). In the post-drought period it was also registered a greater number of species (both rotifers and cladocerans) than were in the pre-drought period. The number of species grew to an average of eight species each year, but in year 2002 they were more similar to year 2003 than others years. After 2004's rainfalls a greater quantity of macrophytes developed in the dam's shore, probably favouring the higher number of species.

Keywords: Zooplankton; Diversity; Caatinga; long-term studies.

2007 BDUA – Journal of Biology, 2: 26. T0123Nagela29012007

Title: **Species of the genus *Chaetoceros* (Bacillaryophyceae) in the plankton from Cumá, São Marcos and São José's bays, MA - Brazil**

Authors: Nágela G.R.Santos, Marco V.J. Cutrim, Andrea C.G. Azevedo, Francisca Ires M.S.B. Ribeiro & Eliesé I. Rodrigues

SPECIES OF DIATOMS GENUS *Chaetoceros* (BACILLARIOPHYCEAE) IN THE PLANKTON FROM THE CUMÃ, SÃO MARCOS AND SÃO JOSÉ'S BAYS – MA - BRAZIL

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ABSTRACT

Phytoplankton samples were collected along the north coast of the Maranhão State (Cumã, São Marcos and São José's Bays) in different seasons in the period 1999-2000 and 2005-2006 from 8 stations. Qualitative samples were taken with a 40 µm mesh net. The preserved net material was treated with to 4% formalin.

Twenty-two *taxa* (21 species and only one variety) were identified. The total *taxa* identified, 4.6% were considered very frequent, 9.1% frequent, 45.5% less frequent and 40.8% sporadic. São José Bay was the most representative with 17 species, followed São Marcos Bay (8 species) and 5 in Cumã Bay. The most common and widespread *taxa* were *Chaetoceros subtilis* and *C. peruvianus*. A considerable number of *taxa* have been exclusive from São José Bay (12 species), only 4 from São Marcos and no exclusives species in Cumã Bay. Fourteen species showed exclusive occurrence during the rainy period, while 2 species occurred in dry period.

Keywords: Diatoms, *Chaetoceros*, phytoplankton, Brazilian north.

2007 BDUA – Journal of Biology, 2: 27. T0124TathianeGaldino15022007
Title: **Zooplankton from the convergence zone in the North and South inlets of the Santa Cruz Channel – Itamaracá, Pernambuco, Brazil**
Authors: Tathiane Galdino dos Santos, Lúcia Maria de Oliveira Gusmão, Sigrid Neumann-Leitão, Tâmara de Almeida e Silva & Ralf Schwamborn

ZOOPLANKTON FROM THE CONVERGENCE ZONE IN THE NORTH AND SOUTH INLETS OF THE SANTA CRUZ CHANNEL – ITAMARACÁ, PERNAMBUCO, BRAZIL

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ABSTRACT
Zooplankton studies were carried out on the Orange and Catuama Inlets at the Santa Cruz Channel, Itamaracá, Pernambuco – Brazil.
Zooplankton samples were obtained when convergence zones were registered in the Mid (M) station. At the same time two stations were sampled at Island (I) and Continent (C) sides of the convergence zone. Collections were made during spring and neap tides in the rainy season (August/2001). Zooplankton samples were obtained at surface by horizontal hauls during 3 minutes using a 300 µm mesh size net. The convergence zone was registered only four times at each inlet.
Thirty-four zooplankton *taxa* were identified. Copepoda was the most abundant with twenty-two species. In the North Inlet (Catuama), the most frequent organisms were: *Acartia lillgerborgi*, *Temora turbinata*, *Calanopia americana*, *Paracalanus aculeatus*, *Labidocera fluviatilis*, *Euterpina acutifrons*, *Corycaeus* (*Onychocorycaeus) giesbrechti*, Teleostei (eggs), Decapoda larvae, *Lucifer* sp. (zoeae), Brachyura (zoeae), Gastropoda (veliger), Amphipoda (Gammaridea), *Lucifer faxoni* and *Sagitta tenuis*. In the South Inlet (Orange), the most frequent organisms were: *Acartia lilljeborgi*, *Temora turbinata*, *Euterpina acutifrons*, *Pseudodiaptomus acutus*, *Calanopia americana*, Teleostei (eggs and larvae), *Balanus* sp. (nauplius), Brachyura (zoeae), *Oikopleura longicauda*, Decapoda larvae and *Lucifer* sp. (protozoeae and zoeae). The South Inlet (Orange) presented the largest average density (1427,83 org.m^{-3}). At the North Inlet (Catuama) predominated Brachyura zoeae larvae. Species diversity and evenness presented medium values.
The area is productive and strongly influenced by the marine flux.

Keywords: Zooplankton, estuary, Convergence zone, Santa Cruz Channel.

2007 BDUA – Journal of Biology, 2: 28. T0125RobertoSassi14022007
Title: **Nychthemeral variations of Tintinnina (Ciliata: Oligotrichida) at the athol das Rocas region (western of South Atlantic) and their relationships to other microzooplanktonic components**
Authors: Roberto Sassi, Eliane Maria de Souza Nogueira & Tarcísio Alves Cordeiro

NYCHTHEMERAL VARIATIONS OF TINTINNINA (*CILIATA: OLIGOTRICHIDA*) AT THE ATOL DAS ROCAS REGION (WESTERN OF SOUTH ATLANTIC) AND THEIR RELATIONSHIPS TO OTHER MICROZOOPLANKTONIC COMPONENTS

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ABSTRACT
The major question in the study of microzooplankton is the scarcity of data particularly from oceanic waters of the South-Atlantic. In this work it was studied tintinnines and other microzooplanktonic organisms found at surface waters of a fixed oceanic station near the Atol das Rocas Island (Northeast Brazil), in different times of a day-night cycle from 14 to 17 March 1999.
Tintinnines dominated and were represented by 42 species. Greatest diversities and abundances were found in diurnal samples though the largest fluctuations were observed at all the times. The greatest diversities and abundances were found in the daytime at 6:00 h and at 14:00 h and in the night-time at 19:00 h and at 21:30 h. The most frequent and abundant species were *Rhabdonellopsis apophysata, Rhabdonella amor, R. elegans*, *Undella claparedei*, *Epiplocylis undella*, and *Eutintinnus apertus*. Copepods and crustacean larvae had expressive occurrence during the day, being more abundant at 7:00 h and at 14:00 h. The Foraminifera showed greater contribution only at 6:00 h, 9:00 h, 10:00 h, and 14:00 h. Other microzooplantktonic groups were observed occasionally. Vertical migrations, patchy distributions and the 'island effect' were the principal hypotheses that were used to explain the observed pattern.

Keywords: Microzooplankton, Tintinnina, Nicthemeral variations, Tropical Atlantic Ocean.

2007 BDUA – Journal of Biology, 2: 29. T0126RobertoSassi14022007
Title: **Structure of Tintinnina communities in the atol das Rocas (Rio Grande do Norte) and Fernando de Noronha (Pernambuco)**
Authors: Eliane Maria de Souza Nogueira, Roberto Sassi & Tarcísio Alves Cordeiro

STRUCTURE OF TINTINNINA COMMUNITIES IN THE ATOL DAS ROCAS (RIO GRANDE DO NORTE) AND FERNANDO DE NORONHA (PERNAMBUCO)

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ABSTRACT
In the present work it was studied the diversity and distribution of Tintinnina occurring in the area influenced by the Atol das Rocas and the archipelago of Fernando de Noronha, Northeast Brazil.
Analyses were carried out in twenty-seven samples of plankton gathered from 200 m depth up to the surface between 12 March/1999 and 01 April/1999 by using a plankton net 20 µm mesh. The samples collected were fixed in neutral 4% formalin being later examined in an inverted microscope.
Thirty-six species were found in the 27 stations studied, of which 10 were very frequent and 8 were frequent. The majority of Tintinnina occurred in the station 26 (122 individuals.m^{-3}), situated close to Fernando de Noronha; but high densities were also recorded in the stations 1 and 2, situated in distant areas, and in the station 5, situated close to the Atol das Rocas. *Eutintinnus fraknoi* was the most quantitatively important species, representing 57.89% of dominance in the station 4. The index of specific diversity varied from high to median, because in 27% of samples the values were above 3 bits.ind^{-1} and in 17% of samples the values were above 2 bits.ind^{-1}. The equitability oscillated between 0.59 and 1.05. The association of species and the association of stations did not allow any expressive cluster type in the regions studied.
The data obtained here are discussed taking in account the hydrographic features of the region and the distribution of chlorophyll.

Keywords: Oceanic plankton, spatial distribution, western South Atlantic, microzooplancton, Tintinnina, Northeast Brazil.

2007 BDUA – Journal of Biology, 2: 30. T0127NunoMelo14022007
Title: **Diversity and distribution of Copepoda (Crustacea) in the Amazon (North Brazil) continental shelf**
Authors: Nuno Filipe Alves Correia de Melo, Sigrid Neumann, Lúcia Maria de Oliveira Gusmão, Tâmra de Almeida e Silva & Caio Aguiar Rodrigues Ramos

DIVERSITY AND DISTRIBUTION COPEPODA (CRUSTACEA) IN THE AMAZON (NORTH BRAZIL) CONTINENTAL SHELF

Nuno Filipe Alves Correia de Melo[1], Sigrid Neumann-Leitão[2], Lúcia Maria de Oliveira Gusmão[2], Tâmara de Almeida e Silva[2] & Caio Aguiar Rodrigues Ramos[3]

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ABSTRACT
Studies were carried in 51 oceanographic stations located in neritic and oceanic stations along the North Brazil Continental Shelf, during three oceanographic cruises in 2001. A bongo net 300 µm mesh size was used to collect the samples through oblique hauls.
It was identified 109 Copepoda species. Calanoida was represented by 81 species, followed by Poecilostomatoida (19 species), Harpacticoida (4 species) and Cyclopoida (5 species). The most abundant species in the neritic province were *Subeucalanus pileatus, Temora stylifera* and *Rhincalanus cornutus.* At the oceanic province outranked *Undinula vulgaris, Euchaeta marina, Nannocalanus minor, Clausocalanus furcatus, Scolecitrix danae, Calocalanus pavo, Corycaeus (O.) speciosus, Farranulla gracilis* and *Oithona plumifera*, indicators of oligothrofic condition. The species diversity index varied from 1.04 bits.ind^{-1} to 3.16 bits.ind^{-1}. Diversity increased from the neritic to the oceanic province. Evenness was generally over 0.5 showing a balanced community. The Amazon plume has an important role in structuring the Amazon continental shelf and adjacent area, creating a complex mosaic of habitats for the zooplankton, contributing to a high diversity in the region.

Keywords: Amazon, Copepoda, Zooplankton.

2007 BDUA – Journal of Biology, 2: 31. T0128NunoMelo14022007
Title: **Composition and density of Cladocera (Crustacea) in two Central Amazonian Lakes (Amazonas, Brazil)**
Authors: Nuno F. A. Correia de Melo, Elsa Rodrigues Hardy & Bárbara Ann Robertson

COMPOSITION AND DENSITY OF CLADOCERA (CRUSTACEA) IN TWO CENTRAL AMAZONIAN LAKES (AMAZONAS, BRAZIL)

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ABSTRACT
Two Central Amazonian lakes were studied: Camaleão lake (white water) and Cristalino lake (black water), two station collection for each (Cam-I/Cam-II and Cris-I/CrisII). The sampling was made weekly in two periods of the hydrological cycle, flood and low water. For the composition, a plankton net was used, with a mesh size of 55 µm, being towed both horizontally and vertically in water column. For the density, a Schindler-Patalas trap was used. That material was preserved, by first adding carbonated water and soon after that formaldehyde at 6%. Simultaneously abiotic factors were taken.
Cladocera was represented by 57 *taxa* in witch 32 rates occurred exclusively in the Camaleão lake, only 2 in Cristalino lake, and 23 showed up in the two environments. In the Camaleão lake, 8 families were registered, being Chydoridae represented by 27 rates, Sididae by 9 rates, Macrothricidae with 7, Daphnidae and Bosminidae with 4, Moinidae with 2 and Holopedidae and Ilyocryptidae with 1 taxon. In Cristalino lake, 7 families were registered, Chydoridae with 9 rates, Bosminidae with 5, Sididae and Daphnidae with 3, Macrothricidae and Moinidae with 2 rates, and Holopedidae with 1 taxon. In general the highest density registered occurred in Cristalino lake with 428,800 ind.m^{-3} (Cris-I) and 770,298 ind.m^{-3} (Cris-II), almost 5 times greater than Camaleão lake. The largest densities were registered in the dry season of the two lakes. *Bosminopsis deitersi*, *Ceriodaphnia cornuta, Diaphanosoma polyspina* and *Moina minuta*, were the most frequent and abundant species during the study period.

Keywords: Amazon, Zooplankton, Floodpulse.

2007 BDUA – Journal of Biology, 2: 32. T0129NunoMelo14022007
Title: **Preliminary Caracterization of zooplankton in National forest of Caxiuanã (Pará-Brazil)**
Authors: Atilla Melo do Nascimento, Fábio Ferreira Cardoso, Caio Aguiar Rodrigues Ramos, Cristiane Teixeira Contente & Nuno Filipe Alves Correia de Melo

PRELIMINARY CARACTERIZATION OF ZOOPLANKTON IN NATIONAL FOREST OF CAXIUANÃ (PARÁ-BRAZIL)

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ABSTRACT
The national forest of Caxiuanã is located in city of Melgaço-Pará, 350 Km far from west of Belém next to Museum's Emílio Goeldi Scientific Station Ferreira Penna.
Quantitativity and qualitativity samples were collected on January/06, June/06 and November/06 in 23 stations, using conical plankton net measuring 64 µm. Data of physical-chemical parameters were obtained.
Temperature varied from 25°C (Station I - Nov/06) to 32°C (Station XVIII - JUN/06). Dissolved oxygen varied from 3.37 mg.L^{-1} (Station I - Jan/06) to 9.92 mg.L^{-1} (Station XVI - Nov/06), and pH varied from 4.45 (Station II - Jan/06) to 6.82 (Station XIX - Nov/06). Were identified 22 zooplankton species, which 14 were rotifers: *Asplanchna* sp., *Filinia* sp., *Lecane bulla, lecane cornuta, lecane ludwigi, Lecane luna, Keratella americana, Keratella cochlearis, Platyias quadricornis, Proales* sp., *Testudinela ohlei, Testudinela patina, Trichocerca insignis and Trichocerca similis*; 6 Cladocera's species: *Alonella daday, alonella excisa, alonella* sp., *Bosmina hagmanni, Bosmina longirostris and Chydorus eurynotus* and two Copepoda's species: *Thermocyclops* sp. and *Paracyclops fimbriatus*. Beside Copepoda, nauplius, mite and insect larvae were found. The most frequent rotifers species were the genus Lecane, specifically *Lecane luna, Alonella daday* and *Bosmina longirostris* were the most frequent Cladocera's species, and among Copepoda's species, *Paracyclops fimbriatus* presented the highest density.

Keywords: Amazon, Zooplankton, Limnology.

2007 BDUA – Journal of Biology, 2: 33. T0130RodrigoMeire15022007
Title: **Mysidacea found in the estuaries and coast waters of Rio Grande do Norte**
Authors: Rodrigo Rocha Meire, Katrine Bezerra Cavalcanti & Guilherme Fulgêncio de Medeiros

MYSIDACEA FOUND IN THE ESTUARIES AND COAST WATERS OF RIO GRANDE DO NORTE

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ABSTRACT
Zooplankton samples were analyzed at the Zooplankton Laboratory of the Department of Oceanography and Limnology of the Federal University of Rio Grande do Norte, with the aim of identifying the mysidacea found in the estuaries and coast waters of Rio Grande do Norte.
The samples were obtained by vertical and horizontal hauls using a plankton conical net (30 cm diameter, 1.5 m length and 120 µm mesh size).
Until now the following species have been found: *Siriella thompsoni* (H. Milne Edwards, 1837), *S. chierchiae* Coifman, 1937, *Anchialina typica* Kröyer, 1861, *Bowmaniella recifensis* da Silva, 1971, *B. dissimilis* Coifman, 1937, *B. inarticulata* da Silva, 1972 and *Metamysidopsis swifti* Bacescu, 1969. The *Anchialina typica* species has been the most abundant and most frequent one among our samples.

Keywords: Mysidacea, estuary, coast, Rio Grande do Norte.

2007 BDUA – Journal of Biology, 2: 34. T0131AlbanoMagrin15022007
Title: **Diatom plankton across a section of Dourados River connected to a small, shallow lake (Mato Grosso do Sul – Brasil)**
Authors: Albano Geraldo Emilio Magrin

DIATOM PLANKTON ACROSS A SECTION OF DOURADOS RIVER CONNECTED TO A SMALL, SHALLOW LAKE (MATO GROSSO DO SUL – BRASIL)

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ABSTRACT
This is the first study carried out in a section of Dourados River, connected to a shallow lake (Rebojo Lake), aiming to characterize the diatom component of the river and lake plankton. Dourados River drains an area of 9,205.41 Km^2 and is a right margin tributary of Ivinhema River, in the Paraná Basin.
Samples were collected in 3 sites located along Dourados River between the coordinates 22°21'28,2"–22°22'43,2" S and 54°31'34,8"–54°59'20,4" W, from November 2002 to October 2003, every 2 months in the lotic sites and monthly in Rebojo Lake.
Planktonic diatons were characterized by 36 genera, 83 species and 5 varieties. Genera with the higher number of species were *Eunotia* (13), *Gomphonema* (6), *Navicula* (6), *Surirella* (6), and *Aulacoseira* (5). Sixty two species were biraphide, 17 araphide and only 4 monoraphide, while 66 were unicellular, 10 chains forming and 7 colonial. Taxonomic and functional groups analyses based on shapes, sizes, habitats and survive strategies of the diatoms showed a clear spatial distribution of the species. In the lotic sites, unicellular, great species and chains forming were commonly found, forms adapted to the typical turbulence of the river to the maintenance of the suspended life. On the other hand, in the lentic site, in addition to the euplanktonic *taxa*, the diatom plankton showed several benthic and epiphytic species encountered also in the periphyton.
This interchange of species, moreover, reveals a tycoplanktonic character of the community in the lake due to the profuse development of floating macrophytes.

Key words: Diatoms, Dourados River, spatial distribution.

THEME 2

Environmental control of plankton. Effects of physical, chemical and biological forcing on plankton distribution, structural properties and rate processes at any spatial and temporal scale

2007 BDUA – Journal of Biology, 2: 37. T0201Rita10092006
Title: **Control of plankton dynamic in a shallow lake**
Authors: Ana R. Lopes, Vânia S. Bessa, Catarina Pereira, Adelaide Almeida, M. Ângela Cunha & Mário J. Pereira

CONTROL OF PLANKTON DYNAMIC IN A SHALLOW LAKE

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ABSTRACT
Cyanoprokaryota are bacteria that behave like algae. They have chlorophyll *a* and release oxygen as a subproduct of photosynthesis, using water molecules as electron donors. In this group there are organisms highly diverse in terms of morphology, cytology and environment preferences, cover more than 2000 species.
Depending on environmental conditions, these organisms may form blooms, with highly diverse consequences in water quality, in water fauna, flora and in public health. These organisms may have many and relevant applications such as: food supplement (*Spirulina/Arthrospira*), fertilizing (*Anabaena azollae* in symbiosis with *Azolla*) in rice cultures, effluents treatments, and antiviral and antitumors synthesis. Despite these advantages, some cyanobacteria produce toxins that may become dangerous to life in general and for Humankind that may become an ecologic problem reverting in health problems.
This communication aims to discuss biotic and abiotic parameters in order to contribute to explain the plankton dynamics in a shallow lake.

Keywords: Cyanobacteria, phytoplankton, biotic and abiotic parameters, population dynamics.

2007 BDUA – Journal of Biology, 2: 38. T0202Kannan06122006
Title: **Planktonic characteristics of the pristine, remote, oceanic island, the Great Nicobar Island, India**
Authors: L. Kannan, S. Paramasivam, P. Perumal & S. Ajmal Khan

PLANKTONIC CHARACTERISTICS OF THE PRISTINE, REMOTE, OCEANIC ISLAND, THE GREAT NICOBAR ISLAND, INDIA

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ABSTRACT
Community structure of phyto- and zooplankton of the pristine, remote island viz. The Great Nicobar island was studied for a period of three years from 2000 – 2003 at 33 selected locations. The study revealed the occurrence of 150 species of phytoplankton and 109 forms of zooplankton in the coastal waters of the island. Higher percentage composition of phytoplankton of the coastal waters was contributed by Bacillariophyceae followed by Dinophyceae, Cyanophyceae and Chlorophyceae, with the population density values ranging from 34,000 to 1,88,000 cells.m^{-3}. In the case of zooplankton, copepode was the dominant group followed by larval forms and others with the population density ranging from 15,000 to 2,97,000 orgs.m^{-3}. There was also a greater spatial variation in the distribution, diversity, density, richness and evenness of phyto- and zooplankton as a result of the primary (0.6 - 32.03 mg C m^3.day^{-1} of gross primary productivity 1.2 - 15.63 mg C m^3.day^{-1} of net primary productivity) and secondary productivities (103.7 to 647.6 mg C.m^{-2} year), which also widely fluctuated depending upon the habitat of the study sites. By comparing the generic level data of phytoplankton, a total of 57 genera viz. Bacillariophyceae (30 genera), Dinoflagellates (5 genera), blue-greens (12 genera) and Chlorophyceae (10 genera) have been found to be the new distributional records to this island. A better list could have been given up to species level, provided the already existing literatures have had the species level identification. In the back drop of the 2004 Boxing Day tsunami, these data could be helpful in identifying the possible planktonic bioinvasions into this region, causing serious damage to the local ecology of the island.

Keywords: Characteristics, diversity, population density, primary productivity.

2007 BDUA – Journal of Biology, 2: 39. T0203AdelaideVirusLVela11012007

Title: **Variation of viruses-to-bacterium ratio during a phytoplankton bloom in a shallow freshwater lake**

Authors: Adelaide Almeida, Sara Salvador, Nance Loureiro, Ângela Cunha, Ana R. Lopes, Vânia S. Bessa & Mário J. Pereira

VARIATION OF VIRUSES-TO-BACTERIUM RATIO DURING PHYTOPLANKTON BLOOM IN A SHALLOW FRESHWATER LAKE

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ABSTRACT

The high viral counts reported in aquatic systems suggest that viral infection may be an important factor controlling bacterial populations in natural waters. In order to test the importance of viruses on bacterial dynamics, we have taken advantage of the spring phytoplankton bloom, which occurs regularly in the shallow freshwater Vela Lake, causing large natural fluctuations in the density of pelagic viruses and bacteria. Viral particles were counted by epifluorescence microscopy after staining with SYBR gold. Total bacterial number was determined by epifluorescence microscopy after staining with acridine orange. Viral and bacterial densities were determined every second day between April and June of 2006 in surface water samples (32 samples). The concentration of viruses through the spring bloom decrease from 2 x 10^{12} viruses.L^{-1} after the chlorophyta bloom to 5 x 10^{10} viruses.L^{-1} during the peak of cyanobacteria, with a mean of 2 x 10^{11} viruses.L^{-1}. Bacterial numbers followed the same pattern of variation, decreasing during the bloom from 3.3 x 10^{11} cells.L^{-1} to 1.1 x 10^{11} cells.L^{-1} with a mean of 1.6 x 10^{11} cells.L^{-1}. Although viruses counts were, on average, higher than bacterial counts, yielding mean virus-to-bacterium ratio of 1.4 (range 0.3 to 5.7), the virus-to-bacterium ratio was frequently low, showing values below 1 in 57 % of the cases. The same pattern of variation of viruses and bacteria during the phytoplankton bloom as well as the significant correlation between viruses and bacteria ($p<0.05$) suggest that a significant fraction of viruses are bacteriophages. However, the frequent low viruses-to-bacteria ratios seem to indicate that during a bloom a large fraction of planktonic viruses results from phytoplankton cells infection.

Keywords: Viruses, bacteria, phytoplankton bloom, freshwater.

2007 BDUA – Journal of Biology, 2: 40. T0204CBicudo16012007
Title: **Phytoplankton adaptive strategies in a long-term study (8 years) in an urban eutrophic shallow reservoir (Garças reservoir) in spatial and temporal scale**
Authors: Luciane O. Crossetti & Carlos E. de M. Bicudo

PHYTOPLANKTON ADAPTIVE STRATEGIES IN A LONG-TERM STUDY (8 YEARS) IN AN URBAN EUTROPHIC SHALLOW RESERVOIR (GARÇAS RESERVOIR) IN SPATIAL AND TEMPORAL SCALE

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ABSTRACT
Evaluation of phytoplankton adaptive strategies in an urban eutrophic shallow reservoir considering temporal and vertical scales. Garças Reservoir is located in the Parque Estadual das Fontes do Ipiranga Biological Reserve, southeast Brazil.
Samplings were carried out monthly during 8 consecutive years (1997-2004), following the water column vertical profile (5 depths: sub-surface, 1 m, 2 m, 3 m and ± 20 cm from the bottom).
At the beginning of the 8 years series, reservoir was eutrophic with 20% of its surface covered by *Eichhornia crassipes* (phase I); water hyacinth growth reached 40-70% of pond surface (phase II), being mechanically removed (phase III). Regarding adaptive phytoplankton community strategies, phase I was basically dominated by *Sphaerocavum brasiliense*, mainly in the stratified months (September) represented by non flagellated colonies, M functional group, S-strategists and greater biomass of species with higher GALD and cellular volumes (> 50 µm and > 10^4 µm^3); phase II was dominated by *Cryptomonas curvata*, *Cryptomonas erosa*, *Cryptomonas marsonii*, *Trachelomonas sculpta*, *Trachelomonas volvocinopsis*, *Trachelomonas kellogii, Trachelomonas hispida*, *Peridinium* spp., *Aphanocapsa* spp. and *Aphanotece* spp., represented by flagellated unicellular species, Y, W2, K, L0 functional groups and C-strategists, greater biomass of species with intermediate GALD and cellular volumes (21-50 µm and 10^3-10^4 µm^3); and phase III was dominated by *Microcystis aeruginosa*, *Microcystis panniformis*, *Cylindrospermopsis raciborskii*, *Planktothrix agardhii* and *Aphanizomenon gracile*, represented by non-flagellated colonies, M, S, H1, S functional groups, S and R-strategists, greater biomass of species with higher GALD and cellular volumes (> 50 µm and > 10^4 µm^3).

Keywords: Phytoplankton, long-term study, functional groups, adaptive strategies, tropical shallow reservoir, eutrophication.

2007 BDUA – Journal of Biology, 2: 41. T0205ClaudiaFileto16012007
Title: **Effects of Temperature and seston quality on cladocerans from Camargo lake (transition zone of Paranapanema river – Jurumirim reservoir)**
Authors: Cláudia Fileto, R. Henry & R.A.R. Ferreira

EFFECTS OF TEMPERATURE AND SESTON QUALITY ON CLADOCERANS FROM CAMARGO LAKE (TRANSITION ZONE OF PARANAPANEMA RIVER – JURUMIRIM RESERVOIR)

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ABSTRACT
The effects of temperature on the life cycle and of seston quality (algae size and shape) on individual growth and reproduction of cladocerans species were tested in laboratory.
Life table experiments, using the green algae *Scenedesmus spinosus* as food, were carried out at 17 ºC and 27 ºC (means of water temperature at winter and summer, respectively). Growth bioassays tested the influence of natural seston separated into two size classes by net filtration. The treatments used were: (1) seston ≤ 36 µm size, (2) seston > 36 µm size and (3) total seston enriched with *S. spinosus* (1 mg $C.L^{-1}$).
Higher values of the intrinsic rate of natural increase were found for *Moina micrura* (0.43) and *Daphnia ambigua* (0.25) at 27 ºC compared to 17 ºC (0.12 and 0.14, respectively). Primipara values increased for both species at 17 ºC (6.5 and 6.0 days for *M. micrura* and *D. ambigua*, respectively). *Moina micrura* growth rates were significantly higher in the ≤ 36 µm seston fractions (0.10) compared to the > 36 µm (zero) while no significantly differences were found for *Bosmina longirostris*.
Reproduction was negatively affected by the large fraction (> 36 µm) for both species. Phytoplankton counting of seston showed high densities of large Bacillariophyceae in the treatment using the fraction > 36 µm, which could have contributed to the reduced growth and reproduction of the species. It was concluded that temperature can affect cladoceran population and that the size of food influences growth and reproduction of the tested species.

Keywords: Cladocera, food size, phytoplankton, seston, temperature, tropical cladocerans.

2007 BDUA – Journal of Biology, 2: 42. T0206NaithirithiChellappa17012007

Title: **Reservoir phytoplankton ecology of annual cycle 2004 – 2005 from Rio Grande do Norte State, Brazil**

Authors: Naithirithi T. Chellappa, Fabiana Rodrigues de Arruda Câmara & Rafson Varela dos Santos

RESERVOIR PHYTOPLANKTON ECOLOGY OF ANNUAL CYCLE 2004 – 2005 FROM RIO GRANDE DO NORTE STATE, BRAZIL

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ABSTRACT

The ecology of the freshwater phytoplankton assemblages was investigated in João Alves Reservoir of Parelhas, Rio Grande do Norte, from July, 2003 to June, 2004. These studies are important for the reservoir management and development of inland fisheries. This tropical shallow reservoir is located on the Serido River of Piranhas-Açu hydrographic basin and has a water holding capacity of 85.012.750 m^3. Water samples, Phytoplankton and fish samples were collected on fortnightly basis from a fixed station where maximum depth was registered. Ecological indices, such as, Shannon-Weaver and Pielou were calculated for species diversity and evenness, besides Margalef's species richness index. The variables, such as, pH, temperature, electrical conductivity and dissolved oxygen concentrations were analyzed, besides nitrate-nitrogen, ammoniacal nitrogen, orthophosphate and chlorophyll content. Alkaline pH, reduced transparency, significant dissolved oxygen concentrations and moderate electrical conductivity were observed during an annual cycle. The trophic status of the reservoir shows a tendency of oligo to mesotrophic state, with low to moderate inorganic nutrients. The phytoplankton showed the dominance of diatom species, *Aulacoseira granulata, A. distans* and *Cyclotella meneghiniana* both during dry and wet period and correlated significantly with reactive silicate and nitrate-nitrogen. The Chlorophyceae species, particularly *Oocystis borgei* grew with the onset of rainy season and co-existed with the Cryptophyceae species. The proliferation of “r” strategists’ of unicellular and colonial forms of phytoplankton species contributed to increase the diversity and co-occurrence. The reduced cyanobacterial species was attributed to corrective management practice, which aimed to keep sustained development of cage culture of fishes under organic cultivation and limited nutrient levels.

Keywords: Phytoplankton, Rio Grande do Norte, hydroperiod, eutrophication.

2007 BDUA – Journal of Biology, 2: 43. T0207RegaliSeleghim19012007
Title: **Protozooplankton of an oligotrophic tropical lake (Dom Helvécio-Brazil) – Spatial distribution and composition**
Authors: M.H. Regali-Seleghim, M.J.L. Godinho & O. Rocha

PROTOZOOPLANKTON OF AN OLIGOTROPHIC TROPICAL LAKE (DOM HELVÉCIO-BRAZIL) – SPATIAL DISTRIBUTION AND COMPOSITION

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ABSTRACT
Protozooplankton (ciliates, sarcodines and microflagellates) density and composition was analyzed from samples of the surface of nine sampling stations in an oligotrophic tropic lake situated in the southern Brazil (Dom Helvécio). The bottom and metalimnion samples of two stations were also analyzed to verify the protozooplankton vertical distribution.
For the analyses, 200mL water samples were fixed with mercuric chloride and stained with bromophenol blue and the concentrated material was used for qualitative and quantitative analyses.
Ciliates were numerically dominant (11.5 ind.mL^{-1}), followed by the sarcodines (2.0 ind.mL^{-1}) and the microflagellates (0.3 ind.mL^{-1}). Among the sarcodines, the testaceans were the most important ones (1.8 ind.mL^{-1}). It was found 52 protozoan *taxa* (40 of ciliates, 8 of testacea, 2 of heliozoa and 2 of microflagellates). This number of *taxa* is higher than the commonly found in the literature for one single water body. The two most abundant were *Mesodinium pulex* and *Halteria grandinella*.
Considering the dominant protozoan *taxa*, the most successful ecological strategies in this oligotrophic environment was the jumping behavior, which facilitate predation escape, and the variability of feeding. The water column was stratified and the bacterivorous protists (Hymenostomata) were more important with the increasing depth. The analyses of the horizontal distribution of protozoa showed that the sampling stations were heterogeneous concerning the protozoan densities but, taxonomically, samples from the littoral were quite different from pelagic ones, with the dominance of the peritrichids and testaceans in the littoral.

Keywords: protozoa, lake, plankton, tropical.

2007 BDUA – Journal of Biology, 2: 44. T0208MLuiseKoening20012007
Title: **Microphytoplankton from neritic and oceanic regions of Pernambuco State – Brazil**
Authors: Maria Luise Koening, Byanca Eugenia Wanderley & Silvio José de Macedo

MICROPHYTOPLANKTON FROM THE NERITIC AND OCEANIC REGIONS OF PERNAMBUCO STATE – BRAZIL

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ABSTRACT
This research was carried out to access the phytoplankton biodiversity, distribution and ecology at Pernambuco Continental Shelf and Oceanic region.
Samples were obtained during the Joint Oceanographics Project (JOPS II)-Leg 5 by double oblique hauls with a bongo net 64 μm mesh size. Seven transects perpendicular to coast were studied, totaling 34 stations.
The temperature and salinity characterized the tropical water mass. The dissolved oxygen was over saturated in all stations and the pH was alkaline. The nutrients low concentrations, characterized an oligothrophic pattern. It was identified 173 specific and infraspecific *taxa*: Dinophyta (103 *taxa*), Bacillariophyta (61 *taxa*), Cyanophyta (7 *taxa*), Chlorophyta and Chrysophyta (1 *taxon*). The family Ceratiaceae presented the highest species number (47 *taxa*). The blue-green algae *Trichodesmium thiebautii*, *Oscillatoria* spp. and the diatom *Leptocylindrus danicus* had higher frequency of occurrence and abundance. Species diversity varied from 0.71 to 3.46 bits.cell^{-1}, this low index due to *Trichodesmium thiebautii* bloom and evenness from 0.14 to 0.65, showing an unstable pattern. The oceanic planktonic species outranked by the higher species richness with 78 *taxa*. The species association presented two groups, the first divided in two subgroups: the first associated the neritic/oceanic and oceanic planktonic species and the second subgroup the oligotrophic indicator species. The second group was composed by some keys species, and the most abundant and frequent at the area. The Principal Component Analysis explained 50.91% of the data variance and showed that the area is structured by two groups, one occurring offshore composed by oligotrophic indicators, and another near shore influenced by continental fluxes.

Keywords: Microphytoplankton, ecology, neritic region, oceanic region, Pernambuco State.

2007 BDUA – Journal of Biology, 2: 45. T0209AngelaCunha24012007
Title: **Characterization of bacterioplankton and bacterioneuston in the estuarine system Ria de Aveiro, Portugal**
Authors: Ângela Cunha, Francisco Coelho, Ana L. Santos, Vanessa Oliveira, Luisa Santos & Adelaide Almeida

CHARACTERIZATION OF BACTERIOPLANKTON AND BACTERIONEUSTON IN THE ESTUARINE SYSTEM RIA DE AVEIRO, PORTUGAL

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ABSTRACT
The surface microlayer (SML) is defined as the upper 10-1000 µm of the marine water column, at the interface with the atmosphere. The communities of bacteria developing in this thin layer are referred as the bacterioneuston. Several studies show that these communities are distinct from bacterioplankton developing below in terms of abundance, composition and activity rates. The aim of this work was to verify if these differences also occur in the water column of shallow estuarine systems.
Rates of ectoenzymatic activities (peptidase, aminopeptidase, β-glucosidase, β-galactosidase, esterase and phosphatase) were determined fluorimetrically as the maximum hydrolysis rate of the fluorogenic model substrates. Monomer incorporation rates were estimated by amendment of radiolabeled glucose, leucine or acetate. The composition of SML and underlying water (UW) bacterial communities was assessed by fluorescence in situ hybridization (FISH) using the oligonucleotide probes Alf968 for α-*Proteobacteria*, Gam42a for γ-*Proteobacteria* and CF319a for the *Cytophaga-Flavobacterium* cluster. Samples of SML and UW were also compared as to their sensitivity to UV light and tributyltin (TBT).
Ectoenzymatic activities were higher in SML than in UW for all the substrates tested. The opposite trend occurred with monomer incorporation which was higher in UW than in SML. The number of cultivable bacteria (total colony counts) was much higher in the SML that in UW and the difference was particularly marked at the outer estuarine station. The SML bacterial communities were dominated by members of the *Cytophaga-Flexibacter* cluster. However in UW, α-*Proteobacteria* were the most abundant group at stations highest salinity sites and γ-*Proteobacteria* dominated at station at the brackish water site. TBT addition caused a decrease in total colony counts and UV exposure inhibited glucose incorporation. These effects were significantly more pronounced in the SML than in UW.
The results confirm that SML and UW bacterial assemblages are distinguishable in abundance of culturable cells, community composition, activity rates and sensitivity to environmental stress and can be playing complementary roles in the estuarine carbon cycle.

Keywords: Bacterioneuston, bacterioplankton, surface microlayer.

2007 BDUA – Journal of Biology, 2: 46. T0210JulianaAbra25012007
Title: **Variability of spatial distribution of rotifera in a lateral lake of Paranapanema river in its mouth zone into Jurumirim reservoir (São Paulo-Brazil)**
Authors: Juliana Abra & Raoul Henry

VARIABILITY OF SPATIAL DISTRIBUTION OF ROTIFERA IN A LATERAL LAKE OF PARANAPANEMA RIVER IN ITS MOUTH ZONE INTO JURUMIRIM RESERVOIR (SÃO PAULO-BRAZIL)

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ABSTRACT
Coqueiral Lake is an aquatic system permanently connected with Paranapanema River. Experiences an annual change in depth of 2.5m and, presents four different compartments, one far and isolated from the connection with river (compartment A) and the other three submitted to direct influence of water level (compartments B, C and D, in a decreasing order of the river effects). The aim of this communication was to show the spatial variability of rotifers distribution in the compartments during the high water period (January 2006).
The sampling was made through vertical hauls of 50 um mesh net in the pelagic zone of twelve sites (three sites for each of the four different compartments of the lake). The organisms were identified and counted in a Sedgwick-Rafter chamber.
The lowest diversity (1.37 bits ind.), abundance (28,090 ind.m^{-3}) and species richness (11 *taxa*) and the highest dominance (0.6) were recorded in compartment A, while the means of diversity, abundance, species richness and dominance of B (2.23 bits ind.; 66,910 ind.m^{-3}; 15 *taxa* and 0.22 in dominance), C (2.80 bits ind.; 63,403 ind.m^{-3}; 15 *taxa* and 0.18 in dominance) and D compartments (2.44 bits ind.; 99,393 ind.m^{-3}; 13 *taxa* and 0.25 in dominance) were distinct.
Coqueiral Lake is submitted to lateral hydrological pulses by Paranapanema River and, the compartment A, an area subjected to minor disturbances by the river, presents in consequence a rotifer assembly characterized by different attributes when compared with the other areas.

Keywords: Spatial Distribution, Coqueiral Lake, rotifers.

2007 BDUA – Journal of Biology, 2: 47. T0211ElieseRodrigues27012007
Title: **Relations between physical-chemical variables and phytoplanktonic community of three estuarine areas in the North coast of Brazil (São José de Ribamar, Cedral and Cajapió, Maranhão State)**
Authors: Eliesé Idalino Rodrigues, Marco Valério Jansen Cutrim, Odilon Teixeira de Melo & Evandro Gilson Moreira

Relations between physical-chemical variables and phytoplanktonic community of three estuarine areas in the North coast of Brazil (São José de Ribamar, Cedral and Cajapió, Maranhão State)

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ABSTRACT
The estuarine areas in São José de Ribamar, Cedral and Cajapió counties, Maranhão State (Brazil), are localized between 2° - 3° S and 44° - 45° W.
Six superficial collections at high tide in morning time were carried out during the period from May/2005 to April/2006 for each sample station to determine phytoplanktonic variables (total and size-fractionated biomass and cell density) and the hydrological and climatic variables, considering their seasonal variations (the rainy season, from January to June, and the dry season, from July to December).
Algal biomass (chlorophyll *a*) ranged from 2.4 to 16.56 $mg.m^{-3}$. Cell density of phytoplankton varied from 11,551 to 175,683 $cel.L^{-1}$.
Multiple linear regressions revealed that phosphate influenced biomass, while nitrate and silicate did it to cell density. Principal Component Analysis showed a positive correlation between phytoplanktonic biomass and accumulated solar radiation, such as phytoplanktonic density and water transparency. A diagram with biotic and abiotic variables was constructed in order to better comprehending the interrelations involving phytoplanktonic community.

Keywords: Estuary; phytoplanktonic biomass, size-fractionated chlorophyll, nutrient concentration, Brazil.

2007 BDUA – Journal of Biology, 2: 48. T0212ElisaBazzuri27012007
Title**: Seasonal variation in the phytoplankton during an intensive sampling period in a saline lowland river (Bs. As. – Argentina)**
Authors: M.E. Bazzuri, N. Gabellone & L. Solari

SEASONAL VARIATION IN THE PHYTOPLANKTON DURING AN INTENSIVE SAMPLING PERIOD IN A SALINE LOWLAND RIVER (Bs. As. – Argentina)

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ABSTRACT
The main aim of this survey was to analyze seasonal variations in phytoplankton composition, relating its behaviour to temperature and conductivity, at two sampling sites in the Salado river lower-basin: El Destino (ED) and Guerrero (G). At each site, 28 samples were taken twice a week from 9/3 to 20/7/2004.
A total of 145 and 143 species were identified for ED and G respectively, although rare species were discarded to avoid statistical misinterpretation. Correlation coefficients and autocorrelation analyses (Q-Ljung-Box statistic) were performed in order to establish seasonal patterns of species abundance.
Significant autocorrelations (p <0.05) were observed between phytoplankton species and temperature-conductivity patterns, illustrating their seasonal behaviour. Moreover, the species were grouped according to their occurrence during different water temperature periods: 'summer' group: included 34 species that were well represented during warm-waters (>22ºC): *Planctonema lauterbornii*, *Gloeocapsa dermochroa*, *Geminella interrupta,* among others; 'winter' group: included 10 species whose highest densities were reached during cold-waters period (<12ºC): e.g. *Binuclearia* sp., *Nitzschia fruticosa*, *Schroederia indica*, *Microcystis firma*; 'transitional' group: of only 4 species with abundance peaks during 'intermediate' conditions (15.5 ºC average), *Closteriopsis* sp. and *Nodularia spumigena* being the most remarkable; and 'indifferent' group: with 22 species of random behaviour whose autocorrelations remain within confidence limits: *Oscillatoria limnetica, Monoraphidium griffithi, Scenedesmus linearis*, etc.
Aforementioned results correspond to species with similar behaviour in both sampling sites; remaining ones presented slightly different patterns. An evident seasonal succession was detected, having species substitution from summer warm-stagnant adapted species to cold-waters favoured ones, hence indicating different successional stages.

Keywords: Seasonal succession, phytoplankton assemblages, autocorrelations, lowland river.

2007 BDUA – Journal of Biology, 2: 49. T0213ArmineHayrapetyan28012007
Title: **Seasonal dynamics of zooplankton community of river Hrazdan**
Authors: A.H. Hayrapetyan & S.H. Hakobyan

SEASONAL DYNAMICS OF ZOOPLANKTON COMMUNITY OF RIVER HRAZDAN

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ABSTRACT
The river Hrazdan is one of the tributaries of river Araks. It is the unique out flowing river from Lake Sevan. The length of the river Hrazdan is 146 Km and the surface of catchments basin is 2046 Km^2. River Hrazdan traverses territories of four Marzes (regions) of Armenia. Traversing the territories of Kotayk Marz of the Republic, Yerevan City, Ararat Valley, river Hrazdan mixes the river Araks and inflows into Caspian Sea. Waters of river Hrazdan irrigate many territories of the republic. Therefore the river Hrazdan plays a great role in the water resources management of Armenia.
Scope of the work includes study of the dynamics of Hrazdan river zooplankton community. The water samples for testing were taken from 5 points once a month (March-September 2004). The quantity and biomass of zooplankton were determined, and were given the seasonal dynamics of Cladocerans and Copepods. We came to a conclusion that not big quantitative indicators and prevalence of *Copepods* are observed in rapid flowing segments of river Hrazdan and in the water reservoirs with big quantity of the suspended materials.

Keywords: Zooplankton, quantity, biomass, seasonal dynamics, river Hrazdan.

2007 BDUA – Journal of Biology, 2: 50. T0214CatharinaAlvesdeSouza29012007
Title: **Evidence of phytoplankton thin layers in a southern Chilean fjord, Comau fjord**
Authors: Catharina Alves-de-Souza, José Luís Iriarte & Humberto González

EVIDENCE OF PHYTOPLANKTON THIN LAYERS IN A SOUTHERN CHILEAN FJORD, COMAU FJORD

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ABSTRACT
The inland seas of southern Chile have a variety of channels and fjords systems characterized by distinctive oceanographic conditions. Although the phytoplankton species composition in this extensive area presents a well documented pattern of spatial (horizontal) and temporal (seasonal) distribution, there is no information on the fine vertical structure of phytoplankton.
The vertical distribution of phytoplankton was studied in Comau fjord, between 5 and 18 m in variables depths (0.5-1.0 m intervals) for three days every 12 h interval during December 2006.
Density profiles during the sampling period, showed a highly variable water column (homogeneous surface water versus a subsurface pycnocline). The fluorescence profiles commonly showed a subsurface maximum (15 m depth; 5.0 mg m^{-3}) in most of the profiles. In one opportunity, a thin layer near surface maximum (at 5 m; 12.2 $mg.m^{-3}$) was observed. Microscopic analysis of samples by Utermöhl method identified *Rhizosolenia pulgens, Ceratium pentagonum* and *C. horridum* as the as the main species at this thin layer. Moreover, *Leptocilindrus minimus*, *Dinophysis acuminata, D. punctata,* several species of phytoflagellates and the ciliate *Myrionecta rubra* showed a distinctive pattern of vertical distribution.

Key words: phytoplankton, vertical distribution, thin layers, southern Chile.

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2007 BDUA – Journal of Biology, 2: 51. T0215LucianaSartori29012007
Title: **Zooplankton distribution in Rosana Reservoir (SE Brazil) – longitudinal compartmentalization**
Authors: Luciana Pinto Sartori & Marcos Gomes Nogueira

ZOOPLANKTON DISTRIBUTION IN ROSANA RESERVOIR (SE BRAZIL) – LONGITUDINAL COMPARTIMENTALIZATION

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ABSTRACT
Longitudinal patterns on the zooplankton (microcrustaceans) distribution in Rosana Reservoir (Paranapanema River, SE Brazil), was studied during summer and winter periods of 2004 and 2005. The mouth zones of the main tributaries (Rivers Pirapó and Pirapozinho) were also analyzed, as well as the water transparency, temperature, dissolved oxygen, pH, conductivity, suspended solids and chlorophyll *a*. Vertical hauls (from the bottom to the surface - 50 μm zooplankton net) were performed in the tributary rivers and along the whole reservoir main axis (c.a. 90 Km), every 3 Km (total of 32 sampling sites).
About 45 different *taxa* were identified, being Cladocera represented by 29, followed by Copepoda and Cyclopoida with 9, Calanoida with 6 species and one unidentified Harpacticoida. The most abundant and frequent zooplankton species were *Notodiaptomus* c.f. *henseni, Thermocyclops decipiens, T. minutus, T. inversus, Diaphanosoma birgei, Ceriodaphnia cornuta, C. silvestrii, Moina minuta, Bosmina hagmanni, B. longirostris, Daphnia ambigua* and *D. gessneri*. Total zooplankton was more abundant in the lacustrine (dam) zone. Smaller densities occurred during the rainy season (summer) especially in the medium region of the reservoir - transition between lotic and lenthic compartments. Among cladocerans Sididae and Moinidae predominated in the rainy period and Bosminidae in the dry (winter). Copepoda, (mainly copepodids) was numerically dominant in almost the whole reservoir, except during the rainy period when Cladocera was very abundant in the lacustrine zone. The relation between the species distribution and limnological variables are also presented.

Keywords: Tropical reservoir, copepods, cladocerans, wet and dry periods, compartmentalization.

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2007 BDUA – Journal of Biology, 2: 52. T0216EnideEskinazi29012007
Title: **Spatial and seasonal dynamics of microphytoplankton at the South Continental Platform of Pernambuco – Northeastern Brazil**
Authors: Enide Eskinazi Leça, Maria Luise Koening & Maristela Silva de Oliveira

SPATIAL AND SEASONAL DYNAMICS OF MICROPHYTOPLANKTON AT THE SOUTH CONTINENTAL PLATFORM OF PERNAMBUCO – NORTHEASTERN BRAZIL

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ABSTRACT
With the purpose of analyzing the microphytoplankton spatial and seasonal variability at the continental platform of Pernambuco, samples were collected in rainy (July/05) and dry (November/06) seasons, from two profiles transversal to the coast: one located in front of Gaibu Beach (8º18' S and 34º56' W) and one in front of Serrambi Beach (8º32' S and 35º00' W). Three stations were plotted in each profile: the first located five miles from the coast and the third, 20 miles. The collections used a 20 µm mesh net and the microphytoplankton was analyzed in terms of variety, occurrence frequency and relative abundance.
In total, 122 infrageneric *taxa* were identified divided into: Cyanophyta (7 spp.), Euglenophyta (2 spp.), Dinophyta (39 spp.), Crysophyta (1 sp.), Bacillariophyta (71 spp.) and Chlorophyta (2 sp.). The Bacillariophyta species were predominant closer to the coast, with emphasis to *Chaetoceros curvisetus* Cleve, predominating in the rainy season, in Gaibu Beach profile. The Dinophyta presented higher species diversity at the most distant stations from the coast (20 miles), with emphasis to *Ceratium* Schrank*, Prorocentrum micans* Ehrenberg and *Protoperidinium* sp. as the most frequent *taxa*. The Cyanophyta species were represented by the presence of *Trichodesmium thiebauthii* (Gomont ex Gomont), also more frequent at the most distant sites from the coast, with rates over 60%. The highest number of species occurred during the rainy season, with a gradual reduction in the total number of species from the coast to the ocean region.

Keywords: Microphytoplankton, occurrence frequency, relative abundance, Northeastern Brazil.

2007 BDUA – Journal of Biology, 2: 53. T0217SilviaSchwamborn26012007
Title: **Composition, distribution and abundance of neustonic ichthyoplankton of the Potiguar basin, Northeast Brazil**
Authors: S.H.L. Schwamborn, J.L. Bezerra Júnior, K. Carrapateira, F.W. Kurtz, R. Schwamborn & M. de F. Rocha

COMPOSITION, DISTRIBUTION AND ABUNDANCE OF NEUSTONIC ICHTHYOPLANKTON OF THE POTIGUAR BASIN, NORTHEAST BRAZIL

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ABSTRACT
In order to assess patterns of composition, spatial distribution and abundance of fish eggs and larvae in the neuston of the Potiguar Basin, Rio Grande do Norte State, Brazil. Four oceanographic surveys were performed between 2002 and 2004. Two vertically stacked 500 µm mesh nets were diurnally towed to collect the Ichthyoneuston.
The study area presented mean densities of 234.14 (± 49.36 Std.) and 40.61 (± 27.26 Std.) eggs and fish larvae/100 m³, respectively. In all surveys, density values for eggs and fish larvae in the neuston (0 to 7.5 cm depth) were, respectively, in average 38 and 66% superior to the values observed in the hiponeuston (7.5 to 22.5 cm depth). Fish larvae were represented, in average, by 19 families, 20 genera and 19 species. Most abundant *taxa*, belonging to Exocoetidae, Clupeidae, Hemiramphidae, Carangidae, Paralepididae and Scombridae, presented mean densities between 2.71 and 11.95 larvae.100m^{-3}. No clear spatial distribution was observed for eggs and fish larvae. Instead, in all surveys, a mixture of larvae belonging to taxa from coastal, onshore and offshore waters represented the community in the neustonic layer of the Potiguar basin. Fish larvae belonging to Carangidae, Scombridae, Hemiramphidae, Clupeidae, Exocoetidae and Mugilidae families were spread up to 40% of the total surveyed area. Mean values of diversity (in bits.individuals) and evenness were 1,17 (± 0,13 Std.) and 0,9 (± 0,09 Std.), respectively.
Patterns of along-shore composition, abundance, and diversity of the ichthyoneuston in the Potiguar basin can be considered typical of tropical oligotrophic coastal waters.

Keywords: Fish larvae, neuston, community structure, Northeaster Brazil.

2007 BDUA – Journal of Biology, 2: 54. T0218GimelZanin26012007
Title: **Seasonal variation of ichthyoplankton in the Santos Bay region and Bertioga Channel, SP, Brazil (23º57'28'' S; 46º18'07'' W)**
Authors: Gimel Roberto Zanin, Camilla Nunes Garbini, Mario Katsuragawa, Maria de Lourdes Zani-Teixeira, Sarah Charlier Sarubo & Lucas Nakaozi Prioli

SEASONAL VARIATION OF ICHTHYOPLANKTON IN THE SANTOS BAY REGION AND BERTIOGA CHANNEL, SP, BRAZIL (23º57'28'' S; 46º18'07'' W)

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ABSTRACT
This work aims to investigate and describe the processes related to the ichthyoplankton structure and dynamics of the coastal and estuarine system, in Santos, Brazil.
The hydrographic data were collected with a CTD and the ichthyoplankton was sampled by oblique tows using Bongo net, 505 μm mesh size, during Nov/2004, Feb/2005, May/2005, and Aug/2005. In each cruise, 12 oceanographic stations were carried out, including 3 sub-areas: Santos bay (4 stations), Harbour channel (2 stations), and Bertioga channel (6 stations).
The highest mean surface temperature (25.79^{o}C) was recorded in Feb/05, and the lowest (21.66^{o}C) in Aug/05. The highest (35.40) and the lowest (33.56) mean value of salinity, at surface, was observed subsequently in Nov/04 and in Aug/05. The mean density of fish egg (in terms of eggs.m^{-2}) estimated for the total study area was 22.45 (sd = 49.40). Concerning the larval mean density (larvae.m^{-2}), the estimated value for the total area was 11.58 (sd = 12.98). Among the sub-areas the highest mean density of eggs was obtained in the Harbour channel (66.01; sd = 92.44), followed by Bertioga channel (17.27; sd = 37.36). Similar result was observed for fish larvae, in which the Harbour channel revealed to be the most important (mean density = 23.02; sd = 16.97) followed by Bertioga channel (10.95; sd = 12.60). In total, 16 families were identified: Achiridae, Blenniidae, Carangidae, Clupeidae, Elopidae, Engraulidae, Gobiidae, Mugilidae, Sciaenidae, Syngnathidae, Trichiuridae, Ephippidae, Gerreidae, Paralichthydae, Pristigasteridae, and Tetraodontidae. The Engraulidae (47.4%), Gobiidae (16.5%) and Sciaenidae (11%) were the predominant.

Keywords: Ichthyoplankton; Santos Bay; estuarine system.

2007 BDUA – Journal of Biology, 2: 55. T0219MCristinaClaps26012007
Title: **Influence of regional factors on zooplankton structure in a saline lowland river: the Salado River (Buenos Aires, Argentina)**
Authors: María Claps, Néstor Gabellone & Nancy Neschuk

INFLUENCE OF REGIONAL FACTORS ON ZOOPLANKTON STRUCTURE IN A SALINE LOWLAND RIVER: THE SALADO RIVER (BUENOS AIRES, ARGENTINA)

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ABSTRACT
The structure and dynamics of the zooplankton were seasonally analyzed in a saline lowland river (basin area: 150000 Km^2). The samples were taken from the main channel and tributaries (15 sampling stations) during 1997-1999. One hundred and seventy five species were identified (54 protists, 89 rotifers and 32 crustaceans). Rotifers were the most abundant group with predominance of loricate species (*Brachionus plicatilis*, *Brachionus angularis* and *Keratella tropica*) tolerant to high conductivities or salinity variations. The crustaceans were important in the headwaters, where the river is directly connected to large shallow lakes. These environments contributed inocula to the river mainly during flood periods. The protists were in low densities along the longitudinal axis but in the headwater sector, *Paramecium caudatum* and *Stentor roeseli* were abundant and *Tintinidium fluviatile* was conspicuous in some tributaries and in the lower river sector. Zooplankton density peaks were recorded in the middle sector of the basin coinciding with the highest conductivity values (maximum: 4685 individuals L^{-1} with 7390 $\mu S.cm^{-1}$). The spatial heterogeneity of the zooplankton composition in the Salado River basin was associated with differences in the ionic composition (geological features), conductivity and, phytoplankton biomass (chlorophyll "a" concentration), among other river characteristics.
We concluded that, to obtain a good knowledge of the regional zooplankton characteristics of a semi-arid basin, it is necessary to include the main channel and tributaries that represent sub-catchments in order to identify the pattern and processes of the zooplankton community.

Keywords: Zooplankton density and composition, water ionic composition, nutrients, chlorophyll, sub-catchments.

2007 BDUA – Journal of Biology, 2: 56. T0220MacDonagh27012007
Title: **Plankton relationships under minimum water level fluctuations in a subtropical reservoir (Córdoba, Argentina)**
Authors: M.E. Mac. Donagh, M.A. Casco & M.C. Claps

PLANKTON RELATIONSHIPS UNDER MINIMUM WATER LEVEL FLUCTUATIONS IN A SUBTROPICAL RESERVOIR (CÓRDOBA, ARGENTINA)

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ABSTRACT
The management politics implemented in the Río Tercero reservoir since 1983 have promoted a reduced range of water level fluctuations, in order to ensure the availability of water for cooling a nuclear power plant, by maintaining a minimum-security level. The main effect of this measure has been the anticipation of the spillway outflow period. Rainfall was strongly seasonal and its duration has influenced the extension of the spill outflow period.
As a result, the monthly renovation was variable, ranging from 0.5 to 0.08 per month. Based on this parameter, during the period February 1999 – February 2000, two phases could be distinguished with significant differences (t= 2.48; *p* = 0.01; n= 15/11) between them. A positive correlation (r= 0.62; *p* = 0.002) was found between the densities of phytoplankton and zooplankton during the first period (when the turnover rate was high) and a negative, but insignificant correlation (r= -0.4 to -0.7, depending on the sampling station considered) during the second period (when the turnover rate was low). During the second period, minimum phytoplankton diversity values and highest phytoplankton density were recorded, *Actinocyclus normanii* being the dominant species. Among the zooplankton, populations of different cladoceran species developed, instead of common species of rotifers and copepoda present during the first period. The PCA analyses showed that both, phytoplankton and zooplankton, were negatively influenced by higher monthly replacement rates during the period of stronger spillway outflow, whereas an opposite relationship was found between phytoplankton and zooplankton densities during more stable conditions.

Keywords: Plankton, reservoir, management, Argentina.

2007 BDUA – Journal of Biology, 2: 57. T0221IsabelReyes27012007
Title: **Hydrological complexity supporting high phytoplankton richness in the Doñana marshland (SW Spain)**
Authors: Isabel Reyes, M. A. Casco, J. Toja & L. Serrano

HYDROLOGICAL COMPLEXITY SUPPORTING HIGH PHYTOPLANKTON RICHNESS IN THE DOÑANA MARSHLAND (SW SPAIN)

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ABSTRACT
Two hundred and fifty-nine phytoplanktonic *taxa* were registered in a riverine floodplain bordering the Doñana marshland from a collection of eight samples spread along two years (2002-2004). The hydrological complexity of the study area can account for this high *taxon* richness by promoting replacement and colonization episodes following seasonal changes in water source (riverine versus tidal inputs). Spatial segregation of phytoplankton was likely due to differences in retention time and distance to water input.
According to multivariate analyses, both temporal and spatial factors produced a pattern in the phytoplankton assemblages dominated by riverine inputs during the flooding season, tidal inputs at the end of summer and transitional stages during the rest of the year. The taxonomic groups dominating during each stage were: Chlorophytes (riverine input), Diatoms (tidal input) and non-diatom Chrysophytes (transitions). The main *taxa* contributing to each stage were: *Tetradesmus crocini* and *Rhodomonas minuta* (riverine input), *Nitzschia palea*, *Monoraphidium contortum* and *Oscillatoria* spp. (tidal input), *Chrysidalis* sp. and *Pyramimonas* sp. (transitions).

Keywords: Phytoplankton, marshland, Lucio, Spain.

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Title: **Phytoplankton Chlorophytes in a saline-lowland river (Salado river, Buenos Aires, Argentina)**
Authors: N. Gabellone, N. Neschuk & L. Solari

PHYTOPLANKTON CHLOROPHYTES IN A SALINE-LOWLAND RIVER (SALADO RIVER, BUENOS AIRES, ARGENTINA)

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ABSTRACT
The plankton of the Salado River was characterised by the abundance and richness of green algae (Chlorophyta), but not by diatoms as is usual in lowland rivers of temperate regions. Spatio-temporal changes of the green algae were analysed seasonally during the period May 1998- May 1999 at 13 locations, from the headwaters to the river mouth, in the main channel of the river and its tributaries.
One hundred and four species were founded (2 Volvocales, 93 Chlorococcales, 2 Ulotrichales and 7 Desmidiaceae). The mean maximum of species richness was recorded in summer with 35 species in the lower basin and 30 species in the middle basin; meanwhile, the mean minimum was recorded in autumn in the tributaries (8 species).
The number of species increased downstream due to the contributions from shallow lakes and tributaries connected to the main channel of the Salado River basin. Changes in density and richness were related to temperature, nutrient concentrations, water velocity and hydrological conditions, as well as the presence of dead zones, backwaters and shallow lakes associated with the river. The mean maximum density for the basin was recorded in spring 1998 and summer 1999 during low and normal water periods, whereas the minimum occurred in autumn 1998, coinciding with a high water period. *Monoraphidium minutum* and *Chlamydomonas* spp. were the most conspicuous species in spring in the middle basin. The Salado River basin is a nutrient enriched environment and this, in conjunction with the high temperature, promotes the development of Chlorophyta, especially Chlorococcales.

Keywords: Chlorophytes, plankton, saline-lowland river.

2007 BDUA – Journal of Biology, 2: 59. T0223LiaSolari27012007
Title: **Structural seasonal changes and life strategies of phytoplankton in a Pamoean shallow lake (Buenos Aires, Argentina)**
Authors: L. Solari, K. Quáini & G. Ruiz

STRUCTURAL SEASONAL CHANGES AND LIFE STRATEGIES OF PHYTOPLANKTON IN A PAMPEAN SHALLOW LAKE (BUENOS AIRES, ARGENTINA)

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ABSTRACT
Dynamics and composition of phytoplankton were analysed in a shallow lake connected to the lower basin of Salado River.
Samples were obtained monthly (9/1997-8/1998), from San Miguel del Monte lake (St2), from the affluent (St1) and from the connection with Las Perdices lake (St3). It was considered that internal (development of submerged macrophytes and grazing) and external (hydrological events) factors affected the phytoplankton and their life strategies.
Cyanophytes were dominant in density and biomass during the annual cycle at all sites. The highest value of biovolume (105.5 $mm^3.L^{-1}$) was observed at St3 in September, when *Nodularia spumigena* was present, while the lowest (0.11 $mm^3.L^{-1}$) occurred at St1 in November, with *Spirulina abbreviata*. Maximum algal density was 94,121 $ind.mL^{-1}$ at St3 (March) whereas the minimum value occurred at St1 in April (1064 $ind.mL^{-1}$).
All sites were characterized by S strategists who were only replaced by R strategists due to hydrological disturbances and the growth of submerged macrophytes. The increase of water inflow at St1 (October-November) caused the replacement of an S strategist (*Nodularia spumigena*) by an R-strategist (*Achnanthes lanceolata)*. Exceptional rainfall (330 mm) in December induced replacement of the cyanophyte *Raphidiopsis mediterranea* (an S-strategist) by diatoms (R-strategists), *Cyclotella meneghiniana* at St2, and by *Navicula radiosa* (R-strategists) at St3. A C-R-strategist, *Cryptomonas* spp., occurred at St3 (July) coinciding with the flood of the Salado River. Thus hydro-meteorological events and the development of submerged macrophytes affected the seasonal variation of the phytoplankton and were determinants of the development of adaptive life strategies.

Keywords: Phytoplankton, biovolume, adaptive life strategies, hydrological disturbance, shallow lake.

2007 BDUA – Journal of Biology, 2: 60. T0224GabrielaCano27012007
Title: **Phytoplankton biomass contributions in a Pampean pond (Argentina) and its interpretation using the Goldsborough & Robinson conceptual model**
Authors: M.G. Cano, M.A. Casco, L.C. Solari, M.E. Mac. Donagh & M.C. Claps

PHYTOPLANKTON BIOMASS CONTRIBUTION IN A PAMPEAN POND (ARGENTINA) AND ITS INTERPRETATION USING THE GOLDSBOROUGH & ROBINSON CONCEPTUAL MODEL

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ABSTRACT
Generally, algal biomass assessments in wetlands include the phytoplankton community not considering the contribution of the rest of the algal associations to the total algal production. This prevents making a complete evaluation of the former community as part of the system. In the present work, biomass contributions (chlorophyll expressed per m^2 of pond) of phytoplankton, epiphyton on submerged and emergent macrophytes and epipelon were measured in arheic Lacombe pond with the purpose of, (1) establishing the relative importance of the phytoplankton, (2) evaluate this contribution in the context of the Goldsborough and Robinson´s conceptual model.
Sampling was carried out monthly along a year in representative sites with different conditions according to depth and type of macrophytes. Physico-chemical analyses of water were performed following standard methods. Plankton was collected making a five level profile in deeper stations and in the shallow one, subsuperficially samples were taken. Corers of sediment were collected for epipelon sampling and segments of plants were cut at different levels, obtaining the epiphytes by scrapping. Pigment extraction was performed using acetone and calculations were made with Lorenzen´s equation.
According to G. & R. model, a lake state developed during the first three months (phytoplankton maxima: 150 mg chl. *a*.m^{-2}). Later, due to submerged macrophytes growth, an open state was observed characterized by epiphyton maxima and lower levels of phytoplankton biomass. Epipelon biomass varied between 50 and 252 mg chl. *a*.m^{-2}, recording a considerable contribution from the phytoplanktonic community above.

Keywords: Phytoplankton, Goldsborough & Robinson conceptual model, shallow lake, epipelon, epiphyton.

2007 BDUA – Journal of Biology, 2: 61. T0225DeniseTenenbaum29012007
Title: **Micro-phytoplankton assemblages in offshore tropical waters of Southeastern Brazil**
Authors: Denise Rivera Tenenbaum, Giselle Parno Guimarães & Maria Célia Villac

MICRO-PHYTOPLANKTON ASSEMBLEGES IN OFFSHORE TROPICAL WATERS OF SOUTHEASTERN BRAZIL

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ABSTRACT
This study reports on the microphytoplankton of an offshore area in the oil production region of Campos Basin, Brazil, based on 203 samples taken between 2001-2006 during 17 cruises. These samples were collected within the Tropical Water-TW (surface and upper limit of thermocline-ULT) and the South Atlantic Central Water-SACW. The analysis was done by the settling technique and found 292 *taxa* with densities varying from 8 to $6.7.10^3$ cells.L^{-1} ($5.0.10^2 \pm 7.5.10^2$ cells.L^{-1}). The study tested differences between periods and sub-areas (Mann-Whitney). Two periods, especially in the TW, were identified: warmer waters and shallower mixing layer with higher numbers of total, cyanobacteria and dinoflagellate cells (period A: October-April); and deeper mixing layer when diatoms were more abundant (period B: May-September). Seasonality was detected in the SACW, where coccolithophorids were more abundant during period A and diatoms during period B. In terms of total cell numbers, the area was homogeneous. However, during period A, cyanobacteria were more abundant in the TW offshore sub-areas (northern/southern) and SACW diatoms had a gradual increase from offshore to the shelf-break. During period B, diatoms had a gradual increase from offshore to the shelf-break at all depths. Cluster analysis (Bray-Curtis, group average linkage) of 94 selected *taxa* (generic and supra-generic) combined with species contributions to similarity (SIMPER-Primer 5.0), determined 3 assemblages for period A: surface dinoflagellates (38%) in the northern offshore sub-area; surface cyanobacteria (76%) of the southern offshore sub-area; and SACW diatoms (21%). For period B, TW diatoms (90%) characterized the ULT at the shelf-break sub-area.

Keywords: Marine micro-phytoplankton, community structure, cell density, species composition, temporal distribution, spatial distribution, oil production region, Campos Basin, Brazil.

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2007 BDUA – Journal of Biology, 2: 62. T0226Turkoglu30012007
Title: **Daily and diurnal fluctuations of summer phytoplankton, nutrient and chlorophyll *a* in the Dardanelles (Çanakkale Strait, Turkey)**
Authors: Muhammet Turkoglu & Yasemin Erdogan

DAILY AND DIURNAL FLUCTUATIONS OF SUMMER PHYTOPLANKTON, NUTRIENT AND CHLOROPHYLL *a* IN THE DARDANELLES (ÇANAKKALE STRAIT, TURKEY)

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ABSTRACT
This study was carried out to determine the daily and diurnal distributions of phytoplankton density, bio-volume and chlorophyll *a* in relation to nutrients and CTD in surface waters of the Dardanelles in the period of 03 July to 04 August 2002. It was collected 99 surface samples for nutrient, chlorophyll *a* and phytoplankton in three different time period of the day (08:00, 13:00 and 18:00) in the sampling period.
Average temperature, salinity, pH, DO, TDS, TSS, NO_2^-+NO_3^-, PO_4^{3-}, SiO_4, chlorophyll *a*, N:P and S:P were calculated as 25.0 ℃, 23.3 ppt, 8.42, 9.26 $mg.L^{-1}$, 23.9 $g.L^{-1}$, 36.1 $mg.L^{-1}$, 1.90 µM, 0.24 µM, 3.61 µM, 1.70 $µg.L^{-1}$, 12.5 and 25.0, respectively. Total phytoplankton density and bio-volume varied between 2.86 x 10^5 - 1.5x10^7 $cell.L^{-1}$ and 5.98 x 10^8 - 8.81 x 10^{10} $µm^3.L^{-1}$, respectively. Rational contribution of Bacillariophyceae (66.5%) to total phytoplankton bio-volume was higher than the contribution of Dinophyceae (31.0%).
Phytoplankton community structure was observed to be controlled by 6-7 phytoplankton species. Other species can be considered as accessory species that do not cause significant fluctuations in the phytoplankton density and bio-volume. It has been showed that there were 9-11 population growth slopes by different species at different times and densities. Therefore, life cycles of phytoplankton species were completed between 3 and 4 days. Diurnal variations of bio-physicochemical parameters in time interval between 08:00 and 18:00 were generally much higher than daily variations in period of 03 July and 04 August due to two counter flows system and domestic inputs of Çanakkale city.

Keywords: Dardanelles, summer period, phytoplankton, nutrient, chlorophyll *a*, CTD Probe Data.

2007 BDUA – Journal of Biology, 2: 63. T0227Turkoglu30012007
Title: **Short time variations of winter phytoplankton, nutrient and chlorophyll *a* in the Dardanelles (Çanakkale Strait, Turkey)**
Authors: Muhammet Turkoglu, Yesim Buyukates & Cenk Oner

SHORT TIME VARIATIONS OF WINTER PHYTOPLANKTON, NUTRIENT AND CHLOROPHYLL *a* IN THE DARDANELLES (ÇANAKKALE STRAIT, TURKEY)

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ABSTRACT
This study was carried out to determine the short time series of phytoplankton density and chlorophyll *a* in relation to nutrients and other environmental parameters in surface waters of the Dardanelles in period of 02 December 2004 to 07 March 2005. Environmental parameters, nutrient and chlorophyll *a* were measured by using Multiple Probe System, Autoanalizor and spectrophotometer, respectively.
Average temperature, salinity, pH, specific conductivity, TDS, DO, TSS, NO_2^-+NO_3^-, PO_4^{3-}, SiO_4, chlorophyll *a*, N:P and S:P were found to be 9.47°C, 27.5 ppt, 8.12, 42.86 $mS.cm^{-1}$, 27.86 $g.L^{-1}$, 9.23 $mg.L^{-1}$, 27.1 $mg.L^{-1}$, 0.43 µM, 0.23 µM, 2.91 µM, 1.97 $µg.L^{-1}$, 1.78 and 14.9 respectively. Total phytoplankton cell density varied between 8.25 x 10^4 and 4.71 x 10^6 $cell.L^{-1}$. Rational contribution of Bacillariophyceae (48.8%) to total phytoplankton cell density was lower than total contributions of Dinophyceae (30.9%) and other taxonomic groups (20.3%) during the winter period. While the biggest contributions to Dinophyceae cell density were from *Prorocentrum* spp., the biggest contributions to Bacillariophyceae density were from *Pseudonitzschia pungens*, *Rhizosolenia fragilissima, Chaetoceros* spp., *Thalassionema nitzschioides*. Except Dinophyceae and Bacillariophyceae, the biggest contributions to other taxonomic groups were from coccolitophorid *Emiliania huxleyi,* silicoflagellate *Dictyocha* spp. and coccoid Cyanophyceae forms.
Short time series distribution of phytoplankton in winter period in the Dardanelles showed that there were 7-9 population growth slope of phytoplankton during the sampling period. Therefore, it can be assumed that life cycles of phytoplankton species were completed in period of 1-2 week in winter period in the Dardanelles.

Keywords: Dardanelles, winter phytoplankton, nutrients, chlorophyll-a, environmental parameters.

2007 BDUA – Journal of Biology, 2: 64. T0228EliGomes30012007

Title: **Protozooplankton microvariations in a tropical coastal ecosystem (Guanabara Bay, RJ, Brazil)**

Authors: Eli Ana Traversim Gomes, Michele de Oliveira Areas, Denise Rivera Tenenbaum & Jean Louis Valentin

PROTOZOOPLANKTON MICROVARIATIONS IN A TROPICAL COASTAL ECOSYSTEM (GUANABARA BAY, RJ, BRAZIL)

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ABSTRACT

Guanabara Bay in Southeastern Brazil (23°S, 43°W) is an estuarine ecosystem that undergoes serious environmental problems derived from man action. Much time and resources have been invested in understanding its plankton dynamics, but little attention has been devoted to the protozooplankton study, a key component of the microbial food web.

To contribute a previous seasonal study, surface and bottom samples were collected at three hour interval from 09 to 12 February 2004 (wet-warm season) with Van Dorn bottle in triplicates at inlet of the central channel (22º40'-23º00'S, 43º00'-43º20'W). Preserved samples (2%, buffered formalin) were analyzed by settling technique, using a combination of bright field and phase contrast illumination. The ciliates between 20-200 µm were counted and identified in four classes: Kinetofragminophora, Oligohymenophora, Polyhymenophora and Oligotrichea (naked and loricated-tintinnids).

The tide micro variations (0.5-1.1 m) during the sampling didn't show influence on protozooplankton which was dominated by oligotrichs (density >86%; biomass >98%), mainly tintinnids (denisity >58%; biomass >90%). In 76 *taxa*, some species were constant (*Strombidium conicum*, *S. delicatissimum*, *S. wulffi*, *Tintinnopsis brasiliensis Helicostomela subulata*, *Undella claparedei*, *U. hyaline*) and others were dominant in density (*Undella hyaline*) or biomass (*Favella ehrenbergii*, *F. serrata*). The high and similar values of total density (surface and bottom 3.00-4.10x10^3 cel.L^{-1}) and total biomass (surface 0.68-2.50 x 10^2 µg C.L^{-1}; bottom 0.70-2.04 x 10^2 µg C.L^{-1}) are typical of eutrophic ecosystem, but the oligotrichs dominance, mainly tintinnids demonstrate the high influence of more saline and clear water of continental shelf.

Keywords: Protozooplankton, tropical ecosystem, biomass, density, Guanabara Bay, Brazil.

2007 BDUA – Journal of Biology, 2: 65. T0229Casanova30012007
Title: **Effects of the river-lake connectivity over the secondary production of Rotifera in two marginal lakes (Paranapanema River, São Paulo, Brazil)**
Authors: Silvia M.C. Casanova, Eliana A. Panarelli & Raoul Henry

EFFECTS OF THE RIVER-LAKE CONNECTIVITY OVER THE SECONDARY PRODUCTION OF ROTIFERA IN TWO MARGINAL LAKES (PARANAPANEMA RIVER, SÃO PAULO, BRAZIL)

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ABSTRACT
The aim of this study was to examine Rotifera population dynamics in short time scale. A comparison of density, biomass and secondary production was made in two marginal lakes with different levels of connectivity with the Paranapanema River, after a long drought period. Samplings were performed daily, for fifteen days, during rainy (January 11 to 25) and dry (July 03 to 17) periods, obtained from one station in the limnetic zone of each lake, next to the connection between lake and river. In order to identify the factors that may influence Rotifera population dynamics, were analyzed: water level, volume and depth of the lakes, temperature, water transparency, dissolved oxygen, pH, alkalinity, conductivity, suspended solids, nutrients and chlorophyll *a*.
The main factors influencing Rotifera population were related to the rising of the water level. The increase of lakes volume resulted in the enhancing of lake depth and water transparency, and in the decrease of pH, alkalinity and suspended solids. In Coqueiral Lake, which has a wide connection with the river and frequent exchange of biotic and abiotic materials, richness and diversity were higher, while density, biomass and productivity were lower. Density, biomass and secondary production were higher in Camargo Lake, which has small connection with the river and elevated physical and chemical stability.
The very eutrophic conditions of Camargo Lake in January may have influenced positively some species like *Brachionus dolabratus*, *Brachionus falcatus* and *Keratella tropica*.

Keywords: Secondary production, Rotifera, connectivity.

2007 BDUA – Journal of Biology, 2: 66. T0230AndreaAzevedo30012007

Title: **Space distribution and temporal distribution of the phytoplanktonic biomass and environmental variables of the Maranhense Gulf - Brazil**

Authors: Andrea Christina Gomes de Azevedo, Fernando António Nascimento Feitosa & Maria Luise Koening

SPACE AND TEMPORAL DISTRIBUTION OF THE PHYTOPLANKTONIC BIOMASS AND ENVIRONMENTAL VARIABLES OF THE MARANHENSE GULF - BRAZIL

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ABSTRACT

The present work was performed in the estuaries of the Maranhense Gulf. The aim of this work was to analysis of the phytoplanktonic community and the environmental parameters. The samples had been collected in the water surface, at four fixed stations, in ebb and spring tides. The collections were taken bimonthly in the period of April/02 to March/03.

The annual pluviometric during the period was of 1,898.5 mm; the salinity from 6 to 35; transparency from 18 to 61 cm; dissolved oxygen from 2.9 to 6.3 $ml.L^{-1}$; oxygen saturation from 65 to 126%; ammonia from 0.02 to 26.45 µmol L; nitrite from 0.01 to 3.53 $\mu mol.L^{-1}$; nitrate from 0.24 to 3.53 $\mu mol.L^{-1}$ and phosphate of 0.13 to 0.58 $\mu mol.L^{-1}$. The phytoplankton biomass from 1.92 to 72.23 $mg.m^{-3}$ and fractional biomass of 0.86 to 36.8 $mg.m^{3}$, characterizing this area as quite productive. Being compared on the Analysis of the Main Components (ACP) it was verified that the chlorophyll *a* showed direct correlation with the salinity, transparency of the water, speed of the winds, phosphate and nitrate and inverse correlation with the rain, dissolved oxygen, saturation of the oxygen, temperature and ammonia.

Keywords: Phytoplankton, biomass, estuary, climatology, hidrology.

2007 BDUA – Journal of Biology, 2: 67. T0231MHoffmeyer30012007
Title: **Vertical distribution and composition of mesozooplankton in Bahía Blanca estuary (Argentina)**
Authors: M.C. Menéndez, M.S. Hoffmeyer, M.C. Piccolo, F. Biancalana & M.D. Fernández Severini

VERTICAL DISTRIBUTION AND COMPOSITION OF MESOZOOPLANKTON IN BAHÍA BLANCA ESTUARY (ARGENTINA)

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ABSTRACT
Composition, abundance and tide-induced variability in the mesozooplankton community of Bahía Blanca Estuary were analyzed at the inner zone of this area during 2 tidal series of 14 hours each (April and August, 2005).
Zooplankton samples were collected at two depths (close to the surface and bottom) every 3 hours. Submersible pumps discharging water into 200 µm mesh nets were used. Salinity and temperature vertical profiles were obtained with a multiparameter probe.
Nineteen mesozooplankton *taxa* were found during both months. In general, *taxa* richness was higher at the bottom than at surface where the contribution of benthic forms was important. Total mesozooplankton abundances were higher in August (315-3109.38 ind.m^{-3}) than in April (68.13-3471.24 ind.m^{-3}). In April, highest total abundance was found at surface during ebb and the calanoid copepod *Acartia tonsa* was the most important taxa. *Tidal* phases and depths influenced significantly on its abundance ($p<0.05$). In August, highest total abundance values were registered during ebb (surface and bottom) and flood (bottom). *Eurytemora americana* was the most abundant species and was followed by *A. tonsa*, harpacticoid copepods, Cirripedia nauplii and Polychaeta larvae, all of which had no significant contribution to total abundance. No significant depth and tide abundance differences were found for *E. americana*.
The differences observed among tide states in April may indicate that the vertical distribution of *A. tonsa* responds to the tide-induced water volume. However, factors other than tide seem to have influenced the distribution of *E. americana* in August.

Keywords: Mesozooplankton, vertical distribution, tide.

2007 BDUA – Journal of Biology, 2: 68. T0232ClaudiaNamiki29012007
Title: **Seasonal variation of larval fish in the Macaé estuary (Rio de Janeiro, Brazil)**
Authors: Cláudia Namiki & Ana Cristina Teixeira Bonecker

SEASONAL VARIATION OF LARVAL FISH IN THE MACAÉ ESTUARY (RIO DE JANEIRO, BRAZIL)

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ABSTRACT
This study reports on the composition and abundance of the larval fish assemblage in the Macaé estuary (041º 46'W 22º 22'S).
Two plankton surveys were conducted during the summer (March, 2006) and the winter (July, 2006). Samples were collected over two days, in the full moon period during the night. Sampling stations were located in the estuary mouth and in the near shore costal waters. Two replicates were done through oblique hauls using a bongo net with 330 µm mesh size.
A total of 1,808 larvae representing 15 families and 14 species were collected. The maximum mean abundances were 880 larvae.100m^{-3} during the summer and 110 larvae (100m^{-3} during the winter) both in the nearshore station. Sciaenidae and Gobiidae were the most abundant families, accounting together for 50% of the total catch during the summer and 63% in the winter. The third *taxa* more abundant were *Pellona harroweri* in the summer and Engraulidae in the winter, including the species *Achoviella brevirostris* and *Anchoviella lepidentostole*. Beside the *taxa* cited above, Blenniidae, Clupeidae (*Opisthonema oglinum*), Tetraodontidae, Synganthidae (*Pseudophalus mindii*), Gobiesocidae (*Gobiesox strumosus*) and Achiridae (*Trinectes paulistanus*) also occurred in both seasons. The eleotrid *Dormitator maculatus* and the family Bothidae occurred only during the winter. The *taxa* Gerreidae, Paralichthyidae, Achiridae (*Achirus lineatus*) and Carangidae (*Oligoplites* sp.) were recorded only during the summer. ANOSIM results demonstrated significant ($p<0.01$) seasonal differences in the *taxa* composition, but there were not significant differences for spatial and tide distribution.

Keywords: Ichthyoplankton, fish larvae, tropical estuary, seasonal variation, Brazil.

2007 BDUA – Journal of Biology, 2: 69. T0233CristinaDias29012007
Title: **A Long-Term Study on Zooplankton in the Estuarine System of Ribeira Bay, near a Power Plant Station (Rio de Janeiro – Brazil)**
Authors: Cristina de Oliveira Dias & Sérgio Luiz Costa Bonecker

A LONG-TERM STUDY ON ZOOPLANKTON STUDY THE ESTUARINE SYSTEM OF RIBEIRA BAY, NEAR A POWER PLANT STATION (RIO DE JANEIRO – BRAZIL)

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ABSTRACT
The structure of the zooplankton community in the region of the Admiral Álvaro Alberto Nuclear Power Plant (Angra dos Reis – RJ – Brazil) was studied, from 2001 through 2005. The results were compared with anterior study (1991–1993).
After 20 years of activities of the Nuclear Power Plant the zooplankton samples were obtained in vertical hauls four times a year, using a 150 µm net at two fixed points (intake and discharge sites). Temperature, salinity and chlorophyll *a* were determined.
The Ribeira Bay water was characterized by warm temperatures and salinities typical of Coastal Water and more saline waters. Differences between the sampling stations were found. The zooplankton density in discharge site of the power plant (Mean: 245,434 ind.m^{-3}, SD: 335,358 ind.m^{-3}) was highest to those found in the intake site (Mean: 84,634 ind.m^{-3}, SD: 101,409 ind.m^{-3}). One hundred and twenty-one mesozooplankton *taxa* were registered during the period from 2001 to 2005. Copepoda constituted the most common *taxon* and comprised more than 57% of the total zooplankton. This group was followed by Branchiopods and Gastropoda larvae. A seasonal zooplankton cycle was not observed while an annual cycle was registered.
Overall mesozooplankton abundance values at discharge site are in agreement with those reported for the same estuary inner zone for 1991-1993. The superficial temperature was the important factor structuring the zooplankton community in the discharge site. The mesozooplankton is not affected by the passage through the condenser. No permanent negative influence on the plankton populations could be detected.

Keywords: Zooplankton, seasonal variation, Nuclear Power Plant, Ribeira Bay, Rio de Janeiro, Southeastern Brazil.

2007 BDUA – Journal of Biology, 2: 70. T0234DouglasPassavante29012007
Title: **Phytoplankton community and biomass in marine artificial reefs of Pernambuco coast, Brazil**
Authors: Douglas Cavalcanti dos Santos, José Zanon de O. Passavante & Maria da Glória Silva Cunha

PHYTOPLANKTON COMMUNITY AND BIOMASS IN MARINE ARTIFICIAL REEFS OF PERNAMBUCO COAST, BRAZIL

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ABSTRACT
Marine artificial reefs are submerged structures consisting of dumped waste material or specific constructions man-made, including vessels, created with the purpose of enhance the local fish populations and other marine life and, thus, to benefit recreational activities and fisheries. Studies of artificial reefs world wide have focused its efforts to investigate fish assemblages and the development of sessile biota related with the structures. The present research aim to study the phytoplankton composition and biomass in two shipwrecks, located in the continental shelf of Pernambuco State, on Brazil northeastern coast.
Phytoplankton hauls were taken around the shipwrecks, using a conical-cylindrical plankton net with a 1 m length, 0.30 m mouth opening and 45 µm mesh size. Water samples were also collected with Nansen bottle at the side of shipwrecks, for chlorophyll *a* and hydrologic variables analysis.
The results shows that the phytoplankton community was represented by 80 *taxa*, prominence the groups of the diatoms (66.25%), followed by the dinoflagellates (18.75%), cyanophycea (12.50%), chlorophycea (1.25%) and euglenophycea (1,25%). The species diversity was high, outranking the species *Trichodesmium thiebautii* (Gomont), characteristic of oceanic area. In relation to chlorophyll *a*, in the depth of the two shipwrecks, varied between 0.61 $mg.m^{-3}$ and 5.97 $mg.m^{-3}$, value that confirms the mesotriphic character of the area. The temperature of the water shows a gradient of 0.5 ºC, being the surface hotter than the bottom (average of 28.7 ºC); the salinity varied from 33 to 38; and the pH from 6.8 to 7.6.

Keywords: Phytoplankton, chlorophyll *a*, artificial reef, shipwreck, hydrology.

2007 BDUA – Journal of Biology, 2: 71. T0235ElianaPanareli29012007
Title: **The role of resting eggs in the recovery of zooplankton community in a marginal lake to Paranapanema river (São Paulo, Brazil), after a prolonged drought period**
Authors: Eliana A. Panarelli, Silvia M.C. Casanova & Raoul Henry

THE ROLE OF RESTING EGGS IN THE RECOVERY OF ZOOPLANKTON COMMUNITY IN A MARGINAL LAKE TO PARANAPANEMA RIVER (SÃO PAULO, BRAZIL), AFTER A PROLONGED DROUGHT PERIOD

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ABSTRACT
The zooplankton community dynamics of Cavalos Lake (a lateral lake to Paranapanema River) was studied during, previously and after a severe drought period (from March 2000 to December 2001). Dry sediment was collected in order to investigate the importance of resting eggs in the recolonization of the ecosystem. During the drought period, a richness of 39 species was noticed. An increase to 49 species was found in the beginning of lake recovery and, the highest richness (67 species) was recorded from June to December 2001, when a hydrological stability was attained in the lake. At the end of the study, species richness and diversity presented values similar to data of the period previous to drought. Although some alterations in composition were recorded: Rotifera presented a higher species number at the end of study; Cladocera richness was reduced to half of the species number found in the period before the drought. Significant changes on densities were reported for Copepoda, with higher abundance being recorded in the period of higher hydrological stability in the lake. Hatching experiment showed that the sediment of Cavalos Lake presents a great amount of diapausing organisms, despite that only 14 species hatched during the laboratory study. The recovery of zooplankton community occurred mainly due to resting eggs present in sediment, since the lake did not receive water from river during the period of this study.

Keywords: resting eggs, zooplankton, lateral lake, drought period.

2007 BDUA – Journal of Biology, 2: 72. T0236MarcosNogueira29012007
Title: **Zooplankton assemblages (Copepoda and Cladocera) in the Paranapanema River cascade reservoirs (Southeast Brazil)**
Authors: M.G. Nogueira, Y.C.T. Britto & P.C. dos R. Oliveira

ZOOPLANKTON ASSEMBLAGES (COPEPODA AND CLADOCERA) IN THE PARANAPANEMA RIVER CASCADE RESERVOIRS (SOUTHEAST BRAZIL)

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ABSTRACT
This research is part of a comprehensive limnological investigation of 8 cascade reservoirs constructed in the River Paranapanema (Southeast Brazil) in the last decades for electric generation. The main aim was to evaluate how the impoundments affect the plankton community structure.
The zooplankton and the main limnological features (transparency, temperature, dissolved oxygen, pH, electric conductivity, suspended solids and chlorophyll *a*) were studied in 19 sampling stations distributed along 700 km of river stretch. Samples were taken seasonally (summer, autumn, winter and summer) (8 expeditions) during two consecutive years. Zooplankton was sampled through vertical net hauls (68 μm of mesh size), from bottom to surface.
It was identified 56 *taxa* of Cladocera and 19 of Copepoda. Besides the composition, it was also analyzed the species richness, total and relative abundance and diversity (Shannon Index). Inter and intra-reservoir (upstream and dam zone) variability were considered. The zooplankton abundance was affected negatively by low water retention time reservoirs and positively by moderate increase in trophic conditions. In addition to the longitudinal spatiality the lateral connectivity (tributary river mouths/soil use and floodplain areas) was also of major importance. There was no clear seasonal fluctuation on zooplankton total richness and abundance. However, some compositional changes were verified. Larger and more oligotrophic reservoirs had higher diversity, mainly in summer and autumn periods. For a synthesis of the information and detection of patterns it is presented the results of a cluster analyzes (r-Pearson using zooplankton data) and a correspondence analyzes (limnological and zooplankton data).

Keywords: Zooplankton, Copepoda, Cladocera, reservoir cascade, tropical river.

2007 BDUA – Journal of Biology, 2: 73. T0237MauroMelo30012007
Title: **Zooplankton flux in a tropical estuarine system (Northeastern Brazil)**
Authors: Mauro de Melo Júnior, Maryse Nogueira Paranaguá, Ralf Schwamborn & Sigrid Neumann-Leitão

ZOOPLANKTON FLUX IN A TROPICAL ESTUARINE SYSTEM (NORTHEASTERN BRAZIL)

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ASBSTRACT
The main objective of this study was to quantify the zooplankton flux between the Santa Cruz Channel (SCC) at Catuama North inlet and its adjacent area. Sampling were done at spring (05 and 06/08/2001) and neap (11 and 12/08/2001) tides, both each 3 hours interval. The samples were collected in three fixed stations and in three depths. Each sample was obtained with a pump and the water was filtered through a plankton net (300 µm) during 5 minutes. Simultaneously, current velocity and direction data (using an ADCP), besides temperature and salinity data (both using a CTD) were obtained. Each sample was totally inspected under an stereomicroscope. The Catuama inlet presented a high variability in density transport with higher values during the spring tide, mainly at night (flood and ebb tides). This high density was caused by Calanoida and Decapoda larvae. In relation to the average transport the values were 831.47 ± 1192.53 org m^{-2} s^{-1} during spring tide and 342.33 ± 445.80 org m^{-2} s^{-1} during neap tide. The importation and exportation flux did not present significant differences ($p > 0.05$). This was probably caused by (1) a strong marine influence on the inlet, (2) estuarine fronts in the SCC, (3) time of the year of low Decapoda larvae liberation and (4) strong impact by planktivorous fishes over the meroplankton. The role of the tropical estuarine systems as zooplankton source to coastal areas was confirmed in the present research.

Keywords: Zooplankton flux, estuarine system, instantaneous transport, Brazil.

CAPES fellowship.

2007 BDUA – Journal of Biology, 2: 74. T0238ValeriaGuinder30012007
Title: **Phytoplankton dynamics during sunlight hours in a winter day, Bahía Blanca Estuary, Argentina**
Authors: Valeria A. Guinder, Cecilia A. Popovich, Gerardo M. E. Perillo & Walter E. Helbling

PHYTOPLANKTON DYNAMICS DURING SUNLIGHT HOURS IN A WINTER DAY, BAHÍA BLANCA ESTUARY, ARGENTINA

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ABSTRACT
Vertical distribution of phytoplankton and physico-chemical variables were studied during the hours of sunlight of a winter day in Puerto Cuatreros (38°50´ S; 62°20´ O), a harbor at the head of the Bahía Blanca Estuary. This estuary is mesotidal with a semidiurnal cycle and its inner reach is influenced by strong, channel-parallel winds and tidal dynamics. On July 2006, profiles of pH, dissolved oxygen, temperature, turbidity and salinity were measured hourly using a digital multi-sensor. With a radiometer LI-COR model LI-192SB, PAR profiles (photosynthetically active radiation) were obtained, and from them the light extinction coefficient (k) and the euphotic zone (Zeu) were estimated. Water samples were collected from surface and bottom of the water column to analyze nutrients (NO_3^-, NO_2^-, NH_4^+, SiO_4^{4-} y PO_4^{3-}), chlorophyll *a*, pheopigments, particulate suspended matter (PSM), particulate organic matter (POM) and phytoplankton. Besides this study, 6 samplings were carried out fortnightly in order to describe the phytoplankton dynamics in winter. The results of this research reveled that in Puerto Cuatreros nutrients are in high concentration and they do not limit the phytoplankton growth in winter. Light is not a limiting factor either, regardless of the high turbidity (high PSM and k). Despite the physical homogeneity of the water column, distribution and composition of the phytoplankton-community are heterogeneous. The one day sampling reveled that phytoplankton abundance and composition are mainly regulated by the tides whereas the vertical distribution depends on the light availability in the water column and the water mixing by turbulent processes.

Keywords: Phytoplankton, light, tides, nutrients, turbidity.

2007 BDUA – Journal of Biology, 2: 75. T0239IsaacZanon29012007
Title: **Microphytoplankton taxonomy and biomass in the Pontas de Pedra Beach (Goiana, Pernambuco, Brazil)**
Authors: Isaac de Veiga Pessoa Madureira & José Zanon de Oliveira Passavante

MICROPHYTOPLANKTON TAXONOMY AND BIOMASS IN THE PONTAS DE PEDRA BEACH (GOIANA, PERNAMBUCO, BRAZIL)

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ABSTRACT
The Ponta de Pedras Beach, 7º36'58" / 7º38'10" Latitude and 34º48'84" / 34º48'40" Longitude, is located in the municipal district of Goiana, northern coast of Pernambuco State, and it is a very important environment for local population, because the economy of the area is linked to the sea ecosystem, by tourism and fisheries activities.
In January 2004, it was conducted a phytoplankton taxonomy and biomass study, using chlorophyll *a* levels, correlating with abiotic data of the Ponta de Pedras Beach. Seven sampling station were selected along the beach. Samplings of the biological material were collected at the water surface, in new and full moon tides, at low and high tides. In order to estimate the phytoplankton biomass, the samples of sea water was filtrate and the chlorophyll *a* was determined by espectrophotometric methodology. For taxonomic study, phytoplankton hauls were taken using plankton net with one meter length and 65 µm mesh size. Taxa identification was carried out under an optic microscope. Besides the biotic parameters, water temperature, salinity and pH of each station were verified.
The temperature varied from 29,88 to 31,25ºC; the salinity from 34,03 to 35,75, and pH from 7,51 to 7,61, with high tide values always higher than low tide. The phytoplankton biomass varied from 0,56 to 9,52mg.m^{-3}, indicating an mesotriphic area, observing also the strong prominence of diatoms, outranking *Bleakeleya notata*, *Isthmia enervis* and mainly the species *Bellerochea malleus*.

Keywords: Chlorophyll, phytoplankton, taxonomic study, surf zone, salinity, temperature.

2007 BDUA – Journal of Biology, 2: 76. T0240WilliamSilva30012007
Title: **Copepods dynamics in the freshwater and saline lakes in the Nhecolandia pantanal (Mato Grosso do Sul, Brazil)**
Authors: W.M. Silva, W.M., K.F. Roche, V. Eilers & M.D. de Oliveira

COPEPODS DINAMICS IN THE FRESHWATER AND SALINE LAKES IN THE NHECOLANDIA PANTANAL (MATO GROSSO DO SUL, BRAZIL)

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ABSTRACT
Seventeen water-bodies of the Nhecolândia floodplain were studied in two periods: April 2003 (beginning of the dry period) and March 2004 (end of the flood period), encompassing temporary and perennial marginal freshwater lakes, hyposaline lakes with sporadic flooding of the river, and more saline (endorheic) lakes, without contact with the river. Twenty seven Limnological parameters were measured and the zooplankton communities analyzed.
The limnological results pointed five saline lakes with salinity up to 0,5‰ and the results shows the limnological dynamics in each lake is particular, with no patter for nutrients or ions concentration between periods. The mean conductivity was higher in 2003 than 2004, showing the effects of evapotranspirations on concentration of the ions. In these lakes were found three Calanoida species, including *Argyrodiaptomus nhumirim* a endemic species from that place and seven Cyclopoida species. In 2003 was found nine of seventeen lakes with none Copepoda species and all others freshwater the Calanoida was the dominant and only in Saline Lake was dominated by Cyclopoida *Metacyclops mendocinus* and in 2004 all of seventeen had a Copepoda communities but Cyclopoida was dominated in eleven lakes including all five salines.
These results suggest that the particularity of each Nhecolândia Pantanal lakes is essential for maintenance of diversity of Copepoda Communities.

Keywords: Nhumirim, Pantanal lakes, Pantanal ecology, Copepoda communities.

2007 BDUA – Journal of Biology, 2: 77. T0241CristinaDias29012007
Title: **Inter-annual Variability of Planktonic Copepods in the Estuarine Region of the Caravelas River and the adjacent coastal region in Northeastern Brazil**
Authors: Cristina de Oliveira Dias, Adriana Valente de Araujo & Sérgio Luiz Costa Bonecker

INTER-ANNUAL VARIABILITY OF PLANKTONIC COPEPODS IN THE ESTUARINE REGION OF THE CARAVELAS RIVER AND THE ADJACENT COASTAL REGION IN NORTHEASTERN BRAZIL

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ABSTRACT
The coastal region of Caravelas (17°44' - 17°53'S and 39°04' - 39°12' W) is located in Northeastern region of Brazil. It contains diverse and productive ecological systems, including the Abrolhos Bank, considered the most important coral reefs of the South Atlantic Ocean. This report describes the structure of the copepod assemblage in the estuarine region of the Caravelas River, from 2003 through 2004. Zooplankton samples were obtained in horizontal tows, using a 200 µm cylindrical-conical net, two times a year, in seven sampling stations located in the estuarine and adjacent coastal region of the Caravelas River. Twenty-seven taxa with 16 copepods species were recorded. The copepod assemblage was formed by estuarine and estuarine/marine copepods such as *Paracalanus quasimodo*, *Acartia lilljeborgi*, *Temora turbinata* and *Parvocalanus crassirostris*, mainly. The highest density was registered during the autumn/04 (Mean: 90941.80 ind.m^{-3}; SD: 26364.79). The abundant species changed during the samplings. *Paracalanus quasimodo* (78%) in the summer/03, *Parvocalanus crassirostris* (20%) in the spring/03, *Acartia lilljeborgi* in the summer (31%) and spring (25%) of 2004-year were the abundant species in the copepod assemblage. Non-parametric multidimensional scaling revealed that spatial variation of copepod density between the sampling stations was not observed. Comparing the sampling was observed differences between the 4-periods of samples. The copepod composition in the Estuarine Region of the Caravelas River and the adjacent coastal region is similar to the one found in Northeastern and Southeastern Brazil.

Keywords: Copepoda, Crustacea, Zooplankton, Northeastern Brazil, Copepod assemblage.

2007 BDUA – Journal of Biology, 2: 78. T0242SergioSonoda30012007
Title: **Diurnal vertical distribution of the microcrustaceans in an artificial shallow lake located in the Brazilian semiarid**
Authors: Sérgio Luiz Sonoda & Viviane Gonzaga dos Santos

DIURNAL VERTICAL DISTRIBUTION OF THE MICROCRUSTACEANS IN AN ARTIFICIAL SHALLOW LAKE LOCATED IN THE BRAZILIAN SEMIARID

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ABSTRACT
The objective of this work was to analyze the vertical distribution of planktonic microcrustaceans during a diurnal cycle in an artificial shallow lake located in Jequié city (13º51'00''S; 40º05''00W), Brazil.
The samplings were carried out in two sites of the limnetic region, comprising three layers (superficial, middle and bottom) from 16/02/2006 to 17/02/2006, in six hours intervals. The samples were collected with a Van Dorn bottle, filtrated in plankton net (36 µm) and preserved in formaline 4%. The treatment of the data was realized using a non-parametric analysis Mann Whitney (U-test) to compare the sampled sites and Kruskal-Wallis (H-test) to compare the layer and times.
The following taxa were reported: *Notodiaptomus cearensis, Thermocyclops minutus, Eucyclops serrulatus* cf*., Bosmina hagmani, Diaphanosoma spinulosum, Moina micrura, Ceriodaphnia cornuta* and Chydoridade. The total mean density in the lake was 369.33 ind.L^{-1} and among adults, *N. cearensis* were the most abundant species with mean density 16.96 ind.L^{-1} (± 11.04). Neither site or layer presented significant differences, while the sampling times were clustered in two distinct periods: diurnal (6:00 and 12:00) with a low density of microcrustaceans (from 0.2 to 3.0 ind.L^{-1}) and nocturnal (18:00 and 00:00) with a higher density (from 5.3 to 9.6 ind.L^{-1}).
The results indicate that microcrustaceans could be migrating horizontally to the littoral region of the lake during the day to avoid predation.

Keywords: Shallow Lake, spatial distribution, Cladocera, Copepoda, Semiarid.

Acknowledge: State University of the Southwest Bahia.

2007 BDUA – Journal of Biology, 2: 79. T0243FabianaBonecker30012007
Title: **Larval fish composition from the Mucuri river estuary (18°06'2''S e 039°34'0''W) in relation to seasonal, day/night and tidal variations**
Authors: Fabiana Teixeira Bonecker, Ana Cristina Teixeira Bonecker & Marcia Salustiano de Castro

LARVAL FISH COMPOSITION FROM THE MUCURI RIVER ESTUARY (18°06'2''S E 039°34'0''W) IN RELATION TO SEASONAL, DAY/NIGHT AND TIDAL VARIATIONS

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ABSTRACT
The Mucuri estuary is located in south Bahia having average depth of 4m in the main channel and wide mangrove vegetation along its margins. This study aimed to analyze the occurrence and abundance of larval fish in relation to seasonal, day/night and tidal variations, and verify the influence of temperature and salinity on this community. Samplings were conducted in one station located in the estuary entrance during the day and night in two tides periods (flood and ebb) along 2002, 2003 and 2004. Oblique hauls were done using a bongo net (330 and 500 µm). A total of 7,230 larval fish were identified, including 22 families and 35 species. Most taxa identified in this study had already been recorded from Mucuri River estuary except by Atherinopsidae (*Atherinella brasiliensis*), Carangidae (*Chloroscombrus chrysurus* and *Oligoplites* sp.) and Haemulidae. The highest taxa number was recorded during the flood tide and night samplings. The highest average densities occurred during the night samplings and in the summer, except by 2004 when the highest mean value was recorded in the winter. The highest average densities of larval fish obtained during the flood tide suggests an important contribution of the adjacent coastal zone on the composition of larval community. The families Engraulidae, Gobiidae, Sciaenidae and Achiridae were dominant. Seasonality and day/night variations didn't influence significantly the density and composition of larval fish community. Ichthyoplanktonic community of the Mucuri River estuary was mainly influenced by tidal variation, being the salinity the main factor for *taxa* occurrence and abundance.

Keywords: Larval fish, Seasonal variation, Day/Night variation, tidal variation, Mucuri estuary.

2007 BDUA – Journal of Biology, 2: 80. T0244LeandroFerreira30012007
Title: **Evaluation of phytoplankton in urban beaches of Southern Pernambuco Coast, Northeast of Brazil**
Authors: Leandro Cabanez Ferreira, Maria da Glória Gonçalves da Silva-Cunha, Maria Luise Koening, Marilene Felipe Santiago & Kátia Muniz

EVALUATION OF PHYTOPLANKTON IN URBAN BEACHES OF THE SOUTHERN PERNAMBUCO COAST, NORTHEAST OF BRAZIL

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ABSTRACT
This study is a contribution to the space-time knowledge on the phytoplankton community of Recife Metropolitan Area beaches, southern Pernambuco coast, Brazil.
Samples were collected with 45 □m-mesh plankton net and bottle during the rainy (May, June and July/2005) and dry seasons (November and December/2005, and January/2006) at Brasília Formosa, Boa Viagem and Piedade beaches. Environmental data such as depth, water temperature, salinity, pH, suspended material, dissolved oxygen, saturation percentage, nutrients (nitrite, nitrate, phosphate and silicate), air temperature, precipitation, and wind direction and velocity, were assessed.
Of the 124 identified *taxa*, Bacillariophyta was the most representative followed by Dinophyta, Chlorophyta, Cyanophyta, Euglenophyta, and Chrysophyta. The most representative diatoms were *Asterionellopsis glacialis*, *Bellerochea malleus*, *Dactyliosolen fragilissimus*, *Heliotheca thamensis* and *Licmophora abbreviata* indicating environmental adaptation ability and suggesting a classification as opportunistic. The specific seasonal environmental conditions altered species composition, total density and chlorophyll *a*, with the dry season showing it better.
Despite sporadic phytoplankton blooms in the area, the ecosystem morphology and dynamics contributed to the absence of accumulations forming diatom patches throughout this sector of the coast.

Keywords: surf zone; diatoms; urban beach; Recife metropolitan area; Pernambuco state.

2007 BDUA – Journal of Biology, 2: 81. T0245AdrianaGuntzel31012007
Title: **Cladocera assemblage associated to macrophytes from three oxbow lakes of the Taquari river, Mato Grosso do Sul State, Brazil**
Authors: Adriana Maria Güntzel, Eliana Aparecida Panarelli, William Marcos da Silva & Kennedy Francis Roche

CLADOCERA ASSEMBLAGE ASSOCIATED TO MACROPHYTES FROM THREE OXBOW LAKES OF THE TAQUARI RIVER, MATO GROSSO DO SUL STATE, BRAZIL

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ABSTRACT
The Taquari River is one of the most important affluents of the Paraguay River running across the northern part of the floodplain of the Pantanal of Nhecolândia, in the State of Mato Grosso do Sul, West Central Brazil. Along the river there are many oxbow lakes with different macrophyte composition and also with different degree of connectivity with the river.
Sampling was carried out from September 2004 to August 2006. Water transparency, dissolved oxygen, pH, electrical conductivity, suspended material, chlorophyll *a*, total nitrogen and phosphorus were determined for the three lakes.
Lakes 1 and 2 presented higher water transparency and lower values for the other limnological parameters than lake 3. A total of 53 species of Cladocera were identified. Of these, 10 species are considered new records for that state. The family Chydoridae was the most representative with 38 species. In the lakes 1 and 2 Chydoridae and Macrothricidae were the most abundant *taxa*, while Daphnidae was the most representative group in the lake 3. The species of dominant macrophytes (*Mayaca* sp. in lake 1, and *Eichhornia* spp. and *Salvinia* spp. in lakes 2 and 3) thus seem to have been of lesser importance in defining the species assemblages. The river-lake connectivity was the major feature in the establishment of the limnetic species in the lakes 2 and 3, which are connected to the river in at least a period of the year. This wasn't observed in the lake 1, where the Cladocera assemblage is mainly composed by littoral species.

Keywords: Cladocera, oxbow lake, macrophytes, Pantanal of Nhecolândia, Brazilian river floodplain, Mato Grosso do Sul State

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2007 BDUA – Journal of Biology, 2: 82. T0246PaulinaBarbosa30012007
Title: **Long term study on Copepoda seasonal fluctuation in Dom Helvécio Lake, Minas Gerais, Brazil**
Authors: N.A.S.T. Mello, A.S. Guimarães, R.S. Peixoto, P.M.M. Maia-Barbosa & F.A.R. Barbosa

LONG TERM STUDY ON COPEPODA SEASONAL FLUCTUATION IN DOM HELVÉCIO LAKE, MINAS GERAIS, BRAZIL

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ABSTRACT
Nowadays, Copepoda have a main role in the zooplankton community of the lakes in Parque Estadual do Rio Doce/PERD (MG-Brazil) and surroundings, since they are the dominant group.
In Lake Dom Helvécio, the largest lake in PERD, this group contributes to over 60% of the zooplanktonic community. This study aimed in evaluating the seasonal fluctuation of the Copepoda group through samples collected during the rain (February) and dry (July) seasons, from 2000 to 2006 in a fixed point of the limnetica region. Lake Dom Helvécio remains thermal and chemically stratified during most of the year and has short period of circulation during the dry season (June to August). Except in 2003, Copepoda presented average density values higher during the dry than the rain season (466.9 and 236.383 org.L^{-1}, respectively), with statistically significant differences (Mann Witney; U = 6.0; p = 0.05).
The obtained data showed the importance of the circulation period, which, by favoring a better nutrient distribution, allows an increase in the phytoplankton biomass and consequent increase of the zooplankton densities. In 2003, a complete circulation in the lake wasn't observed, fact that can explain the lowest Copepoda density values during this period, going against the trend verified for the other years.

Keywords: Copepoda, seasonal fluctuation, thermal circulations.

2007 BDUA – Journal of Biology, 2: 83. T0247MarcosHonorato30012007
Title: **Microphytoplankton community structure from the river Formoso estuary (rio Formoso, Pernambuco, Brazil): Composition, biomass and environmental parameters**
Authors: Marcos Honorato da Silva, José Zanon de Oliveira Passavante, Maria da Glória Gonçalves Silva-Cunha & Christiana Kelly da Silva Grego

MICROPHYTOPLANKTON COMMUNITY STRUCTURE FROM THE RIVER FORMOSO ESTARY (RIO FORMOSO, PERNAMBUCO, BRAZIL): COMPOSITION, BIOMASS AND ENVIRONMENTAL PARAMETERS

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ABSTRACT
The estuary from the Formoso River is located in the Environmental Protection Area of Guadalupe, south littoral of Pernambuco State. This ecosystem presents a high biodiversity and biological potential. This work aims to analyze the seasonal and spatial variations of the hydrological parameters, algae biomass and microphytoplankton composition.
Collections were carried out in 2002, in three fixed stations, during the rainy May to July) and dry (October to December) seasons. It was studied the abiotic data (rainfall, depth, temperature, transparence, nutrients, pH, salinity and dissolved oxygen) and biotic (chlorophyll *a* and micro phytoplankton). Microphytoplankton samples were obtained through horizontal surface hauls with a plankton net 65 μm of mesh size.
It was identified 204 *taxa* outranking the diatoms, mainly: *Odontella mobiliensis, Chaetoceros costatus, Chaetoceros curvisetus, Chaetoceros* sp., *Coscinodiscus centralis, Bacillaria paxillifera, Lithodesmium undulatum, Paralia sulcata, Nitzschia sigma, Chaetoceros lorenzianus, Gyrosigma balticum, Surirella febigerii* and *Entomoneis alata*, followed by dinoflagellates, cyanobacteria, chlorophyceans, euglenophyceans and silicoflagellates. It was also important to the ecosystem *Trachelomonas* sp. and *Phacus acuminatus*.
The rainfall and tide influenced the biomass, hydrological parameters and the microflora distribution; the salinity characterized the ecosystem as euhaline and well mixed. Dissolved oxygen was not critical showing the estuary high capacity of renewing due the high marine influence. Higher nutrients and algae biomass occurred in the rainy season and low-tides characterizing the estuary as euthrophic. Changes in the water quality were responsible by the alterations in phytoplankton community structure, mainly the development of few opportunistic species.

Keywords: Microphytoplankton, Biomass, Estuary, Formoso river.

2007 BDUA – Journal of Biology, 2: 84. T0248RadkaMavrodieva30012007
Title: **Abnormal outburst of the dinoflagellate *Alexandrium ostenfeldii* (Paulsen) Balech et Tangen along the Bulgarian Black sea coast (the bay of Sozopol) in winter – ecological surprise or ecological concern?**
Authors: R. Mavrodieva, S. Moncheva & G. Hiebaum

ABNORMAL OUTBURST OF THE DINOFLAGELLATE *Alexandrium ostenfeldii* (PAULSEN) BALECH ET TANGEN ALONG THE BULGARIAN BLACK SEA COAST (THE BAY OF SOZOPOL) IN WINTER – ECOLOGICAL SURPRISE OR ECOLOGICAL CONCERN?

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ABSTRACT
Phytoplankton seasonal succession in the temperate seas such as the Black sea normally portrays high diatoms abundance in winter and dinoflagellates dominance in summer.
In winter (February) 2005 an abnormal dinoflagellate proliferation was recorded in the bay of Sozopol (Black sea). The aim of this study is to identify the possible factors triggering the phenomenon and the underlying mechanisms.
The analysis is based on an array of environmental variables (temperature, salinity, nutrients, PP, chlorophyll *a*, Secchi depth) in addition to phytoplankton taxonomic structure and abundance measured at 7 stations, and 3 sampling depths down the water column.
Dinoflagellates represented the bulk of the phytoplankton abundance, irrespective of the high nutrients level, including Si. The population of the dominant species *Alexandrium ostenfeldii*, reported for the first time in such density, consisted of cells of different life cycle phase. The higher concentration of early excystment cells in the middle and bottom depths contrasted to the pattern of vegetative cells distribution along the vertical axes.
Most likely, the phenomenon could be related to the presence of *Alexandrium ostenfeldii* "seed population" (cysts) activated by physical forcing (storm in the period prior to the sampling) that act in synergy with limiting light and high content of organic matter.

Keywords: Phytoplankton, Black sea, *Alexandrium ostenfeldii*, winter bloom.

2007 BDUA – Journal of Biology, 2: 85. T0249AndreMagalhaes30012007
Title: **Seasonal variation in composition, density and diversity of copepods from a tropical Amazon estuary (Pará State, Northern Brazil)**
Authors: André Magalhães, João Gabriel Souza Silva, Natália da Rocha Leite, Luci Cajueiro Carneiro Pereira & Rauquírio Marinho da Costa

SEASONAL VARIATION IN COMPOSITION, DENSITY AND DIVERSITY OF COPEPODS FROM A TROPICAL AMAZON ESTUARY (PARÁ STATE, NORTHERN BRAZIL)

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ABSTRACT

Copepods represent one of the most important zooplankton groups of coastal and marine ecosystems and play an important role in the energy flux through the aquatic food web of tropical estuaries. Actually, little information is available about the dynamics of these organisms in the Amazon estuaries. The main purpose of this study was to investigate the seasonal variation of copepod community structure during the months of July, September and November 2003 (dry period) and January, March and May 2004 (rainy period) in Curuçá Estuary, North of Brazil.

Samples were collected during neap tides via gentle 200 μm mesh size net tows from a small boat. Measurements of surface conductivity were registered "*in situ*" using an electronic conductivity meter and salinity was later obtained through the transformation of the conductivity values.

Salinity varied seasonally from 7.2 ± 0.1 ‰ to 39.2 ± 1.8 ‰ (mean ± SD) and has been influenced mainly by differences in the amount of rainfall between the studied sampling periods. In total, 30 copepod *taxa* were identified and *Acartia tonsa* comprised the most representative species throughout the whole studied period followed by *Acartia lilljeborgii*, *Subeucalanus pileatus* and *Paracalanus quasimodo*.

In this study, the density values, ecological indexes and copepod dominance presented a clear seasonal pattern, showing that the studied area could be considered spatially uniform and seasonally heterogeneous in relation to the investigated parameters.

Keywords: Copepod, community structure, dynamics, tropical estuary.

2007 BDUA – Journal of Biology, 2: 86. T0250AndreMagalhaes30012007
Title: **Diel zooplankton dynamics in Taperaçu estuary (Pará, North of Brazil)**
Authors: André Magalhães, Daniely do Socorro Brito Nobre, Luci Cajueiro Carneiro Pereira & Rauquírio Marinho da Costa

DIEL ZOOPLANKTON DYNAMICS IN TAPERAÇU ESTUARY (PARÁ, NORTH OF BRAZIL)

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ABSTRACT

Studies on the composition, density and diversity of zooplankton community were carried out to determine the structure and diurnal dynamics of these organisms in an Amazon tropical estuary (Taperaçu estuary, Pará, North of Brazil).

Zooplankton samples were collected through superficial horizontal plankton net (300 μm mesh size) hauls at intervals of 3 hours over a 24-hour period, during the spring tide, in April 2004 (rainy season). Salinity measurements were performed with a portable refractometer.

Salinity (range: 15-21 ‰, mean: 18 ‰) showed characteristic variation related to the semi-diurnal tidal cycle. The zooplankton community was constituted by thirty-seven *taxa* and the planktonic copepod *Pseudodiaptomus marshi* was the dominant species, comprising 77.5% of the total zooplankton density. Diel variation in density and diversity of the total zooplankton community (min.-max.: 0.0423-3.7509 x 10^4 ind.m^{-3} and 0.4-3.4 bits.ind^{-1}) and copepod groups (min.-max.: 0.0378-3.6596 x10^4 ind.m^{-3} and 0.4-2.8 bits.ind^{-1}) showed no significant (ANOVA, $p > 0.05$) differences between day: night registered values. A significant Spearman correlation between salinity and density of total zooplankton ($rs = -0.88$; $p < 0.01$) and copepods ($rs = -0.77$; $p < 0.05$) was also recorded.

Similar results were observed concerning the diversity of these both groups.

Keywords: Nyctemeral, zooplankton, tropical estuary, North of Brazil.

2007 BDUA – Journal of Biology, 2: 87. T0251JulianoBicalho30012007
Title: **The *Acrocalanus* genus (Copepoda: Paracalanidae) in the Santos Channel, São Paulo State, Brazil**
Authors: Juliano Bicalho Pereira & Luz Amelia Vega-Pérez

THE *Acrocalanus* GENUS (COPEPODA: PARACALANIDAE) IN THE SANTOS CHANNEL, SÃO PAULO STATE, BRAZIL

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ABSTRACT
The aim of this study was to evaluate the occurrence and abundance of the *Acrocalanus* Genus from November 2004 to October 2005.
Zooplankton samples were collected in two stations in the Santos Channel (23°96'S; 46°30'W) with a 140 µm mesh size net.
During the study, the water temperature varied between 20.9 °C (October) and 26.7 °C (March) and the salinity, from 29 (April) to 34.6 (May). The specimens of *Acrocalanus* were absent only in May, being their population formed mainly by mature females. In the inner station (St.1), the Genus abundances varied between 9718 ind.m^{-3} (November) and 55 ind.m^{-3} (August). The young stages were more abundant in April (2736 ind.m^{-3}) and July (1954 ind.m^{-3}). In the outer station (St.2) the *Acrocalanus* abundances varied from 5583 ind.m^{-3} (November) to 105 ind.m^{-3} (April). In this station the number of the young stages was lowest, varying between 488 ind.m^{-3} (February) and 41 ind.m^{-3} (August).
In the estuarine regions, the salinity is an important factor limiting the distribution of most plankters. The occurrence of *Acrocalanus* in the Santos Channel can be principally attributed to the high salinity of the water, since the species of this Genus are mainly oceanic and coastal occurring in waters with salinity ranges from 18 to 36.

Keywords: *Acrocalanus*, Copepoda, Santos Channel, São Paulo State.

2007 BDUA – Journal of Biology, 2: 88. T0252NataliaLeite30012007

Title: **Occurrence and distribution of *Cymbasoma longispinosum* (Copepoda: Monstrilloida) in Curuça estuary (Northern Brazil)**

Authors: Natália da Rocha Leite, João Gabriel Souza Silva, Samara Cristina Campelo Pinheiro, Luci Cajueiro Carneiro Pereira, Fernando Abrunhosa & Rauquírio Marinho da Costa

OCCURRENCE AND DISTRIBUTION OF *Cymbasoma longispinosum* (COPEPODA: MONSTRILLOIDA) IN CURUÇÁ ESTUARY (NORTHERN BRAZIL)

Natália da Rocha Leite[1], João Gabriel Souza Silva[1], Samara Cristina Campelo Pinheiro[1], Luci Cajueiro Carneiro Pereira[2], Fernando Abrunhosa[3] & Rauquírio Marinho da Costa[1]

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ABSTRACT

Monstrilloida is one of the less known copepod orders, due to particular characteristics concerning their biology and ecology. This study was performed to verify the occurrence and distribution of *Cymbasoma longispinosum* Bourne, 1890, in a tropical Amazon estuary in northern Brazil.

Samples were collected bimonthly from July/2003 to July/2004 at two different transects (Muriá and Curuçá rivers) situated along the Curuçá estuary (northeastern Pará, northern Brazil). Zooplankton samples were collected during neap tides via gentle 200 μm mesh size net tows from a small boat. The surface temperature and salinity were measured *in situ* using an electronic multi-parameter equipment (Orion 105). Water transparency was determined through a Secchi disc. Dissolved oxygen and material in suspension determinations were performed in laboratory.

Males and females of *Cymbasoma longispinosum* were only observed during the months of September and November/2003. The highest number of organisms was found in September/2003 at the Muriá River transect.

The total length of organisms from the Curuçá estuary (north region), with few exceptions, was shorter than those observed by other authors in studies carried out at the south and southeast of Brazil, where organisms of this species were also registered.

Key words: Copepoda, tropical estuary, Amazon littoral.

2007 BDUA – Journal of Biology, 2: 89. T0253KelliCosta30012007
Title: **Short and long-term temporal variation of the zooplankton in Taperaçu estuary (Bragança, Pará, North of Brazil)**
Authors: Kelli Garboza da Costa, Cidiane Soares, Luci Cajueiro Carneiro Pereira & Rauquírio Marinho da Costa

SHORT AND LONG-TERM TEMPORAL VARIATION OF THE ZOOPLANKTON IN TAPERAÇU ESTUARY (BRAGANÇA, PARÁ, NORTH OF BRAZIL)

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ABSTRACT

Nyctemeral and seasonal distribution of the zooplankton in Taperaçú estuary (Amazon region, North of Brazil) and the effect of the hydrological parameters on these organisms dynamics were studied during the months of March/2005 (rainy season) and September/2005 (dry season).

Samplings were collected during spring tides at intervals of 2 hours in a 24-hour period. Zooplankton samples were collected through sub-surface hauls of 3 minutes with a plankton net of 120 μm mesh size equipped with a digital flowmeter (Hydrobios, Kiel). Simultaneous temperature, salinity, pH and dissolved oxygen concentration measurements were performed in the water column sub-surface with multi-analyser equipment (WTW-304i).

The estuary presented a high seasonal variation in salinity (9.1 ‰ – 40 ‰) with regimes oscillating from mesohaline to polihaline/marine during the rainy and dry season, respectively. Temperature, pH and salinity were significantly higher ($p < 0.05$) during the dry season. A total of 50 *taxa* were identified, comprising the following groups: Arthropoda, Sacomastigophora, Cnidaria, Mollusca, Nematoda, Platyhelminthes, Bryozoa, Chordata, Annelida and Chaetognatha. Copepods dominated quantitatively the local zooplankton, representing 50% of the total counted organisms. Total zooplankton densities oscillated from 16,491.45 to 397,476.16 ind.m^{-3} during the dry and rainy season, respectively.

Tidal cycles and pluviometric regimen showed to be main factors responsible for the hydrological parameter oscillation and consequently for the population dynamics of the zooplankton in Taperaçu estuary.

Keywords: Dynamics, plankton, Amazon littoral, Northern Brazil.

2007 BDUA – Journal of Biology, 2: 90. T0254MonicaErache01022007
Title: **The Río de la Plata esturine conditions induced morphological variability in the marine copepod *L. fluviatilis*?**
Authors: M. Gómez Erache & W. Norbis

THE RÍO DE LA PLATA ESTUARINE CONDITIONS INDUCED MORPHOLOGICAL VARIABILITY IN THE COASTAL COPEPOD *Labidocera fluviatilis*?

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ABSTRACT
The copepod *Labidocera fluviatilis* has a broad geographic range within the Atlantic Ocean, inhabiting coastal regions of North, Central and South America, with observable patterns of distinctive modifications on body size and sexually modified structures. A comparison of the morphologic characteristics of adult specimens from the Río de la Plata estuary and adjacent platform (34º - 39º S, 52º - 58º W) was carried out.
A total of 375 specimens and 15 morphometric variables and their abbreviations were measured. To remove the size component and the allometric effects, the morphometric measurements were standardized to a total body size. A multivariate discriminant analysis was applied to identify the morphological structures responsible for the separation of two groups (Wilk´s $\lambda = 0.6209$; $F_{(c, 7, 30)} = 2.62$; $F_{(7, 30, 0.05)} = 2.33$).
Fluctuations in the analysed variables appear to be influenced by the local hydrodynamic feature, associated with the instability of the environment. Some variations observed in both groups probably arise from differences of salinity originated from Malvinas and Brazil currents confluence and Río de la Plata discharge. The decrease of cephalothorax length could be related to Río de la Plata´s specimens as a result of an adaptation to lower salinities values. Divergences in external morphology and in adaptation to habitat are the raw data to give a description of the phenotype variability of *L. fluviatilis*. Moprphological divergencies in the specie may act as a barrier against mating, matter which is being discussed.

Keywords: *Labidocera fluviatilis*, morphological divergence, Río de la Plata.

2007 BDUA – Journal of Biology, 2: 91. T0255CreteLopes02022007
Title: **Influence of the South Atlantic central water (SACW) on the spatial distribution of *Calanoides carinatus* (Copepoda, Calanoida) over the Southeastern Brazilian Shelf**
Authors: A.R.M. Créte & R.M. Lopes

INFLUENCE OF THE SOUTH ATLANTIC CENTRAL WATER (SACW) ON THE SPATIAL DISTRIBUTION OF *CALANOIDES CARINATUS* (COPEPODA, CALANOIDA) OVER THE SOUTHEASTERN BRAZILIAN SHELF

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ABSTRACT
Zooplankton sampling was carried out of SE Brazil during summer and winter 2002, at seven inshore-offshore transects, in order to investigate the potential influence of bottom intrusions of the cold and nutrient-rich SACW on the abundance of *Calanoides carinatus.* Samples were collected with a 300µm mesh Multinet within five depth layers were sorted and all copepodid developmental stages were identified, enumerated, and sized.
Highest densities of all stages occurred during summer at coastal stations (<100m), at temperatures below 20 ºC and average chlorophyll concentration of 2.3 mg.m^{-3} (at 25 m), denoting SACW penetration upon the shelf. Copepodids I and CII showed low densities in summer, when CV was dominant. Juveniles inhabited mainly the upper layers and adults the deepers. During winter, when temperature was usually above 20 ºC and chlorophyll concentration lower than 1 mg.m^{-3} (typical of Tropical Water influence), the copepod had low abundance and occurred at few stations. Copepodids I and II weren't found and females prevailed, but at low densities (~6 ind.m^{-3}).
The presence of *C.carinatus* was directly related to SACW intrusions in both study periods, but varying with the frequency and intensity of the upwelling event (higher in summer, lower in winter). The dominance of CV and the lower frequency of CI and CII in summer might be explained by: (1) the upwelling event was in its initial phase during our sampling, hence CVs were brought by SACW; (2) CIs and CIIs were advected toward offshore; and (3) CIs and CIIs were located very next to the coast and were not sampled.

Keywords: *Calanoides carinatus*, density, ontogenic distribution, upwelling, Brazilian continental shelf.

2007 BDUA – Journal of Biology, 2: 92. T0256GilmarNeves03022007

Title: **Temporal variations between zooplanktonic groups close to the Itaipu dam, Paraná river, Foz do Iguaçu, Brazil**

Authors: Gilmar Perbiche-Neves, Gustavo Luis Hirose, Francisco Franceschi, Débora Pestana da Silva, Lineu de Brito, Luciane Rafaele Favareto, Antonio Ostrensky & Walter Boeger

TEMPORAL VARIATIONS BETWEEN ZOOPLANKTONIC GROUPS CLOSE TO THE ITAIPU DAM, PARANÁ RIVER, FOZ DO IGUAÇU, BRAZIL

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ABSTRACT

In this work the temporal variation between the zooplanktonic groups from Itaipu reservoir (Paraná River) were compared.

The samples were carried out in an arm close of to the reservoir dam (Z_{max}= 8m) monthly, during the period of March/05 to February/06. In each sample, 1000 liters of water were filtered in a conical plankton net (mesh = 64µm) caught with a suction bomb (1m of surface). The material restrained was fixed in a 5% formaldeid solution. For each monthly collect, during two consecutives days, was obtained five samples for each period of day: morning (8:00 to 11:00h), afternoon (14:00 to 17:00h) and night (19:00 to 22:00h), totalizing 30 samples/month. To the identification and counting was utilized an optic microscope, sub-sampling 1ml in a Sedgwick-Rafter camera. For each sample, was quantified a minimum of 300 individuals pertaining to groups: Cladocera, Tecameba, Chaboridae and Copepoda (Harpacticoida, nauplius, copepodits and adults).

Significantly differences between groups were observed: (i) periods of day (Cladocera, copepoditos and adults), (ii) months, for all groups and (iii) periods between months (Tecameba, Cladocera, copepodits, adults and Chaoboridae). The most part of groups registered the major abundance in the months with greater temperatures (March, November and December). Cladocera was the most abundant group, follow to copepoditos, adults, nauplius and Rotifera. The smaller abundance was registered to Harpacticoida.

The results indicate that the principal's variations found in the abundance for the zooplanktonic groups were related to the samples with ample interval of time (months).

Keywords: Temporal variations, zooplankton, reservoir.

2007 BDUA – Journal of Biology, 2: 93. T0257MLShutze08022007
Title: **Zooplankton distribution of Rio de Janeiro, Brazil (21°24′2″S- 25°25′3″ S) during the expedition MD-55, May 1987**
Authors: L.C.A. Sales & M.L.M. Schutze

ZOOPLANKTON DISTRIBUTION OF RIO DE JANEIRO, BRAZIL (21°24′2″S-25°25′3″ S) DURING THE EXPEDITION MD-55, May, 1987

L.C.A. Sales & M.L.M. Schutze

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ABSTRACT
The abundance and composition of zooplankton on the eastern off Rio de Janeiro State, Brazil, between the São Tomé Cape and Cabo Frio, was analyzed in relation to the hydrological and biological processes in vertical hauls, in different water columns from 600m towards surface.
The cluster analyses revealed the presence of the Antarctica Intermediate Water in vertical profiles from 600m up to the surface, the Central South Atlantic Water (CSAW) in vertical profile from 100-0m, CSAW, Tropical Water (TW) and Coastal Water (CW) and from 50-0m with TW and Mixing Water. The values of temperature, salinity and density in this period revealled the presence of CSAW dowelled. The termocline was found between 60 and 70m, showing the higher values of chlorophyll *a* concentration. The maximum zooplankton abundance was found in Cabo Frio coastal water with 3265.45 individuals.m^{-3}. The highest abundance *taxa* were Copepoda with 76% of the total of the zooplankton following Appendicularia and Chaetognatha with 12% and 4.8%, respectively. A Principal Component Analysis (PCA) presented three axes: higher concentrations of chlorophyll *a*, lower values of salinity in Cabo Frio coastal stations and higher values of temperature and density of water in the stations close the São Tomé Cape with 50m up to the surface water column. The second axis with higher value of salinity and lower chlorophyll *a* concentration and the last axis with higher density of water and lower value of temperature was found in deeper offshore stations. Zooplankton abundance was found in Cabo Frio coastal water or on the continental shelf.
It was concluded that spatial heterogeneity of the zooplankton was certainly caused by complex interactions between hydrological and biological processes.

Keywords: Zooplankton, water masses, Cabo Frio, São Tomé Cape.

2007 BDUA – Journal of Biology, 2: 94. T0258SusanaSendacz14022007
Title: **Long term changes of the zooplankton community of reservoirs of the Alto Tietê hydrographic basin (São Paulo State, Brazil)**
Authors: Suzana Sendacz

LONG TERM CHANGES OF THE ZOOPLANKTON COMMUNITY OF RESERVOIRS OF THE ALTO TIETÊ HYDROGRAPHIC BASIN (SÃO PAULO STATE, BRAZIL)

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ABSTRACT
The zooplankton-water quality relationships of reservoirs of São Paulo State were evaluated considering the eutrophication process along the last twenty years. Two reservoirs of the Alto Tietê hydrographic basin, Ponte Nova and Guarapiranga, of different trophic conditions were comparatively evaluated concerning the zooplankton and limnological variables in 1979 and in 2001.
Ponte Nova Reservoir can be considered preserved; it is one of the reservoirs used for water supply for the city of São Paulo and has shown, along the last decades, low nutrient concentrations and very few changes on the composition and densities of the zooplankton community. As an example, the calanoid copepod *Odontodiaptomus paulistanus*, registered in five reservoirs of this basin in 1979, occurs nowadays only in Ponte Nova Reservoir, which electric conductivity remained around 32 $\mu S.cm^{-1}$. In the other hand, Guarapiranga Reservoir, submitted to an intense eutrophication process due to a strong anthropogenic impact, has shown important changes of nutrient concentrations which resulted in changes of the zooplankton community along time. *Odontodiaptomus paulistanus* and *Scolodiaptomus corderoi*, registered in 1979, were absent in the early 90's, replaced *by Notodiaptomus iheringi* and *N. cearensis*, among other species. An increase of both the Trophic State Index and electric conductivity (from 45 to 127 $\mu S.cm^{-1}$) were used to explain the replacement and/or disappearance of species. To illustrate the relation of zooplankton and quality of the water, maps of the Alto Tietê hydrographic basin are provided.

Keywords: Alto Tietê, reservoirs, calanoid copepods, water quality.

2007 BDUA – Journal of Biology, 2: 95. T0259RobertoSassi14022007
Title: **Nycthemeral variations of phytoplankton and of some environmental factors in the estuary of the River Paraíba do Norte, Northeast Brazil, in different tides**
Authors: Roberto Sassi, Francisco A. C. de Carvalho & Cristiane Francisca da Costa

NYCTHEMERAL VARIATIONS OF PHYTOPLANKTON AND OF SOME ENVIRONMENTAL FACTORS IN THE ESTUARY OF THE RIVER PARAÍBA DO NORTE, NORTHEAST BRAZIL, IN DIFFERENT TIDES

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ABSTRACT
Phytoplankton nycthemeral behaviour and some physical and chemical variables were characterized in the median portion of the estuary of the River Paraíba do Norte, state of Paraíba, using samples collected in different tide conditions, every two hours, throughout April and May 1991 (rainy period) and February 1992 (dry period).
Wide nycthemeral variations were observed to occur with respect to most of parameters studied, either in spring tide or during neap tide. During spring tide the environment showed to be homogeneous, but it happened to be strongly stratified during neap tide. In spring tide, only salinity and dissolved oxygen showed values directly proportional to the tide height; and in these same conditions the inorganic nutrients, NO_3^-, NO_2^-, and PO_4^{3-}, showed to be inversely proportional to such variables. Water transparency presented lower values during spring tides. Salinity decreased during the rainy period, mainly on the water surface. The cell counts values and chlorophyll *a* concentration were larger during the dry period, but only during conditions of neap tides and the nycthemeral variations of the parameters studied here, did not show to be rhythmically related to tides. The most abundant organisms were the diatoms *Thalassiosira* spp., phytoflagellates, and monads belonging to fractions <5µm and >5<10µm. During most of the sampling times, it was observed that dominant species were replaced.

Keywords: Phytoplankton, Estuaries, Nycthemeral variation, Tide cycles, Northeast Brazil.

2007 BDUA – Journal of Biology, 2: 96. T0260NunoMelo14022007
Title: **Decapoda crustaceans larvae in Guajará-Miri river's estuary, Pará, Brazil**
Authors: Melissa do Socorro Fonseca da Silva, Nuno F.A. Correia de Melo,
Cristiane T. Contente, Fábio Ferreira Cardoso, Igor Penedo de Matos & Lívia O. Nunes

DECAPODA CRUSTACEANS LARVAE IN GUAJARÁ-MIRI RIVER'S ESTUARY, PARÁ, BRAZIL

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ABSTRACT
The present work aims to determine the community's structure formed by Decapoda crustaceans larvae in Guajará-Miri river's estuary, located in Vigia-Pará-Brazil, its nictemeral variation, correlating to environmental parameters.
In March, the temperature varied from 28.2℃ (6:00 a.m.) to 30.3℃ (12:00 p.m.). The salinity ranged from 0.5‰ (0:00 a.m. and 9:00 p.m.) to 0.8‰ (6:00 a.m.). The dissolved oxygen concentration varied from 1.9 mg×L^{-1} (6:00 am) until 4.6 mg×L^{-1} (6:00 pm and 9:00 pm). In September the temperature ranged 29.1℃ (6:00 am) till 30.5℃ (3:00 pm). The salinity deviated from 5.7‰ (12:00 pm) to 6.9‰ (9:00 am). The dissolved oxygen varied from 5.5 mg×L^{-1} (6:00 am) till 7.5 mg×L^{-1} (3:00 pm). This research founded 4 families: *Portunidae, Ocypodidae, Xanthidae* and *Grapsidae.* The predominant family was the Portunidae, which presented the greatest number of organisms in the periods of 5:00, 8:00, 11:00 pm and 2:00 am The *Ocypodidae* was also remarkable, with greatest values occurring in 5:00, 20:00 pm and 2:00 am. The *Xanthidae* was found in 11:00 pm and the *Grapsidae* in 11:00 am. The major densities were obtained in 5:00 pm (3.1 org/l) and 2:00 am (2.3 org/l), whereas the smallest were recorded in 8:00 am (0.1 org/l) and in 2:00 pm (0.3 org/l). The *Portunidae* family registered the maximum density in 5:00 pm (79.4%) and the lowest (41.4%) in 11:00 am The *Ocypodidae* one presented its major in 2:00 am (34.6%) and the smallest in 11:00 pm (4.4%) The *Xanthidae* and *Grapsidae* reached densities of 10.3% and 2.1%, respectively.

Keywords: Decapoda larvae, estuary, Amazon.

2007 BDUA – Journal of Biology, 2: 97. T0261LuciaGusmao14022007
Title: **Zooplankton from the Barra das Jangadas estuarine system (Jaboatão dos Guararapes-PE-Brazil)**
Authors: Valdylene Tavares Pessoa, Fernando de Figueiredo Porto Neto, Lúcia Maria de Oliveira Gusmão, Sigrid Neumann Leitão & Andréa Pinto Silva

ZOOPLANKTON FROM THE BARRA DAS JANGADAS ESTUARINE SYSTEM (JABOATÃO DOS GUARARAPES-PE-BRAZIL)

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ABSTRACT
Studies were carried out to assess the zooplankton community structure from the Barra das Jangadas estuarine system. This system is formed by the Pirapama and Jaboatão rivers.
Collections were made during low and high tides in three fixed stations (Pirapama, Jaboatão and Confluence) from October to December/2005. A plankton net 300 micrometers mesh size was hauled at sub-surface. Abiotic data (salinity, temperature, depth, transparency, nutrients, dissolved oxygen and Biochemical oxygen demand) were collected simultaneously.
It was identified 22 *taxa* being Copepoda the most diverse. Among Copepoda outranked *Pseudiaptomus acutus, Pseudodiaptomus marshi*, *Parvocalanus crassirostris* and *Acartia lilljeborji* an estuarine indicator group. Cladocera was the most numerical abundant group. The meroplankton was represented mainly by Mollusca larvae and Brachyura zoeae. The stations Pirapama and Jaboatão presented high freshwater influence, and the confluence varied from marine to limnetic regime. No difference ($p<0.05$) was registered between tides. Differences occurred among stations, with Jaboatão presenting higher density.

Keywords: Zooplankton, estuary, spatial distribution, bioindicator, tropical.

2007 BDUA – Journal of Biology, 2: 98. T0262FlaviaCorrea14022007
Title: **Phytoplankton biomass and related variables in Bertioga channel**
Authors: Flávia M.P. Saldanha-Corrêa, Rebeca C. Mezzacappa, Thais B. Francisco, Adriana Lippi & Sônia M.F. Gianesella

PHYTOPLANKTON BIOMASS AND RELATED VARIABLES IN BERTIOGA CHANNEL

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ABSTRACT
Bertioga Channel (BC) is a branch of the Santos estuarine system. However BC northern portion is sheltered from exchanges with waters from the heavily polluted Santos Channel (SC), due to the presence of a "water divisor" at its mid-portion. The time-space variability of phytoplankton biomass and related variables was followed by monthly samplings in seven oceanographic stations along the BC northern portion, from November 2004 to December 2005.
At every station CTD profiles were performed and discrete samples of seawater were taken from 3 depths for Chl *a*, seston and inorganic nutrients determinations.
BC has many characteristics of a typical tropical estuary: is surrounded by mangroves and presents high means of rainfall (400 cm y^{-1}), water temperature (24 ± 2.08°C) and silicate (25.5 ± 14.4µM). During the studied period, Chl *a* presented a wide range of variation (1.23 to 44.04 mg m^{-3}) with an annual average value of 9.03 (±6.50) mg m^{-3}, allowing this channel to be classified as meso to eutrophic environment. The inner station always presented the highest Chl *a* values followed by the BC inlet station.
Previous studies conducted at the same place 16 years ago, reported low Chl *a* concentrations and high nutrient availability. Such condition was not observed in the present study. Except for silicate, the other inorganic nutrients displayed medium to low concentrations. Ammonium was the main N form and N:P ratio generally denoted P limitation but 480/665 optical density ratios indicated a good intracellular nutritional state.
Present results indicate a shift in the phytoplankton dynamics in this region.

Keywords: phytoplankton biomass, phytoplankton dynamics, time-space variability, inorganic nutrients, Bertioga Channel.

2007 BDUA – Journal of Biology, 2: 99. T0263DanielliGranado15022007
Title: **Influence of inundation pulse on phytoplankton community in a lateral lake (trasition zone between Paranapanema river and Jurumirim reservoir, São Paulo, Brazil)**
Authors: Danielli Cristina Granado & Raoul Henry

INFLUENCE INNUNDATION PULSE ON PHYTOPLANKTON COMMUNITY IN A LATERAL LAKE (TRANSITION ZONE BETWEEN PARANAPANEMA RIVER AND JURUMIRIM RESERVOIR, SÃO PAULO, BRAZIL)

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ABSTRACT
The aim of this work was to study the effects of inundation pulse of Paranapanema River on the structure of phytoplankton community in a lateral lake (Coqueiral Lake). The samplings (two times/week) extended from November 11, 2004 to February 10, 2005 (in the rainy period, including the rising and high water phases) and, were done in two sites, one near the inlet of the river within the lake and another, far from the connection.
During the three months period, 125 algae species were found, with a predominance of Chlorophyceae (42.4%). Bacillariophyceae presented the second highest class in species richness (17.6%) and Cyanobacteria the third (16.8%). The highest species richness's were observed in the beginning of samplings (36 species in the lake near the river and 27 species in the site for form the river), when Paranapanema River and Coqueiral Lake presented low water level, in relation to high water phase (4 species and 9 species, respectively). The highest densities of phytoplankton were found around the 12th sampling (2697 ind.mL^{-1}) in lake site near the river and, in the 10th sampling (2974 ind.mL^{-1}) in site far from the river. In the terms density, Cryptophyceae was the dominant class and, the species *Cryptomonas brasiliensis* was the more abundant representant along the study. Water levels increased slowly during samplings; from the 14th sampling (around 1,5 m), it was observed an abrupt increase (1.45 m) on water level. In the 20th sampling (4 m), Coqueiral Lake presented the highest depth. The inundation pulse promoted a dilution effect and, total densities of phytoplankton decrease to 240 ind.mL^{-1} (in site near the river) and to 197ind.mL^{-1} (in site far the connection).

Keywords: Phytoplankton, Inundation Pulse, Lateral Lake.

2007 BDUA – Journal of Biology, 2: 100. T0264JanieleCosta21022007
Title: **Sucessionals aspects of the Phytoplanktonic Community of a reservoir of Paraíba semi-arid region, Brazil**
Authors: Janiele da Costa de França, José Etham de Lucena Barbosa, Gilberto Queiroz de Lima Filho, Gabrielle Joanne Medeiros Araújo & Rogério de Sousa Andrade

SUCESSIONALS ASPECTS OF THE PHYTOPLANKTONIC COMMUNITY OF A RESERVOIR OF PARAÍBA SEMI-ARID REGION, BRAZIL

Janiele da Costa de França, José Etham de Lucena Barbosa, Gilberto Queiroz de Lima Filho, Gabrielle Joanne Medeiros Araújo & Rogério de Sousa Andrade

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ABSTRACT
The present work gives information on the phytoplanktonic community ecology in the Brazilian's semi-arid region: Namorados dam (capacity of 2.118.980 m^3). Descriptions of the phytoplanktonic community structure were analyzed, associated with some physical, chemical and climatic variables. Results were based on semimonthly samplings from November/05 to September/06.
The phytoplanktonic community was formed by 90 *taxa*, distributed to 6 classes. The Principal Components Analyses (PCA) allowed distinguishing the system between the dry and rainy seasons. In the dry season, the reservoir presented: (1) mixed, (2) alkaline, (3) limited nitrogen, favoured for the dominance of the functional groups K and L_o (*Aphanocapsa elachista* and *Merismopedia tenuissima*) indicating species of oligotrophic environments, with increased density and biomass, and simultaneously decreased the algal diversity. In rainy season it was observed (1) increasing in the volume of the dam, (2) chemical stratifications, (3) enrichment of the water body due to the allocthonous matter flows. The availability of nutrients promoted an increase of the productivity in superficial layers of the reservoir, in way that the competition for nutrients had favoured the dominance of the W_2 and F functional groups (*Trachelomonas* sp. *and Dictyosphaerium pulchellum*), indicating species of mesotrophic environments, which conciliate efficient mobility with large size, feeding itself in the inferior layers where the nutrients of the water were less depleted.
The conclusion was that in the periods of drought and rain, had strong influences in relation the ecology of the phytoplankton community, acting as a factor of disturbance in the environment.

Keywords: Phytoplanktonic community, ecological succession, hydrology disturbance, semi-arid region.

THEME 3

Planktonic food webs and biogeochemical cycles. Interface fluxes and controls

2007 BDUA – Journal of Biology, 2: 103. T0301DannyRejas11012007
Title: **The role of plankton in Amazonian floodplain lakes: the classic and microbial food webs**
Author: Danny Rejas

THE ROLE OF PLANKTON IN AMAZONIAN FLOODPLAIN LAKES: THE CLASSIC AND MICROBIAL FOOD WEBS

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ABSTRACT
Despite the low nutrient concentrations and phytoplankton densities in Amazonian lakes, they typically sustain high biomasses of fish. This raises questions on the role of planktonic food webs in these environments.
Several experimental studies were carried out to determine the mechanisms controlling the planktonic community and its contribution to fish biomass production in an oxbow lake of a white-water river in the upper Amazon.
The data showed that the lower trophic levels (bacteria and algae) were strongly bottom-up controlled. Phytoplankton growth was N and P co-limited all year round whereas bacterial growth is P-limited during the low-water season, when bacteria and algae compete for inorganic nutrients. Intermediate trophic levels (zooplankton) seem to alternate between bottom-up and top-down control. Under conditions of strong food limitation, the positive effect of fish on zooplankton through nutrient recycling and enhancement of primary production can compensate for losses due to fish predation, resulting in and overall positive effect of fish on zooplankton populations. Estimations on the amount of energy made available to fish via the classic and microbial food webs indicate that, both together can support only around 10 % of the fish biomass production. Nearly 90 % of the energy seems to flow through short chains from detritus to detritivorous fish and higher trophic levels. Stable isotopes indicate that the sedimented particulate organic matter (POM) was the main carbon source for fish. Whether the POM assimilated by fish was originated from decomposing aquatic, terrestrial vegetation or sedimented algae and bacteria is still unclear.

Keywords: Food webs, classic food chain, microbial loop.

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Title: **Planktonic trophic interactions in a coastal upwelling system at SW Atlantic**
Authors: Mariana Guenther, Elian e Gonzalez-Rodriguez, Rodolfo Paranhos, Carlos E. Rezende, Glenda M. Mugrabe & Jean L. Valentin

PLANKTONIC TROPHIC INTERACTIONS IN A COASTAL UPWELLING SYSTEM AT SW ATLANTIC

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ABSTRACT
The food web structure directly affects carbon fluxes within pelagic ecosystems. In shorter, herbivorous food webs, based on larger phytoplankton cells, most of the biogenic carbon produced is exported, while in longer, microbial food webs, based on smaller phytoplankton cells and bacterioplankton, the carbon produced is mostly recycled within the system. The trophic structure of the plankton community was evaluated in a microscale survey conducted during a downwelling-upwelling cycle at the SE Brazilian coast.
Size-fractioned phytoplankton, bacterioplankton biomass and production as well as mesozooplankton abundance were estimated at a fixed station located in the upwelling core area. The studied period, lasting 5 consecutive days, covered both downwelling and upwelling phases.
During the downwelling period, the dominance of small phytoplankton (pico and nanoplankton), higher bacterial biomass and production and lower densities of mesozooplankton, characterized the establishment of a microbial food web. After the South Atlantic Central Water (SACW) upwelling, the participation of microplankton on primary biomass and mesozooplankton densities increased, while bacterial biomass and production decreased, indicating the appearance of an herbivorous food web with the upwelling.
This study shows that, in such a complex hydrodynamic system, the trophic structure can be highly variable, affecting the carbon fluxes through the food web.

Keywords: food webs, trophic structure, carbon fluxes, phytoplankton, bacterioplankton, zooplankton.

2007 BDUA – Journal of Biology, 2: 105. T0303CCasteloBranco29012007
Title: **Some aspects of the feeding behaviour of zooplankton in reservoirs**
Authors: Christina Castelo Branco

SOME ASPECTS OF THE FEEDING BEHAVIOR OF ZOOPLANKTON IN RESERVOIRS

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ABSTRACT
The natural diet of the zooplankton has been determined by measurements of correlation between populations of zooplankton and phytoplankton and the observation of gut contents. Such work has contributed to understanding some plankton interactions, but seldom provided information on the strategies of feeding of zooplankters. Despite the central role of the zooplankton species in freshwater trophic web, there is still little information on the feeding behaviour of them. This study aims to elucidate some feeding strategies of zooplankton genera by direct observations of live specimens.
Zooplankton samples were taken by hauls with 68 µm mesh size plankton net in four reservoirs. A 500 mL concentrated samples was poured in a 1,000 mL bottle and kept in dark, without refrigeration. The observations of live specimens were done some hours after sampling and in the two days after, in an Olympus microscopy and registered with a digital camera.
The direct observations resulted in the elucidation of several feeding procedures. Ciliates showed a high grazing activity on algae, especially on diatoms, chlorophytes and cryptophytes, and an incredible capacity to catch metazoans such as rotifers of almost the same size with of the help of the cytopharynx. Colonial and filamentous cyanobacteria were consumed actively by Brachionid rotifers as well by the ciliate genus *Nassula*. Cladocerans were observed ingesting solitary cells from *Volvox* colonies. The algae *Botryococcus* was actively ingested by protozoans, rotifers and copepods. The preferential predation of turbellarians on cladoceran eggs and the catch of loricated rotifers by *Chaoborus* larvae were also registered.

Keywords: Zooplankton, natural diet, feeding behaviour.

2007 BDUA – Journal of Biology, 2: 106. T0304CledinaldoLeal27012007
Title: **Phytoplanktonic biomass in temporary ponds in São Luís Island (Maranhão State – Brazil)**
Authors: Cledinaldo Borges Leal, Eliesé Idalino Rodrigues & Marco Valério Jansen

PHYTOPLANKTONIC BIOMASS IN TEMPORARY PONDS IN SÃO LUÍS ISLAND (MARANHÃO STATE – BRAZIL)

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ABSTRACT
This work attempted to verify phytoplanktonic biomass in temporary ponds in the South of São Luís island (Maranhão State – Brasil), which assumes an important role for the life cycle of *Physalaemus cuvieri* (Anura, Amphibian) tadpodes.
Chlorophyll *a* was measured through spectrophotometric analysis and extracted from glass filters using 90 % acetone. Three water collections were carried out in a 12 days periodicity between them (June 02, 14 and 26, 2006) in rainy period.
In the third collection, for all ponds, a higher chlorophyll *a* rate was registered, varying from 18.90 to 73.63 $\mu g.L^{-1}$. In the first collection, the chlorophyll rate varied from 6.81 to 27.47 $\mu g.L^{-1}$. In the second collection, the values were lower in all ponds, ranging from undetectable values to 10.99 $\mu g.L^{-1}$.
Pluviosity was an important factor for determining biomass (chlorophyll) in the studied ponds, once the former period. Elevated pluviometric precipitation justify the low quantity of biomass registered.

Keywords: Biomass, phytoplankton, temporary ponds, chlorophyll rate, Brazil.

2007 BDUA – Journal of Biology, 2: 107. T0305ErikTadesco26012007
Title: **Accumulations of the surf-zone diatom *Anaulus australis* Drebes & Schulz and *Asterionellopsis glacialis* (Castracane) Round in Cururupe Beach, Northeastern Brazilian Coast**
Authors: Erik Costa Tedesco & Sylvia Maria Moreira Susini Ribeiro

ACCUMULATIONS OF THE SURF-ZONE DIATOM *ANAULUS AUSTRALIS* DREBES & SCHULZ AND *Asterionellopsis glacialis* (CASTRACANE) ROUND IN CURURUPE BEACH, NORTHEASTERN BRAZILIAN COAST

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ABSTRACT
Patches formed by surf diatoms accumulation in the surf-zone and their forcing factors had been studied in Ilhéus - BA, throughout the year of 2005. The direction and intensity of the winds associated to cold fronts seem to be the main feature responsible for the changes in the physical and chemical variables, determining the phytoplanktonic community.
The total of organisms in the surf-zone of Cururupe beach varied from 2.1 x 10^5 to 9.5 x 10^7 org.L^{-1}. The microplankton qualitative study identified 154 *taxa*, being 109 diatoms, 23 tintinnids, 20 dinoflagellates and 2 cyanobacteria. The microphytoplanktonic assembly was composed, in its majority, by benthic species in strong wind periods and mainly by planktonic species, in moderate or weak wind ones. During strong wind events, the biggest biomass values were found (106.5 µM Chl *a*) associated to the patches. The species *Asterionellopsis glacialis* and *Anaulus australis* reached high cellular densities in the patches, *A. australis* (1.81 x 10^6 to 7,78 x 10^8 org.L^{-1}) and *A. glacialis* (4,72 x 10^5 to 1.81 x 10^9 org.L^{-1}), suggesting a strong contribution of the patches to the higher trophic levels in the beach environment.

Keywords: Phytoplankton, sandy beach, surf-zone, ecology, tropics.

2007 BDUA – Journal of Biology, 2: 108. T0306MCristinaClaps29012007
Title: **Zooplankton characterization in a subtropical reservoir (Córdoba, Argentina) during the period 1996-2005**
Authors: María Claps & Diego Ardohain

ZOOPLANKTON CHARACTERIZATION IN A SUBTROPICAL RESERVOIR (CÓRDOBA, ARGENTINA) DURING THE PERIOD 1996 – 2005

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ABSTRACT
The Río Tercero Reservoir was built for hydroelectric purposes in 1936. Since 1983 the reservoir has been regulated by the requirements of a nuclear power plant, which uses the water for cooling, with reduction of water level fluctuations. The reservoir became mesotrophic in the last decade related to its water management. Since 1999, the presence of an invasive and exotic species (*Limnoperma fortunei*) and blooms of a non edible phytoplankton species (*Ceratium hirundinella*) were recorded in the reservoir. The objective of this investigation is to describe the structure and dynamic of zooplankton related to the mentioned modifications occurred in the environment.
The samples were taken where the Nuclear Power Plant pumps water in for cooling in a vertical profile with six levels every two months.
Fifty eight species were identified (17 protists, 1 turbellarian, 27 rotifers and 13 crustaceans). Only 14 of them were perennial. Rotifers were always dominant due to the abundance contribution of *Keratella cochlearis, Conochilus unicornis, Hexarthra* sp. and *Polyarthra vulgaris*. The mean zooplankton density decreased constantly from 613 individuals.L^{-1} in 1996 to 231 individuals.L^{-1} in 2005 whereas the mean species richness fluctuated between 43 species in 1999 to 24 species in 1998 and 2004. The zooplankton biomass decreased suddenly in the last four years related to the minor contribution of the calanoid *Notodiaptomus incompositus*. The diminution of the zooplankton populations is associated with the low phytoplankton biomass and the repetitive dominance of non palatable algae such as *C. hirundinella*.

Keywords: Long-term investigation, trophic state, zooplankton, structure and dynamics.

2007 BDUA – Journal of Biology, 2: 109. T0307SoledadDiodato29012007
Title: **Contribution of planktonic and detritical fractions to the natural diet of mesozooplankton in late spring**
Authors: Soledad Lorena Diodato & Mónica Susana Hoffmeyer

CONTRIBUTION OF PLANKTONIC AND DETRITICAL FRACTIONS TO THE NATURAL DIET OF MESOZOOPLANKTON IN LATE SPRING

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ABSTRACT
The relative importance of phytoplankton and microzooplankton in the natural diet of mesozooplankton was assessed in Bahía Blanca Estuary, Argentina, in December 2005. Grazing experiments were performed using 200 to 2,000 µm grazers and natural food <100 µm. Individual and community filtration and ingestion rates were estimated for each food fraction after 24 h incubation. Preys and grazers were qualitatively and quantitatively analyzed yielding results in abundance and carbon terms.
Phytoplankton was mainly composed of diatoms whereas microzooplankton was mainly composed of tintinnids. Both fractions were less abundant than detritus. Most of the grazers belonged to the copepod *Acartia tonsa*. Mean filtration and ingestion rates on phytoplankton + microzooplankton were 6.44 mL grazer^{-1} d^{-1} and 0.03 µg C.grazer^{-1}.d^{-1}, respectively. Including detritus, they increased to 6.954 mL.grazer^{-1}.d^{-1} and 1.501 µg C.grazer^{-1}.d^{-1}. Mean weight-specific ingestion rates upon phytoplankton and microzooplankton were 0.0059 and 0.0049 µg C.µg C^{-1}.d^{-1}, respectively, whereas after the addition of detritus, the overall rate increased to 0.536 µg C µg.C^{-1}.d^{-1}. Highly significant differences were found between grazing rates on detritus and planktonic fractions. Consumers showed higher filtration rates on microzooplankton than on phytoplankton although 78% of the cells ingested (54.7% µg C) came from the latter.
Results seem to evidence a higher contribution of detritus to the natural diet of mesozooplankton in late spring. The omnivory of *A. tonsa* and the high turbidity of Bahía Blanca estuary may explain the differences observed in carbon intake among food fractions.

Keywords: Grazing, mesozooplankton, phytoplankton, microzooplankton, detritus.

2007 BDUA – Journal of Biology, 2: 110. T0308HaydeePizarro2007
Title: **Phytoplankton production in a vegetated floodplain wetland: a field experiment simulating alternative stable states**
Authors: Haydée Pizarro, Patricia Rodríguez, Paula de Tezanos Pinto, María Solange Vera, Griselda Chaparro & Inés O´Farrell

PHYTOPLANKTON PRODUCTION IN A VEGETATED FLOODPLAIN WETLAND: A FIELD EXPERIMENT SIMULATING ALTERNATIVE STABLE STATES

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ABSTRACT
The phytoplankton production response to different free floating plant coverage was experimentally explored in a nitrogen deficient floodplain wetland.
Two different alternative states naturally occurring in these ecosystems were simulated: phytoplankton (T1-constant high light) and free floating plants (T2-constant low light) dominant states. Field enclosure experiments were performed in late summer for one month, with a 10 day sampling frequency. Fishes were added to control zooplankton grazing in all enclosures and meshes were placed to mimic the plants effect in T2. Each treatment was run by triplicate. Light, temperature, oxygen and pH were measured in the depth profile at 10 cm intervals and the extinction coefficient calculated. Phytoplankton samples for production (^{14}C assimilation technique) and quantitative analysis, nutrients and chlorophyll *a* were obtained from integrated samples.
Repeated measures ANOVA indicate significant differences in production both between treatments and in time. Under T2, production remained low and similar throughout the study, whilst in the T1 production increased with time. These differences are mainly explained by the strong light reduction at T2 which favors anoxia, sustain low phytoplankton biomass and low chlorophyll *a* (as result of forward stepwise multiple regression) thus establishing a self-stabilizing state with low fluctuations. Conversely, waters at T1 remained oxygenic and the higher mean irradiance allowed the maintenance of high phytoplankton biomass, even under nutrient deficient resources. Moreover, final phytoplankton assemblage in T1 evolved while in T2 final assemblages were similar in all enclosures.

Keywords: Phytoplakton production, field experiment, floodplain wetland, Argentina.

2007 BDUA – Journal of Biology, 2: 111. T0309FranciscoRivera29012007
Title: **Interaction effects between nutrient enrichment and the omnivorous fish, Nile tilapia (*Oreochromis niloticus*), on phytoplankton biomass in a artificial tropical shallow lake in the brazilian semi-arid region**
Authors: Francisco Rivera de Vasconcelos, Rosemberg Fernandes de Menezes, José Luiz Attayde, Danyhelton Douglas Farias Dantas & Fabiana Oliveira de Araújo

INTERACTION EFFECTS BETWEEN NUTRIENT ENRICHMENT AND THE OMNIVOROUS FISH, NILE TILAPIA (*Oreochromis niloticus*), ON PHYTOPLANKTON BIOMASS IN A ARTIFICIAL TROPICAL SHALLOW LAKE IN THE BRAZILIAN SEMI-ARID REGION

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ABSTRACT
This work aimed to understand how phytoplankton biomass and water transparency respond to fish-nutrient interaction, since this interaction may be critical to better predicting the response of lakes and reservoirs to nutrient enrichment.
The mesocosm experiment was conducted during six weeks in a small reservoir in the semi-arid Northeastern Brazil and had a 2X2 factorial design in which two levels of nutrient loading were crossed with two levels of omnivorous fish (*Oreochromis niloticus*).
The results showed that there was a significant nutrient-fish interaction effect on phytoplankton biomass and water transparency at the end of the experiment. The effects of nutrient enrichment on phytoplankton biomass were more pronounced in the presence of omnivorous fish while the effects of omnivorous fish was enhanced with the addition of nutrients.
Given that eutrophication and manipulation of fish populations are probably the most common anthropogenic stressors of freshwater ecosystems, these results are directly relevant to water resource management.

Keywords: Eutrophication, water quality, phytoplankton, omnivorous fish, Nile Tilapia, reservoir, semi-arid.

2007 BDUA – Journal of Biology, 2: 112. T0310GeyleneRibeiro30012007
Title: **Structure of phytoplankton community in estuarine areas subject to the oil spill in Maranhão State- Brazil**
Authors: Geylene Albuquerque Ribeiro, Andrea Christina Gomes de Azevedo & Dairle Santos Costa

STRUCTURE OF PHYTOPLANKTONIC COMMUNITY IN ESTUARINE AREAS SUBJECT TO OIL SPILL IN MARANHÃO STATE – BRAZIL

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ABSTRACT
In aquatic environments, the phytoplankton community is responsible for great part of the primary productivity, representing the base of the food web. Due to the influence of fresh and marine waters and of the distribution of phytoplankton, the estuaries are among the most productive ecosystems.
This work results from quali and quantitative analysis of phytoplankton in São Marcos bay, São Luís Island – Maranhão State, Brazil. Eight superficial collections in two fixed stations (Itaqui Harbour – station I; and Coqueiros Strait – station II) were carried out in the period from May/2005 to June/2006. For the qualitative study, plankton net were used with mesh of 65 µm, and in laboratory were calculated the occurrence frequency and the relative abundance. For the quantitative analysis, the determination of the cell density was maddened through Utermöhl's method. Diversity, evenness and richness indices were calculated.
This study identified 119 *taxa*, and the group Bacillariophyceae obtained larger representatively reaching 99 species. Regarding the occurrence frequency, the most representative category was little frequent with 32%. Of all the analyzed samples the microalgae *Actinocyclus* sp. was considered dominant, representing 72% at the station I. The microphytoplanktonic cell density varied from 23,696 to 110,704 cells.L^{-1}, both belonging to station I. Species diversity varied from 2.06 bits cell to 2.74 bits cell (station II), and the evenness varied from 0.76 to 0.93 (station I and II). Regarding the richness, the variation ranged from 3.20 to 5.29, both referring to II station.

Keywords: Phytoplankton, structure, estuary, cell density.

2007 BDUA – Journal of Biology, 2: 113. T0311OttoOliveira29012007
Title: **Association between plankton and water masses in the São Sebastião Channel (Southeastern Brazil), with emphasis on the gelatinous plankton**
Authors: Otto Müller Patrão de Oliveira & Antonio Carlos Marques

ASSOCIATION BETWEEN PLANKTON AND WATER MASSES IN THE SÃO SEBASTIÃO CHANNEL (SOUTHEASTERN BRAZIL), WITH EMPHASIS ON THE GELATINOUS PLANKTON

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ABSTRACT
The São Sebastião Channel is a marine passage between the Island of São Sebastião and the continent. Four water masses [Coastal Waters (CW), Southern Coastal Waters (SCW), Tropical Waters (TW), and South Atlantic Central Waters (SACW)] fill the channel in different periods along the year, bringing their associated plankton biota. To better know the seasonal variation in this plankton biota, 45 sampling events along 15 months (March 2005 to May 2006) in the channel were performed.
Plankton samples were collected with 300 and 500 µm mesh tows. Temperature and salinity of the water were obtained at 2 and 20 m of depth each sampling event.
Along the year, CW was the predominant water mass, presenting the highest variation of *taxa* in dominant condition. In the summer, SACW inflows the channel in upwelling events. The SACW presence was correlated with a high concentration of *Liriope tetraphylla* in the channel. Also in the warmest months, TW enters the channel bringing *Penilia avirostris* and *Trichodesmum* sp. as dominant *taxa*. The SCW mass inflows the channel in the coldest months, associated with the atmospherically fronts arriving from the south. *Acartia* spp. and *Noctiluca* sp. were the dominant *taxa* in these events. The gelatinous plankton was present all over the year. Ctenophores and tunicates presented high association with SCW, although they were also found in some CW samples.
The plankton biodiversity associated with each water mass increases the general biodiversity of the channel, adding complexity to the local food web.

Keywords: Plankton, Water Masses, Southeastern Brazil, Hydromedusa, Ctenophora, Thaliacea, Association.

Supporting: FAPESP (Proc. 04/15300-0), CNPq.

2007 BDUA – Journal of Biology, 2: 114. T0312ElvioMedeiros29012007
Title: **Importance of zooplankton as a food resource to three native fish species in floodplain waterholes of a dryland river, the Macintyre River, Australia**
Authors: Elvio Sergio Figueiredo Medeiros & Angela H. Arthington

IMPORTANCE OF ZOOPLANKTON AS A FOOD RESOURCE TO THREE NATIVE FISH SPECIES IN FLOODPLAIN WATERHOLES OF A DRYLAND RIVER, THE MACINTYRE RIVER, AUSTRALIA

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ABSTRACT
Zooplankton has been recognized as an important energy resource for small body-sized fish that, in turn, provide energy to piscivorous fish consumers higher up the food web. This study evaluates the importance of zooplankton to the diets of three species of fish on floodplain waterholes of an Australian dryland river (Macintyre River, Queensland/New South Wales). The selected species represent different components of the trophic web: *Ambassis agassizii* is a microcarnivore, *Leiopotherapon unicolor* is an omnivore and *Nematalosa erebi* is a detritivore. Several size-classes where evaluated to understand possible ontogenetic shifts in zooplankton consumption.
The diet of *Ambassis agassizii* was comprised of zooplankton (99.9%, being 81.6% Calanoida and 17.4% Moinidae), regardless of the size of individuals. *Leiopotherapon unicolor* fed on zooplankton (47%), mostly Daphniidae and Moinidae, and aquatic insects (46.7%). Smaller individuals of this species (30-49 mm TL) were responsible for 36.1% of the plankton consumed. *Nematalosa erebi* fed mostly on detrital and vegetal matter (86.2%) and only 13.7% on zooplankton (Calanoida, Moinidae and Cyclopoida). However, smaller individuals (40-69 mm TL) were responsible for 98% of the plankton consumed by *Nematalosa erebi*, and all individuals with size 40-49 mm (TL) fed exclusively on zooplankton (53.8% Moinidae and 46.2% Calanoida).
Although the three species had different diets, reflecting differences in species-specific and ontogenetic morphological and behavioral characteristics, zooplankton was the basis of the diet of all species when young. These results confirm the importance of zooplankton as a major food resource for small fish in floodplain waterholes of the Macintyre River.

Keywords: Fish, diet, zooplankton, floodplain waterholes, dryland rivers, Australia.

2007 BDUA – Journal of Biology, 2: 115. T0313Promarlam30012007
Title: **Contrasts in the vertical distribution of salps and copepods on the Southeastern continental shelf of Brazil**
Authors: L.P. Oliveira & R.M. Lopes

CONTRASTS IN THE VERTICAL DISTRIBUTION OF SALPS AND COPEPODS ON THE SOUTHEASTERN CONTINENTAL SHELF OF BRAZIL

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ABSTRACT
The goal of this study was to study the spatial and seasonal distribution of *Thalia democratica* (Salpida), in comparison with copepod distribution, and evaluate the influence of South Atlantic Central Water (SACW) on biological processes in Southern Brazilian waters.
Sampling was carried out in summer and winter through vertical hauls of a 200 µm mesh closing net in three depth layers (0-20m, 20-70m and 70-90m). Organisms were identified and their morphometric data obtained through the ZoopBiom program.
In summer, it was observed high zooplankton concentrations throughout the study area as a response to SACW bottom intrusions. During that season, *Thalia democratica* dominated in 32% and 65% of the stations in terms of density and biomass, respectively. Copepods outnumbered salps during winter and *Thalia democratica* dominated in just 17% of the stations in terms of biomass. Highest abundances of *T. democratica* (up to 2,100 ind.m^{-3}) were observed in surface layers, decreasing with depth. Therefore, the salp:copepod ratio was lower toward deeper layers.
The salps and copepods development were probably favoured by the presence of SACW in surface layers during summer, contrasting with the winter situation. The inverse relationship between these two *taxa* may be related to a number of hypotheses: (i) salps and copepods compete for the same food (nanoplankton mainly), (ii) salps feed on copepods eggs and nauplii, thus reducing their recruitment and (iii) salps may release inhibitory compounds that affect other zooplankton.

Keywords: *Thalia democratica*, Thaliacea, Copepoda, upwelling, vertical distribution.

2007 BDUA – Journal of Biology, 2: 116. T0314DanielaRimoldi30012007
Title: **Control of phytoplankton growth by microzooplankton grazing in a sub-tropical estuary**
Authors: D.R. Cunha, N.A. Aquino, J.J. Barrera-Alba, R.M. Lopes & S.M.F. Gianesella

CONTROL OF PHYTOPLANKTON GROWTH BY MICROZOOPLANKTON GRAZING IN A SUB-TROPICAL ESTUARY

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ABSTRACT
To investigate the impact of microzooplankton grazing on the phytoplankton growth rate in a eutrophicated sub-tropical estuary, four *in situ* experiments using the dilution technique were conducted during January 2006. Experiments A and C were realized at the estuary/coastal interface (ICAP) during spring and neap tides, respectively. Experiments B and D were conducted in situ at the river/estuary (VG) interface during spring and neap tides, respectively. The dilutions used were: 100, 75, 50, 25 and 10% of the natural sea water collected from the surface. Four replicates were done to each dilution with and without the addition of nutrients. Chlorophyll concentration was analyzed at the beginning and after 24 hours to calculate phytoplankton growth rates (GR).
Even higher dissolved inorganic nutrients were registered in VG, no significant differences were observed between natural and nutrient-enriched treatments. All experiments, except A, showed positive values of GR. In experiment B were not observed any relationship between % of dilution and GR. So, during spring tides, experiments did not show satisfactory results. During neap tide, were observed a negative relationship between GR and % of dilution in the experiment C and positive one in the experiment D.
This experiment suggests that there was a top-down control of phytoplankton in the nutrient-rich region (VG), since GR increased with diminution of grazing pressure. In the other hand, in the ICAP region (experiment C) results suggest a bottom-up control of phytoplankton, since GR decreased with dilution, probably due to nutrient dilution.

Keywords: Grazing, dilution technique, phytoplankton, estuary.

2007 BDUA – Journal of Biology, 2: 117. T0315LeonardoMiyashita30012007
Title: **Copepod production on the inner shelf of Santos (Southeaster Brazil)**
Authors: Leonardo Kenji Miyashita, Mauro de Melo Júnior & Rubens Mendes Lopes

COPEPOD PRODUCTION ON THE INNER SHELF OF SANTOS (SOUTHEASTERN BRAZIL)

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ABSTRACT
This work aimed to determine the spatial and temporal distribution of biomass and secondary production of pelagic copepods on the continental shelf off Santos, southeastern Brazil.
Zooplankton samples were collected in 14 stations with a Hydrobios Multinet (300 µm mesh size), between Peruíbe and São Sebastião, São Paulo State.
Among the 34 species recorded, the numerically most abundant were *Ctenocalanus vanus*, *Temora stylifera*, *Clausocalanus furcatus*, *Oithona plumifera*, *T. turbinata* and *Oncaea venusta*. On average, these species accounted for 83% of the copepod density, with higher numbers occurring off Santos Bay. The biomass was dominated by *T. stylifera*, *C. vanus*, *Euchaeta marina*, *C. furcatus* and *T. turbinata* but did not show a clear inshore-offshore gradient. The average copepod growth rate predicted with the empirical model of Huntley & Lopez (HuL) (0,458 d^{-1}) was higher than that of the Hirst & Lampitt (HiL) model (0,0869 d^{-1}), as expected. The production rate of all copepods combined was estimated as 1.02 mg C m^{-3} d^{-1} (HuL) and 0.18 mg C m^{-3} d^{-1} (HiL). *Temora stylifera*, *C. vanus*, *E. marina* and *C. furcatus* represented 81% of the estimated production.
The results suggest an influence of Santos Bay on copepod density, biomass and production on the innermost shelf stations close to the bay. Due to such influence, anthropogenic impacts caused by urban and industrial pollution and dredging activities inside the bay might compromise part of the pelagic food web in this coastal ecosystem.

Keywords: Copepods, secondary production, biomass, density, Santos, continental shelf.

2007 BDUA – Journal of Biology, 2: 118. T0316BozelliManca30012007
Title: **A big-bang or small-bangs? Hatching in the way environment informs**
Authors: R.L. Bozelli & M. Manca

A BIG-BANG OR SMALL-BANGS? HATCHING IN THE WAY ENVIRONMENT INFORMS

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ABSTRACT
Entering and terminating diapause are important moments of cladocerans life history that are not clearly understood. The present work focus on the emergence from diapause testing (1) if ephippia of *Daphnia obtusa* Kurz can access chemical information in the water provided by a typical planktivorous, or by direct interacting ostracods sharing the same environment and (2) if such assessment will result in a change in the hatching strategy.
Total hatching of *D. obtusa* ephippia was not different between control and fish or ostracod treatments (P = 0.8837). However, the hatching process did not happen in same way during the time frame of the experiment. In the control 83.3 % of the total eggs hatched on day 4, compared with 38.3 % in the fish treatment and 24.0 % in the ostracods treatment. But ephippia tend to delay the hatching time in the treatments (P = 0.0052). Organisms in fluctuating environments must constantly adapt their behavior to survive and probably *D. obtusa* may be accomplishing this through its diapause strategies.
Three aspects emerged in this study: (1) ephippia are capable of access environmental quality by infochemicals; (2) they probably are able to get different levels of information and (3) one of the possible reactions is the short term hatching asynchrony.

Keywords: Infochemicals, gape-limited predator, resting eggs, hatching, life strategy.

2007 BDUA – Journal of Biology, 2: 119. T0317JadesonBrasil30012007
Title: **Does omnivory prevent trophic cascades in pelagic food webs?**
Authors: Nils Okun, Jandeson Brasil Dias, José Luiz Attayde & Ivaneide Alves Soares da Costa

DOES OMNIVORY PREVENT TROPHIC CASCADES IN PELAGIC FOOD WEBS?

Nils Okun, Nils Okun, Jandeson Brasil Dias, José Luiz Attayde & Ivaneide Alves Soares da Costa

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ABSTRACT

Omnivory is considered an important factor to limit trophic cascades in food webs. Strong trophic cascades have been well documented in pelagic food webs of temperate lakes but it is a contentious issue whether similar strong cascades are to be expected in tropical lakes where omnivorous filter-feeding fish are keystone species.

To measure the effects of omnivorous fish on planktonic communities and water transparency of a small man-made tropical lake, it was performed a 5-week *in situ* enclosure experiment where five densities of omnivorous tilapia were randomly allocated to 20 enclosures. Zooplankton and phytoplankton biomass as well as water transparency were measured weekly since the start of the experiment.

Results show that omnivorous tilapia significantly decreased the abundance of large cladocerans, increased the abundance of small algae (GALD <50 µm) and decreased water transparency as predicted by trophic cascade theory.

Therefore, omnivory was not a sufficient factor to prevent a trophic cascade in this pelagic community, even though the cascading effect was not widespread enough to affect the total biomass of zooplankton and phytoplankton.

Keywords: Trophic cascade, direct and indirect effects, omnivory, prey heterogeneity.

2007 BDUA – Journal of Biology, 2: 120. T0318XiomaraGarcia30012007
Title: **Planktonic copepods from Saint Peter and Saint Paul archipelago - Brazil**
Authors: Xiomara Franchesca García Díaz, Sigrid Neumann-Leitão, Lúcia Maria de Oliveira Gusmão, Pedro Augusto Mendes de Castro Melo & Valdylene Tavares Pessoa

PLANKTONIC COPEPODS FROM SAINT PETER AND SAINT PAUL ARCHIPELAGO – BRAZIL

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ABSTRACT
This research describes the copepods community structure from surface waters of the Saint Peter and Saint Paul archipelago (Enseada station: 00°55'03"N - 29°20'42"W – Cabeço da Tartaruga station: 00°55' 03"N - 29°20'46"W), from May 30 to June 4th (rainy season) and from September 23 to October 1^{rst} 2005 (dry season).
The results showed low biomass and high diversity characteristic of tropical oceanic waters. The zooplanktonic community was dominated by the holoplankton during the rainy season outranking Copepoda and by the meroplankton during the dry season. The key organisms found constantly in the zooplanktonic community of the Saint Peter and Saint Paul archipelago were the Copepoda *Clausocalanus furcatus, Undinula vulgaris, Scolecithrix danae, Euchaeta marina, Nannocalanus minor, Oithona plumifera, Oncaea venusta, Oncaea media, Corycaeus speciosus* and *Farranulla gracilis*; The presence of Copepoda *Pleuromamma piseki, P. borealis, P. xiphias, Lucicutia gaussae* and *Heterorhabdus papilliger*, in one sample collected in one day during May-June, can indicate upwelling process due interactions among the wind, the current flux and the area topography.

Keywords: Zooplankton, Saint Peter and Saint Paul archipelago, oceanic island, tropical oligothrophic waters.

2007 BDUA – Journal of Biology, 2: 121. T0319LourenaGalvao30012007
Title: **Preliminary study of the macrozooplankton in the region of Cururupu, Maranhão - Brazil**
Authors: Lourena Sousa Galvão & Leila Cristina Almeida de Sousa

PRELEMINARY STUDY OF THE MACROZOOPLANKTON IN THE REGION OF CURURUPU, MARANHÃO - BRAZIL

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ABSTRACT
The material collected in August/2006 is from Cururupu, western coast, located between 00º57”85” S and 44º47’27” W coordinates, influential area of maranhenses frecess and Amazon’s unload wich takes to productivity and abundance of plankton.
It was used net with 200 µm and 60 cm mesh syzes to the zooplankton quality and quatity collection, in horizontal dragging to the water surface. Samples were fix with formaldehyde 4%. The specific groups composition was done in species level when it was possible, using specific bibliography to each group.
With the quality analyses it was possible to identified 54 *taxa*, including Foraminífera, Radiolaria, Hidromedusae, Siphonophora, Chaetognatha, Copepoda, Larvacea, Thaliacea, Amphipoda, Decapod crustacean, Polychaeta,, Bryozoa, Echinoderma and fish’s eggs and larva. It was qualified a total of 1521 organisms, corresponding 59% to sample 1 and 41% to sample 2. The holoplankton was responsable to the abundance and densidy high number, the foraminiferos and copepods, achieved the same quantitative of 2284 org.m^{-3}. The meroplankton was represented mainly by pelagic eggs and fish larva in many gronth phasis, the macrozooplankton composition revealed a broad faunistic diversity with indivíduos in reproductive stages.
Therefore the study of local productivity becames relevant, as the region is parto f Maranhão’s coast zoaning, being na with absorption potencial of ambiental impacties.

Keywords: Study, macrozooplankton, Cururupu.

2007 BDUA – Journal of Biology, 2: 122. T0320DilmaAguiar31012007
Title: **Copepoda as food of estuarine tropical fishes**
Authors: Antônio de Lemos Vasconcelos Filho, Dilma Aguiar do Nascimento-Vieira, & Sigrid Neumann Leitão

COPEPODA AS FOOD OF ESTUARINE TROPICAL FISHES

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ABSTRACT
Many economical and ecological important estuarine fishes are common in the artisan fisheries at the Santa Cruz Channel (Itamaracá – Brazil). Studies about fishes feeding emphasized the Copepoda as they are important to assess the throphic web interactions.
Samples were monthly collected along Santa Cruz Channel with a seine net, from 1995 to 1999. Fishes stomach content were analysed under a compound microscope and stereomicroscope.
Copepoda species registered in the stomach content of fishes were: *Opistronema oglinum* (*Oithona* spp. - 40%), *Citharichthys spilopterus* (*Parvocalanus crassisrostris* - 18%; *Oithona* spp. - 5%; *Calanopia americana* - 8%), *Symphurus plagusia* (*Parvocalanus crassisrostris* - 20%, *Euterpina acutifrons* - 5% and *Acartia lilljeborgi* - 5%, *Oithona* spp. - 5%); *Eugerres brasilianus* and *Diapterus auratus* (*Macrosetella gracilis* - 6%, *Farranula gracilis* - 3%, *Acartia lilljeborgi* - 10%, *Euterpina acutifrons* - 3% and *Oncaea* sp.- 3%). Copepoda nauplii, eggs and carapace from non identified species were also commonly registered.
It was observed that planktonic Copepoda was a frequent food item to many fish species in Santa Cruz Channel.

Keywords: Copepoda, fish's stomach content, throphic web, estuary.

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Title: **Plankton response to an upwelling event at a fixed station in the Cabo Frio innershelf – RJ, Brazil**
Authors: Mayza Pompeu, Sylvia Maria Moreira Susini Ribeiro, Salvador Airton Gaeta, Gustavo Prouvot Ortiz & Ana Tereza Miranda Souza

PLANKTON RESPONSE TO AN UPWELLING EVENT AT A FIXED STATION IN THE CABO FRIO INNERSHELF – RJ, BRAZIL

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ABSTRACT
Physical and chemical temporal variations, in upwelling zones, influence the structure, composition and abundance of phytoplankton and microzooplankton communities.
During eight days in a fixed station, in front of Cabo Frio Island, temperature, salinity, dissolved inorganic nutrients, chlorophyll *a* and primary production data were analyzed at standard depths up to 50 meters. Phytoplankton and microzooplankton samples, for quantitative studies, were collected at two depths: over and under the thermocline layer.
Results revealed an upwelling of ACAS in the surface, followed by a gradual increase of temperature and intrusion of the surface coastal water from offshore, caused by the relaxation of upwelling. Plankton response to hydrological changes showed two stages. First stage, phytoplankton was characterized by a total of organisms below 2.7 x 10^5 cell.L^{-1} and dominated by nanoplankton with flagellates, coccolithophorids and benthic diatoms. The second phase showed 3.6 times more organisms than the previous one (9.9 x 10^5 cel.L^{-1}), and this increase was accounted for by microplankton. Two peaks of biomass were noticed: one under the thermocline layer (10.9 mg Chl *a* m^3) was formed almost exclusively by *Asterionellopsis glacialis*; the other in surface (26.7 mg Chl *a* m^3) caused primarily by *Scrippsiella trochoidea* and Gymnodiniales >20 μm. Surface primary production ranged from 0.84 to 267.12 mg C m^3 d. Tintinnids showed an increase in the second phase and were more abundant bellow the thermocline, while copepods nauplii showed similar abundance during all experiment, being more represented at the surface.
The upwelling event conditioning the plankton response is discussed.

Keywords: Phytoplankton; microzooplankton; upwelling event; *Scrippsiella trochoidea*; *Asterionellopsis glacialis*; Cabo Frio.

2007 BDUA – Journal of Biology, 2: 124. T0322JuneDias09022007
Title: **Trophic position and nutritional condition of the Atlantic anchovy *Engraulis anchoita* larvae in Cape Frio region, Brazil**
Authors: June Ferraz Dias, Carla Bertolucci Fiadi & Helcy Lylian Nogueira Silbiger

TROPHIC POSITION AND NUTRITIONAL CONDITION OF THE ATLANTIC ANCHOVY *Engraulis anchoita* LARVAE IN CAPE FRIO REGION, BRAZIL

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ABSTRACT
Stable isotopes and nutritional condition for *Engraulis anchoita* larvae were measured under downwelling and upwelling processes in the Cape Frio region.
Values of stable isotopes showed a seasonal variation of the $\delta^{15}N$ enrichment of 5 to 14 mm in standard length (SL) larvae, from 7.45 ‰ of $\delta^{15}N$ in austral summer to 10.58 ‰ in austral winter, suggesting an increase in trophic position of the smallest larvae captured in winter in comparison with the larvae from summer. Post-flexion larvae and early juvenile (14 to 29 mm SL) did not follow the same pattern.
These results could be a direct consequence of downwelling and retreats of the South Atlantic Central Water (SACW) toward the shelf break in winter, increasing regenerate production and bringing low input of $\delta^{15}N$.
Nutritional condition of anchovy larvae, evaluated by biochemical (RNA/DNA, protein content) and histological (glycogen in the liver and zymogene in the pancreas) indicators was weak, under this hydrographic situation. On the other hand, during the summer, anchoita larvae showed better condition and differences around 3 ‰ of $\delta^{15}N$ between small and post-flexion larvae.
Probably this was related to enhancement of primary production by the western boundary coastal upwelling and penetration of SACW, suggesting an increase of a half of one trophic level as they grew from 5-14 to 14-29 mm SL. The stable isotope showed differences in trophic position of the Atlantic anchovy, however, they were not related to ontogenetic changes, but due to hydrographical contrasting processes that controls production and nutritional condition.

Keywords: *Engraulis anchoita* larvae, upwelling, stable isotopes, nutritional condition.

2007 BDUA – Journal of Biology, 2: 125. T0323ACarolinaMoina14022007
Title: ***Moina minuta* population answers to different trophic conditions**
Authors: Ana Carolina Brito Vieira & Maria Cristina Crispim

Moina minuta POPULATION ANSWERS TO DIFFERENT TROPHIC CONDITIONS

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ABSTRACT
Aquatic environments in semi arid regions suffer periodic alterations in their water capacity, due to the irregularity of hydrological conditions which affects the water quality during the hydrological cycle development. Consequently the zooplankton community experiences an ecological succession to adapt to the new environmental conditions. The purpose of this experimental work was to determine how the *Moina minuta* communities of theTaperoá II dam, located in the semi arid region of Brazil, are affected by changes in trophic conditions.
This species were tested under different trophic conditions in a simulated environment in the laboratory. An initial density of 10 individuals in 2 L glass flasks, and the experiment lasted 3 weeks was used. To simulate the different trophic conditions (oligotrophic, mesotrophic, eutrophic) nitrogen and phosphate were added to the water of Taperoá II dam. *M. minuta* and algal food were also brought from that environment. Organisms were fed with a plurialgal culture and counted twice a week.
M. minuta increased better in more eutrophicated conditions, because the increase of algae enriched the nutrient conditions in those flasks. At the end of the experiment a strong decrease in *M. minuta* densities was observed, similar to that observed in the dam populations. That explains the appearance of this species in the beginning of the rain period, when the trophic conditions were higher and the subsequent disappearance, when the trophic conditions decreased in the environment.

Keywords: *Moina minuta*, Trophic conditions, Caatinga.

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2007 BDUA – Journal of Biology, 2: 126. T0324CCrispim14022007
Title: **Effects of different trophic conditions on *Ceriodaphnia cornuta* population dynamics**
Authors: Maria Cristina Crispim & Ana Carolina Brito Vieira

EFFECTS OF DIFFERENT TROPHIC CONDITIONS ON *Ceriodaphnia cornuta* POPULATION DYNAMICS

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ABSTRACT
Cladocerans are important consumers in aquatic environments, especially in freshwater systems. Aquatic environments semi arid regions, including Taperoá II dam, experience cyclical changes due the irregular hydrological cycle, being observed an ecological succession in plankton communities, following environmental alterations in water parameters. To understand the main factors which regulate organisms in the environment and their interactions are important to subside future environmental manage works. So the aim of this work was to evaluate the influence of different trophic environmental conditions on *Ceriodaphnia cornuta*, one of the constant species in Taperoá II Dam.
The work was experimental and developed in Ecological aquatic laboratory in UFPB/CCEN/DSE. The tests were realized in 2 L flasks with 10 *C. cornuta* initial population, and spent 3 weeks. Were added nutrients (N and P) in order to achieve different trophic conditions (oligotrophic, mesotrophic and eutrophic) already observed in the dam. The animals were fed with a plurialgal culture and counted twice a week. The water and organisms used in the experiment were from Taperoá II Dam. *C. cornuta* populations presented a slow increase, but showed a better increase in an intermediate trophic situation (mesotrophy), followed by the lower trophic condition (oligotrophy). In the environment, they are present between these two trophic states, showing that the trophic condition, more than biological interferences regulate the presence of this species in Taperoá II Dam.

Keywords: *Ceriodaphnia cornuta*, trophic state, experiment, population dynamics.

2007 BDUA – Journal of Biology, 2: 127. T0325RobertoSassi14022007
Title: **The pseudoplankton from coral reefs of Northeastern Brazil: Organic aggregates as a trap of diatoms and zooxanthellae in coastal reefs of Cabo Branco, Paraíba**
Authors: Cristiane Francisca da Costa & Roberto Sassi

THE PSEUDOPLANKTON FROM CORAL REEFS OF NORTHEASTERN BRAZIL: ORGANIC AGGREGATES AS A TRAP OF DIATOMS AND ZOOXANTHELLAE IN COASTAL REEFS OF CABO BRANCO, PARAÍBA

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ABSTRACT
Mucus and organic aggregates exuded by benthic invertebrates of reef environments, especially by cnidarians, represent an important via for transferring food to plankton and filter feeding animals. They are also involved in nutrients renewal and presumably, they act as traps of microorganisms and their transportation to long distances, spreading them over reef environments. Such compounds have been denominated of pseudoplankton, which have been observed in many regions of the Earth. In the present work, 18 samples of mucus exuded by the coral *Siderastrea stellata* were examined, from the coastal reefs of Cabo Branco, state of Paraíba, Northeast Brazil.
The samples were collected in 2004, by using 20 mL syringes, being then preserved in neutral 4% formalin and examined in a microscope under several magnifications. It was observed the presence of diatoms, cyanobacteria, protozoans and zooxanthellae, which totalized 18 identified genera. Diatoms predominated with 16 genera and 15 species, one cyanobacteria, and the endosymbiont dinoflagellate, included usually in genus *Symbiodinium* and commonly designated as zooxanthella. Diatoms were the most abundant group with species of the genera *Nitszchia* and *Navicula*, followed by zooxanthellae, which were always present in all slides we examined.
Photographs of all species identified are presented in this study. A possible contribution of organic aggregates in the dissemination of zooxanthellae and its importance for the symbiosis of these organisms with corals are also discussed here.

Keywords: Organic aggregates, pseudoplankton, coastal reefs, *Siderastrea stellata*, Northeast Brazil.

CNPq/485550/2006-7

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Title: **Macrozooplankton from the Amazon Neritic and Oceanic Province, North Brazil**
Authors: Caio Aguiar Rodrigues Ramos, Nuno F.A. Correia de Melo, Sigrid Neumann-Leitão, Lúcia M. de Oliveira Gusmão & Tâmara de Almeida e Silva

MACROZOOPLANKTON FROM THE AMAZON NERITIC AND OCEANIC PROVINCE, NORTH BRAZIL

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ABSTRACT
Studies about the influence of the Amazonas River estuarine plume on the macrozooplankton community were carried in 2001.
Sampling was made in 23 stations during the North-IV Operation oceanographic cruise and in 28 stations during the Prospec-XIX and Prospec-XX cruises. A bongo net 300µm mesh size was oblique hauled. Concurrent hydrological data were obtained for comparing with the zooplankton.
Temperature varied from 28.8°C to 26.7°C. Salinity varied from 27.0 to 36.4. The plankton biomass at North-IV Operation varied from 11 $mg.m^{-3}$ to 388.6 $mg.m^{-3}$; and in the Prospec-XIX, varied from 14.5 $mg.m^{-3}$ to 108.7 $mg.m^{-3}$, while in the Prospec-XX, biomass varied from 11.9 $mg.m^{-3}$ to 56 $mg.m^{-3}$. It was identified 164 zooplanktonic *taxa*, of which 109 belonged to Copepoda. Among the Copepoda the most abundant in the oceanic province were *Undinula vulgaris, Euchaeta marina, Nannocalanus minor, Clausocalanus furcatus,* and at the neritic province *Subeucalanus pileatus, Temora stylifera* and *Rhincalanus cornutus*. Chaetognatha was also abundant and frequent, mainly, *Sagitta tenuis* and *Sagitta enflata* species. Among Larvacea *Oikopleura* spp. and *Fritillaria* spp. were numerically abundant contributing to the marine snow, where adhered a lot of organisms. Zooplankton density at North-IV operation varied from 41.2 $org.m^{-3}$ to 3,754.5 $org.m^{-3}$. At Prospec-XIX, the density varied from 4.3 $org.m^{-3}$ to 128 $org.m^{-3}$ and at Prospec-XX, density varied from 25.8 $org.m^{-3}$ to 86 $org.m^{-3}$.
The Amazonas River enriches the continental shelf allowing a high density of zooplankton.

Keywords: Amazon, zooplankton, copepoda.

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Title: **Composition and abundance of fish larvae in Guamá river, Belém - Pará-Brazil**
Authors: Igor Penedo de Matos, Cristiane Teixeira Contente, Nuno Filipe Alves Correia de Melo, Caio Aguiar Rodrigues Ramos & Mayuime Silva Kawamoto

COMPOSITION AND ABUNDANCE OF FISH LARVAE IN GUAMÁ RIVER, BELÉM - PARÁ-BRAZIL

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ABSTRACT
This study was made to evaluate the ichthyoplankton presented in Guamá River, in Pará/Brazil.
Thirty three stations were analyzed using a conical plankton net measuring 500 μm of net aperture in sub-superficial trawls realized in the water column, in the course of 3 minutes. The samples were fixed with 4% neutral formalin, selected and identified up to family level. The station 8 reached the maximum temperature value, with 29.5 ºC; the minimum was observed in station 25 (25.8 ºC). The pH obtained its maximum value in station 11 (6.6) and its lesser value in station 31 (5.5). As for the dissolved oxygen, the station 24 presented the minor value (2.1 $mg.L^{-1}$) and the major value was observed in station 27 (6.2 $mg.L^{-1}$). The conductivity recorded its greater value in station 18 (24) and the smaller one (9) in station 8. 828 larvae Were collected, divided in 7 families: Engraulidae, Clupeidae, Gobiidae, Sygnathidae, Gonostomatidae, Auchenipteridae and Tetraodontidae. The Engraulidae family was the most frequent (76.5%), followed by Clupeidae (41%); The Auchenipteridae (17%), Sygnathidae (6%), Gobiidae (6%), Gonostomatidae (6%) and Tetraodontidae (6%) families were low frequent. Regarding the abundance, the Engraulidae family was the most abundant with 41%, succeeded by Clupeidae with 7%; the others families reached less than 1%.
The Engraulidae family is essential to the local population's feeding because it is fundamental in the tropical estuaries' food chain. Based in the ichthyoplankton composition, the conclusions are that estuaries are of great importance as estuarine species' nursery.

Keywords: Guamá River, Amazon, fish larvae.

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Title: **Structure of phytoplankton community in the estuary of Guajará - Miri river (Vigia, Pará, Brazil)**

Authors: Fábio Ferreira Cardoso, Nuno F.A. Correia de Melo, Rosildo Santos Paiva, Caio Aguiar Rodrigues Ramos, Melissa do Socorro Fonseca da Silva & Lívia O. Nunes

STRUCTURE OF PHYTOPLANKTONIC COMUNITY IN THE ESTUARY OF GUAJARÁ - MIRI RIVER (VIGIA, PARÁ, BRAZIL)

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ABSTRACT

Vigia is located in the state of Pará, northeast region. On January, March, May, July, September and November of the year 2005. Qualitative and quantitative samples were collected for microphytoplankton taxonomic studies. In addition physical and chemical parameters were measured.

The temperature varied from 28.7 ℃ (E4/low tide/March) to 29.9℃ (E3/flood tide/July). The salinity varied from 0.7‰ (E1/low tide/March) to 10.1‰ (E1/flood tide/March). The pH varied from 7.1 (E3/low tide/March) to 8.9 (E1/flood tide/July). The dissolved oxygen concentration varied from 2.4 $mg.L^{-1}$ (E3/low tide/March) to 8.9 $mg.L^{-1}$ (E3/low tide/November). Seventy nine species were identified, being, 6 Chlorophyta, 3 Dinophyta, 3 Cyanophyta e 1 Chrysophyta. The species more abundant were *Aulacoseira granulata, Coscinodiscus concinnus, Coscinodiscus rothii, Cyclotella striata, Polymyxus coronalis* and *Skeletonema costatum.* The species which have high frequency *were Cerataulus smithii, Coscinodiscus concinnus, Coscinodiscus perforatus, Coscinodiscus rothii, Melosira arctica, Melosira dubia, Melosira nummuloides, Odontella mobiliensis, Odontella regia, Odontella sinensis, Pleurosigma angulatum, Polymyxus coronalis, Skeletonema costatum, Thalassiosira* sp. and *Triceratium favus*. The lowest density of microphytoplankton was in July, presenting 666.7 $cells.L^{-1}$ (E4/flood tide). The highest concentrations were in January showing the variation from 2,047,979.5 $cells.L^{-1}$ station E3/ low tide to 105,998.9 $cells.L^{-1}$ station E1/flood tide. The high density in January might be, in part, to *Skeletonema costatum* bloom and this can indicate a favourable period to breeding and growth of aquatic organisms because there was addition of nutrients in the food chain base by phytoplankton.

Keywords: Phytoplankton, Estuary, Amazon.

2007 BDUA – Journal of Biology, 2: 131. T0329NunoMelo14022007
Title: **Nychthemeral variation of microphytoplankton composition and density in the estuary of Guarajá-Miri river, in rainy and dry season (Vigia, Pará, Brazil)**
Authors: Fábio Ferreira Cardoso, Rosildo Santos Paiva, Nuno F.A. Correia de Melo, Caio Aguiar Rodrigues Ramos, Rayette Souza da Silva & Lívia Oliveira Nunes

NYCHTHEMERAL VARIATION OF MICROPHYTOPLANKTON COMPOSITION AND DENSITY IN THE ESTUARY OF GUAJARÁ-MIRI RIVER, IN RAINY AND DRY SEASON (VIGIA-PARÁ-BRAZIL)

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ABSTRACT
Plankton samples were collected at a station during 24h, in Vigia's estuary, northeast of Pará state-Brazil, on March and September, 2005, using a conical plankton net; this dragnet has a 64 µm mesh size and it was used in water column sub-surface.
In March, the temperature varied from 28.2 ℃ (6 h) to 30.3 ℃ (12 h). The salinity varied from 0.5‰ (00 and 21h) to 0.8‰ (6h). The dissolved oxygen concentration varied from 1.9 mg.L^{-1} (6 h) to 4.6 mg.L^{-1} (18 h and 21 h). In September the temperature varied from 29.1 ℃ (6 h) to 30.5 ℃ (15 h). The salinity varied from 5.7‰ (12 h) to 6.9‰ (9 h). The dissolved oxygen concentration varied from 5.5 mg.L^{-1} (6 h) to 7.5 mg.L^{-1} (15 h). 63 species were identify, 57 belong to division Bacillariophyta, 4 to Chlorophyta and 2 to Dinophyta. In March, were detach as more abundant the species *Coscinodiscus concinnus*, *Coscinodiscus rothii*, *Cyclotella striata*, *Polymyxus coronalis* and *Skeletonema costatum*. In September, they had been distinguished *Coscinodiscus concinnus* and *Polymyxus coronalis*. The most frequently species were *Coscinodiscus concinnus*, *Coscinodiscus oculus*, *Coscinodiscus perforatus*, *Melosira arctica*, *Odontella regia*, *Pleurosigma angulatum*, *Polymyxus coronalis* and *Skeletonema costatum*. In March, the highest value of density was registered at 13h with 152,000 Org./L, and the lowest from 12,000 cells.L^{-1}, at 10h. In September, the greatest density occurred at 6 h, with 166,000 cells.L^{-1}, the lowest was 26,000 cells.L^{-1} at 15 h. It was observed that *Coscinodiscus concinnus* and *Polymyxus coronalis* were the species most important in the estuary.

Keywords: Phytoplankton, Estuary, Amazon.

2007 BDUA – Journal of Biology, 2: 132. T0330MichelleFeitosa14022007
Title: **Effects of competition between two cladoceran species from paraiban semi-arid environments**
Authors: Michelle Albuquerque Feitosa & Maria Cristina Crispim

EFFECTS OF COMPETITION BETWEEN TWO CLADOCERAN SPECIES FROM PARAIBAN SEMI-ARID ENVIRONMENTS

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ABSTRACT
Competition for resources is one of the main forces influencing cladoceran populations. The aim of this work was to test the effect of competition between two cladoceran species: *Moina minuta* and *Diaphanosoma spinulosum*. This species, collected in Cariri dams and cultured in lab, was used to determine whether or not competition is among the causes that influence population dynamics of these species in the environment.
Two experiments were developed, one with a larger availability of food Exp.1 (2.69 x 10^6 cells.mL^{-1}) and another one with less quantity of food, Exp 2 (1.28 x 10^6 cells.mL^{-1}). The species were maintained in isolated cultures (control) and in mixed ones. In the experiments, densities, fecundity rates, and body length were analyzed. All experiments were in 3 replicates. Results were compared with ANOVA.
In Exp.1 (more food) *M. minuta* presented lower densities, number of juveniles and partenogetic eggs in mixed cultures, comparing with control cultures. The opposite was observed in *D. spinulosum*. This species in relation to *M. minuta* was a superior competitor. In Exp 2 (less food) *M. minuta* presented an increase in densities, egg numbers and in body length. *D. spinulosum* showed a populational decrease, less egg production and smaller individuals comparing with control. In this experiment a reverse response was observed, being *M. minuta* a superior competitor related to *D. spinulosum*. So, in the presence of a larger quantity of food *D. spinulosum* was a superior competitor, while in the presence of less food *M. minuta* is a superior competitor.

Keywords: *Moina minuta, Diaphanosoma spinulosum*, resource competition.

2007 BDUA – Journal of Biology, 2: 133. T0331Manoel14022007
Title: **Analyze of the stomach contents of *Crassostrea rhizophorae* Guilding, 1828 (Bivalvia – Ostreidae) cultivated in Alagoas – Brazil**
Authors: Alinne D. Ramos da Silva, Manoel M. da Silva Costa, Eliane Maria de S. Nogueira, Rose P.M. de Omena, Ágata C.H. Giancoli, Euripedes A.S. Filho, Fábio N. Colin, Fernanda G.M.C.C. Baracho, Everton C.S. Amorim & Élica A.C. Guedes

ANALYZE OF THE STOMACH CONTENTS OF *Crassostrea rhizophorae* GUILDING, 1828 (BIVALVIA - OSTREIDAE) CULTIVATED IN ALAGOAS – BRAZIL

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ABSTRACT
The Phylum Mollusca understands seven classes with aspect and different habits, being Bivalvia the second largest class. Analyses of the stomach contents of the Class Bivalvia allow to know the biodiversity related with the seasonal parameters. The research work analyzed the alimentary habits of the mangrove oyster, *Crassostrea rhizophorae* Guilding, 1828, through her stomach content.
The studied material was collected of May - November (2005) during the low tide in: Passo de Camaragibe, Coruripe, Roteiro, and Paripueira (Alagoas). The totals of 210 digestive treats of oysters were analyzed.
It was found larger occurrence of the phytoplankton, 70% of the Bacillariophyceae class, among the species of larger occurrence found: *Nitszchia longissima* (BreÂbisson) Ralfs, *N. acicularis* (Kütz.) W. Smith and *Coscinodiscus centralis* Ehrenberg collected in Coruripe and Roteiro the months of June and July (rainy period) and October (dry period). Zooplankton was also found in the stomachs of *C. rhizophorae* that had been taken directly from their natural habitat. Condition of zooplankton in the stomachs of the oysters varied with zooplankton species, but to species more found were *Tintinnidium incertum* Brandt collected in Roteiro (July) and *Tintinnopsis lobiancoi* Daday (Ciliophora) collected in Passo de Camaragibe (June).
The mangrove oysters ingest any element brought microscopic suspension in the water, also being found in the digestive tracts, organic matter and sediments. Therefore, this selectivity results in substantially higher organic values of the stomach contents than of the sediments.

Keywords: Stomach contents, *Crassostrea rhizophorae*, phytoplankton, zooplankton, oyster cultivation.

2007 BDUA – Journal of Biology, 2: 134. T0332KarlaMontenegro14022007
Title: **Plankton composition in the food diet of S*teindachnerina notonota* (Teleostei: Curimatidae) in Taperoá II Dam, semi-arid region in Paraíba State**
Authors: Ana Karla A. Montenegro, Maria Cristina Crispim, Jane Torelli & Randolpho S. de A. Marinho

PLANKTON COMPOSITION IN THE FOOD DIET OF S*teindachnerina notonota* (TELEOSTEI: CURIMATIDAE) IN TAPEROÁ II DAM, SEMI-ARID REGION IN PARAÍBA STATE

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ABSTRACT
Plankton is constituted by animals and algae, distributed in the water column that serve as prey for all fish larvae, and for some species, during all life stages. In this study the importance of plankton in the *Steindachnerina notonota* food diet was analyzed in Taperoá II Dam, located in the semi arid region of Paraíba State.
Fishes were collected at 5 sampling events (October and December of 2005, March, June and August of 2006) using hand nets and trap nets. In order to identify plankton items, macro- and microscopic analyses were conducted based on the points method and frequency of occurrence of items. These values were applied over the feed index (IAi).
Along the study 42 individuals were analyzed and the results showed that *S. notonota* diet was basically constituted of detritus, phytoplankton and zooplankton. In October and November 2005, dry period, a greater diversity of phytoplankton was registered, with most abundancy of Clorophyceae and Bacillariophyceae, (*Chlorella vulgaris* – IAi= 6,94 and *Melosira granulata* – IAi=6,74*,* respectively). In March and June 2006, rainy period, in addition to these phytoplankton species, there was a great contribution of zooplankton: Copepoda IAi=5,56 and Cladocera (*Diaphanosoma spinulosum* IAi=1,46). Nevertheless, in August 2006, second dry period, phytoplankton was the main item over again, followed by Rotifera (*Keratella americana* IAi=1,08). It can be concluded that plankton was an important item in the food diet of *S. notonota*, with predomination of phytoplankton in the dry periods and zooplankton in the rainy ones.

Keywords: Plankton, food diet, *Steindachnerina notonota*.

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2007 BDUA – Journal of Biology, 2: 135. T0333FlaviaCorrea14022007
Title: **Assessment of the contribution of Santos and São Vicente channels to the Santos Bay based on total transport rates**
Authors: Flávia M. P. Saldanha-Corrêa, Marco Antonio Corrêa, Luiz Bruner de Miranda, José Roberto B. Leite, Cintia M. Ancona & Sônia M. F. Gianesella

ASSESSMENT OF THE CONTRIBUTION OF SANTOS AND SÃO VICENTE CHANNELS TO THE SANTOS BAY BASED ON TOTAL TRANSPORT RATES

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ABSTRACT
The contribution of Santos and São Vicente channels to the trophic state of Santos bay was evaluated by the computation of the total transport rates of salt, phytoplankton (Chl *a*), seston and nutrients (ammonium, nitrate, nitrite, phosphate and silicate). Data used were obtained during 13 h time-series in a fixed station located at the lower portion of Santos channel in July, August, October, November and December 2005 and also at São Vicente channel inlet (only in October 2005). Hourly CTD (Falmouth) and ADCP (Sontek) profiles were performed and discrete samples of seawater were taken from 3 depths (surface, mid-water and bottom) for Chl *a*, seston and inorganic nutrients determinations.
Results indicated that freshwater discharge and tidal correlation were the main transport components. Santos channel imported salt, nutrients, seston and Chl *a* in all studied occasions except in October, when measurements in São Vicente channel also indicated outwelling for most of the analyzed variables. These findings are against former reports based on instantaneous transport estimations, which pointed out Santos channel as an important nutrient source for the system. Mean vertical profiles of the longitudinal velocity component indicated inflow predominance in most of the series. Otherwise, samplings were conducted on spring tides, when baroclinic circulation is intensified by the longitudinal salinity gradient, especially in rainy periods, increasing the flux towards the estuary. Diurnal tidal asymmetries (known for Santos channel) and wind pattern may also have biased the results, contributing to the brackish water retention into the estuary.

Keywords: total transport rates, transport components, inorganic nutrients, phytoplankton transport, estuarine channels, Santos estuarine system.

2007 BDUA – Journal of Biology, 2: 136. T0334BarreraAlba15022007
Title: **Effect of microzooplankton grazing on phytoplankton growth during August 2006 in Cananeia estuary**
Authors: D.R. Cunha, P.C. Moraes, A. Maranho, J.B. Pereira, M.M. Junior, C.D.S. Pereira, & J.J. Barrera-Alba

MEFFECT OF MICROZOOPLANKTON GRAZING ON PHYTOPLANKTON GROWTH DURING AUGUST 2006 IN CANANEIA ESTUARY

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ABSTRACT
During August 2006 an experiment using the dilution technique was performed to investigate the microzooplankton grazing impact on the phytoplankton growth rate was conducted in Cananeia Estuary, a sub-tropical estuary in the southeast coast of Sao Paulo State, Brazil. For the experiment, natural sea water (NSW) was collected from the surface at the estuary/coastal interface, S = 36 and T = 18 C. NSW was filtered by 0.2 µm to obtain the filtrated sea water (FSW) for dilutions. An initial chlorophyll concentration of 3.53 $\mu g.L^{-1}$ was measured in NSW. The dilutions used were: 100, 75, 50, 25 and 10% of NSW in FSW. Four replicates were done to each dilution with and without the addition of nutrients. Chlorophyll concentration was analyzed at the beginning and after 24 hours to calculate phytoplankton growth rates (GR).
No significant differences were observed between natural and nutrient-enriched treatments. Mean chlorophyll concentrations after 24 h varied between 0.56 $\mu g.L^{-1}$ (at 10% NSW) and 2.94 $\mu g.L^{-1}$ (at 100% NSW). It was observed a negative relationship between GR and percentage of dilution, suggesting that there was a top-down control of phytoplankton, since GR increased with diminution of grazing pressure and a decrease in chlorophyll concentration was also observed at the 100% NSW.

Keywords: Grazing, dilution technique, phytoplankton, estuary.

2007 BDUA – Journal of Biology, 2: 137. T0335CintiaAncona15022007

Title: **Assessment of the main environmental forcing on phytoplankton biomass in Santos (Brazil) estuary and bay**

Authors: Cintia M. Ancona, Flávia M. P. Saldanha-Corrêa, M. Stephan & Sônia M. F. Gianesella

THE MAIN ENVIRONMENTAL FORCING ASSESSMENT ON PHYTOPLANKTON BIOMASS IN SANTOS (BRAZIL) ESTUARY AND BAY

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ABSTRACT

The contribution of the main environmental forcing for the phytoplankton biomass was evaluated in Santos bay and estuary. Data were obtained during 12 field campaigns, developed between November 2004 and December 2005, along seven stations. At each station, light penetration was obtained using Secchi disc, CTD profiles were performed and water samples were taken from three depths for dissolved nutrient (nitrate, nitrite, ammonium, phosphate and silicate), seston (total, organic and inorganic) and phytoplankton biomass (as Chlorophyll-a) determinations. Data were analyzed using Principal Components Analysis (PCA) from STATIGRAPHICS® Plus 5.1 software. Two main sets of data were analyzed: one (*a*) used mean values and descriptive single variables for each station; the other (*b*) used the data obtained for each depth.

Results from the (*a*) set showed the stratification of the water column and high temperatures as relevant to the Chl *a* development and that phytoplankton biomass was not the main component of the organic seston, which may be significant in the area. It also showed that nutrients in high concentrations were associated to waters from continental origin, but were not actually limiting the biomass development. The (*b*) set could not include the stratification parameter, so, for each depth analyzed, light penetration and temperature were the main controlling factors for Chl *a* development.

This analysis also emphasized the good physiological conditions of the phytoplankton in the area, since a high correlation between active and total Chl *a* was observed.

Keywords: Phytoplankton biomass, environmental forcing agents, Santos, bay, estuary.

2007 BDUA – Journal of Biology, 2: 138. T0336GuilhermeMedeiros15022007
Title: **Ontogenetic development of the sensitive structures in the antennules and antenna the *Macrobrachium rosenbergii* (De Man 1879) (Crustacea, Palaemonidae)**
Authors: Virginia Maria Cavalari Henriques, Wagner Cotroni Valenti & Guilherme Fulgêncio de Medeiros

ONTOGENETIC DEVELOPMENT OF THE SENSITIVE STRUCTURES IN THE ANTENNULES AND ANTENNA OF *Macrobrachium rosenbergii* (DE MAN 1879) (CRUSTACEA, PALAEMONIDAE)

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ABSTRACT
The crustaceans dispose of sensitive structures that allow them to receive stimuli from the environment. These are used to locate and capture food. Chemoreception and mechanoreception are known as the main senses used by the decapods crustaceans to identify food particles. The objectiv of this work was to research the occurrence of the sensitive structures during the ontogenetic development of *M. rosenbergii* in antennules and antennas. The research was performed at the carciniculture sector of the CAUNESP. The larvae and the post larvae were collected from larvae culture under a closed dynamic system and the young and adult animals from the cultivating systems of the sector. The animals were set with Karnovsky and dissected. From each animal the antennules and antennas were removed to allow the observation of the sensitive structures. The appendices were metalized and photo documented by electronic scanning microscope.
The antennules showed simple, plumose, pappose and esthete setae. During the ontogenesis, these structures increased in density, area and distribution. The antenna showed setae with chemoreception and mechanoreception during all the life stages of *M. rosenbergii.* Simple, plumose and pappose setae were identified. The larvae of *M. rosenbergii* hatch with an apparatus of sensitive structures that allow them chemical and tact perception stimuli.
These structures should perform an important role in the survival strategy of the species in the environment.

Keywords: Ontogenetic development, sensitive structures, antennules, antenna, *Macrobrachium rosenbergii*.

2007 BDUA – Journal of Biology, 2: 139. T0337Arnola23022007
Title: **Morphological alterations in *Ceriodaphnia cornuta* fa *rigaudi* induced by *Chaoborus brasiliensis***
Authors: Arnola Cecília Rietzler, Odete Rocha, Kennedy Francis Roche & Marcela Martins Ribeiro

MORPHOLOGICAL ALTERATIONS IN *Ceriodaphnia cornuta* fa *rigaudi* INDUCED BY *Chaoborus brasiliensis*

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ABSTRACT
Studies have shown that polymorphism in cladocerans can be a response to invertebrate predators, with, for example, the effects of the predator *Chaoborus* on *Daphnia* morphology being well studied. However, induction by invertebrate predators of morphological alterations in *Ceriodaphnia* is poorly known. Preliminary laboratory experiments carried out in 1996 demonstrated the appearance of spines on the head, tail, and side of *Ceriodaphnia cornuta* fa *rigaudi* in the presence of individuals of *Chaoborus* sp. and of substances released by the latter into the water.
In the present study, adult specimens of *C. cornuta* fa *rigaudi* maintained routinely in the laboratory were exposed to the presence of *Chaoborus brasiliensis* in the proportion of 1 predator to 15 prey in 500 mL of lake water (filtered through a net of mesh size of 75 µm, and pre-conditioned for five days) from the Lagoa do Nado (Belo Horizonte – Minas Gerais), where the *Chaoborus* larvae had been collected, and also in 500 mL of laboratory culture water. After 10 days of interaction, specimens of *C. cornuta* were collected to verify possible morphological changes, and the appearance of spines was recorded on the specimens exposed to the predator under both experimental conditions, in contrast to the individuals (of the same clone) maintained in routine culture.
These results corroborate those previously obtained, whereby morphological changes were induced by the predator, under experimental conditions with densities approximate to natural, indicating that *Chaoborus* is one of the organisms involved in the appearance of polymorphic forms of *C. cornuta*.

Keywords: Inducible defenses, *Ceriodaphnia cornuta*, *Chaoborus brasilianus*.

2007 BDUA – Journal of Biology, 2: 140. T0338Flavia22022007
Title: **The influence of food quantity and quality on *Macrothrix* sp. (Cladocera, Crustacea)**
Authors: Flávia Martins Franco de Oliveira & Maria Cristina Crispim

THE INFLUENCE OF FOOD QUANTITY AND QUALITY ON *Macrothrix* sp. (CLADOCERA, CRUSTACEA)

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ABSTRACT
In semi-arid regions where the high evaporation rates concentrate the nutrients, inducing an increase in eutrophication in a cycle pattern, there is a strong alteration in water quality along the hydrological cycle, so the quantity and quality of food changes. In order to understand how the main forces affect the ecological succession verified in the aquatic systems, an experiment was developed, testing different quantities and qualities of food on *Macrothrix* sp. dynamics.
It were used specimens from the semi arid environment (dams) in 1 Liter flasks. The initial density was 15 individuals, and food was added every 2 days. The experiment lasted 11 days. The tests were developed in 3 replicates each in which unialgal and plurialgal cultures were used. The unialgal was *Kirchneriella contorta* and the plurialgal were several species *Chlorella* sp., *Tetraedron* sp., *Microcystis* sp., *Scenedesmus* sp., *Coelastrum* sp., *Kirchneriela* sp., *Trachelomonas* sp., *Selenastrum* sp. and *Merismopedia* sp., being the more abundant *Chlorella* sp. and *Merismopedia* sp.. In both experiments, the following concentrations of uni and plurialgal were used $T10^3$ - 2.4 x 10^3 cél.mL^{-1}, $T10^4$ - 2.4 x 10^4cél.mL^{-1} and $T10^5$ - 2.4 x 10^5cel.mL^{-1}.
The results showed that *Macrothrix* sp. responded differently to both quality and quantity of food. A greater increase in population growth was observed in the presence of mixed algae and more food. This species survived in the 3 treatments, but in the presence of the lower unialgal food it died. In the presence of the mixed food the body length reached higher values.

Key words: food availability, *Macrothrix* sp., population dynamics.

2007 BDUA – Journal of Biology, 2: 141. T0339Flavia22022007
Title: **Food availability effect on *Moina minuta* (Cladocera, Crustacea) dynamics**
Authors: Flávia Martins Franco de Oliveira & Maria Cristina Crispim

FOOD AVAILABILITY EFFECT ON *Moina minuta* (CLADOCERA, CRUSTACEA) DYNAMICS

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ABSTRACT
Food is one of the main factors that regulate the maintenance of the species in the environment. In Caatinga's aquatic environments, the irregularity and low precipitation rates cause an increase in the trophic state, as the long dry period develops. During this period, changes occur in the environment, including the availability of food. In order to analyze the influence of quality and quantity of food on *Moina minuta*, laboratorial experiments were developed.
Specimens from the semi arid environment (dams) were used in 1 Liter flasks. The initial density was 15 individuals, and food was added every 2 days. The experiment lasted 11 days. The tests were developed in 3 replicates each in which unialgal and plurialgal cultures were used. The unialgal had *Kirchneriella contorta* and the plurialgal had several species *Chlorella* sp.*, Tetraedron* sp., *Microcystis* sp.*, Scenedesmus* sp.*, Coelastrum* sp.*, Kirchneriela* sp.*, Trachelomonas* sp.*, Selenastrum* sp. and *Merismopedia* sp., being the more abundant *Chlorella* sp. e *Merismopedia* sp.. In experiments, the following concentrations of unialgal and plurialgal, were used $T10^3$ - $2.4x10^3$ cél.mL^{-1}, $T10^4$ - $2.4x10^4$cél.mL^{-1} and $T10^5$ - $2.4x10^5$cel.mL^{-1}.
The results showed that *M. minuta* is more sensitive to food quantity than food quality. Its populations decreased in the lower food concentrations, both unialgal and mixed. The greater density peak occurred on the eighth day in the presence of unialgal food.

Keywords: food availability, *Moina minuta*, population dynamics.

2007 BDUA – Journal of Biology, 2: 142. T0340Lili27022007
Title: **The effect of invertebrate predation on some cladoceran species: An experimental study**
Authors: Liliane de Jesus da Silva & Maria Cristina Crispim

THE EFFECT OF INVERTEBRATE PREDATION ON SOME CLADOCERAN SPECIES: AN EXPERIMENTAL STUDY

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ABSTRACT
The zooplankton community is present in all kind of aquatic environments. These organisms answer rapidly to environmental chemical, physical and biological changes, as predation for example. In Caatinga bioma, cladocerans present high population oscillations. This work analyzes, in laboratory, the influence of some invertebrate species predation on population dynamics of some cladoceran species.
Five experiments were developed in the aquatic ecology laboratory in DSE/UFPB. Were used ciclopoid copepods and chironomidae as predators. The cultures were maintained in plastic flasks with 150 mL of water. The initial densities of cladocerans (*Macrotrix* sp., *Diaphanosoma spinulosum* e *Ceriodaphnia cornuta*) were of 10 ind by flask, being adults and no eggs or embryos in their incubation chambers. Tree flasks had only the cladoceran species isolated (control) and other 3 had the same species of Cladocera and copepods (3 ind/flask) or the chironomidae larvae (3 ind/flask).
The effect of Copepoda predation on the 3 analyzed cladocerans species did not show differences in densities, but showed differences in fecundity rates, comparing with control, and *Macrothrix* sp. presented a higher length in the presence of the predator. In the presence of chironomidae larvae, cladocerans were suppressed.

Keywords: Predation, Cladocera, Copepoda, Chironomidae larvae.

THEME 4

Pollution and Plankton. Plankton as useful indicators of environmental water quality

2007 BDUA – Journal of Biology, 2: 145. T0401JoanaAnaMJP22012007
Title: **Growth inhibition of three freshwater microalgae after Paraquat exposure**
Authors: Joana B. Oliveira, Ana M. M. Gonçalves, Fernando Gonçalves & Mário J. Pereira

GROWTH INHIBITION OF THREE FRESHWATER MICROALGAE AFTER PARAQUAT EXPOSURE

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ABSTRACT

Aquatic organisms' toxicity tests are frequently conducted in environmental risk assessment to determine the potential effect of pesticides on primary producers. This study aims to determine Paraquat® thresholds which inhibit the growth of the three microalgae tested - *Pseudokirchneriella subcapitata* (Korshikov) Hindak, *Chlorella vulgaris* Beijerinck and *Pandorina morum* (Müller) Bory.

Algal tests were conducted in 100 mL Erlenmeyer flasks with 40 mL of final test volume. A stock solution of paraquat was prepared in distilled water from the commercial formulation Paraquato SAPEC 20® and then different volumes were added to a nutritive culture medium (MBL). The tests were performed in an incubation chamber with continuous agitation, at 100 rpm, a $16h^{L}$:$8h^{D}$ photoperiod and controlled temperature at 20± 2ºC. After 96h of incubation two biomass parameters were determined: optical density (at 440 nm) for *P. subcapitata* and *C. vulgaris* and chlorophyll *a* concentration for *P. morum*.

Results were reported as IC_{50} values and demonstrate that these microalgae have different sensitivities towards Paraquat®, with *P. morum* being the most sensitive species and *P. subcapitata* the most tolerant.

These results demonstrated adverse effects of Paraquat® upon freshwater green algae. Thus, the application of this herbicide for weed control in agricultural practices must be done carefully since any disturbance affecting algae with similar or higher sensitivity will have severe repercussions on higher trophic levels.

Keywords: Paraquat®, growth inhibition tests, *Pseudokirchneriella subcapitata, Chlorella vulgaris, Pandorina morum,* IC_{50}.

2007 BDUA – Journal of Biology, 2: 146. T0403Keyi Ussami11012007
Title: **Assessing DNA damage in *Dunaliella tertiolecta* using comet assay**
Authors: Keyi Ando Ussami, Maria José de Arruda Campos Rocha Passos, Vicente Gomes & Phan Van Ngan

ASSESSING DNA DAMAGE IN *Dunaliella tertiolecta* USING COMET ASSAY

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ABSTRACT
The comet assay, a method for detecting DNA damage (mainly strand breaks) in eukaryotic individual cells, was performed in the unicellular planktonic green algae *Dunaliella tertiolecta* strain CF-1 (Microbial Culture Collection, Oceanographic Institute) exposed to a well-known genotoxicant, 4-nitroquinoline-1-oxide (4-NQO).
D. tertiolecta cells (mid-logarithmic phase, Guillard f/2 culture media) were exposed to 0.25 µM, 0.5 µM and 1 µM of 4-NQO, for 1h at 20 °C under dark conditions. The experiments included controls and solvent controls (0.15% dimethyl sulfoxide). Two independent experiments using cells of the same strain were conducted. After treatment, the cells viability was assessed and the comet assay was performed. At least 100 randomly selected cells per treatment were analyzed.
In both experiments, all exposures to 4-NQO resulted in significantly higher tail moments (tail length x % DNA in tail) in relation to control and solvent control. At least 85% of the cells were viable after the treatment, indicating that the effects on DNA were due to genotoxicity and not to citotoxicity. The results demonstrated that DNA damage in *D. tertiolecta* induced by a genotoxic chemical can be evaluated by comet assay and that this species could be potentially used with field samples for genotoxicity assessment of pollutants.

Keywords: comet assay, genotoxicity, microalgae, *Dunaliella tertiolecta*, phytoplankton.

2007 BDUA – Journal of Biology, 2: 147. T0404DeniseBicudo16012007
Title: **Undesirable side-effects of water hyacinth control in a shallow tropical reservoir**
Authors: Denise de C. Bicudo, Bárbara M. Fonseca, Luís M. Bini, Luciane O. Crossetti, Carlos E. de M. Bicudo & Tatiane Araújo-Jesus

UNDESIRABLE SIDE-EFFECTS OF WATER HYACINTH CONTROL IN A SHALLOW TROPICAL RESERVOIR

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ABSTRACT

Based on eight years dataset, effects of mechanical removal of *Eichhornia crassipes* on the limnological characteristics and algal biomass were evaluated in a shallow tropical reservoir.

PCA separated samples gathered before and during the macrophyte removal from those gathered thereafter. Limnological responses to macrophyte removal were classified as an abrupt permanent impact. Analyses indicated a significant increase for pH, TP, total phytoplankton and cyanobacteria biomass, and a decrease in transparency and CO_2 in the surface water; also, increase in water stability, increase of bottom soluble SRP and decrease in bottom oxygen. Cyclic anoxic periods previously observed during springs and summers were replaced by a persistent period of anoxia in the sediment overlying water. Anoxic conditions were suitable for SRP release from sediments. Cyanobacteria blooms became more persistent. Maximum biomass was 30 times larger and blooms frequently reached 2 m and, sometimes, the reservoir bottom, contrasting to the pre-removal period in which it reached at most 1 m deep.

Long-term P dynamics was initially driven by allochthonous nutrient loadings and soon after replaced by internal ecological processes. Macrophyte removal accelerated the eutrophication process due to internal feedback mechanisms and led to a switch to a more turbid state. Biological feedback mechanisms were driven by cyanobacteria blooms by enhancing water stability, oxygen anoxia at the bottom, and by increasing suitable conditions for P internal loading. Data support the hypothesis of cyanobacteria blooms functioning as an important factor impairing water quality and driving the ecosystem towards a stable degraded state.

Keywords: Cyanobacteria bloom, eutrophication, internal feedback, phosphorus, restoration.

2007 BDUA – Journal of Biology, 2: 148. T0405SoniaGianesella24012007
Title: **Impact of nutrient load in a tropical estuary**
Authors: Sônia M. F. Gianesella & Flávia M. P. Saldanha-Corrêa

IMPACT OF NUTRIENT LOAD IN A TROPICAL ESTUARY

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ABSTRACT
Santos estuary, Southern Brazil, has a small drainage basin but receives a huge load of nutrients. The system is partially stratified, with higher stratification at the inner areas during the winter and lower stratification mainly at the Santos Channel. Present work intended to identify the impact of this nutrient input on phytoplankton biomass and productivity in summer and winter conditions.
High nitrogen (up to 60 μM) and phosphorus (up to 10 μM) concentrations were always observed, but with a low N/P ratio (lower than 9:1). Chl *a* average values were around 10 mg m^{-3}. Primary productivity rates attained 42.2 mgC (mgChl *a* h^{-1}) in summer, while in winter values ranged between 2 and 4 mgC (mgChl *a* $h)^{-1}$. Light attenuation was high, but the euphotic zone usually attained the bottom. Despite the high nutrient load, anoxic conditions were not observed, which was attributed to the high productivity and mixing. The lowest dissolved oxygen saturations were observed at the inner regions during the winter (around 50%). In summer the pH decreased and CO_2 concentrations increased due to heterotrophic activity (three times higher than winter). Both autotrophic and heterotrophic activities were higher during summer, due to the increase in water temperatures (6°C higher than winter). Heterotrophy dominates the inner portion of the estuary and São Vicente channel. The equilibrium between these both processes, estimated by the ratio CO_2/O_2 ≈1, was observed at Santos channel mouth.
Since nutrients were never limiting, phytoplankton biomass and productivity were controlled by water temperature, stability and light.

Keywords: Nutrients, tropical estuary, eutrophication, biomass, primary productivity, autotrophic/heterotrophic balance, phytoplankton, Santos estuary.

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Title: **Relationship between bacterial and phytoplankton dynamics in a eutrophicated sub-tropical estuary**
Authors: José Juan Barrera-Alba, Sônia Maria Flores Gianesella, Gleyci Aparecida Oliveira Moser & Flávia Marisa Prado Saldanha-Corrêa

RELATIONSHIP BETWEEN BACTERIAL AND PHYTOPLANKTON DYNAMICS IN A EUTROPHICATED SUB-TROPICAL ESTUARY

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ABSTRACT
Bacterial and phytoplankton communities were studied in the Northern region of an estuarine system which is under an intense anthropic eutrophication processes since 2002.
Two surveys were developed during July 2005 and January 2006, both at spring and neap tide periods. Since great freshwater inputs were registered in this region, organic suspended matter and phosphate amounts higher than 1.0 mg L^{-1} and 20.0 µM, respectively. Phytoplankton and bacterial production rates as high as 15.8 µg $C.L^{-1}$ h^{-1} and 7.6 µg $C.L^{-1}$ h^{-1} were also observed during the present work. A strong gradient was observed in suspended matter and dissolved inorganic nutrients from the river/estuary interface to the estuary/coastal one. This gradient was also observed in phytoplankton and bacterial production rates.
Primary production rates (PP) were positively correlated to salinity and euphotic depth. Bacterial production rates (BP) were inversely correlated with salinity and positively correlated with organic matter and exopolymer particles. Results also indicate that phytoplankton is light-limited in this region, with higher PP were observed during July 2005, when lower suspended matter concentrations were registered. On the other hand, higher BP were observed during January 2006, when BP oversized PP. This fact suggests that allocthonus organic carbon inputs are the main source to support the bacterial activity in this region, since no correlation was observed between BP and PP.

Keywords: Bacterial community; phytoplankton interactions; eutrophication; exopolymer particles.

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Title: **Preliminary study of the zooplankton community of the lagoa dos Índios, macapá – AP, Brazil**

Authors: Camila Barbosa de Araújo, Fernanda Assunção Nascimento, Maria Edigleise Santos, Michelle Cristina Ribeiro Costa, Mucio de Queiroz L. Lucio Filho, Tatiane de Lima Silva & Júlio César Sá de Oliveira

PRELIMINARY STUDY OF THE ZOOOPLAKTON COMMUNITY OF LAGOA DOS INDIOS, MACAPÁ-AP, BRAZIL

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ABSTRACT

This preliminary study had as objective the analysis of the zooplankton community at the Lagoa dos Índios, in the city of Macapá-AP. Mainly for its ecological importance in lacustrine ecosystems as component of the diet of several species of fish, as well as for its importance in the flow of the energy and cyclagem of nutrients improving the understanding of the trophical dynamics of aquatic environments.

Collections were made in the months of October and December of 2006, which were registered chemical and physics changeable: temperature (28:7¨C), electric conductivity (58.0 µS cm), pH (6.0), dissolved oxygen (1.5 mg.L^{-1}), and salinity (0.0 ppt), and qualitative zooplankton collected in net of 20 and 50 µm mesh size through horizontal and preserved drags in formalin (4%). The 32 results consist of *taxa* of zooplankton, distributed in the groups: 26 Rotifera (81.25%), 3 Cladocera (9.38%), 3 Copepod (9.38%). The most representative families of the rotifers were Branchionidae, with the sorts *Kellicottia*, *Anuraeops*, *Keratella*, *Platyas* and Lecanidae with the species *Monostyla* and *Lecane*. Between the cladocerans the family Sididade with *Diaphanosoma* species and Daphinidade with *Daphinia* species. The Cyclopoidae family got predominance between Copepods.

Therefore this partial study demonstrates the Rotifers as main zooplanktonic group of the area in study.

Keywords: Zooplankton, Lagoa dos Indios, Macapá, Amapá.

2007 BDUA – Journal of Biology, 2: 151. T0409ElisangelaBranco27012007
Title: **Ambient changeable influence in the phytoplanktonic community structure of the Barra das Jangadas estuary system (Recife – Pernambuco – Brazil)**
Authors: Elisângela de Sousa Branco, Fernando Antônio do Nascimento Feitosa & Maria da Glória Gonçalves da Silva Cunha

AMBIENT CHANGEABLE INFLUENCE IN THE PHYTOPLANKTONIC COMMUNITY STRUCTURE OF THE BARRA DAS JANGADAS ESTUARY SYSTEM (RECIFE – PERNAMBUCO – BRAZIL)

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ABSTRACT
The Barra das Jangadas estuary system (8º12'30 "and 34º55'00") is characterized by the strong influence of the Jaboatão and Pirapama rivers, that contributes with the entrance of nutrients enriching the area and consequently fishes it. Its edges present, on the other hand, mangrove sufficiently preserved, and on the another one, intense deforestation, as consequence of the demographic growth. The analysis of the structure phytoplanktonic community is excellent to know the composition, biomass, density and productivity of the aquatic ecosystem, besides diagnosis it, a time that some species are bioindicator of the ambient quality. The present work had as objective to diagnosis this ecosystem through the structure and dynamics of the phytoplankton and ambient changeable.
The collections had been carried in June, July and August of 2003 (rainy period), December of 2003, January and March of 2004 (dry period). Statistically, the dissolved oxygen and nitrate had been significant in the rainy period and silicate and temperature in the dry period.
The environment varied of limnetic to eualino vertically being homogeneous, in the majority of the times. How much to the taxa of oxygen saturation the estuary varied of poled zone the supersaturated. Wise the algal biomass, it was verified that the fraction of pico/nanofitoplankton was the one that more contributed with the way. It had been identified 214 *taxa*, distinguished the Bacillariophyta, inside it *Coscinodiscus centralis* and *Bellerochea malleus* were the most representative.
The algae diversity, equitabily, biomass and density had been typical of environment that suffer strong atrophic providing the predominance of few opportunist species that quickly adapted in eutrophyc conditions found in the ecosystem.

Keywords: Phytoplankton, biomass, estuary, hydrology.

2007 BDUA – Journal of Biology, 2: 152. T0410EnideEskinazi28012007

Title: **Floristic and space-temporal microphytoplankton variation from Carpina Reservoir – PE (Northeastern Brazil)**

Authors: Claúdio Santos da Costa, Enide Eskinazi-Leça, Alfredo Matos Moura, Carmen Silvia Zickel & Ariadne do Nascimento Moura

FLORISTIC AND SPACE-TEMPORAL MICROPHYTOPLANKTON VARIATION FROM CARPINA RESERVOIR – PE (NORTHEASTERN BRAZIL)

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ABSTRACT

The aim of this work was to analyze the floristic and space-temporal microphytoplankton variation from Carpina Reservoir – PE (Northeastern Brazil).

Samplings were taken in three places located in the littoral region of the reservoir in superficial water, from June/2001 to May/2002, with plankton net (25 µm). Microphytoplankton composition, richness, frequency, relative abundance was analyzed and run specific tests to diversity and equitability.

It was identified 83 specific and infraspecific *taxa* had been identified belonging to Cyanophyta (34%), Chlorophyta (35%), Bacillariophyta (26%), Euglenophyta (4%) and Cryptophyta (1%). There were no significant differences in floristic neither among places nor among months, indicating that species are well distributed in littoral region of the reservoir. *Planktothrix agardhii* (Gomont) Anagnostidis et Komárek and *Geitlerinema amphibium* (Agardh ex Gomont) Anagnostidis were the most important species, dominating in some months, mainly in the beginning of the rainy period, denoting that the reservoir presents indications of ambient disequilibrium during the beginning of the rain period. However, for the other months, the microphytoplankton composition and the relative abundance had confirmed that the Carpina reservoir presents conditions to support a rich and varied planktonic flora.

Keywords: Microphytoplankton, richness, relative abundance, reservoir, Northeastern Brazil.

2007 BDUA – Journal of Biology, 2: 153. T0411EvelineAquino26012007
Title: **The phytoplanktonic community from stabilization ponds in the Cariri area, Ceará**
Authors: Eveline Pinheiro Aquino, Antônia Ionara Gonçalves & Sírleis Rodrigues Lacerda

THE PHYTOPLANKTONIC COMMUNITY FROM STABILIZATION PONDS IN THE CARIRI AREA, CEARÁ

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ABSTRACT

Stabilization ponds are tanks built by the man with the purpose of treating domestic and industrial waters. These ponds are characterized by a considerable growth of phytoplankton resulting in a eutrophic environment.

To study the phytoplankton composition, samples were collected in ponds of aerobic processes in two sewage treatment stations, located in Juazeiro do Norte and Barbalha (Cariri, Ceará). In both ponds it was identified the divisions Cyanophyta, Euglenophyta, Bacillariophyta and Chlorophyta. The most abundant species were *Planktothrix isothrix* (Skuja) Komárek et Komárková and *Microcystis aeruginosa* Brébisson present in all samples, being both toxic species.

The presence of flagellate species as *Euglena* sp., *Phacus* sp. and *Chlamydomonas* sp. indicate the poor water condition as these species are bioindicators of pollution.

Keywords: Phytoplankton, eutrophication, stabilization ponds.

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Title: **Characterization of phytoplankton community of Cruzeta Reservoir, RN, Brazil**
Authors: Ranielly Karen de Oliveira, Emilly Kataline R. Pessoa, Juliana L. de M. Borba, Fabiana R.A. Câmara, Patrícia Luiza da S. Carmo & Naithirithi T. Chellappa

CHARACTERIZATION OF PHYTOPLANKTON COMMUNITY OF CRUZETA RESERVOIR, RN, BRAZIL

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ABSTRACT
The present work characterizes the phytoplankton community of Cruzeta Reservoir, RN, located in the semi-arid North-eastern region of Brazil.
This study was carried out based on monthly collections of water samples from the surface, column and bottom of Cruzeta Reservoir, during September, 2005 to June, 2006. Temperature, pH, dissolved oxygen, electrical conductivity, concentrations of nitrate-nitrogen, ammoniacal nitrogen, orthophosphate, chlorophyll *a* was measured, besides identification and counting of phytoplankton community. A multi-parameter kit was utilized for the analysis of abiotic characteristics of the water samples.
The results indicate high phytoplankton diversity with the presence of 95 *taxa* distributed in six classes: Chlorophyceae (42), Cyanophyceae (18), Bacillariophyceae (28), Dinophyceae (2), Chrysophyceae (3) and Euglenophyceae (2), indicating dominance of Chlorophyceae. Chlorophyll *a* concentration presented mean of 5.3 $mg.L^{-1}$, indicating active state of physiology of phytoplankton. During the dry and rainy seasons, mean respective values were: pH 9.06 and 8.71, water temperature 28.0 ºC and 28.3ºC, dissolved oxygen 4.2 $mg.L^{-1}$ and 5.1 $mg.L^{-1}$, electrical conductivity 329 $\mu S.cm^{-1}$ and 435 $\mu S.cm^{-1}$. The mean respective values of nutrients during dry and rainy seasons were: nitrate-nitrogen 0.10 $mg.L^{-1}$ and 0.08 $mg.L^{-1}$, ammoniacal nitrogen 0.11 $mg.L^{-1}$ and 0.08 $mg.L^{-1}$, orthophosphate 0.32 $mg.L^{-1}$ and 0.44 $mg.L^{-1}$.
Cruzeta Reservoir can thus be classified as mesotrophic environment due to high concentration of nutrients and high electrical conductivity.

Keywords: Phytoplankton community, Diversity, Reservoir, Cruzeta/RN.

2007 BDUA – Journal of Biology, 2: 155. T0413Chellappa29012007
Title: **Ecology of phytoplankton community and environmental parameters of Marechal Dutra (Gargalheiras) Reservoir, Acari, RN, Brazil**
Authors: Emilly Kataline R. Pessoa, Ranielly Karen de Oliveira, Juliana L. de M. Borba, Fabiana R.A. Câmara, Patrícia Luiza da S. Carmo & Naithirithi T. Chellappa

ECOLOGY PHYTOPLANKTON COMMUNITY AND ENVIRONMENTAL PARAMETERS OF MARECHAL DUTRA (GARGALHEIRAS) RESERVOIR, ACARI, RN, BRAZIL

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ABSTRACT
The present study deals with the ecology of phytoplankton community and environmental parameters of Marechal Dutra Reservoir, a water body of considerable regional importance, located in Acari, RN.
Surface water samples from the reservoir were collected from August, 2005 to June, 2006. Temperature, pH, dissolved oxygen, electrical conductivity, concentrations of nitrate-nitrogen, ammoniacal nitrogen, orthophosphate, chlorophyll *a* and phaeophytin were measured. A multi-parameter kit was utilized for the abiotic characteristics analysis of water samples. Quali–quantitative analyses of phytoplankton were carried out.
Water temperature varied from 26.8 to 32.3ºC (mean 29.0ºC), pH from 6.96 to 9.8 (mean 8.66), dissolved oxygen varied from 2.78 $mg.L^{-1}$ to 11.1 $mg.L^{-1}$ (average 7.21 $mg.L^{-1}$), and electrical conductivity was high during rainy season (1451 $\mu S.cm^{-1}$). The nitrate-nitrogen varied from 0.003 to 0.038 $mg.L^{-1}$ (mean 0.012 $mg.L^{-1}$), ammoniacal nitrogen varied from 0.090 to 0.305 $mg.L^{-1}$ (average 0.181 $mg.L^{-1}$) and orthophosphate varied from 0.086 to 0.830 $mg.L^{-1}$ (average 0.415 $mg.L^{-1}$). Potentially toxic bloom causing phytoplankton species, such as *Anabaena planktonica* and *Microcystis aeruginosa*, were present. The concentration of chlorophyll *a* (4.30 $mg.L^{-1}$ and 1.60 $mg.L^{-1}$ during rainy and dry seasons, respectively) and phaeophytin (3.02 $mg.L^{-1}$ and 0.97 $mg.L^{-1}$ during rainy and seasons, respectively) showed decrease in trend from rainy to dry seasons, with low density of phytoplankton organisms.
Marechal Dutra Reservoir has characteristics of a disturbed environment, and as such, can be classified as mesotrophic, considering the Index of Trophic State Criteria.

Keywords: Phytoplankton community, Environmental parameters, Reservoir, Acari/RN.

2007 BDUA – Journal of Biology, 2: 156. T0414SirleisLacerda26012007
Title: **Estuarine system of Barra de Jangadas – Northeastern Brazil: Phytoplankton bioindicators species of the environmental quality**
Authors: Sirleis Rodrigues Lacerda, Maria Luise Koening, Sigrid Neumann Leitão & Kátia Muniz Pereira da Costa

ESTUARINE SYSTEM OF BARRA DE JANGADAS – NORTHEASTERN BRAZIL: PHYTOPLANKTON BIOINDICATORS SPECIES OF ENVIRONMENTAL QUALITY

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ABSTRACT
The Barra das Jangadas estuarine system (PE-Brazil), located at the south of Recife city, has been under intense antropic impacts in the last years. This ecosystem was studied to assess the phytoplankton species temporal dynamic and to obtain the main environmental forces.
Sampling was carried out in a fixed station during the dry (09 to 15 January 2001) and rainy periods (04 to 10 July 2001), in a temporal series (seven consecutive days) from a spring to an ebb tide, every three hours interval. Collections were made with a net 45 µm mesh size and the samples fixed with neutralized formaldehyde at 4%. Hydrological data were obtained simultaneously.
It was identified 204 *taxa* being the community structured by the diatoms *Cyclotella meneghiniana* Kützing and *Coscinodiscus centralis* Ehrenberg and by the cyanobacteria *Microcystis aeruginosa* Brébisson and *Microcystis flos-aquae* (Wittr.) Kirchener.
These species outranked in density and frequency and are r-strategists (opportunists), being indicators of a eutrophic unbalanced system. The estuary receives a high load of organic pollution causing changes in the environmental parameters. The rain, tide cycle and salinity were the main factors influencing the system.

Keywords: Phytoplankton, bioindicators species, estuarine system.

2007 BDUA – Journal of Biology, 2: 155. T0415MLuiseKoening26012007
Title: **Phytoplankton of impacted and non – impacted areas in estuarine system of Itamaracá – Pernambuco, Brazil**
Authors: Maria Luise Koening, Maristela Silva de Oliveira & Manuel de Jesus Flores Montes

PHYTOPLANKTON OF IMPACTED AND NON – IMPACTED AREAS IN ESTUARINE SYSTEMS OF ITAMARACÁ-PERNAMBUCO, BRAZIL

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ABSTRACT
This study is part of an Environment and Biodiversity Quality project of the Millennium Institute (MCT), and its purpose is to establish the phytoplanktonic community relation with the physical and chemical characteristics of the environment.
The results were obtained from collections performed at 4 stations for one year, on an experimental transverse along the pollution gradient (Botafogo River) and one control collection performed at a non-impacted area (Carrapicho River).
The recorded hydrologic conditions indicated the presence of greater anthropic influences upstream from Botafogo river estuary, where low dissolved oxygen values and high concentrations of nutrient salts were detected. Concerning Carrapicho river estuary, the obtained values corresponded to normal standards, due to the renewal capability enabled by marine waters that come in through the North Dam. The cell density ranged from 8.0 x 10^4 cells.L^{-1} to 1.7 x 10^3 cells.L^{-1}, both at Botafogo river estuary. The predominant *taxa* were phytoflagellates and *Euglena* sp. in Botafogo river, and phytoflagellates, as well as *Chaetoceros lorenzianus*, *Coscinodiscus centralis* and *Cyclotella meneghiniana* in Carrapicho river. The specific diversity ranged from 0.47 to 3.62 bits.cells^{-1}; this low index is due to the *Chaetoceros lorenzianus* and the equitability from 0.13 to 1.03. The analysis of the main components explained 60.97% of the data variance emphasizing Carrapicho river, with better hydrologic conditions, favoring high densities of phytoflagellates and diatoms, greater diversity and equitability, and Botafogo river, which is characterized by its higher nutrient concentrations and consequently greater polluting mass, phytoflagellates, Euglenophyceae and Cyanophyceae.

Keywords: Phytoplankton, estuaries, ecology.

2007 BDUA – Journal of Biology, 2: 158. T0416LauraMasuda26012007
Title: **Contribution of *Skeletonema costatum* to phytoplankton community in a eutrophicated sub-tropical estuary during January 2006**
Authors: Laura Shizue Moriga Masuda, José Juan Barrera-Alba, Sônia Maria Flores Gianesella & Gleyci Aparecida Oliveira Moser

CONTRIBUTION OF *Skeletonema costatum* TO PHYTOPLANKTON COMMUNITY IN AN EUTROPHICATED SUB-TROPICAL ESTUARY DURING JANUARY 2006

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ABSTRACT
Phytoplankton community composition was studied in the Northern region of a sub-tropical estuarine system during January 2006, under spring tide conditions.
Environmental properties and phytoplankton biomass, density and taxonomic composition were analyzed in three anchor stations from river to the estuarine inlet.
A strong gradient was observed in salinity from the river/estuary interface to the estuary/coastal one, varying on average from 0.5 to 27.9. Phytoplankton density and biomass were no correlated to salinity and higher values were registered in the intermediate sampling site, with a maximum of 2.0 x 10^8 cells.L^{-1}. Even though, specific richness varied between 7 and 37, phytoplankton was dominated by the nanoplanktonic diatom *Skeletonema costatum*, which represented in average between 20.5% and 77.8% of total density. Higher contributions of *S. costatum*, as high as 97.7%, were also observed in the intermediate sampling site. Density of this species was correlated with dissolved inorganic nutrients distribution, suggesting high production rates of this opportunist diatom in an estuarine region with high nutrient concentration, low turbidity and intermediated salinities.
The study is under an intense anthropogenic eutrophication processes since 2002, which could help to explain the proliferation of opportunist phytoplankton species like *Skeletonema costatum*.

Keywords: *Skeletonema costatum*, phytoplankton composition, eutrophicated estuary.

2007 BDUA – Journal of Biology, 2: 159. T0417RobHart29012007
Title: **Temporal dynamics and spatial perspectives of contemporary blooms of the dinoflagellate *Ceratium* in a subtropical South African reservoir**
Author: Rob Hart

TEMPORAL DYNAMICS AND SPATIAL PERSPECTIVES OF CONTEMPORARY BLOOMS OF THE DINOFLAGELLATE *Ceratium* IN A SUBTROPICAL SOUTH AFRICAN RESERVOIR

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ABSTRACT
A *Ceratium hirundinella* bloom encountered during a serendipitous survey of Albert Falls Dam in October 2006 highlights a rising nuisance in SA reservoirs. This large (2 352 ha) major Umgeni River storage reservoir (289 x 10^6 m^3) impounded in 1976 secures the potable water supply for > 4 million inhabitants. A 22-site synoptic survey of the bloom was undertaken immediately, with a follow-up survey in January 2007. Historical algal count records of the Umgeni Water utility revealed an abrupt first emergence of *Ceratium* late in 2004, to peak densities around 1000 cells.mL^{-1}. It has persisted subsequently, with densities pulsing to peaks of between 150 and 750 cells.mL^{-1}. In October 2006, *Ceratium* densities around the lake varied up to 1320 cells mL^{-1}, with commensurate total chlorophyll values reaching 50 µg.L^{-1} (median = 11.8 µg.L^{-1}). Daytime chlorophyll values increased vertically, reaching highest values at 4–5 m (within the 5 m vertical profile measured), a first-ever suggestion of deep chlorophyll maxima in this relatively clear-water lake (survey-mean Secchi depth = 2.6 m), broadly concordant with the incipient seasonal thermocline at 6 m. Exploratory nocturnal sampling yielded evidence of diel vertical migration.
Re-sampling in late January 2007 revealed substantially lower chlorophyll values (range = 2 to 15, median = 3.7µg.L^{-1}) excluding the river inflow site (99 µg.L^{-1}). More extensive and detailed profiling in the inflow region revealed a remarkably abrupt longitudinal bloom development within 150 m of river channel – reflected in a chlorophyll gradient from 0.6 to 101 µg.L^{-1}.
Data are examined in relation to water chemistry records, and zooplankton abundance and composition details collected during the surveys.

Keywords: Historical eruption, dinoflagellate bloom, environmental assessment, environmental correlates.

2007 BDUA – Journal of Biology, 2: 160. T0418EneidaEskinazi29012007
Title: **Ecological status and zooplankton characterization of an impacted coastal lagoon of Rio Grande do Norte State (Northeast Brazil)**
Authors: Laura Ribas de Almeida & Eneida Maria Eskinazi-Sant'Anna

ECOLOGICAL STATUS AND ZOOPLANKTON CHARACTERIZATION OF AN IMPACTED COASTAL LAGOON OF RIO GRANDE DO NORTE STATE (NORTHEAST BRAZIL)

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ABSTRACT
Guaraíras lagoon is a shallow estuarine lagoon submitted to intense impacts, including shrimp aquaculture, urban expansion and agricultural activities, and therefore vulnerable to eutrophication. A spatial-temporal study was conducted in order to verify the ecological status of the lagoon and zooplankton (micro- and mesozooplankton) species composition. Algal biomass (chl. *a*: mean = 13.8 $\mu g.L^{-1}$) and phosphorous total (mean = 2.79 µM) indicated that the lagoon can be characterized as a meso-eutrophic coastal system in the inner part and oligotrophic in the areas under influence of marine water. High salinity values (mean ± SD = 34.25 ± 4.8‰) characterized coastal-marine conditions in the lagoon rather than an estuarine condition. Positive correlations (p <0.05) between microzooplankton and salinity suggest that the seasonal changes of this community were strongly driven by the saline dynamic of the lagoon. No significant seasonal differences (p >0.05) in mesozooplankton density was observed. Mesozooplankton species composition was characterized by an estuarine group dominated by *Oithona* spp., *Acartia lilljeborgi* and *Parvocalanus crassirostris* and a coastal marine group characterized by the presence of *Paracalanus quasimodo*, *Calanopia americana* and *Corycaeus speciosus*. A positive correlation (r^2 = 0.43; t_{calc} = 2,74) between copepods and microzooplankton density was registered, suggesting the occurrence of trophic pathways.
The modifications of the lagoon basin associated with human impacts have resulted in changes in zooplankton species composition and trophic structure, with an increase in marine influence under the lagoon. Studies should be conducted to verify how zooplankton productivity can have been affected by the changes in saline pattern and eutrophication of Guaraíras lagoon.

Keywords: Tropical, zooplankton, coastal lagoon, ecological status, eutrophication.

2007 BDUA – Journal of Biology, 2: 161. T0419EneidaEskinazi29012007
Title: **Zooplankton composition in six eutrophic reservoirs of the Brazilian semi-arid (Rio Grande do Norte State, Northeast Brazil)**
Authors: E.M. Eskinazi-Sant'Anna, R.F. Menezes, J.L. Attayde, I.A. Soares, M.M.F. Araújo & R.F. Panosso

ZOOPLANKTON COMPOSITION IN SIX EUTROPHIC RESERVOIRS OF THE BRAZILIAN SEMI-ARID (RIO GRANDE DO NORTE STATE, NORTHEAST BRAZIL)

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ABSTRACT
The spatial and seasonal distribution of zooplankton in six eutrophic reservoirs (Armando Ribeiro Gonçalves, Gargalheiras, Itans, Parelhas, Passagem das Traíras and Sabugi) in the semi arid region of Rio Grande do Norte State were studied.
Zooplankton sampling was made every three months between September 2002 and August 2003, at two sites (riverine and lacustrine). Concurrently, various environmental parameters were measured.
The most numerically important zooplankton species were the rotifers *Filinia longiseta* and *F. terminalis*, the cladoceran *Diaphanosoma spinulosum* and the Calanoids copepods *Notodiaptomus cearensis* and *Argyrodiaptomus azevedoi*. It was observed a significant seasonal variation (p <0.05) of water temperature (^oC) and total nitrogen with highest values during dry season (September and December). Phytoplankton biomass (chl. *a*) was extremely high in all reservoirs, revealing the occurrence of punctual hypereutrophic conditions in Armando Ribeiro Gonçalves and Gargalheiras reservoirs (mean 48.5±25 $ug.L^{-1}$).
Zooplankton abundance correlated negatively with chl. *a* especially for Calanoids copepods. A positive correlation (p <0.01) between copepods and protozoan density was registered in Armando Ribeiro Gonçalves, Gargalheiras and Parelhas reservoirs, suggesting the occurrence of trophic pathways via microbial community. It wasn't observed significant temporal differences (p >0.05) in zooplankton abundance and composition in any of the reservoirs studied. This homogeneous seasonal pattern was also reflected in the zooplankton spatial patterns (riverine to lacustrine) (p >0.05). Water column stability, high light extinction coefficient and expressive concentrations of dissolved nutrients contributed to promote a dominance of cyanobacteria, a scenario that can be decisive to the homogeneity of the zooplankton community of the studied reservoirs.

Keywords: Reservoirs, eutrophy, zooplankton, temporal and seasonal distribution, Brazil.

2007 BDUA – Journal of Biology, 2: 162. T0420MarcoCutrim30012007
Title: **Phytoplankton community in a recreational fishing ponds, Brazilian North**
Authors: Marco Valério Jansen Cutrim, Simone Morais Costa, José Policarpo C. Neto & Janaína M. Barros

PHYTOPLANKTON COMMUNITY IN A RECREATIONAL FISHING PONDS, BRAZILIAN NORTH

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ABSTRACT
The recreational fishing pounds are located in the São Luis Island – Maranhão State, Brazil. Water samples were collected in two previously selected pounds throughout 2006 year and analyzed regarding floristic composition and physical-chemical parameters. Phytoplankton collected using a 45 µm mesh net consisted of 65 *taxa*, distributed among seven classes with concentrations ranging from 8.46 x 10^6 to 1.36 x 10^7 cells.L^{-1}. Some physical and chemical parameters seemed to influence phytoplankton community behavior. Chlorophyceae development was favored by local conditions. The genus *Scenedesmus* was represented with 13 species. Among the species of cyanobacteria identified, *Microcystis aeruginosa*, *Microcystis wesembergii,* and *Anabaena* species were the most important due to their ability to produce toxins, posing a high risk to public health. Shannon diversity index (H') characterizes the pounds with medium specific degrees.

Keywords: Phytoplankton community, fishing pounds, *Microcystis*.

2007 BDUA – Journal of Biology, 2: 163. T0421KarolineSantos30012007
Title: **Phytoplanktonic biomass in the estuarine areas subject to the oil spill in Maranhão State, Brazil**
Authors: Ana Karoline dos Santos & Andrea Christina Gomes de Azevedo

PHYTOPLANKTONIC BIOMASS IN THE ESTUARINE AREAS SUBJECT TO THE OIL SPILL IN MARANHÃO STATE, BRAZIL

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ABSTRACT
The estuaries constitute intersection located between marine environments and fresh water, presenting abundant phytoplanktonic community which transforms organic into particulate material through the photosynthesis, comprehending the biomass (chlorophyll *a*). The purpose of this study was to investigate quali and quantitatively the phytoplankton in estuarine areas São Marcos bay, with stations in Itaqui Harbour and Coqueiros strait, in the period from May/2005 to June/2006. For qualitative analysis, superficial horizontal samples were accomplished using phytoplankton net (65 µm) and applying to occurrence frequency of the identified species. For biomass, 2 liters of water were collected, immediately percolated and spectrophotometric readings were performed. 2,328 mm pluviosity was observed in São Luís island rainy period, tide amplitudes varying from 5.3 to 6.9 m, water transparency from 0.15 to 0.62 m, seston from 324.8 to 1,111 mg L, and salinity from 13 to 35, oxygen saturation from 49.38 to 70.11% and water temperature from 26 to 30.6 º C. In this work, 124 species were identified, of which 86% correspond to the division Bacillariophyta. The total biomass varied from 1.15 to 13.98 mg m³ and the size-fractionated varied from 0.42 to 5.25 mg m³, microphytoplankton from 18% to 70% and nano/picophytoplankton from 30% to 82%. For the occurrence frequency, an 18% frequency was obtained, 32% little frequent, 29% sporadic and 21% very frequent. Nine microalgae occurred in 100% of the samples: *Coscinodiscus oculusiridis, Ditylum brightwellii, Odontella mobiliensis, Odontella regia, Skeletonema costatum, Skeletonema tropicum, Thalassionema frauenfeldii, Thalassiosira subitilis* and *Triceratium favus*.

Keywords: Phytoplankton, biomass, estuary.

2007 BDUA – Journal of Biology, 2: 164. T0422MariliaMarins30012007
Title: ***Skeletonema costatum* (Greville) Cleve (Bacillariophyceae): morphometric variations in estuarine areas of Pernambuco (Northeastern Brazil)**
Authors: Marília Oliveira Silva Marins, Enide Eskinazi-Leça, José Zanon de Oliveira Passavante & Maria da Glória Gonçalves da Silva-Cunha

Skeletonema costatum (Greville) Cleve (Bacillariophyceae): morphometric variations in estuarine areas of Pernambuco (Northeastern Brazil)

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ABSTRACT
The purpose of this study was to evaluate the populations of *Skeletonema costatum* (Greville) Cleve that occur in two estuarine areas in the Metropolitan Region of Recife, Pernambuco, and Northeastern Brazil: Ipojuca River and Pina Basin.
The study constituted in the analysis of the hydrologic characteristics of each ecosystem (temperature, salinity, pH, dissolved oxygen and nutrient salts), as well as the identification of the cellular biovolume and the morphometric variations in the individuals (cell height, size of cellular processes and number of cell/colony). The analyzed samples were collected in June, July and August (dry period) and in October, November and December (rainy period), during both tide periods, in 1986 (Ipojuca River), and in 1990 (Pina Basin). The collections used a 65 µm mesh plankton net.
The species presented distinct morphologic characteristics if comparing the two environments, which indicated morphometric variations regarding environmental factors. At Ipojuca River estuary, where the environmental conditions indicated a less euthropic ecosystem, the individuals showed greater cellular biovolume, more robust cells and processes and colonies with higher number of cells. The morphometric variations were not significant if comparing the annual periods of the same ecosystem, but showed significant values if comparing both ecosystems.
The results showed that *Skeletonema costatum* can develop better in less euthrophic environments, which can be considered an environmental health indicator in estuarine areas of Pernambuco.

Keywords: *Skeletonema costatum*, morphometric variations, estuarine areas, Northeastern Brazil.

2007 BDUA – Journal of Biology, 2: 165. T0423SigridLeitao29012007
Title: **Zooplankton from Shrimp Culture Ponds in Northeastern Brazil**
Authors: Sigrid Neumann Leitão, Eneida Eskinazi Sant'Anna, Eliane de Holanda Cavalcanti, Maristela Case & Enide Eskinazi Leça

ZOOPLANKTON FROM SHRIMP CULTURE PONDS IN NORTHEASTERN BRAZIL

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ABSTRACT
The zooplankton was examined in 14 commercial shrimp *Litopenaeus vannamei* pond in tropical Brazil to: (1) assess their composition, (2) determine their density, (3) indicate environmental quality.
In each farm, two ponds and the water capitation point were monitored in 2003. Sampling at each station was made with a standard plankton net 50 micrometers mesh size and 3 minutes horizontal subsurface hauls were made at each pond. The zooplankton presented 40 *taxa* being essentially composed of typical marine euryhaline species and suspension-feeding forms. In all farms the dominant group was Copepoda with a total of 45%, followed by Protozoa (18%). Among the meroplankton outranked Polychaeta larvae (dominated by spionids), Gastropoda larvae, nauplii of Cirripedia and zoeae of Brachyura with large distribution in the region, sometimes dominating the community. Zooplankton abundance varied from 972 ± 209 ind.m^{-3} to 4,235 ± 2,877 ind.m^{-3}.
In the studied marine shrimp culture ponds, copepods dominance were replaced by protozoan and rotifers as nutrient concentrations increased with the culture period, indicating that zooplankton trophic structure can be strongly affected by the occurrence of eutrophic conditions in shrimp ponds. The tendency of low species diversity is indicative of an unbalanced hipereuthrophic system decreasing the water quality and the cultured species. These results can be an important appointment to understand the effects of eutrophication in coastal plankton structure and its effects to marine aquatic food web.

Keywords: Zooplankton, aquaculture, shrimp ponds, *Litopenaeus vannamei*.

2007 BDUA – Journal of Biology, 2: 166. T0424Marilene30012007
Title: **The microphytoplankton of the littoral of Olinda (Pernambuco, Brazil)**
Authors: Aldineide de Alcantara Velho Barretto, Maria da Glória Gonçalves da Silva Cunha, José Zanon de Oliveira Passavante & Marilene Felipe Santiago

THE MICROPHYTOPLANKTON OF THE LITTORAL OF OLINDA (PERNAMBUCO, BRAZIL)

Aldineide de Alcantara Velho Barretto, Maria da Glória Gonçalves da Silva Cunha, José Zanon de Oliveira Passavante & Marilene Felipe Santiago

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ABSTRACT
This study objective was to assess the phytoplankton community structure from Casa Caiada and Rio Doce beaches, at the North region of Pernambuco State, Brazil.
Sampling was carried out at the dry and rainy seasons in 2003, in three fixed stations, during the low and high tides of the same day. Hydrological data were obtained with a Nansen bottle and the microphytoplankton was collected with a 65 micrometers mesh size net, through surface horizontal hauls.
The salinity was high characterizing the area as euhaline. The dissolved oxygen didn't present a defined seasonal cycle, with higher values during high tide presenting in general a saturated condition, with few under saturated values. The BOD presented irregular values, indicating a polluted condition in some stations and tides. The pH presented acceptable values to marine life. It was identified 103 taxa, distributed among the divisions Bacillariophyta (82 species), Cyanophyta (8 species), Pyrrophyta (6 species), Euglenophyta (5 species), and Chlorophyta (2 species). The most representative were: *Asterionellopsis glacialis, Bacillaria paxillifera, Chaetoceros* sp., *Heliotheca thamensis, Nitzschia* sp., *Skeletonema costatum*, *Pseudo-nitzschia pungens, Thalassiosira* sp., *Trachelomonas* sp. The tychoplankton dominated the area, due low depth and intense hydrodynamics.
The dominance of few species and low diversity values indicate a qualitative selectivity, mainly of Rio Doce which receives the direct influence of domestic sewage and from the Paratibe river.

Keywords: Phytoplankton, taxonomy, beach, Pernambuco.

2007 BDUA – Journal of Biology, 2: 167. T0425GloriaSilvaCunhal30012007
Title: **Seasonal and spatial distribution of the phytoplankton in a tropical coastal ecosystem (Santa Cruz Channel, Pernambuco, Brazil)**
Authors: Maria da Glória Gonçalves da Silva-Cunha, Enide Eskinazi-Leça, Sigrid Neumann-Leitão & Marilene Felipe Santiago

SEASONAL AND SPATIAL DISTRIBUTION OF THE PHYTOPLANKTON IN A TROPICAL COASTAL ECOSYSTEM (SANTA CRUZ CHANNEL, PERNAMBUCO, BRAZIL)

Maria da Glória Gonçalves da Silva-Cunha, Enide Eskinazi-Leça, Sigrid Neumann-Leitão, Marilene Felipe Santiago

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ABSTRACT
The phytoplankton was studied to assess the Santa Cruz Channel inlets environmental quality.
Plankton samples were collected with a net 45 micrometers of mesh size in three stations (Island, Middle and Continent) at the South (Orange) and North (Catuama) inlets, during the rainy (May1996) and dry (December1996) seasons, in a nictemeral spring tidal cycle.
A total of 209 *taxa* were identified outranking the Bacillariophyta (170 *taxa*) division. The presence of marine euryhaline species was highly representative due the strong marine influence in the inlets.
A strong interaction between Santa Cruz Channel and the adjacent shelf concurs to the high richness and species diversity and indicate a balanced and good environmental quality.

Keywords: Phytoplankton, Diversity, Estuary, Spatial Distribution, Tropical.

2007 BDUA – Journal of Biology, 2: 168. T0426GloriaSilvaCunhaII30012007
Title: **Spatial and temporal distribution of the microphytoplankton at the Capibaribe river estuary (Recife, Pernambuco, Brazil)**
Authors: Maria da Glória Gonçalves da Silva-Cunha, Manoel de Jesus Flores Montes & Marilene Felipe Santiago

SPATIAL AND TEMPORAL DISTRIBUTION OF THE MICROPHYTOPLANKTON AT THE CAPIBARIBE RIVER ESTUARY (RECIFE, PERNAMBUCO, BRAZIL)

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ABSTRACT
The phytoplankton was studied to assess the environmental quality of the Capibaribe river estuarine area, Recife City, Pernambuco.
Plankton samples were weekly collected with a 65 micrometers mesh size plankton net in three fixed stations, during the dry season (October, November and December 2006) at the low and high tides.
A total of 67 *taxa* were identified outranking Bacillariophyta (22 species), followed by Cyanophyta (20 species), Chlorophyta (20 species) and Euglenophyta (5 species). The most abundant and frequent species were the diatoms *Thalassiosira* sp., *Cyclotella striata*, *Cylindrotheca closterium*, the bluegreen *Oscillatoria* sp. and the green algae *Scenedesmus dismorphus* and *Pediastrum duplex*. The ecological distribution showed the predominance of freshwater planktonic (55.56%), tychoplanktonic (19.44%, of which 11.11% freshwater and 8.33% marine), exclusively estuarine (16,67%) and neritic marine planktonic (8.33%). Species diversity varied from 1.68 to 2.51 bits.cells.L^{-1} showing a low diversity. Smallest values were due to the dominance of *Thalasssiosira* sp. and *Cyclotella striata*.
Freshwater species were highly representative showing the strong influence of the limnetic flux. The lower number of marine eurihaline species, however still representative, show their resistance to salinity variations.

Keywords: Eurihaline species, phytoplankton, Capibaribe river estuarine.

2007 BDUA – Journal of Biology, 2: 169. T0427Marilene30012007
Title: **Water quality in a tropical hiperhaline ecosystem (Pisa Sal river, Galinhos, Rio Grande do Norte, Brazil)**
Authors: Marilene Felipe Santiago, Maria da Glória Gonçalves da Silva-Cunha, José Zanon de Oliveira Passavante & Anderson Araújo Nunes

WATER QUALITY IN A TROPICAL HIPERHALINE ECOSYSTEM (PISA SAL RIVER, GALINHOS, RIO GRANDE DO NORTE, BRAZIL)

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ABSTRACT
The Northeast coast of Rio Grande do Norte State are under anthropic stress (mainly oil exploration, salt production and marine shrimp culture expansion etc). The present study was conducted in the Pisa Sal River estuary, which belongs to Galinhos-Guamaré ecosystem, and provides the main water supply and drainage to the Camarus shrimp culture farm. The present research was carried out to assess the influence of these activities on phytoplankton composition and biomass along with the abiotic parameters as environmental quality indicators.
Sampling of plankton and hydrology were made in three fixed stations during the dry (September, November/02, January, May, July/03) and rainy (March/03) seasons, at the diurnal low and high tides, in spring tide. The microphytoplankton was collected with a net 38 micrometers of mesh size.
It was identified 210 phytoplankton *taxa*, outranking the diatoms *Thalassiosira subtilis*, *Thalassionema nitzschioides*, *Asterionellopsis glacialis* and *Chaetoceros danicus* followed by dinoflagellates, blue-greens algae, and Euglenophyceae. The flora was composed by true marine planktonic species (neritic and oceanic) and tycoplanktonics, showing the direct influence of the coastal marine water. Some freshwater species were also registered due the rivers influence. Species diversity and evenness were high showing a balanced community.
The analyzed results show that the Pisa Sal River estuary is hyperhaline, with a strong marine influence. Although the dissolved oxygen is high the environment is eutrophic, towards a hypereuthrophic tendency condition during the rainy season, presenting already a poor condition.

Keywords: Pisa Sal river estuary, hyperhaline, phytoplankton, taxonomy, biomass, eutrophic.

2007 BDUA – Journal of Biology, 2: 170. T0428LeilaRonqui30012007
Title: **Spatial and Temporal distribution of Protozooplankton, Bacterioplankton and *Peridinium* sp. on Antas Reservoir: Radioecological effects of the nuclear Installation**
Authors: Leilane B. Ronqui, Heliana A. Gomes, Mirna H. R. Seleghim & Marcos Roberto L. Nascimento

SPATIAL AND TEMPORAL DISTRIBUTION OF PROTOZOOPLANKTON, BACTERIOPLANKTON AND *Peridinium* sp. ON ANTAS RESERVOIR: RADIOECOLOGICAL EFFECTS OF THE NUCLEAR INSTALLATION

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ABSTRACT
This study was conducted in order to survey the possible environmental impact caused for the Nuclear Installation on Antas Reservoir (AR) on points: Cab, P41 and P14S, through the characterization of protozooplankton, bacterioplankton and *Peridinium* sp..
Sampling campaign was performed every month during 10 months, where chemical and biological variables were evaluated.
According to the Saprobity index obtained on the AR: 2.5, this reservoir has a classification of Class III for quality of water. The smaller value obtained for the *Peridinium* sp. biomass was on P41-AR point = 41.70 $\mu g.L^{-1}$ followed by Cab-AR = 58.80 $\mu g.L^{-1}$ and P14S-RA = 104.22 $\mu g.L^{-1}$. The values for the bacteria were: P41-AR = 0.38 $\mu g\ L^{-1}$, Cab-AR = 0.41 $\mu g.L^{-1}$ and P14S-AR = 0.51 $\mu g.L^{-1}$. Protozoans: P41-AR = 6.06 $\mu g\ L^{-1}$, P14S-AR =151.39 $\mu g.L^{-1}$ and Cab-AR = 12,329.74 $\mu g\ L^{-1}$. The P41 point always showed the smallest amount of microorganisms biomass. This also applies to the value of the Diversity index, where the smallest value was detected on the P41-AR: H = 0.005, followed by Cab-AR H= 0.44 and P14S-AR H = 0.05.
The chemical analysis showed values above the Brazilian current legislation for fluoride (3.98 $mg.L^{-1}$) and manganese (2.63 $mg.L^{-1}$) on P41 point. The fluoride and manganese results agreed with the biological analysis, once, the P41 point showed the smallest diversity and biomass of the protozooplanktonic organisms, indicating a possible environmental impact in this ecosystem due to the discharge of effluent by this mining company.

Keywords: Protozooplankton, Antas Reservoir, Uranium Mine, Bacterioplankton, *Peridinium* sp..

2007 BDUA – Journal of Biology, 2: 171. T0429ClaraMenendez30012007
Title: **Cadmium and lead concentrations in mesozooplankton from Bahía Blanca estuary (Argentina)**
Authors: M.D. Fernández Severini, N. Chiarello, M.C. Menéndez, M.S. Hoffmeyer & J.E. Marcovecchio

CADMIUM AND LEAD CONCENTRATIONS IN MESOZOOPLANKTON FROM BAHÍA BLANCA ESTUARY (ARGENTINA)

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ABSTRACT
Heavy metals (Cd, Pb) were analyzed in mesozooplankton and suspended particulate matter from the Bahía Blanca Estuary, a coastal environment in Argentina, which receives important urban and industrial discharges.
Sampling was carried out in five stations of the inner zone of the estuary. Plankton was sampled with a Nansen net (200 µm) and suspended particulate matter (SPM) with a Van Dorn bottle. Physicochemical variables were measured *in situ* with a multisensor HORIBA U-10 and some of them in the laboratory. It was also carried out a qualitative and quantitative analysis in order to characterize zooplankton samples. Metal concentrations were determined by atomic absorption espectrophotometry with an air/acetylene flame.
Cadmium concentrations in zooplankton, along the sampling stations, ranged between 1.94 $\mu g.g^{-1}$ and 3.98 $\mu g.g^{-1}$ dry weight while in SPM between 0.58 $\mu g.g^{-1}$ and 1.49 $\mu g.g^{-1}$ d. w. Lead concentrations in zooplankton were between 46.58 $\mu g.g^{-1}$ and 73.47 $\mu g.g^{-1}$ while in SPM 24.83 µg/g and 146.19 µg/g. Zooplankton were mainly represented by the copepods *Eurytemora americana* and *Acartia tonsa* and larvae of *Balanus glandula*.
Environmental variables were in agreement with historical data for the study area. In general, Cd concentrations in zooplankton were in the same range of those from other similar areas of the world, while Pb in the present study showed largely exceeded values. Possible explanations may be related to differences in the species considered, the uptake mechanism, accumulation strategies and metal bioavailability. Finally, though several factors determine metal content in zooplankton, enhanced Pb levels found would imply anthropogenic contamination.

Keywords: Heavy metals, mesozooplankton, estuary.

2007 BDUA – Journal of Biology, 2: 172. T0430LuizFernandes30012007
Title: **Copepod composition and diversity in an estuarine system under the influence of a pulp mill effluent in Northeast Brazil**
Authors: Luiz Loureiro Fernandes & Juliano Bicalho Pereira

COPEPOD COMPOSITION AND DIVERSITY IN AN ESTUARINE SYSTEM UNDER THE INFLUENCE OF A PULP MILL EFFLUENT IN NORTHEAST BRAZIL

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ABSTRACT
Copepod composition and diversity were studied in an estuarine system in the south region of the Bahia State, Northeast Brazil, during the year 2005. This system is influenced by a pulp mill effluent located upstream at the Mucuri River, which flows into the estuary.
Samples were collected using two distinct plankton nets: for the river stations it was used a conical plankton net with a 30 centimeters mouth diameter and 60 microns mesh size, and for the estuarine stations a conical plankton net with a 60 centimeters mouth diameter and 200 microns mesh size, both fitted with a mechanical flowmeter. At the estuary, a tidal variation was studied. Samples were preserved in a buffered 5% formaldehyde solution.
Thirty species and three genera, among the orders Calanoida, Cyclopoida, Poecilostomatoida, Harpacticoida and Monstrilloida were identified. *Parvocalanus crassirostris* was the most abundant specie followed by *Oithona hebes*. Other dominant copepod species were *Corycaeus giesbrechti*, *Acartia lilljeborgi*, *Euterpina acutifrons* and *Temora turbinata*. Spring was dominated by freshwater species, and summer, fall and winter by coastal and estuarine species. Copepod diversity varied significantly in both river and estuary stations. At the river stations, Shannon diversity indexes varied from 0.69 bits individual in the summer to 2.19 bits individual in the winter. Estuarine stations had indexes ranging from 0.35 bits individual in the fall to 2.49 bits individual in the spring, both in the neap tide.
Tidal cycle influenced the copepod community being the neap tides with the lowest amount of organisms throughout the year.

Keywords: Copepod, diversity, composition, estuary, pulp mill effluent, northeast Brazil.

2007 BDUA – Journal of Biology, 2: 173. T0431SergioSonoda30012007
Title: **Seasonal and spatial differences of the Cladocera and Copepoda assemblage in temporary rivers, Brazil**
Authors: Nadson Ressyé Simões da Silva, Sérgio Luiz Sonoda & Sylvia Maria Moreira Susini Ribeiro

SEASONAL AND SPATIAL DIFFERENCES OF THE CLADOCERA AND COPEPODA ASSEMBLAGE IN TEMPORARY RIVERS, BRAZIL

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ABSTRACT
The Jequiezinho River Hydrographic Basin (JRHB) is formed by intermittent rivers and is located in Brazilian semiarid (13º40' – 13º50´S and 40º17' – 41º06' W). Intermittent rivers are environments that present a dynamic hydrologic, with a period of water flow and successive drought, which leads to extreme environmental variation. The aim of this work was to examine spatial and seasonal variation on Cladocera and Copepoda assemblages from September/2002 to August/2003.
The sampling was carried out monthly in three sites located at the upper region and three sites at the lower part of the JRHB. Microcrustaceans were collected with plankton net (70 µm) and preserved in formaline 4%. A two-way ANOVA was carried out for data treatment.
A total of 29 *taxa* were recorded: 9 Cladocera, 3 Copepoda Calanoida and 17 Copepoda Cyclopoida. Microcrustaceans assemblages showed more spatial differences than temporal ones. Only nauplii density showed significant differences between the dry and rainy seasons, with higher density in the rainy season. Species richness, nauplii, Cladocera and Cyclopoida densities showed differences ($p < 0.05$) between upper and lower regions of the hydrographic basin, with higher values at the upper sites.
These results suggest better conditions for Cladocera and Copepoda assemblages upstream of JRHB, once the sections downstream are more impacted by fluvial discharge in the rainy season and have an intense anthropogenic activity.

Keywords: Cladocera; Copepoda; Intermittent river; semiarid; microcrustaceans; Tropical Brazil

Acknowledge: State University of the Southwest Bahia, State University of Santa Cruz and CAPES.

2007 BDUA – Journal of Biology, 2: 174. T0432DilmaVieira30012007
Title: **Macrozooplankton of Tamandaré reef area, Pernambuco, Brazil**
Authors: Dilma Aguiar do Nascimento Vieira, Sigrid Neumann-Leitão, Ralf Schwamborn, Fernando de Figueiredo Porto Neto & Andréa Pinto Silva

MACROZOOPLANKTON OF TAMANDARÉ REEF AREA, PERNAMBUCO, BRAZIL

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ABSTRACT
Zooplankton studies were carried out at Tamandaré reef area to: (1) assess the biodiversity, (2) determine the numerical abundance before and after the Environmental Protection Area.
At first stage three stations were sampled from June/89 to May/90 at low and high tides. At second stage, sampling was carried out in one fixed station in January/1998 and July/1998, in a 24 hours cycle, each 3 hours. Co-current abiotic data were collected. Plankton samples were obtained by horizontal surface hauls with plankton net 300 micrometers of mesh size. Plankton biomass increased around nine times from 1989 to 1998.
It was identified 46 zooplankton *taxa*. Holoplankton dominated with 61% and 62% at stages 1 and 2, respectively. Copepoda was the most diverse and abundant outranking in both stages *Acartia lilljeborgi* and *Parvocalanus crassirostris.* A zooplankton pattern was observed at first stage, with higher densities at summer months. A zooplankton pattern was also observed at stage 2 with densities varying according to the tides, with higher quantities at high tide. Species diversity had scores from 2 to 3 bits ind^{-1}, low to a reef area. Samples association presented different groups influenced by tides and rainfall. Principal Component analysis presented at first stage a group of reef area indicators. At second stage the main role was played by estuarine indicators. This is a consequence of intense tourism, mangrove destruction and a higher influx of organic pollution.

Key words: Zooplankton, impacts, estuarine plume, coastal reefs.

2007 BDUA – Journal of Biology, 2: 175. T0433JoaoAmaral30012007
Title: **Phytoplankton Response to Human Impacts in seven rivers in the middle Rio Doce basin, Southeast Brazil**
Authors: João Henrique Fernandes Amaral, Cristiane Freitas de Azevedo Barros & Francisco Antônio Rodrigues Barbosa

PHYTOPLANKTON RESPONSE TO HUMAN IMPACTS IN SEVEN RIVERS IN THE MIDDLE RIO DOCE BASIN, SOUTHEAST BRAZIL

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ABSTRACT
The Rio Doce basin, one of the most important basins of Minas Gerais State, has been suffering impact due to the urbanization and the populational growth. The impacts can modify aquatic biota, reducing the species' diversity and changing the trophic chains.
Human interference on the phytoplankton was evaluated through collected samples in seven rivers in February (rainy season) and August (dry season) 2005.
The 114 registered *taxa* were distributed in nine classes. Considering all samplings, Zygnematophyceae and Bacillariophyceae were the richest ones (32 and 30 *taxa*, respectively). This trend was repeated in most of the environments, except in the Ipanema river, which receives elevated sewage discharges, where Cyanobacteria was the main group. All the rivers presented higher richness in dry season, with the highest values recorded in Santa Bárbara (56 *taxa*), Ipanema (47) and Doce (40) rivers. Caraça, a poor nutrient river, located inside a natural reserve, showed only two species in rain and seven in dry seasons. All environments presented higher densities in dry season. In Peixe river, algal density maintained high values in both seasons (5000-6000 org.mL^{-1}) *Pseudanabaena* sp., (93%) and *Planktolyngbya* sp. (92%) predominated in the rainy and dry periods, respectively, indicating eutrophic conditions. The great contribution of Zygnematophyceae in Santa Bárbara, Severo and Doce rivers during the dry period indicated low human interference. Peixe and Ipanema rivers had seemed to be greatly impacted, being distinguished for the predominance of Cyanobacteria in both seasons.

Keywords: phytoplankton, Human impacts, Cyanobacteria.

2007 BDUA – Journal of Biology, 2: 176. T0434ValdemiFerreira30012007
Title: **Microalgae community from the rivers Granjeiro and Batateiras (Crato – Ceará)**
Authors: Valdemi Marcelino Ferreira, Ubirajara Lima Fernandes, Elaine Cristina Conceição de Oliveira & Sírleis Rodrigues Lacerda

MICROALGAE COMMUNITY FROM THE RIVERS GRANJEIRO AND BATATEIRAS (CRATO-CEARÁ)

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ABSTRACT
The rivers Granjeiro and Batateiras located at Crato City, south of Ceará State (7º13'06,34'' S and 39º24'09,63'' W) have been degraded by several types of pollutants and all sewage (hospital, industries, domestic) are discharged without any previous treatment. In order to evaluate the water quality of these rivers studies were carried out on the microphytoplankton community.
Monthly collections were made filtering 50 L of water through a PVC tube with a net 45 µm mesh size.
It was identified the following *taxa*: Cyanophyta (*Oscillatoria* sp., *Arthrospira* sp., *Chroococcus* sp.), Euglenophyta (*Euglena* sp.), Bacillariophyta (*Synedra* sp., *Navicula* sp., *Surirella* sp.), Chlorophyta (*Scenedesmus* sp., *Closterium* sp.). Species diversity was very low being the diatoms the most representative group.

Keywords: Phytoplankton, river, pollution.

2007 BDUA – Journal of Biology, 2: 177. T0435FernandoPorto30012007
Title: **Using Zooplankton to Identify Ecosystem Fragmentation at Tamandaré Reef Complex, Pernambuco – Brazil**
Authors: F. de F. Porto Neto, S. Neumann-Leitão, R.F. Beltrão, A.P. Losada & T.M.S.P. Barreto

USING ZOOPLANKTON TO IDENTIFY ECOSYSTEM FRAGMENTATION AT TAMANDARÉ REEF COMPLEX, PERNAMBUCO - BRAZIL

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ABSTRACT
Zooplankton was carried out at Tamandaré to elucidate the role of human impacts, environmental fragmentation, and to identify how impacts affect zooplankton.
Samples were collected at mangrove and reefs (64 µm mesh size plankton net towed at surface). At mangrove, samples were taken once-a-month during high and low tide (02/1998 to 01/1999). At reef area samples were taken in winter (07/2000) and summer (01/2001), representing 2 low- and 2 high-tide samples per station/season), and also one sample at the Maceió River mouth was taken. Hydrographic parameters were also measured.
During the rainy season salinity dropped to 0 at mangrove, from the previous 35 PSU (dry season). At reefs salinity was constant (34 PSU). Temperature varies from 24 to 29°C in both areas. Oxygen readings ranged between 5.73 (reefs) to 0.42 $mgO_2.L^{-1}$ (mangrove). Highest zooplankton densities were recorded during the summer at mangrove and reefs. The rainy season was not favourable for zooplankton production in the mangrove. Copepoda and nauplii were dominants: 80% at mangrove, 70% at reefs. *Oithona hebes*, *O. nana*, and *Parvocalanus crassirostris* were the dominant and abundant *taxa*. Taxonomic abundance and spatial distribution were analysed in both areas and ecological subsystems were delimited and explicated. Bioindicators of anthropic impacts (Rotifera and Nematoda) were very found at reef area (higher nutrients concentrations), being an indication of organic pollution source (Maceió river). It suggests that the reef area in front of urban sector is impacted and the lateral area forms a fragment of the original reef ecosystem.

Keywords: Zooplankton, Bioindicatos, Tamandaré reef complex, Ecological Fragmentation, Environmental Impacts.

2007 BDUA – Journal of Biology, 2: 178. T0436FernandoPorto30012007
Title: **Zooplankton as Environmental Indicator at Rio Formoso estuary, Pernambuco, Brazil**
Authors: H.A.S. Araújo, F. de F. Porto Neto, S. Neumann-Leitão, C.T. Adloff & G.C. Oliveira

ZOOPLANKTON AS ENVIRONMENTAL INDICATOR AT RIO FORMOSO ESTUARY, PERNAMBUCO, BRAZIL

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ABSTRACT

In order to evaluate environmental condition at the rio Formoso estuary, Pernambuco State - Brazil, zooplankton studies were used.
The samples were taken in two stations, at diurnal- low and high tides (September 24, 2000). Also, an environmental check-list was applied in order to evaluate the human influences and environmental impacts of the area, identifying impact sources. The samples were obtained using two plankton nets (65 and 300 micrometers of mesh size) horizontally hauled during 3 minutes at surface. Each sample was preserved using 4% formoldehyde. In laboratory zooplankton qualitative and quantitative analysis were done. Hydrological data were also collected for this research.
At the Formoso river estuary predominated the marine eurihaline zooplankton community. Zooplankton was represented by 35 *taxa*, outranking Copepoda (13 species, e.g. *Oithona hebes*, *Oithona oswaldocruzi, Parvocalanus crassirostris*, and *Euterpina acutifrons*), Protozoa (6 species) and Rotifera (6 species). Rotifera, Polychaeta larvae occurrence indicates organic pollution in the area. Rotifera were abundant in the samples. Organic pollution was classified as an extreme impact in the check-list matrix, besides litter deposition and predatory fisheries. Meroplankton was mainly represented by Gastropoda larvae. Benthic Foraminiferida (*Spirillina* sp.) shows local turbulence and low depth by sedimentation. Total density varied from 53 ind.m^{-3} to 54.174 ind.m^{-3} (due *Tintinnopsis tocantinensis* bloom).
The registered impacts river estuary are usually also cited to Pernambuco due urban expansion, as result of social and economical problems. This work shows that the zooplankton community is an excellent indicator of environmental condition, mainly for eutrofication.

Keywords: Zooplankton, bioindicatos, rio Formoso, estuary, environmental impacts.

2007 BDUA – Journal of Biology, 2: 179. T0437ElaineOliveira30012007
Title: **Phytoplankton community of the dam Thomaz Osterne de Alencar – Crato, Ceará, Brazil**
Authors: Elaine Cristina Conceição de Oliveira, Ubirajara Lima Fernandes, Valdemi Marcelino Ferreira & Sírleis Rodrigues Lacerda

PHYTOPLANKTONIC COMMUNITY OF THE DAM THOMAZ OSTERNE DE ALENCAR – CRATO, CEARA, BRAZIL

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ABSTRACT
The Dam Thomaz Osterne de Alencar, located in Crato (7º 6' 43'' S and 39º 31' 33'' W), South of Ceará has been under many impacts such as deforestation, advanced process of erosion, domestic sewage discharge and agro toxics, reducing its sustainable use. To evaluate the water quality the phytoplanktonic community was monthly studied.
Samples were collected at surface from April to September/2006, with a plankton net (45 µm mesh size) and with a PVC tube (64 mm), where 50 L were filtered.
It was identified a total of 41 *taxa*, distributed in the divisions: Chlorophyta (42%), Cyanophyta (37%), Bacillariophyta (17%), Euglenophyta and Dinophyta (2%). Chlorophyta division outranked being *Staurastrum* sp. the most abundant. The dinoflagellate *Protoperidinium* sp. was also representative.

Keywords: Phytoplankton, Dam, Environmental Impact.

2007 BDUA – Journal of Biology, 2: 180. T0438JulianoBicalho30012007
Title: **Survey of the microzooplankton volumes from the Bertioga channel, São Paulo, Brazil**
Authors: Luz Amelia Vega-Pérez, Juliano Bicalho Pereira & Katya P. Schinke

SURVEY OF THE MICROZOOPLANKTON VOLUMES SURVEY FROM THE BERTIOGA CHANNEL, SÃO PAULO, BRAZIL

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ABSTRACT
The volume of microzooplankton from six fixed stations distributed along the Bertioga Channel longitudinal axis were estimated (Lat. 23° 50' to 23° 56'S - Long. 46° 79' to 46° 19'W). Samples were taken using a zooplankton net (140 μm mesh size) with flowmeter, at 4m to 18m depth during the day period, from November 2004 to October 2005. Temperature and salinity were determined with CTD system.
During the study, the water temperature ranged from 20.9°C to 26.7°C (March) and the salinity from 29.0 to 34.6. The volume of zooplankton decreased towards the inner region of the Channel. In the outer station (St 1), the zooplankton volume varied from 36.8 $mL.m^{-3}$ (January) to 24.6 $mL.m^{-3}$ (March). In contrast, the volume was lower in the middle stations, varying between 2.1 $mL.m^{-3}$ (December) and 7.4 $mL.m^{-3}$ (January) in the St.3, while in the St.4 the volume ranged from 1.0 $mL.m^{-3}$ (December) to 10.7 $mL.m^{-3}$ (Marsh). The volume increased in both inner stations especially in November: 12.6 $mL.m^{-3}$ (St.5) and 19.6 $mL.m^{-3}$ (St.6). However, the lowest volume was registered in the St.6 in December (2.1 $mL.m^{-3}$).
In this study, the zooplankton volume was usually far larger in the outer region, where the composition and distribution of zooplankton was much influenced by salinity and tidal current.

Keywords: Zooplakton, Bertioga Channel, São Paulo, Brazil.

2007 BDUA – Journal of Biology, 2: 181. T0439EnioDantas30012007
Title: **Phytoplanktonic Dynamic in a hydrological cycle in Pedra Hydroelectric Plant, Brazilian Northeast**
Authors: Ariadne do Nascimento Moura, Helton Soriano Bezerra de Oliveira, Emanuel Cardoso do Nascimento, William Severi, Rejane Pimentel & Ênio Wocyli Dantas

PHYTOPLANKTONIC DYNAMIC IN A HYDROLOGICAL CYCLE IN PEDRA HYDROELECTRIC PLANT, BRAZILIAN NORTHEAST

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ABSTRACT
The present study aimed a floristic and quantitative survey of phytoplanktonic species occurring in Pedra Hydroelectric Plant, Bahia State, in Brazilian Northeast.
The samplings were carried out on three month intervals from November 2005 to August 2006 in 13 stations. The material was collected through vertical dragging integrated along the euphotic zone using a net cylindrical-conical, with mesh of 40 µm and preserved with 4 % formalin. The identification of phytoplanktonic community was made through specialized bibliography. The density was determined through the method of sedimentation and counted in an inverted microscope.
The phytoplanktonic flora presented 86 infrageneric *taxa*, especially by Chlorophyta, Bacillariophyta and Cyanophyta. The density varied from 19 org.L^{-1} in the station 6 in May 2006 to 119614 org.L^{-1} in the station 2 in August 2006. The Chlorophyta dominated early in rainy period, being substituted by Cyanophyta and Bacillariophyta in period without rain. The greater observed densities were consisted by cyanobacteria, and it took place in the end of rainy period. The most quantitative and representative species were *Microcystis wesenbergii, M. aeruginosa, Geitlerinema unigranulatum, Aulacoseira granulata* and *Coelastrum reticulatum*.
The occurrence of these species were related to light and mixed factors linked to the algal succession in this reservoir. The index of specific diversity varied from very low to high. The lowest diversities took place in the end of rainy period, where greatest densities were registered and more than 99 % of the phytoplanktonic community was consisted by *Microcystis wesenbergii*.

Keywords: Algal dynamic, *Microcystis wesenbergii*, *Aulacoseira granulata*, *Coelastrum reticulatum*, Brazilian Northeast.

2007 BDUA – Journal of Biology, 2: 182. T0440ChristianaGrego30012007
Title: **Hydric analysis of Timbó river estuary (Pernambuco, Brazil) based on the microphytoplankton structure and hydrologic variables**
Authors: Christiana Kelly da Silva Grego, Maria da Glória Gonçalves Silva-Cunha, Fernando Antônio do Nascimento Feitosa & Marcos Honorato da Silva

HYDRIC ANALYSIS OF TIMBÓ RIVER ESTUARY (PERNAMBUCO, BRAZIL) BASE ON THE MICROPHYTOPLANKTON STRUCTURE AND HYDROLOGIC VARIABLES

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ABSTRACT
The estuarine area of the Timbó River is one most impacted due to anthropic actions. Thus a comparative study with past data was carried out to assess the water quality.
Collections were carried out in three stations in the dry (October to December 2002) and rainy (May to July 2003) seasons. It was collected samples for hydrology data (local depth, transparence, temperature, salinity, dissolved oxygen, pH, suspended material and nutrients) and microphytoplankton through horizontal surface hauls with a plankton net (64 μm).
The dissolved oxygen varied from saturated to semi-polluted zone. The salinity from mesohaline to euhaline regime and an alkaline pH. The nutrients were high due organic sewage. It was identified 146 phytoplankton *taxa* and the diatoms attained 68.71% of the community, the cyanobacteria (10.20%), euglenophyiceans (9.53%), chlorophyceans (6.12%), dinoflagellates (4.76%) and the crisophyceans and criptophyceans (0.68%). The most frequent and abundant were: *Coscinodiscus centralis, Gyrosigma balticum, Chaetoceros teres, Surirella febigerii* and *Thalassiosira* sp.. The density varied from 0.15 cells.L^{-1} in the criptophyceas group to 3.014,79 to diatoms, outranking *Thalassiosira* sp. (1,637.75 cell. L^{-1}). Species diversity varied from low to high according to the dominance of *Thalassiosira* sp_2, an opportunistic species with high reproduction tax.
Comparing the present data with those from 18 years ago it was registered higher nutrient concentration, mainly nitrite, indicating a high load of organic matter, semi-polluted zone in relation to oxygen, and a higher number phytoplankton species organic matter indicator as cyanobacteria and euglenophyceans.

Keywords: Microphytoplankton, impacts, hydrology, river Timbó.

2007 BDUA – Journal of Biology, 2: 183. T0441SamaraCampelo30012007
Title: **Zooplankton population dynamics in Bragantine coastal plain (Northeastern Pará, Brazil)**
Authors: Samara Cristina Campelo Pinheiro, Luci Cajueiro Carneiro Pereira, Priscila Amorim Carmona, Natália da Rocha Leite & Rauquírio Marinho da Costa

ZOOPLANKTON POPULATION DYNAMICS IN BRAGANTINE COASTAL PLAIN (NORTHEASTERN PARÁ, BRAZIL)

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ABSTRACT
In the scientific literature little information is available about the zooplankton community of the coastal Amazon environments. This study was carried out to determine the zooplankton structure and the dynamics of three different beaches of Bragantine Coastal Plain for a one-year period, from October/2002 to September/2003.
Samplings were collected during the ebb and flood tides using a plankton net with mesh size of 120 μm. Water transparency and temperature were measured *in situ* with a Secchi disc and a portable thermometer, respectively. Salinity (refractometer) and pH (digital pH meter) of surface water were also determined.
Water transparency varied from 0.09 m in March/2003 (rainy period) to 0.4 m in December/2002 (dry period). The lowest temperature values were registered in January/2003 (beginning of the rainy season). Holoplanktonic *taxa* were most frequent being mainly represented by copepods, which dominated the zooplankton community along the studied period. The highest total densities were observed at Ajuruteua Beach (440,056.00 org.m^{-3}) during the ebb tide, mainly in the equinoctial spring tide (September/2003). The lowest densities (3,848 org.m^{-3}) were registered at Farol Beach in July/2003.The lowest (1,42 bits.ind^{-1}) and highest (3,8 bits.ind^{-1}) diversity indexes were registered at Ajuruteua (rainy period) and Farol Beach (dry period), respectively.

Keywords: Zooplankton, send beaches, Amazon littoral.

2007 BDUA – Journal of Biology, 2: 184. T0442WanessaSousa30012007
Title: **The zooplankton assemblage's response to variations in the water quality of four man-made lakes in the semi-arid Northeastern Brazil**
Authors: Wanessa de Sousa, Elinez da Silva Rocha, José Luiz de Attayde & Eneida Maria Eskinazi Sant´Anna

THE ZOOPLANKTON RESPONSE ASSEMBLAGES TO VARIATIONS IN THE WATER QUALITY OF FOUR MAN-MADE LAKES IN THE SEMI-ARID NORTHEASTERN BRAZIL

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ABSTRACT
The zooplankton response assemblages to variations in the water quality of four man-made lakes, caused by eutrophication and siltation, was investigated by means of canonical correspondence analysis (CCA).
The CCA revealed that changes in zooplankton species composition along the environmental gradients of trophic state and abiogenic turbidity were highly significant. The species *Brachionus calyciflorus*, *Thermocyclops* sp. and *Argyrodiaptomus* sp. were good indicators of eutrophic conditions while the species *B. dolabratus*, *Keratella tropica* and *Hexarthra* sp. were good indicators of high turbidity due to suspended sediments. The rotifer genus *Brachionus* was the most species-rich *taxon*, comprising five species which were associated with different environmental conditions. Therefore, it was tested whether this genus alone could potentially be a better biological indicator of these environmental gradients than the entire zooplankton assemblages or any other random set of five species. The ordination results show that the five *Brachionus* species alone did not explain better the observed pattern of environmental variation than most random sets of five species. Therefore, this genus could not be selected as a target *taxon* for more intensive environmental monitoring as has been previously suggested.
Overall, the obtained results showed that changes in the water quality of man-made lakes in a tropical semi-arid region have significant effects on the structure of zooplankton assemblages that can potentially affect the functioning of these ecosystems.

Keywords: zooplankton assemblages, eutrophication, siltation, canonical correspondence analysis.

2007 BDUA – Journal of Biology, 2: 185. T0443LudmilaCosta30012007
Title: **Preliminary data of mesozooplankton diversity under influence of carciniculture at the Camarupim river's estuary/Parnaíba – PI, 2007**
Authors: L.C.F. Pereira, D.F. Pereira, Arzabe, C. & J.C. Brunini

PRELIMINARY DATA MESOZOOPLANKTONIC DIVERSITY UNDER INFLUENCY OF CARCINICULTURE AT THE CAMURUPIM RIVER´S ESTUARY, PARNAÍBA - PI, 2007

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ABSTRACT
This study is part of an integrated project realized in an estuary at the municipality of Luís Corrêia/Parnaíba-PI (02.53º 17.9' S; 41.41º 28.1' W), where the abundance and diversity of the mesozooplanktonic community was analyzed, seeking the evaluation of its functionality as a bioindicator for environmental impacts resulting from carcinicultura.
To this, collects were made in the period of January/06 to November/06 at CAMAPI Farm and Camurupim river's estuary. The collect stations are located at the drainage and bombardment points at the Camurupim estuary and the supplying and draining floodgates of a fishpond randomly chosen at the study farm. The samples of mesozooplankton were collected filtering 20 L of the river's water (collected with a bucket) in plankton net with mesh of 120 µm and fixed with formalin 4%, neutralized with sodium tetraborat. In laboratory the identification of the species was made with the help of a counting camera and stereoscope microscopy. It was made the accompanying of variables like the water transparency, pH, dissolved oxygen, temperature, salinity, chlorophyll *a* and nutrients.
In all the analyzed samples a small diversity of species was observed. The copepod was the most abundant community in all the analyzed samples. *Paracalanus Crassirostris* and *Oithona hebes* were the most significant species. During the collects the variables dissolved oxygen, pH, transparency, temperature and salinity presented, respectively, an average 9 $mg.L^{-1}$; 7.7; 0.6 m; 29 ºC and 34 ppt. The levels of nutrients were considered low and chlorophyll *a* varied of 0.3 to 33 $\mu g.L^{-1}$.

Keysword: Density, mesozooplankton, effluent, carcinicultura.

2007 BDUA – Journal of Biology, 2: 186. T0444MonicaErache01022007
Title: **Planktonic Copepods of an Impacted Bay in the Río de la Plata: Zonification Patterns**
Authors: Jorge Gabriela, R. Ferrero, W. Norbis & M. Gómez Erache

PLANKTONIC COPEPODS OF AN IMPACTED BAY IN THE RÍO DE LA PLATA: ZONIFICATION PATTERNS

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ABSTRACT
Copepods composition, distribution, and abundance at Montevideo Bay waters were studied to assess the impacts caused by industrial and anthropogenic sources on zooplankton community.
Sampling was done at six stations during the cold (July – September/1997) and warm (January – April/1998) seasons.
Copepods represented more than 80% of the overall mesozooplankton, but only eight species were recorded (range of species diversity H'_{cold} = 0.080 - 0.342; H'_{warm} = 0.599 - 1.241) with a dominance of *Acartia tonsa* around the study period. Temporal and spatial variations in the distribution of copepods and environmental variables were analyzed using PCA and Cluster Analysis revealing seasonal and spatial variations. Significant correlations of component loadings of copepods distributions across stations with water analysis data revealed statistically significant trends of seston, organic matter, chlorophyll and dissolved oxygen in relation to location and abundance of copepods community. During both periods, the first and second components (cold: 52% and warm: 90% of the total variance was explained) revealed two clear environment zones: one characterized by internal waters of the bay with low diversity of estuarine and freshwater species, and another zone characterized by the influence of outside Río de la Plata waters, with the dominance of true estuarine species. The most remarkable changes in the copepods community were associated to environmental changes caused by El Niño event in 1997/98.
The results indicated that hydrology was the primary processes that controled the copepods taxocenosis, but also environmental conditions affected the diversity features and variations in zooplankton abundance.

Keywords: Copepods, species composition, seasonal and spatial Variation, Montevideo Bay.

2007 BDUA – Journal of Biology, 2: 187. T0445SofiaBrito07022007
Title: **Zooplankton Community as Trophic Indicator in Two Large Tropical Reservoirs (Furnas and Três Marias, Minas Gerais, Brazil)**
Authors: S.L. Brito, P.M. Maia-Barbosa & R.M. Pinto-Coelho

ZOOPLANKTON COMMUNITY AS TROPHIC INDICATOR IN TWO LARGE TROPICAL RESERVOIRS (FURNAS AND TRÊS MARIAS, MINAS GERAIS, BRAZIL)

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ABSTRACT
Furnas and Três Marias are two large reservoirs of Minas Gerais State built *c.* 40 years ago mainly for energy generation. In order to support a governmental initiative of building cage fish farming in reservoirs, a project has been conducted aiming to characterize physical, chemical and biological variables from selected areas of these reservoirs. Data presented referred to preliminary analysis of zooplankton community from samples taken in July 2006 (Três Marias) and in August 2006 (Furnas).
Temperature (°C), dissolved oxygen (mg.L^{-1}) and electric conductivity (µS.cm^{-1}) transects were done. Vertical rows (68 µm plankton net) were done at four depths. Sub-samples (1 mL) were counted in Sedgwick-Rafter chambers until 250 individuals from dominant species were reached.
Despite considered oligotrophic, these reservoirs present remarkable differences in the structure of zooplankton community. Três Marias showed higher total densities (21,356 to 34,100 org.m^{-3}) than Furnas (12,855 to 14,622 org.m^{-3}). Microzooplankton (nauplii and rotifers) predominance was observed on both reservoirs. Cladocera and Copepoda (copepodits and adults) varied from 10 and 14% in Três Marias to 17 and 33 % in Furnas. Futhermore, in Três Marias smaller microcrustacean's species (e.g. *Thermocyclops minutus, Bominopsis deitersi, Bosmina hagmanni* and *Ceriodaphnia cornuta*) predominated while in Furnas larger ones. *Notodiaptomus henseni*, *Daphnia ambigua*, *Moina minuta*, *Diaphanosoma spinulosum* and *C. silvestrii* were observed with higher densities.
The presence of larger species (e.g. Calanoida and Daphnidae) could be an indicator of phytoplankton control by grazing. Furthermore, the recorded aspects suggest better water quality in Furnas.

Keywords: Zooplankton community, trophic indicator, large tropical reservoirs.

2007 BDUA – Journal of Biology, 2: 188. T0446FMorgado09022007
Title: **Composition and trophic structure of zooplankton in a shallow tempa«erate estuary (Mondego estuary, Western Portugal)**
Authors: F. Morgado, C. Quintaneiro, M. Pastorinho, P. Bacelar-Nicolau, L. Vieira & U.M. Azeiteiro

COMPOSITION AND TROPHIC STRUCTURE OF ZOOPLANKTON IN A SHALLOW TEMPERATE ESTUARY (MONDEGO ESTUARY, WESTERN PORTUGAL)

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ABSTRACT
Zooplankton composition and trophic structure of the 335 μm taxocenosis were study in two different locations of the salinity and eutrophication gradients in the Mondego estuary south arm.
The two sampling stations displayed significant different patterns of temporal variation of the environmental variables. The total zooplankton density at each station showed significant spatial and temporal variability ($p < 0.001$). While, the number of *taxa* did not show significant differences between months and sites, the densities of the most abundant *taxa* differed significantly ($0.01 p < 0.001$) amongst months and stations in all cases. The zooplankton assemblages were dominated by omnivores, representing 43.9 % of the total zooplankton. Herbivores and carnivores represented, 4.4 % and 0.5 %, respectively, of the entire. Omnivores were significantly more abundant ($p< 0.05$) during autumn, winter and spring. It was observed important densities of omnivores in October, March and May, at station 2, and during January, March and April, at station 1. The herbivores were significantly more abundant ($0.05 < p < 0.01$) during autumn, late winter and spring and significantly more abundant ($0.05 < p < 0.01$) at station 1. Carnivores presented low densities during all year, being more abundant in summer and autumn.
Despite the detected similarities to other temperate estuaries, the results of this work may reflect the environmental stress in this ecosystem: spatial structure dominates over seasonal patterns; lower diversities and high numbers of resident populations. This kind of ecological pattern has been previously reported for other biological communities. The prevailing conditions in the Mondego estuary, namely eutrophication, should result in the development of opportunistic adaptive strategies among invertebrates.

Keywords: Zooplankton, Mondego estuary, eutrophication.

2007 BDUA – Journal of Biology, 2: 189. T0447AGoncalves13022007
Title: **The growth of four freshwater microalgae under different concentrations of phosphate and nitrate**
Authors: Ana M. M. Gonçalves, Daniela R. de Figueiredo, Mário J. Pereira, António Correia and Fernando Gonçalves

THE GROWTH OF FOUR FRESHWATER MICROALGAE UNDER DIFFERENT CONCENTRATIONS OF PHOSPHATE AND NITRATE

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ABSTRACT
Freshwater microalgae are considered good bio-indicators and used as test organisms in ecotoxicological testing procedures. The microalgal development is dependent on several factors such as nutrient availability, temperature and light intensity and each species may have different optimal values to grow. The aim of this study was to evaluate the effect of different nutritive conditions on the growth of four freshwater microalgae: *Chlorella vulgaris* Beijerinck, *Pseudokirchneriella subcapitata* (Korshikov) Hindak, *Pandorina morum* (Müller) Bory and *Coelastrum astroideum* De Notaris.
A set of different concentrations was tested for phosphate (from 0.00 to 8.71 $mgPO_4^{3-}.L^{-1}$) and nitrate (from 0.00 to 85.01 $mgNO_3^{-}.L^{-1}$).
The results obtained for *C. vulgaris* and *P. subcapitata* showed a significant growth reduction (in relation to the saturated nutrient conditions in MBL media) at 1.09 $mgPO_4^{3-}.L^{-1}$ and 8.50 $mgNO_3^{-}.L^{-1}$. *P. morum* showed a significant growth inhibition at 4.36 $mgPO_4^{3-}.L^{-1}$ and 8.50 $mgNO_3^{-}.L^{-1}$. *C. astroideum* was significantly affected in its growth only under nitrate depletion (0.00 $mgNO_3^{-}.L^{-1}$), growing without a significant decrease at phosphate concentrations from 8.71 to 0.00 $mgPO_4^{3-}.L^{-1}$.
In this work the *C. astroideum* biomass determined through optical density proved to have highly significant correlations with the time-consuming procedures such as cell counting, determination of chlorophyll *a* concentration and dry weight.

Keywords: Algal growth tests, phosphate and nitrate concentrations, *Chlorella vulgaris*, *Pseudokirchneriella subcapitata*, *Pandorina morum*, *Coelastrum astroideum*.

2007 BDUA – Journal of Biology, 2: 190. T0448ACarolinaTaperoa14022007
Title: **Temporal aspects of limnological features and zooplankton community in the Taperoá II Dam (Paraíba State, Brazil)**
Authors: Ana Carolina Brito Vieira, Leonardo Leôncio Ribeiro, Darlan Patrício N. Santos & Maria Cristina Crispim

TEMPORAL ASPECTS OF LIMNOLOGICAL FEATURES AND ZOOPLANKTON COMMUNITY IN THE TAPEROÁ II DAM (PARAÍBA STATE, BRAZIL)

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ABSTRACT
The aquatic environments in Brazilian semi-arid regions are subject to several pressures because of the great water loss by evaporation (2000mm/year) and concentrated rains in a few months (usually three) in a year, which lead them to a complex scenario of fast changes in trophic degrees in a short period of time. This work aimed to describe some aspects of limnological variables and zooplankton community in Taperoá II Dam, a 15.048.900m³ reservoir in central Paraíba, Northeast Brazil, from January to December 2006.
Rainy season extended from February to June, but the main rainfalls occurred in March and April, when the highest values of total phosphorus (1.80 µM) and orthophosphate (0.30 mM) were registered due to runoff. Chlorophyll *a* showed highest values in January (0.03 mM), but lower ones came with the rainfalls, which reflected directly in dissolved oxygen concentrations and inversely in water transparency. Nitrate registered higher concentrations from the beginning of rainy season to the middle of dry season, and ammonia showed raising values from March to October, which had the highest one (9.70 µM). The Trophic State Index (TSI) revealed that the Taperoá II Dam was mainly oligotrophic, but it was mesotrophic in the beginning of rainy season and in December. Large filter feeding zooplankton, such as calanoid copepods and cladocerans, registered highest densities in January but declined due to the low algal food in the rainy season, while rotifers showed rising densities along the dry season. *Moina minuta* and *Ceriodaphnia cornuta* probably peaked in the first rainfalls more due to resting eggs hatching from the sediment than by direct population growth.

Keywords: Zooplankton, Environmental features, Caatinga.

2007 BDUA – Journal of Biology, 2: 191. T0449VanessaNascimento14022007
Title: **Calanoida (Copepoda) and water quality of reservoirs of Alto Tietê hydrographic basin, São Paulo, Brazil**
Authors: Vanessa Cristina Nascimento & Suzana Sendacz

CALANOIDA (COPEPODA) AND WATER QUALITY OF RESERVOIRS OF ALTO TIETÊ HYDROGRAPHIC BASIN, SÃO PAULO, BRAZIL

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ABSTRACT
Calanoid copepods are considered as a group extremely sensible to trophic conditions, related mainly to oligo-mesotrophic habitats, although some authors have been pointing out different degrees of tolerance among species. Reservoirs of the Alto Tietê hydrographic basin present different trophic conditions due to different anthropogenic impacts.
Along three decades it was analyzed the occurrence of calanoid copepods and its relation to the water quality of Billings and Guarapiranga reservoirs, and five reservoirs of a cascade system (Ponte Nova, Jundiaí, Taiaçupeba, Paraitinga and Biritiba).
Electric conductivities ranged between 32 (Ponte Nova) and 214 $\mu S.cm^{-1}$ (Billings Reservoir). It was observed that *Odontodiaptomus paulistanus* only occurred at the first reservoir of the cascade system, Ponte Nova, related to the low electric conductivity values (around 30 $\mu S.cm^{-1}$). *Argyrodiaptomus furcatus*, *Notodiaptomus iheringi*, and *Scolodiaptomus corderoi* were related to a gradient of increasing conductivities. *A. furcatus* was registered at Guarapiranga (in the 90's) when conductivities were between 52 and 95 $\mu S.cm^{-1}$, *N. iheringi*, at Guarapiranga Reservoir, when conductivities were between 52 and 127 $\mu S.cm^{-1}$ and *S. corderoi*, at Billings Reservoir, when conductivities were between 180 and 195 $\mu S.cm^{-1}$. In Paraitinga and Biritiba Reservoirs, which conductivities were 65 and 75 $\mu S.cm^{-1}$ respectively, it was observed the occurrence of *Notodiaptomus cearensis* and *Notodiaptomus* sp. (Paraitinga) and *Notodiaptomus iheringi* and *Notodiaptomus* sp. (Biritiba).

Keywords: Alto Tietê, reservoirs, calanoid copepods, water quality.

2007 BDUA – Journal of Biology, 2: 192. T0450SofiaErika15022007
Title: **Characterization of the zooplankton community of an artificial reservoir (Soledade Dam) in the Paraiba state, Brazil**
Authors: Sofia Erika Moreira Gomes, A.C.B. Vieira, L. Lima-Silva & M.C. Crispim

CHARACTERIZATION OF ZOOPLANKTON COMMUNITY OF AN ARTIFICIAL RESERVOIR (SOLEDADE DAM) IN THE PARAIBA STATE, BRAZIL

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ABSTRACT
Zooplankton organisms have a great sensibility to the environmental conditions, so they are good indicators of the trophic state in aquatic ecosystems also being an important link for the food chain. The goal of this study was to analyze the composition of the zooplankton community of the reservoir Soledade Dam, state of Paraiba, Brazil. This region has a semi-arid climate, with the raining season lasting for just three months.
Sample surveys were carried out from January 2002 to September 2006. Organisms were collected by filtering 40 L of water through a plankton net of 44 µm, and preserved in a 4% formalin solution. Individuals were counted using a Sedgwick-Rafter camera, and samples were analysed through density, diversity and equitability indexes.
Samples were constituted of Rotifera (26 species), Cladocera (4 species) and Copepoda (3 orders). Most abundant species of Rotifera were *Brachionus angularis*, *B. urceolaris* and *Keratella valga*. Those organisms were more frequent during the dry seasons. The main species of Cladocera were *Moina minuta*, *Diaphanosoma spinulosum* and *Ceriodaphnia cornuta*. Calanoida order was most represented by nauplii stages and *Notodiatomus cearenses*. Cyclopoid copepods were more abundant during the dry season, whereas Calanoids were observed all over the studied period. For Rotifera and Cladocera species, the highest values of the Shannon index (H') were observed in February 2002 for both groups. The highest value of equitability index for Rotifera was in February 2004 and for Cladocera in May 2003.

Keywords: Plankton, semi-arid, diversity.

2007 BDUA – Journal of Biology, 2: 193. T0451RaquelAssis15022007
Title: **Phytoplankton biomass and hydrology dynamics in the reef ecosystem of Porto de Galinhas, Pernambuco, Brazil**
Authors: Fernando Antonio do Nascimento Feitosa, Raquel Correia de Assis Machado, Rafaella Brasil Bastos & Rysoaurya Keyla Travassos

PHYTOPLANKTON BIOMASS AND HIDROLOGY DYNAMICS IN THE REEF ECOSYSTEM OF PORTO DE GALINHAS, PERNAMBUCO, BRAZIL

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ABSTRACT
The Porto de Galinhas beach has coral reef formations that form natural pools of extreme beauty, and consequentely, actually suffer an intense tourist activity, as one of the most visited beaches of Northeastern Brazil. The phytoplankton biomass and some hydrologic parameters were studied to assess the environmental quality of the area.
Water samples were collected in the water sub-surface, during three months of the dry and rainy seasons, in three fixed stations, during the diurnal low and high tides from the same day.
Temperature, water transparency, dissolved oxygen and its saturation level presented higher values during the dry season, while the suspended material, nitrite and pH presented higher values during the rainy season. In the Principal Components Analysis the dissolved oxygen presented direct correlation with the oxygen saturation level, temperature and water transparency; and inverse correlation with the suspended material, nitrite and rain. The phytoplankton biomass varied from 1.13 to 4.85 $mg.m^{-3}$ being high to a coral reef ecosystem. The obtained results showed that coral reef ecosystem is free of organic pollution and that the Maracaípe River influences the area during the rainy season.

Keywords: Coral reef ecosystem, phytoplankton biomass, hidrology.

2007 BDUA – Journal of Biology, 2: 194. T0452NunoMelo14022007

Title: **Environmental quality, mesozooplankton distribution and density on Vigia de Nazaré estuary's, Northeast Pará - Brazil**

Authors: Caio Aguiar Rodrigues Ramos, Nuno F.A. Correia de Melo, Fábio Ferreira Cardoso, Glauber David Almeida Palheta & Melissa do Socorro Fonseca da Silva

ENVIRONMENTAL QUALITY, MESOZOOPLANKTON DISTRIBUTION AND DENSITY ON VIGIA DE NAZARÉ ESTUARY'S NORTHEAST PARÁ STATE, BRAZIL

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ABSTRACT

The aim of the present study was to characterize Vigia's Estuary, his environmental quality and zooplankton dispersion.

Planktonic data were collected in four fixed stations placed between mouth and limit of the maximum extension for salt edge invasion, sampling were carried in an adapted regional boat. Samples were taken bimonthly from November/04 to November/05, collected during six campaigns and two nictemerals collections in March/05 (rainy period) and September/05 (dry period). Quality water data was measured through multiparameters data logger Hydrolab datasond - 4A. Studies of abundance, dominance and zooplankton diversity were carried through, being these parameters related to the quality water data.

The most diverse zooplanktonic group found in the analyzed samples was Copepoda, being distinguished *Pseudodiatomus richard, Pseudodiatomus marsh*, *Pseudodiatomus gracilis, Acartia plumosa, Acartia tonsa*, *Oithona gessneri*, *Notodiaptomus paraensi* e *Notodiaptomus amazonicus* having densities varying of 2.6 at 129.24 org.m^{-3}. The Crustacea larvae, mainly of Brachyura had also been distinguished, mainly March/05, where they had been very abundant, reaching 860.86 org.m^{-3}. Evidencing a period of bigger spawning for the Brachyura larvae. Beyond these, also occurred Cladocerans, Bivalve, Gastropod, Cirriped, Hydromedusa and Isopods larvae.

The species composition in the study area were similar, characterizing alternations of species dominance.

Keywords: Amazon, zooplankton, Copepoda.

2007 BDUA – Journal of Biology, 2: 195. T0453LuciaGusmao14022007
Title: **Copepoda community distribution of Pernambuco, Northeastern Brazil**
Authors: Lúcia Maria de Oliveira Gusmão, Sigrid Neumann Leitão & Ralf Schwamborn

COPEPODA COMMUNITY DISTRIBUTION OF PERNAMBUCO, NORTHEASTERN BRAZIL

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ABSTRACT
The Copepoda was studied along the gradient from neritic to oceanic waters of Pernambuco State to detect the major processes that control the community structure.
Samples were obtained on 34 stations, during the Brazilian-German bilateral JOPS II Project (leg 5) on board RV Victor Hensen, from 25/02 to 03/03/95. Stations were located along 7 profiles (orthogonal to the coastline) of Pernambuco State, between 7º 33'00" to 8º 41'00" S and 34º 03'00" to 35º 00'00" W. Sampling was performed through oblique hauls with a Bongo net (300 µm mesh size, net diameter: 60 cm), that was equipped with a flow meter.
A total of 93 species were identified being the most abundant *Undinula vulgaris*, *Clausocalanus furcatus* and *Nanocalanus minor*. Most stations showed total abundance values below 150 ind.m^{-3}. This can be considered extremely low, typical of oligotrophic areas. This result was corroborated by the biomass values, which were at < 50 mg.m^{-3} offshore and at about 63 mg.m^{-3} near shore. Both biomass values were extremely low. Species diversity was generally high (> 3 bits.ind.$^{-1}$), except at near shore stations (< 3 bits.ind.$^{-1}$), where values as low as 0.7 bits.ind^{-1} were found. Evenness was high, showing a complex and well-structured community. Terrigenous influence was very small at neritic and oceanic areas off Pernambuco State.
The processes at the continental shelf margin seem to be enhancing zooplankton productivity. However, more detailed hydrographic studies are necessary to confirm this pattern found for the zooplankton.

Keywords: Copepoda, neritic, oceanic, tropical, oligothrophic.

2007 BDUA – Journal of Biology, 2: 196. T0454LeandroFerreira15022007
Title: **Planktonics microalgae and environmental characterization in estuarine system of Mamucaba river, Tamandaré, Pernambuco, Brazil**
Authors: Michelle Rosevel da Silva, Maria da Glória Gonçalves da Silva-Cunha & Leandro Cabanez Ferreira

PLANKTONICS MICROALGAE AND ENVIRONMENTAL CHARACTERIZATION IN ESTUARINE SYSTEM OF MAMUCABA RIVER, TAMANDARÉ, PERNAMBUCO, BRAZIL

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ABSTRACT
The estuary of the Mamucaba River is very important to the city of Tamandaré, and to the region, because of its good water quality.
Phytoplankton samples and abiotic variables were collected in a fixed station, during low and high tides, in 1998 and 1999.
It was identified 119 infrageneric *taxa* belonging to Cyanophyta, Euglenophyta, Bacillariophyta, Dinophyta, and Chlorophyta. The most abundant were *Trichodesmium erythraeum* Ehrenberg ex Gomont, *Coscinodiscus centralis* Ehrenberg all planktonics marine *Bacillaria paxillifera* (Müller) Hendey, and *Terpsinoe musica* Ehrenberg, estuarine species. Taxonomic richness varied from 8 to 57 *taxa*. Phytoplankton density oscillated between 2,22 to 411,03 cel.L^{-1}. The maximum values of richness and phytoplanktonic density occurred during the rainy season when highest concentration of nitrite (NO_2^-) and nitrate (NO_3^-) were registered. During high tide the salinity, dissolved oxygen and phosphate (PO_4^{3-}) concentrations were highter than in the low tide. The specific diversity and evenness were raised with most of the values higher than 3,0 bits.cel^{-1} and 0,50, respectively, corroborating the excellent condition of the cited environment.

Keywords: Planktonic microalgae, environmental characterization, estuary, Mamucaba river.

2007 BDUA – Journal of Biology, 2: 197. T0455FabianoSerpe14022007
Title: **Zooplankton of an urban lake in Recife, Pernambuco State, Brazil – Preliminary list of species**
Author: Fabiano Ramiro Serpe

ZOOPLANKTON IN AN URBAN LAKE IN RECIFE, PERNAMBUCO STATE, BRAZIL- PRELIMINARY LIST OF SPECIES

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ABSTRACT

The zooplanktonic organisms are important in the aquatic ecosystems dynamics, especially in the cycle of nutrients and energy flow.
In each station, 30 liters were taken and after filtered in 64 µm plankton net.
The zooplanktonic community was represented to 34 *taxa*, 24 of rotifers, one cladocerans species (*Moina minuta*) and one order of copepods (Cyclopoida), and five *taxa* of other organisms as, Mollusca *larvae*, Chironomidae and Protozoans.
The Cavouco creek are eutrophic environment, due to domestic effluents throw in the water, many species are found in this kind of environment, for instance, *Brachionus angularis*, *Brachionus urceolaris, Brachionus calyciflorus, Anuraeopsis fissa* and *Trichocerca* sp.. Other species of rotifers was been found, such as: *Anuraeopsis coellata, Asplanchna sieboldi*, *Brachionus angularis bidens, B. angularis chelonis, B. calyciflorus, B. caudatus, B. caudatus caudatus, B. leydigii rotundus, B. quadridentatus ancylognatus, Epiphanes macrourus, Kellicotia* sp, *Lecane bulla, Lecane cornuta rotunda, Lecane luna, Platyias quadricornis, Polyarthra dolichoptera, Rotaria* sp.. Rotifer diversity was higher especially were aquatic macrophytes was found.

Keywords: Rotifers, eutrophic lake, aquatic macrophytes, Cavouco Creek, zooplankton diversity.

2007 BDUA – Journal of Biology, 2: 198. T0456ClarisseAdloff15022007
Title: **Microzooplankton community from Bacia do Pina estuarine complex, Recife, Pernambuco, Brazil**
Authors: Clarisse Teixeira Adloff & Sigrid Neumann Leitão

MICROZOOPLANKTON COMMUNITY FROM THE BACIA DO PINA ESTUARINE COMPLEX, RECIFE, PERNAMBUCO, BRAZIL

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ABSTRACT
Studies were carried out at the Pina Basin estuarine system to assess the environmental quality.
Samples were collected in a spring tide of October, 2006, during high and low tide. Four stations were sampled: station 1 was located in Recife´s harbor (8º4'55,4" S; 34º51'23,5"W), station 2 close to the Capibaribe river mouth (8º4'4,4" S; 34º52'23,3"W), station 3 close to Pina's bridge (8º4'58,4" S; 34º58'23,7"W) and station 4 in the confluence of the Capibaribe and Jordão rivers (8º5'21,4" S; 34º54'1,7"W). Samplings were carried out with a plankton net 64 µm mesh size, horizontally hauled at sub-surface during 5 minutes.
It was identified 56 *taxa* dominating the holoplankton (75 %), of which 17 Rotifera, 17 Copepoda and 9 Tintinnida species were registered. Among the meroplankton outranked Polychaeta, Echinodermata, Crustacea (Decapoda and Cirripedia) and Mollusca larvae. The presence in high numbers of *Brachionus angularis* and *Favella ehrenbergi* was indicative of organic pollution. However, the occurrence in high densities of *Brachionus plicatilis*, Copepoda nauplii and Bivalvia larvae showed the marine influence improving the environmental quality. Species diversity was low (<2.0 bits.ind^{-1}) characteristic of unbalanced system. The density varied from 76,110 ind.m^3 (Station 4, low tide) to 341,290 ind.m3 (Station 1, high tide). This high density was indicative of a euthrophic system.

Keywords: Estuarine zooplankton, Organic pollution, Environmental quality.

2007 BDUA – Journal of Biology, 2: 199. T0457ClarissaBarbosa15022007
Title: **Plankton community attributes of an oligotrophic lake of Central Brazil (Lagoa Bonita) during dry and wet seasons**
Authors: Clarissa Barbosa-Oliveira, Patrícia Pereira Gomes, June Springer de Freitas & Maria do Socorro Rodrigues

PLANKTON COMMUNITY ATTRIBUTES OF AN OLIGOTROPHIC LAKE OF CENTRAL BRAZIL (LAGOA BONITA) DURING DRY AND WET SEASONS

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ABSTRACT
Plankton, physical and chemical water characteristics of a shallow, oligotrophic lake located in a Protected Area of Distrito Federal were investigated during dry (September) and wet (February) seasons.
Three sampling stations, two in littoral zone (1 and 3) and one in pelagic zone (2) were chosen. Acidic (5.7 to 6.1) warm waters (23.5 to 26.5 ºC) with low electric conductivity (4.3 to 7.1 µS.cm^{-1}), chlorophyll *a* (0.26 – 2.90 µg.L^{-1}) and dissolved oxygen were found (5.6 to 7.10 mg.L^{-1}). Total phosphorus (6.46 x 10^{-5} to 5.81 x 10^{-4} mol.L^{-1}) had low values as well as total nitrogen (0.017 to 0.054 mol.L^{-1}). Zooplankton was composed by 32 *taxa* with the following composition and abundance, respectively: Rotifera (58%; 2%), Cladocera (33%; 5%), Copepoda Cyclopoida (6%; 10%) and Calanoida (3%; 83%). The littoral zone had higher zooplankton densities (Kruskall-Wallis, $p > 0.05$), 61.1 ± 38.5 ind.L^{-1} at point 3 and 46.5 ± 30.0 at point 1 ($n = 4$), than the pelagic one 33.2 ± 18.3 ($n = 4$). The Shannon-Wienner diversity indexes were low (maximum value of 1.43 bits.ind. at littoral zone in dry season) due to the dominance of *Trichodiaptomus coronatus*. Phytoplankton comprised 83 *taxa* (63% Zygnematophyceae, 13% Chlorophyceae, 13% Bacillariophyceae, 5% Cyanophyceae and others). Biovolume was higher in the dry season (9.9 ± 4.7 mm^3.mL^{-1}, $n = 6$, Wilcoxon, $p < 0.05$) and consisted mostly of Zygnematophyceae (99%).
Although the environment is under progressive human impact the lake continues oligotrophic.

Keywords: Planktonic communities, oligotrophic lake, Lagoa Bonita, Brazil.

2007 BDUA – Journal of Biology, 2: 200. T0458GuilhermeAlfenas15022007
Title: **Structure of the microbial community along a trophic gradient in urban stream**
Authors: Guilherme Alfenas, Alessandro Del'Duca & Dionéia César

MICROBIAL COMMUNITY STRUCTURE ALONG A TROPHIC GRADIENT IN URBAN STREAM

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ABSTRACT
Urban lotic environments are commonly the target of anthropic waste discharge, causing artificial eutrophication. The eutrophication influence in the structure of the microbial community was evaluated along a trophic gradient in a stream named São Pedro, in the city of Juiz de Fora, Minas Gerais state, Brazil.
Density of bacteria (DAPI), flagellates and ciliates (Utermöhl) and abiotic factors were determined in samples collected at five different spots monthly during one year.
The collected results of the biotic and abiotic data separate the sampling points into two distinct systems: low trophic and high trophic. The low trophic region showed less density of bacteria ($0.3 \pm 0.2 \times 10^9$ cels.L^{-1}), of flagellates ($0.3 \pm 0.3 \times 10^4$ ind.L^{-1}) and of ciliates ($0.2 \pm 0.2 \times 10^4$ ind.L^{-1}) compared with the high trophic region (bacteria – $0.9 \pm 0.4 \times 10^9$ cels.L^{-1}, flagellates – $1.3 \pm 0.8 \times 10^4$ ind.L^{-1}, ciliates – $1.5 \pm 1.0 \times 10^4$ ind.L^{-1}). A laboratorial experiment with water exchange of the two environments was carried out to evaluate the factors that control the density and composition of the microbial community (by FISH) during 72 hours. Samples of the low trophic region (30 mL) were transferred to water samples of the high trophic region previously filtered through GF/F filter (270 mL) and *vice versa*.
The experiment confirmed the impact of the eutrophication in the structure of the microbial community affecting the composition and also the density of the microorganisms.

Keywords: Bacterioplankton, eutrophication, stream.

2007 BDUA – Journal of Biology, 2: 201. T0459LidyaneLima15022007
Title: ***Daphnia similis* (Crustacea, Cladocera) as a test-organism in ecotoxicological water – analysis**
Authors: Lidyane Lima-Silva, S.M.E. Gomes & M.C. Crispim

Daphnia similis (CRUSTACEA, CLADOCERA) AS A TEST-ORGANISM ECOTOXICOLOGICAL WATER-ANALYSIS

Lidyane Lima-Silva, S.E.M. Gomes & M.C. Crispim

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ABSTRACT
The aquatic toxicology appeared out of the need of the development of more detailed analytical methods for the detection of toxic or potentially toxic agents naturally present in the environment or introduced by human action, even if in lower concentrations. The contamination of drinking water reserves occurs as a result of the disordered exploration of the environment by the human being. With the objective to sensitize and evidence the practicability of this method, consider to use this simple, cheap and efficient methodology for ecotoxicological analyses of aquatic environments, using the microcrustacean *Daphnia similis*, as a test-organism.
Therefore, acute and chronic tests were realized, to verify the effect of contaminated water on the survival and reproduction-tax of the test-organisms. Water of the "Sólon de Lucena"-Park lake has been used as test solution, collected at four different spots, previously determined according to the presence or absence of galleries of sewers.
The results of the acute as well as the chronic tests showed a satisfactory survival-index of the test-organisms, even in the conditions of stress, to which they had been submitted. In the acute test, there was observed the occurrence of a malformation in one of the neonates of the F2 generation. Since in the chronic test, difficulties in swimming, smaller primipara and raised increase of egg production by females had been verified, which was not corresponding to the number of neonates, especially in those points near the galleries of sewers.

Keywords: Ecotoxicology, *Daphinia similis*, Park Sólon de Lucena.

2007 BDUA – Journal of Biology, 2: 202. T0460RodrigoLeonardo15022007
Title: **Water quality of Itaperi Campus dam, Fortaleza, Ceará**
Authors: Aldeney A. Soares Filho, Célia M.S. Sampaio, Rodrigo L. Gomes de Oliveira, Rodrigo Leite Rodrigues, Bruno Edson Chaves, Thiago Dias Ferreira, Vanessa Tomaz Rebouças, José de Ribamar Arrais de Paiva & Wladimir Ronald Lobo Farias

WATER QUALITY OF ITAPERI CAMPUS DAM, FORTALEZA, CEARÁ

Aldeney A. Soares Filho, Célia M. de Souza Sampaio, Rodrigo L. Gomes de Oliveira, Rodrigo Leite Rodrigues, Bruno Edson Chaves, Thiago Dias Ferreira, Vanessa Tomaz Rebouças, José de R.A. de Paiva & Wladimir R.L. Farias

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ABSTRACT
The present work aims at to analyze the water quality of Itaperi Campus dam of the State University of Ceará, in Fortaleza, being analyzed physical-chemical and planktonics parameters.
For the work development weekly collections were carried through since June of 2006, in two stations: entry and exit of the dam.
The results of physico-chemical analysis evidenced a state of advanced eutrophication, with levels of dissolved oxygen, ammonia, nitrite, orthophosphate and free carbon dioxide not fitting in the recommended standards. How much to the analysis of phytoplankton they had been registered "blooms" of *Chlorococcum*, *Eudorina* and *Micractinium pussillum* in the August/06; *Cyclotella*, *Scenedesmus quadricauda* and *Micractinium pussillum* in the September and October/06. Phytoplanctonic bioindicators of eutrophic waters, such as *Oscillatoria* and *Merismopedia* had been observed during the period of study, with bigger incidence in the July/06. The zooplanktonic community the presence of *Brachionus*, *Filinia*, *Moina*, *Hexarthra*, *Polyarthra* and *Vorticella* was distinguished. After a manual removal of the aquatic macrophytic, as *Eichhornia crassipes*, had a significant reduction in the vegetal covering of the mirror waters of the dam, passing of 90 for 15%, witch could had influenced in the significant increase of the Chlorophyceae and Bacillariophyceae.
The works continue in course.

Keywords: Water Quality, physic-chemistries and planktonics.

2007 BDUA – Journal of Biology, 2: 203. T0461TathianeGaldino15022007
Title: **Copepoda from Tamandaré bay – Pernambuco, Brazil**
Authors: Aislan Galdino da Cunha, Lúcia Maria de Oliveira Gusmão, Valdylene T. Pessoa, Tathiane Galdino dos Santos, Xiomara Francesca & Diana A. dos Santos

COPEPODA FROM TAMANDARÉ BAY – PERNAMBUCO, BRAZIL

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ABSTRACT
Studies about Copepoda were conducted in Tamandaré Bay (Pernambuco, Brazil), to assess the environmental quality under anthropic influence.
The samples were collected during early morning and at sunset, in September 2006. Plankton samples were obtained by horizontal surface hauls with a plankton net 300 micrometers of mesh size.
It was identified 17 Copepoda species during daytime and 14 species at night. *Acartia lilljeborgii* showed the highest abundance, with 80.5% during the day and 91.9% in the night samples. Besides *Acartia lilljeborgii* outranked in the bay the species: *Clausocalanus furcatus* and *Pseudodiaptomus acutus* during the day and *Temora turbinata* and *Corycaeus giesbrechi*, at nocturnal sampling. The diversity and evenness values were below 1.64 bit.ind^{-1} and 0.56, respectively.
The results showed that Tamandaré Bay is influenced by the estuarine plume of the adjacent Mamucaba river. The lower diversity and evenness values indicated an unbalanced system and the anthropic impacts.

Keywords: Copepods, diurnal variation, human impacts, Northeastern Brazil.

2007 BDUA – Journal of Biology, 2: 204. T0462JBarbosa21022007
Title: **Spatial and temporal attributes of phytoplankton and environmental co-determinants from Mossoró River estuary – Rio Grande do Norte, Brazil**
Authors: José Etham de Lucena Barbosa, Célia Regina Diniz, Jaqueline da Silva Mendes, Ruceline Paiva Lins, Milton Araújo Lucena filho & Renato de Medeiros Rocha

SPATIAL AND TEMPORAL ATTRIBUTES OF PHYTOPLANKTON AND ENVIRONMENTAL CO-DETERMINANTS FROM MOSSORÓ RIVER ESTUARY – RIO GRANDE DO NORTE, BRAZIL

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ABSTRACT
The Mossoró River estuary is characterized by its scarce rains, high sunstroke, intense winds, high evaporation and a pluvial stream with graduated waters from saltworks, making it a hypersalty, semi-arid and negative system.
Since September 2003 until August 2006, phytoplankton was sampled monthly on a horizontal gradient, with 18 collect points between the mouth and the freshwater zones.
The taxonomic inventory counted 128 *taxa*, with the majority belonging to the Diatoms. It was registered in a temporal scale an average occurrence of 68 *taxa* per month, and some values was expanded in rainy periods (February – March), due to the increasing of freshwater species inserted by the growth of freshwater stream. Through PCA it was discriminated four estuary sections: (1) the first one from P1 to P4; (2) the second one from P5 to P10; (3) the third one from P11 to P14; (4) and the fourth one from P15 to P18, where *Odontella mobiliensis* (J. W. Bailey) Grunow*, Amphiprora alata* and *Melosira sulcata* diatoms presented high tolerance to salinity variations in the month, and *Cylindrospermopsis raciborskii* and *Planktothix* sp. showed the major density, as well as restricted distribution in waters with lower salinity. It was observed that brackish water influenced indirectly the community diversity and directly the biomass. Urban effluent interfered directly on nutrient concentrations and influenced on the trophic state of the system.

Keywords: Phytoplankton, estuary, hypersalty environment.

2007 BDUA – Journal of Biology, 2: 205. T0463GilbertoLima21022007
Title: **Limnological Monitoring and Characterization of the Trophic State of Taperoá II Dam – PB**
Authors: Gilberto Queiroz de Lima Filho, José Etham de Lucena Barbosa, Janiele da Costa de França, Gabrielle Joanne Medeiros Araújo & Rogério de Sousa Andrade

LIMNOLOGICAL MONITORING AND CHARACTERIZATION OF THE TROPHIC STATE OF TAPEROÁ II DAM – PB

Gilberto Queiroz de Lima Filho, José Etham de Lucena Barbosa, Janiele da Costa de França, Gabrielle Joanne Medeiros Araújo & Rogério de Sousa Andrade

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ABSTRACT
Dams are the unique water resource to the major of the population from Brazilian Northeast, and they are determinants both to the environmental conditions and the communities's life qualities.
This work had studied 18 parameters with bimonthly sampling since November/2005 until September/2006 and it was described vertical and horizontal variations for monitoring and characterization of the trophic state of Taperoá II dam.
A total of 72 *taxa* were identified in the phytoplankton. The dry period, with higher temperatures, showed microstratifications and a clinograd behaviour related to the dissolved oxygen. This peculiarity supported the growth of the Cyanophyceae. *Cylindrospermopsis raciborskii* was the most representative species during the research, which was marked to the highest algal density. The alkalinity showed an opposition among chlorophyll, conductivity and pH variation, due to the carbonate composition of the hydrographic basin. The Secchi depth showed significant correlation with the volume, and its increasing was characterized for water mixing, and the corresponding domain of *Aulacoseira granulata* in the water column. In accordance with the levels of ammonia, nitrite, nitrate and phosphorus, the dam was considered an oligotrofic reservoir, evidencing total nitrogen in lower values.
Temporal fluctuation of phytoplankton community was associated with column stability during the dry period, and to the water mixing at the period of rain and volume increase. These characteristics are essentials in the description of the environment standards as a request for monitoring the quality of the water in accordance with the phytoplankton communities.

Keywords: Monitoring, temporal fluctuation, water quality, phytoplanktonic community dynamics.

2007 BDUA – Journal of Biology, 2: 206. T0464Arnola23022007
Title: **Toxicity of substances produced by *Eucalyptus* spp in Vale do Rio Doce (Minas Gerais, Brazil) to cladocerans**
Authors: Arnola Cecília Rietzler, A.C. Zoratto, L.P. Duarte, F. Carazza, P.M. Barbosa & F.A.R. Barbosa

TOXICITY OF SUBSTANCES PRODUCED BY *Eucalyptus* spp. IN VALE DO RIO DOCE (MINAS GERAIS, BRAZIL) TO CLADOCERANS

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ABSTRACT
In the region outside Rio Doce State Park, in the State of Minas Gerais, extensive areas have been used for the plantation of *Eucalyptus*. Many natural lakes and ponds occur within these plantations, thus being subject to leaf wash-in and litter leaching. However, little is known of the potential toxicity of substances found in eucalyptus leaves to aquatic biota.
Two of cladocerans species found around lakes Palmeirinhas and Ferruginha, before (litter leaves) and after being maintained in these lakes for 30 to 60 days, between October and December of 2005 (wet season) and between July and September of 2006 (dry season) were maintained. In this context, toxicity tests were carried out with *Daphnia similis* and *Daphnia laevis* using vegetal extractions (essential oils and other vegetal extractives) obtained from the leaves of *Eucalyptus grandis* and *E. urophila*.
The results indicated toxicity of both litter leaves and leaves maintained in the lakes. These data, complemented by experiments on the decomposition of leaves of both species showed a greater toxic effect of *E. urophila* with regard to the extracted materials.
The leaves of *E. grandis* possibly enable a greater liberation of substances into the water, as observed in the laboratory decomposition experiments carried out after 4, 7, 15 and 30 days of decomposition. Thus, the data show potential toxicity of the substances produced by these eucalyptus species, indicating that such substances can cause deleterious effects on the aquatic biota.

Keywords: *Eucalyptus* substances, natural lakes, Minas Gerais (Brazil), toxicity tests, cladocerans.

2007 BDUA – Journal of Biology, 2: 207. T0465DPareschi15022007
Title: **Rotifers as bioindicators in constructed wetlands for sewage treatment**
Authors: Daniela Cambeses Pareschi, Eneida Salati & Abílio Lopes de Oliveira-Neto

ROTIFERS AS BIOINDICATORS IN CONSTRUCTED WETLANDS FOR SEWAGE TREATMENT

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ABSTRACT
During the period of 2001-2002, a system of constructed wetlands for sewage treatment for approximately a quarter of 1100 inhabitants in Piracicaba/SP was studied.
The survey of the fauna of Rotifera and physical and chemical variables of the residuary water in the canals of the treatment system was made. Analysis of coliformes and DBO5, which values were related to the rotifers species composition, was also made along the canals.
A total of 20 taxa of rotifers monogonontas, besides other organisms that could have been identified were registered in the studied system. The effluent, at the beginnig of the treatment, presented polysaprobic characteristics (polluted). The richness and density of species of rotifers had increased with the improvement of the water quality.
It was concluded that the richness and density of species of rotifers could serve as indicative of water quality and efficiency of removal of pollutants in systems of sewage treatment, also being able to have important role in the reduction of pathogenic bacteria.

Keywords: Rotifera, zooplankton, constructed wetlands, water treatment, sanitary limnology.

THEME 5

Harmful Algal Blooms: description, origins, evolution and control factors

2007 BDUA – Journal of Biology, 2: 211. T0501LumiHaragushi05012007
Title: **Spatial distribution of Dinophysiales Species (Dinophyceae) in the South of Brazil in winter 2005**
Authors: L. Kannan, S. Paramasivam, P. Perumal & S. Ajmal Khan

SPATIAL DISTRIBUTION OF DINOPHYSIALES SPECIES (DINOPHYCEAE) IN THE SOUTH OF BRAZIL IN WINTER 2005

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ABSTRACT
The Dinophysiales (Dinophyceae) include harmful species producing toxins responsible for diarrhetic shellfish poisoning.
Neritic and oceanic samples were analyzed from Santa Marta Grande Cape ($28^0$40'S) and the far South of Brazil (34^0S, Chuí), aiming the determination of the spatial distribution of Dinophysiales species. In August-September 2005, 27 vertical hauls with plankton mesh nets (20 µm) were performed on the Research Vessel *Atlântico Sul* within the PRONEX-FURG project and then fixed with 4% neutral formaldehyde and analysed in sedimentation chambers under the inverted microscope.
A total of 679 individuals of the order Dinophysiales were observed, 28 species were identified and their digital images captured (Diagnostics In Sight camera). Three toxic species, *Dinophysis acuminata*, *D. tripos* and *D. fortii* were found and one supposed to be toxic, *D. caudata*. A greater number of individuals were found in the Chuí region (535), but the most abundant species was the same *D. caudata* (53-59%) in both areas. *D. acuminata* was more abundant in Chuí (30%) when compared to Santa Marta Grande (7%); *D. fortii* was only found in the latter (6%), where other *Dinophysis* species were also more abundant (35%) in comparison with the far South of Brazil (10%). Most of species were not found in the coastal stations except *D. acuminata*, *D.caudata*, *D. fortii* and *D. schroederi*, widely distributed in coastal, shelf and slope waters. Some species, *D. dubia, D. exigua, D. schuetti, Histioneis para, Histioneis hippoperoides, Ornithocercus thumii* and *Ornithocercus splendidus* were observed in oceanic stations only.

Keywords: Dinoflagellates, biodiversity, *Dinophysis*.

2007 BDUA – Journal of Biology, 2: 212. T0502MariangelaMenezes21012007
Title: **Recurrent blooms of *Peridinium quinquecorne* (Dinophyta) in a tropical shallow coastal lagoon, Lagoa Rodrigo de Freitas, Rio de Janeiro, Brazil**
Authors: Mariângela Menezes, Patrícia Domingos, Gláucia Freitas Sampaio & Gisele Alves Gômara

RECURRENT BLOOMS OF *Peridinium quinquecorne* (DINOPHYTA) IN A TROPICAL SHALLOW COSTAL LAGOON, LAGOA RODRIGO DE FREITAS, RIO DE JANEIRO, BRAZIL

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ABSTRACT
Recurrent short-lived blooms of the dinoflagellate *Peridinium quinquecorne* Abé have been observed in Rodrigo de Freitas lagoon during summer 2005 (January to April). This system, located in a highly populated area at Rio de Janeiro city (RJ, southeastern Brazil), is a semi-confined environment connected to the sea by just one channel showing eutrophic waters with events of high fish mortality. Bloom episodes always occur in confined zones soon after drainage of rivers discharge. Compared to the rest of lagoon this zone is shallower, with low turbulence and water residence time varying due to the opening and closing of the artificial connection of lagoon.
During February 2005, samples were taken from the surface water for morphological (light and scanning electron microscopy), quantitative (Utermöhl method) and some abiotic data (temperature, dissolved oxygen, salinity, depth) analysis. The bloom lasted for about three weeks at concentrations up to 8.17 x 10^{-6} cells.L^{-1}, forming moderate mucilaginous strands in the water surface.
Cells morphological variations and ecological aspects are discussed in relation to these blooms. Moreover, information about accompanied flora is included.

Keywords: *Peridinium quinquecorne*, recurrent blooms, coastal urban lagoon, tropics.

Project partially financed by the CNPq 555284/2006-9.

2007 BDUA – Journal of Biology, 2: 213. T0503IrinaIzaguirre25012007
Title: **Phytoplankton and primary production in clear and turbid shallow lakes from the Pampa Plain (Argentina)**
Authors: I. Izaguirre, L. Allende, G. Perez, A. Torremorell, G. Tell, J. Bustingorry, R. Escaray &. H. Zagarese

PHYTOPLANKTON AND PRIMARY PRODUCTION IN CLEAR AND TURBID SHALLOW LAKES FROM THE PAMPA PLAIN (ARGENTINA)

I. Izaguirre[1,2], L. Allende[1,2], G. Perez[2,3], A. Torremorell[3], G. Tell[1,2], J. Bustingorry[3], R. Escaray[3] & H. Zagarese[2,3]

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ABSTRACT
Phytoplankton structure and primary production was studied in ten shallow lakes from the Pampa Plain (Argentina) that are in three different steady states: clear (with submersed macrophytes), turbid (due to high phytoplankton biomass), and turbid (due to inorganic suspended matter).
The shallow lakes showed strong differences in their optical properties, resulting in differing light climates conditions for the photosynthetic organisms. Mean attenuation coefficients of PAR varied between 4.5 m^{-1} (in one vegetated lake) and 64.1 m^{-1} (in one inorganic turbid lake). The contrasting *k*d values determined important differences in the euphotic zones of the water bodies. Dissolved organic carbon also differed among the lakes, with highest concentrations in vegetated lakes or in those that showed cyanobacteria blooms. Marked differences in phytoplankton structure, pigments and primary production were also found among lakes. Lowest phytoplankton densities occurred in most vegetated lakes and in inorganic turbid water bodies (870 - 4750 ind.mL^{-1}), whereas highest figures in lakes with Cyanobacteria blooms (113,250 - 222,880 ind.mL^{-1}). Nanoflagellates dominated in clear water bodies. Autotrophic picoplankton was dominated by ficocianine-rich picocyanobacteria in all cases, varying from 8.61 x 10^3 cells.mL^{-1} to 4.17 x 10^6 cells.mL^{-1}, with the lowest values in the lakes dominated by cyanobacteria > 20 µm. The most turbid lakes were the more productive in terms of P max and the more efficient, and the clear lakes resulted the less productive and efficient ones.

Keywords: Phytoplankton, primary production, clear and turbid shallow lakes.

2007 BDUA – Journal of Biology, 2: 214. T0504LauraMasudaP26012007
Title: **Recent *Prorocentrum minimum* bloom and *Nitzschia seriata* complex occurrence in Santos estuarine**
Authors: Laura Shizue Moriga Masuda, Gleyci Aparecida Oliveira Moser & José Juan Barrera-Alba

RECENT *Prorocentrum minimum* BLOOM AND *Nitzschia seriata* COMPLEX OCCURRENCE IN SANTOS ESTUARINE

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ABSTRACT
Santos estuarine channel, in São Paulo coast, is a complex system with assorted pollution sources. Pollution coming from an industrial pole, port activities and domestic sewage from slams and other diffuse fonts, lead to intense eutrophication. Complex relationship between the physical and chemical properties in a constant changing environment can affect the phytoplanktonic community, since these organisms respond promptly to these changes. Algal blooms, commonly related to eutrophic environments, can cause environmental problems such as oxygen depletion, mortality of marine organisms, and in some cases, due to toxin production, health public problems as well. In this sense, the present work analyzed the phytoplanktonic floristic composition and biomass during complete tidal cycles in dry and rainy seasons.
During the dry season, 103 *taxa* were identified, corresponding to 3420 cells.mL^{-1} and total biomass of 5.29 mg chl *a*.m^{-3}, while in the rainy season 100 *taxa* were identified (2363 cells.mL^{-1} and 4.17 mg chl *a*.m^{-3}), with noticeable increasing of dinoflagellates. In the dry season, microphytoplanktonic community was characterized by dominance of pennate diatoms, represented mainly by species of the *Nitzschia seriata* complex (*sensu* Hasle), potential producers of amnesic shellfish poisoning toxins. However, during the rainy period, a bloom of *P. minimum* (28.840 cells.mL^{-1}) occurred, related to nutrient increases. This dinoflagellate is a diarrheic shellfish poisoning toxins producer and its occurrence shall be monitored.

Keywords: *Prorocentrum minimum, Nitzschia seriata* complex, estuary.

2007 BDUA – Journal of Biology, 2: 215. T0505DouglasDantas29012007
Title: **Avaliation of grazing rate of copepods *Notodiaptomus* spp. on non-toxic strains of *Cylindrospermopsis raciborskii***
Authors: D.D.F. Dantas, F.R. Camacho, F.R. Vasconcelos, F.O. Araújo, J.L. Attayde & R.F. Panosso

AVALIATION OF GRAZING RATE OF COPEPODS *Notodiaptomus* spp. ON NON-TOXIC STRAINS OF *Cylindrospermopsis raciborskii*

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ABSTRACT
Harmful cyanobacteria blooms are common in eutrophic lakes and reservoirs. In the reservoirs of northeastern Brazil one of the main species of cyanobacteria that forms blooms is *Cylindrospermopsis raciborskii*. This study aimed to quantify the ingestion rates of non-toxic strains of *C. raciborskii* by the copepod *Notodiaptomus* spp., which co-exists with blooms of these cyanobacteria in the reservoirs.
Cyanobacteria ingestion rates by copepods were quantified across a gradient of cyanobacteria concentration. The experiment was conducted in the laboratory and the experimental design consisted of ten treatments, where the presence/absence of copepods was manipulated in five different concentrations of cyanobacteria concentrations with six replicates of each treatment. Two water samples were taken for the determination of chlorophyll *a* concentration, in the beginning and another after five hours from the start of the experiment. Initial and final concentrations of chlorophyll *a* were determined in a spectrophotometer, after filtration of samples and pigment extraction in ethanol at room temperature.
The t-test results showed that there was a significant reduction of chlorophyll *a* mean concentrations in the treatments without copepods but not in the treatments with copepods. A linear regression analysis showed that there was no significant relation between the ingestion rates of copepods and cyanobacteria concentration.
The results suggest that there was no significant ingestion of *C. raciborskii* by the copepods *Notodiaptomus*. However, additional experiments are necessary before it can be concluded that these copepods don't have a significant grazing pressure on these cyanobacteria under natural conditions.

Keywords: Cyanobacteria, zooplankton, *Notodiaptomus, Cylindrospermopsis raciborskii,* functional response.

2007 BDUA – Journal of Biology, 2: 216. T0506GleyciMoser29012007
Title: **Changes in phytoplankton biomass and composition during spring and neap tides in Santos bay (summer/2006)**
Authors: Gleyci Aparecida Oliveira Moser, Maria Fernanda Coló Giannini & Áurea Maria Ciotti

CHANGES IN PHYTOPLANKTON BIOMASS AND COMPOSITION DURING SPRING AND NEAP TIDES IN SANTOS BAY (SUMMER/2006)

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ABSTRACT
Santos Bay is a polluted coastal system influenced by both domestic and industrial sewage, input by two estuarine channels and a submarine outfall, where public policies started recently a monitoring program for harmful algal blooms. The present study analyzes differences in floristics and phytoplanktonic biomass during distinct tidal levels, taking potential harmful species into account.
The data presented here was collect in the summer survey (March/2006), in 17 stations during neap tide and 20 stations during spring tide. Average chlorophyll *a* concentration during spring (9.38 $mg.m^{-3}$) and neap (11.11 $mg.m^{-3}$) tides were not statistically different. The relationship between accessory pigments and chlorophyll *a* suggests the importance of diatoms. In both tidal periods, phytoplankton concentrations around 1.0 x 10^7 $cells.L^{-1}$ were observed in the coastal stations near the submarine outfall and estuarine channels. During neap tide microphytoplanktonic community was mainly represented by pennate diatoms (*Pseudo-nitzschia* spp.) from the *Nitzschia seriata* complex (*sensu* Hasle), and *Prorocentrum minimum* was abundant near Santos estuary. During neap tide, the diatoms from *Nitzschia seriata* complex were less abundant and *Guinardia striata*, *Hemialus hauckii* and *Chaetoceros* spp. dominated the microphytoplankton. Changes in phytoplankton composition during neap and spring tides were probably related to the water column alternate stratified and well mixed conditions. Stratified conditions during summer, better established during neap tides, can favor the development of some harmful species, as those of *Nitzschia seriata* complex.
The present results illustrate the need of taking the tidal cycles in Santos Bay into consideration in future monitoring efforts.

Keywords: HAB, eutrophication, *Nitzschia seriata* complex.

2007 BDUA – Journal of Biology, 2: 217. T0507GiulliariLira29012007
Title: **Cyanobacteria in a eutrophic reservoir in the Northeast of Brazil**
Authors: Giulliari Alan da Silva Tavares de Lira, Maria do Carmo Bittencourt-Oliveira & Ariadne do Nascimento Moura

CYANOBACTERIA IN A EUTROPHIC RESERVOIR IN THE NORTHEAST OF BRAZIL

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ABSTRACT
The objective of this work was to identify and quantify the cyanobacteria along the water column at a eutrophic reservoir in Pernambuco State (Mundaú reservoir), relating them to the hydrological and physical-chemical aspects.
Samplings were bimonthly carried out between January and November, 2006 at eight depths, using a Van Dorn bottle. Physical data and oxygen were sampled *in situ*. Nutrients concentration was determined in the laboratory from usual limnology methodologies.
Water temperature was always over 22 ºC, oxygenated waters, electric conductivity, total dissolved solids and turbidity were elevated, neutron-alkaline pH and high N an P concentrations. A total of 22 *taxa* were identified with detachment to Chroococcales (10 species). *Cylindrospermopsis raciborskii*, *Microcystis aeruginosa*, *Merismopedia punctata*, *Geitlerinema amphibium*, *G. unigranulatum* and *Pseudanabaena* sp., stood out during the studied period by presenting high densities (over 10^6 ind.L^{-1}). *C. raciborskii* was dominant, presenting two morphotypes: straight and spiral. Straight morphotype represented 45% from the total individuals quantified for cyanobacteria, and presented average density 54 times higher than the spiral type. Along the water column higher densities of *C. raciborskii* up to 4m depth were observed (78% of the individuals), related to the higher light availability up to this point.

Keywords: Cyanobacteria, Eutrophic reservoir, Brazilian Northeast.

2007 BDUA – Journal of Biology, 2: 218. T0508RauquirioCosta30012007
Title: **Effects of toxic *Alexandrium minutum* strains on the feeding and survival rates of pelagic marine copepods *Acartia grani* and *Euterpina acutifrons***
Authors: Rauquírio Marinho da Costa, Luci Cajueiro Carneiro Pereira & Felipe Fernández

EFFECTS OF TOXIC A*lexandrium minutum* STRAINS ON THE FEEDING AND SURVIVAL RATES OF PELAGIC MARINE COPEPODS A*cartia grani* AND *Euterpina acutifrons*

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ABSTRACT
Feeding and survival experiments with three different toxic strains of *Alexandrium miunutum* (AL1V, AL2V and AMINAR1) revealed that copepods *Acartia grani* and *Euterpina acutifrons* were able to consume all *A. minutum* strains to a similar extent at which they fed on the non-toxic and similar sized *Scrippsiella trochoidea* (strain S. T.). Feeding of both copepod species showed a typical satiation response to increasing food concentrations. Ingestion rates of *A. grani* on the four dinoflagellates strains were always higher than those observed for *E. acutifrons*. Significant differences ($p < 0.05$) were found between these rates for the most toxic strain (AL1V) when comparing both copepod species. For carbon concentrations higher than 800 µg C.copepod^{-1}.h^{-1}, ingestion rates of both copepod species on AL1V were higher than those found for S. T., and such behaviour could probably be linked to digestive dysfunction or to the use of part of the accumulated energy in detoxification processes. Survival rates and physiological condition index data suggested that *A. grani* was more sensitive to *A. minutum* PSP-toxins than *E. acutifrons*. A long-term exposure experiment (288 hours) showed 0% survival for *A. grani* when exposed to AL1V, whereas *E. acutifrons* showed survival values higher than 50% for this strain. For the less toxic AMINAR1 strain *E. acutifrons* showed survival rates of 80% compared to 95% survival on *S. trochoidea*.
The present results suggested that both *A. grani* and *E. acutifrons* can act, to a different extent, as PSP *A. minutum* toxin vectors through the food web.

Keywords: Feeding rates, copepods, toxic dinoflagellates.

2007 BDUA – Journal of Biology, 2: 219. T0509MelissaCarvalho06022007
Title: ***Oscillatoria erythraea* bloom in the continental shelf of Santos, Southeast Brazil**
Authors: Melissa Carvalho, Sônia M. F. Gianesella & Flávia M. P. Saldanha-Corrêa

Oscillatoria erythraea BLOOM IN THE CONTINENTAL SHELF OF SANTOS, SOUTHEAST BRAZIL

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ABSTRACT
The occurrence of a bloom of *Oscillatoria erythraea* was detected during an oceanographic cruise conducted in March 23-26 of 2006, in the continental shelf in front of the Santos estuarine system, Southeast Brazil. This cyanobacteria is able to fix atmospheric N, being a source for new production to the oligotrophic mixing layers, and can be also a potential source of ciguatoxins.
The relative abundance of *O. erythraea* in net plankton samples, obtained by vertical tows (30µm mesh) in 33 oceanographic stations, was evaluated in order to determine the bloom extension and the relative importance of the patch to the bulk net phytoplankton biomass along the water column, but having in mind that these brownish colored patches are neustonic. The cells were counted individually except for *O. erythraea*, to which the number of filaments was considered. When filaments of *O. erythraea* represented more than 50% of the total cell number, the sample was considered as being inside the bloom. According to this criterion (very conservative according to the literature), the bloom enclosed 12 stations in the central region of the study area, representing about 1100 Km^2.
The highest *O. erythraea* abundance was 113.2 x 10^6 filaments.L^{-1} (99% of the total). During the event, surface water was calm and flat, with temperatures between 27 °C and 29 °C, but with a strong vertical stratification and the presence of the South Atlantic Central Water in bottom layers. A conspicuous deep chlorophyll maximum was also detected at the thermocline base in the studied area.

Keywords: *Oscillatoria erythraea*, bloom, phytoplankton, Santos, continental shelf, Southeast Brazil.

2007 BDUA – Journal of Biology, 2: 220. T0510ClarisseOdebrecht30012007
Title: **The dinoflagellate *Gymnodinium catenatum* in southernmost Brazilian continental shelf (32^0 34^0 S) in autumn 1991: evidence of coastal northwards transport**
Authors: Clarisse Odebrecht, Áurea Maria Ciotti & Ivan Dias Soares

THE DINOFLAGELLATE *Gymnodinium catenatum* IN SOUTHERNMOST BRAZILIAN CONTINENTAL SHELF (32º 34º S) IN AUTUMN 1991: EVIDENCE OF COASTAL NORTHWARDS TRANSPORT

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ABSTRACT
The dinoflagellate *Gymnodinium catenatum*, known for the production of paralytic shellfish poisoning, presents a wide geographical distribution in the southern and northern hemispheres. In Brazilian waters, the occurrence of *G. catenatum* was first reported between 1998 and 1999, in a bivalve culture area (26°48'S, Santa Catarina state), where the presence of its associated toxins was also confirmed. Afterwards, *G. catenatum* was observed further north, of Paraná and São Paulo states. The present work investigated the spatial distribution of *G. catenatum* and related environmental conditions in continental shelf and slope waters in southernmost Brazil (32°S to 34°S), with a dataset collected during an oceanographic cruise performed in autumn 1991, thus, prior to the first register.
Relatively higher cell concentration (10^2 - 10^3 cells.L^{-1}) of *G. catenatum* was observed in regions with intermediate degree of vertical stratification in the southern and northern continental shelf and northeastern slope, while lowest values (<10^2 cells.L^{-1}) matched with mixed and highly stratified waters.
The results suggested the influence of hydrography on spatial distribution of the species in the area as well as its introduction from the south by influence of currents driven by onshore northwards winds that were frequent during autumn, the main growth season of *G. catenatum* in both Argentinean and Uruguayan waters. Cell density was modest probably due to the unfavorable concentration of inorganic nutrients (low nitrogen) that hampered population growth during this study period.

Keywords: *Gymnodinium catenatum*, harmful dinoflagellate, Southwest Atlantic, spatial distribution.

2007 BDUA – Journal of Biology, 2: 221. T0511AnnaPaula30012007
Title: **Relation between nitrogen/phosphorous ratio and abundance of Cyanophyta in two environments, one with oligo-mesotrophic characteristics and another one with eutrophic characteristics**
Authors: A.P. Luzia, T. Matsumura-Tundisi, J.G. Tundisi & D.C. Pareschi

RELATION BETWEEN NITROGEN/PHOSPHOROUS RATIO AND ABUNDANCE OF CYANOPHYTA IN TWO ENVIRONMENTS, ONE WITH OLIGO-MESOTROPHIC CHARACTERISTICS AND ANOTHER ONE WITH EUTROPHIC CHARACTERISTICS

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ABSTRACT
Eutrophication in rivers, lakes and reservoirs occurs due to nutrient enrichment of these water bodies, especially of nitrogen and phosphorous, and one of the main consequences of this increase of nutrients is an excessive growth of phytoplankton, especially Cyanophyta. In an aquatic ecosystem, as the nitrogen/phosphorous ratio increases better are the trophic conditions of the system. On the other hand, as this ratio decreases, the system becomes more eutrophic. The main objective of this work was the comparison of two environments, one with oligo-mesotrophic characteristics and another one with eutrophic characteristics, considering the nitrogen/phosphorus ratio and the abundance of Cyanophyta.
The studied environments were the reservoirs of Bariri and the Lobo (Broa), both located in the countryside of the State of São Paulo. Two samplings were taken, one in the dry period (August of 2005) and another one in the rainy period (January of 2006).
The results showed the consequences of the impacts of the uses of the hydrographic basins, especially in the UHE Bariri reservoir. It was demonstrated for the Lobo/Broa reservoir a little impact in the degree of eutrophication due to the state of conservation of the hydrographic basin of this aquatic ecosystem.
The results found were within the theoretical calculus of the N:P ratio and abundance of Cyanophyta.

Keywords: Nitrogen, phosphorous, abundance of Cyanophyta.

2007 BDUA – Journal of Biology, 2: 222. T0512DanielaF06022007
Title: **Genetic affiliation, ecological nutrient preferences and allelopatic potential of a freshwater *Synechococcus* strain (UADFSSYN1)**
Authors: D.R. de Figueiredo, A.M.M. Gonçalves, F. Gonçalves, M.J. Pereira & A. Correia

GENETIC AFFILIATION, ECOLOGICAL NUTRIENT PREFERENCES AND ALLELOPATHIC POTENTIAL OF A FRESHWATER *Synechococcus* STRAIN (UADFSYN1)

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ABSTRACT
Cyanobacterial blooms of *Synechococcus* strains occur in freshwaters and sea waters and some of them have been reported as toxic. The bloom formation is known to be enhanced by special nutritive conditions such as low N:P ratios.
The *Synechococcus* sp. (strain UADFSYN1) used in the present study was isolated from a freshwater shallow lake and genetically characterized through sequencing of fragments from *16S rRNA* and *nifH* genes. This work highlighted the nutrient requirements (nitrogen and phosphorus) as well as nutrients concentrations that become limitative to its growth (1.1 mg $PO_4^{3-}.L^{-1}$ and 8.5 mg $NO_3^{-}.L^{-1}$).
Synechococcus sp. (strain UADFSYN1) was not able to develop under phosphorus or nitrogen depletion (in spite of having the *nifH* gene).
In order to assess the allelopathic potential of the strain UADFSYN1, algal inhibition tests were performed: exudates of exponential cultures of this strain were applied to four green algae (*Pseudokirchneriella subcapitata, Chlorella vulgaris*, *Pandorina morum* and *Coelastrum astroideum*).
Significant growth inhibition effects were found only for *P. morum* and *C. astroideum*. Nevertheless, the potential for microcystin synthesis was discarded after PCR analysis using primers targeted to conserved regions of the microcystin synthetase gene.

Keywords: *Synechococcus* sp., *16S rRNA*, nutritive requirements, allelopathy.

2007 BDUA – Journal of Biology, 2: 223. T0513PaulinaBarbosa30012007

Title: **Limnological changes in Dom Helvécio lake: a natural or anthropogenic consequence?**

Authors: Paulina Maia-Barbosa, Luciana Barbosa, Sofia Luiza Brito, Fábio Garcia, Cristiane Barros, Maria Betânia de Souza, Érika Brandes, Nelson Mello, Alice de Souza Guimarães & Francisco Antônio R. Barbosa

LIMNOLOGICAL CHANGES IN DOM HELVÉCIO LAKE: A NATURAL OR ANTHROPOGENIC CONSEQUENCE?

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ABSTRACT

Limnological research in Rio Doce State Park started in 1976, increasing remarkably with the launching of the Long Term Ecological Research Program (LTER) in 1999. The lakes started to be monitorized in a systematic and regular way, resulting in a more consistent database. Dom Helvécio, the largest and deepest lake of the Rio Doce Lake District, despite being located within a conservation unit, showed significant changes in physical and chemical characteristics as well as in the composition and abundance of planktonic communities during the last 30 years.

A drastic reduction of euphotic zone (from 16.0 to 8.0m) was registered followed by an increase of phosphorous (c. 0.26 $\mu M.L^{-1}$ in 1977/78 to 0.45 $\mu M.L^{-1}$ in 2006) and chlorophyll *a* (c. 5 to 19 $\mu g.L^{-1}$) concentrations. The phytoplankton diversity increased from 81 (1988) to 153 (2006) species with the dominance of *Pseudoanabaena galeata* and *Cosmarium asphaerosporum*. Among the zooplankton the dominant species (*Scolodiaptomus corderoi e Argyrodiaptomus furcatus*) have been replaced by *Thermocyclops minutus* and the total number of species increased from 13 in 1978 to 67 in 2006, being Copepoda the dominant group.

The introduction of *Pygocentrus* sp. and C*ycla occelaris*, predator species (piscivorous) associated with the increase of tourism can explain the registered differences. The replacing of an herbivorous zooplankton (Calanoida) by an omnivorous one (Cyclopoida) implies in a lower predation pressure on the phytoplankton. This change might have contributed to higher chlorophyll *a* concentrations, blooms of *Microcystis* sp. and the establishment of *Cylindrospermopsis raciborski* (potentially toxic), which was first recorded in 1999.

Keywords: Limnological changes, Dom Helvécio lake, anthropogenic impacts.

2007 BDUA – Journal of Biology, 2: 224. T0514LucianaGalvao06022007
Title: **Recovery process and food web changes in a tropical reservoir: Paranoá Lake, Central Brazil**
Authors: Luciana Mendonça-Galvão & Cláudia Padovesi-Fonseca

RECOVERY PROCESS AND FOOD WEB CHANGES IN A TROPICAL RESERVOIR: PARANOÁ LAKE, CENTRAL BRAZIL

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ABSTRACT
Lake Paranoá (15º48'S, 47º47'W) is a large, relatively shallow urban reservoir (area 38.1 Km^2, volume 498.6 $x10^6$ m^3, mean depth 12.0 m), situated in central Brazil. Strong eutrophication had been observed since the 1970s and led to high phytoplankton standing crops (due to *Cylindrospermopsis raciborskii*), blooms of *Microcystis aeruginosa*, fish death, anoxia, low Secchi transparency and dominance of detritivorous microzooplankton (rotifers and Cyclopoida nauplius). Since 1993, a restoration program focusing on nutrient external loading reduction has been developed. In 1999, Paranoá was intentionally flushed. This study examined trophic status evolution and planktonic food web since nutrient loading reduction began (after 1993) and after flushing (1999 - 2000).
Two data sets were analyzed: long-term data (1990 to 2000, monthly values) for nutrients, chlorophyll *a*, electric conductivity, pH, zooplankton density and short-term data, (1997, 1998, 1999 and 2000, biweekly sampled during rainy and dry seasons), for the same variables.
Despite progressive reduction on total phosphorus after 1994, no shifts in plankton communities occurred until flushing. Cyanobacterial dominance, anoxia, low Secchi transparency (1.0 m), high values of electric conductivity (80.00 $\mu S.cm^{-1}$, annual mean) and pH (8.0, annual mean) remained. After flushing, notable shifts in plankton community and physical-chemical properties occurred. Plankton richness and diversity increased, total density and biomass decreased abruptly. Diatoms and chlorophytes predominated and *C. raciborskii* virtually disappeared.
Large-bodied herbivorous zooplankton exerted top-down control over phytoplankton, resulting in low values of phytoplankton biomass. Flushing seemed to be the key-factor in Paranoá evolution to mesotrophic state and in food-web changes.

Keywords: Restoration, trophic state, food web, top-down control.

2007 BDUA – Journal of Biology, 2: 225. T0515ChristinaPacheco13022007

Title: **The use of PCR in the detection of toxic *Microcystis* spp. in Northeast Brazilian water reservoirs**

Authors: Christina Pacheco, Rosely V. Meissner, Hernani Pinto, Ivaneide A. S. Costa, Amanda Palhares, Pablo C. Santos & Renata Panosso

THE USE OF PCR IN THE DETECTION OF TOXIC *Microcystis* spp. IN NORTHEAST BRAZILIAN WATER RESERVOIRS

Christina Pacheco, Rosely V. Meissner, Hernani Pinto, Ivaneide A. S. Costa, Amanda Palhares, Pablo C. Santos & Renata Panosso

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ABSTRACT

Cyanobacteria are important components of the phytoplankton in lakes and reservoirs; however, some species are capable of producing toxins. One of these cyanotoxins is the hepatotoxin microcystin, which can be produced by *Microcystis, Planktothrix, Anabaena, Nostoc* and *Hapalosiphon,* among other genera. Since microcystin producing and non microcystin producing members of a species cannot be distinguished morphologically, the occurrence of microcystin is generally detected by bioassays, HPLC (High Precision Liquid Chromatgraphy) and ELISA (Enzime-Linked Immunosorbant Assay). PCR (Polymerase Chain Reaction) is a method which can detect the presence of genes responsible for microcystin production. This research used PCR in the detection of microcystin producing *Microcystis* spp. in environmental samples and evaluated the efficacy of the method.

Ten samples from reservoirs in Northeast Brazil were collected during 2005. These were submitted to DNA extraction, two different PCRs (indicating the presence of *Microcystis*/ detecting the *mcyB* gene), microscopic analyses, mouse bioassays and HPLC.

Polymerase Chain Reaction indicated presence of *Microcystis* spp. in 70% of the samples. When compared to microscopic analyses, PCR was capable of correctly indicating the presence or absence of *Microcystis* spp. in 90% of the samples. Half of the samples also presented positive results for the *mcyB* gene, having therefore the genetic capacity to produce microcystin. When PCR was compared to HPLC and mouse bioassays, the results of the different analyses agreed in 70% of the samples.

The results are promising, although improvements can still be done to the PCR technique used in order to obtain higher correlations between genetic and conventional methods.

Keywords: Cyanotoxins, *Microcystis* spp., microcystin, PCR, *mcyB*.

2007 BDUA – Journal of Biology, 2: 226. T0516ChristinaPacheco13022007
Title: **Molecular diversity and PCR primer analyses of the *mcyB* gene in *Microcystis aeruginosa***
Authors: Christina Pacheco, Rosely V. Meissner, Tatiana M. Galvão, Yulyanna M. Rodrigues, Nirlley Y. P. Gurgel & Renata Panosso

MOLECULAR DIVERSITY AND PCR PRIMER ANALYSES OF THE *mcyB* GENE IN *Microcystis aeruginosa*

Christina Pacheco, Rosely V. Meissner, Tatiana M. Galvão, Yulyanna M. Rodrigues, Nirlley Y. P. Gurgel & Renata Panosso

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ABSTRACT
Microcystin is a cyclic heptapeptide produced by *Microcystis aeruginosa*. It is produced non ribosomally in a Non-Ribosomal Peptide Synthetase (NRPS)/Polyketide Synthase (PKS) system. In *Microcystis aeruginosa* 10 genes direct microcystin biosynthesis, organized in two operons: *mcyA,B,C* and *mcyD,E,F,G,H,I,J*. Once the sequence became elucidated, since 1999, researchers started using PCR to detect the potential to produce microcystin. The *mcyB* gene was chosen for this study due to the number of papers showing strong correlations between the detection of fragments of the gene and the presence of microcystin. This study aimed to analyse the conservation of the *mcyB* gene and evaluate a number of non-degenerative primers used in the detection of this gene.
Eight sequences of *M. aeruginosa´*s *mcyB* gene deposited in GeneBank were aligned using ClustalW and the conservation of the different portions of the gene was analyzed. Eleven non-degenerative primers documented in scientific literature, specific for the *mcyB* gene in *Microcystis* spp., were also analyzed. They were manually positioned on the alignment in order to search for any variations in the target sequence and BLAST-N searches were performed in order to find out homologous sequences and possible primer target sequences.
The *mcyB* gene in *Microcystis aeruginosa* was found to have a high degree of conservation, except for a few variable regions. Due to the conservation of the annealing sequences, and the fact that it could not amplify the homologous sequence in *Planktothrix* and *Anabaena*, the primer pair Tox2P/Tox2M was classified as the best primer pair.

Keywords: *mcyB*, *Microcystis aeruginosa*, PCR, primers.

2007 BDUA – Journal of Biology, 2: 227. T0517GabrielleAraujo21022007
Title: **Phytoplankton dynamics and environmental features in the spatial and temporal chracteristics on Soledade dam, Brazilian semi arid**
Authors: Gabrielle Joanne Medeiros Araújo, José Etham de Lucena Barbosa, Rogério de Sousa Andrade, Janiele da Costa de França & Gilberto Queiroz de Lima Filho

PHYTOPLANKTON DYNAMICS AND ENVIRONMENTAL FEATURES IN THE SPATIAL AND TEMPORAL CHRACTERISTICS ON SOLEDADE DAM, BRAZILIAN SEMI ARID

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ABSTRACT
The present study includes the phytoplankton dynamics, their spatial and temporal variations and their relationships with environmental attributes and with the water quality from Soledade dam, a shallow reservoir used for urban consumption and commercial fishing.
The samples were carried out bimonthly on the margin and in the limnetic sites between November 2005 and September 2006.
The survey about the specific richness resulted in 67 *taxa* spread in five classes, and Chlorophyta showed the highest diversity. Cyanophyta was emphasized for having the most number of individuals, which it was dominant during all the period of sampling, except only November 2005, when diatoms were prevailing. Cyanophyta density average was 177.515 individuals.mL^{-1}, whose value is considered 7.4 times higher than what is reported in CONAMA 375/05 resolution. In July/06, it was observed fish mortality, related with strong algal biomass and high density of *Cylindrospermopsis raciborskii* and *Microcystis aeruginosa*, toxic Cyanophyceae with environmental affinity for mixed and eutrophic waters.
Temporal variations were more significant than spatial ones, because of remarkable differences between dry and wet period, and due to the small depth and intensive dam's turbulence, respectively. The high density, fish death, and extreme chlorophyll *a* concentration, allied to Trophic State Index (TSI), confirmed the worrying situation of dam's eutrophycation and the risk submitted to the communities that are depend to it directly or indirectly.

Keywords: algal richness, algal density, Cyanophyceae, eutrophication, spatial temporal scales, semi arid region.

2007 BDUA – Journal of Biology, 2: 228. T0518RenataPanosso15022007
Title: **Phytoplankton composition and cyanotoxins at six semi-arid eutrophic reservoirs (Rio Grande do Norte State, Brazil)**
Authors: Ivaneide Alves Soares da Costa, R.F. Panosso, M.M.F. Araújo, Eneida Maria Eskinazi-Sant'Anna & J.L. Attayde

PHYTOPLANKTON COMPOSITION AND CYANOTOXINS AT SIX SEMI-ARID EUTROPHIC RESERVOIRS (RIO GRANDE DO NORTE STATE, BRAZIL)

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ABSTRACT
There is a growing concern on the harmful effects caused by cyanobacteria and their toxins (cyanotoxins) on animals and humans that consume water from eutrophic water reservoirs. Hepatotoxins and neurotoxins produced by many cyanobacteria species have been recorded all over the world and also in Brazilian waters. This study was conducted to access the spatial and seasonal distribution of the phytoplankton at six eutrophic man made reservoirs located at the semi-arid region of Rio Grande do Norte State.
Phytoplankton sampling was carried out every three months between September 2002 and March 2004, at two sites (riverine and lacustrine). Samples for phytoplankton identification was collected with a plankton net (20 μm mesh size) and preserved with 4% formalin. Samples for cell counting were preserved with lugol and processed according to method of Ütermol. Seston samples for toxin analysis (mouse bioassay) were collected through a plankton net (20 μm mesh size), and preserved in a freezer (-20 ºC).
A total of 123 *taxa* of phytoplankton, belonging to Cyanophyceae (41), Chlorophyceae (54), Bacillariophyceae (20), Euglenophyceae (3), Xanthophyceae (1), Cryptophyceae (1) and Chrysophyceae (1) were found at the samples. The total phytoplankton biomass ranged between 0.1 and 3.500 $mm^3.L^{-1}$. Cyanobacteria was dominant at all sites, reaching >90% of the total phytoplankton biomass, which was composed, in general, by two or three species. The dominant species were found to be *Microcystis aeruginosa*, *M. protocystis, M. panniformis, Planktothrix agardhii, Anabaena circinalis* and *Cylindrospermopsis raciborskii.* Hepatotoxic blooms were found through mouse bioassay in three reservoirs.
The frequent occurrence of cyanobacteria blooms and cyanotoxins at semi-arid reservoirs at Rio Grande do Norte State is a challenge for water managers and an issue for public health concern.

Keywords: reservoir, eutrophycation, cyanobacteria, Hepatotoxins.

THEME 6

Plankton and Human Affairs

2007 BDUA – Journal of Biology, 2: 231. T0601PauloMafalda19012007
Title: **Distribution and Abundance of Tetraodontiformes Larvae (Pisces, Teleostei) along the Northeast Brazilian Exclusive Economic Zone between 1ºN and 14ºS.**
Authors: Marcos Moura Nogueira & Paulo Mafalda Júnior

DISTRIBUTION AND ABUNDANCE OF TETRAODONTIFORMES LARVAE (PISCES, TELEOSTEI) ALONG THE NORTHEAST BRAZILIAN EXCLUSIVE ECONOMIC ZONE BETWEEN 1ºN AND 14ºS

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ABSTRACT
The Exclusive Economic Zone is defined as the area between external limit of the Territorial Sea, of 12 miles of width and 200 nautical miles of the coast. This work objective was to study the ontogeny, abundance and distribution of the Tetraodontifomes larvae collected during four expeditions: Period 1 (August – October 1995), Period 2 (January – April 1997), Period 3 (April – July 1998) and Period 4 (September – December 2000), realized in the Northeast Exclusive Economic Zone.
The 1230 Bongo-net (300 and 500 µm) samples examined contained about 61 Tetraodontoidei larvae from six families: Balistidae (*Balistes capriscus*), Monacanthidae (*Stephanolepis hispidus*), Ostraciidae (*Lactophrys trigonus*), Tetraodontidae (*Sphoeroides maculatus* and *Sphoeroides* sp.), Diodontidae (*Diodon hystrix)* and Molidae *(Ranzania laevis*). *S. maculatus* was the species most abundant, with higher abundance (64% of the total), during the Period 3, while the period 2 was the Period of low abundance (27% of the total). *Ranzania laevis* was the second species in abundance representing 17.6% of the total of Tetraodontiformes. This species had greater abundance during the period 1 however in period 2 was lesser abundance. The third species in abundance was *S. hispidus.*

Keywords: Ontogeny, Tetraodontifomes larvae, Exclusive Economic Zone.

2007 BDUA – Journal of Biology, 2: 232. T0602Jacinta15012007
Title: **Bacterioplankton and food safety**
Authors: Jacinta M. Oliveira, Fernanda Castilho & Mário J. Pereira

BACTERIOPLANKTON AND FOOD SAFETY

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ABSTRACT
Shellfish exploration is a significant component of Portugal's economy. In Ria de Aveiro there is an considerable production of these molluscs which are commercialized nationally and through Europe. Bivalve molluscs constitute a preferential choice in gastronomic terms. That ecosystem is harmed by pollution. Besides natural bacterioplankton, other microbiological contaminants are being introduced in the lagoon. Many diseases have been related to the ingestion of contaminated shellfish, especially by bacteria (*Escherichia coli, Salmonella* spp.) and virus (*Hepatovirus*). Prevention of human consumption and commercialization of contaminated shellfish is a question of public health. Since 1970, depuration has been a process that helps to eliminate a big part of shellfish's contamination. However, this artificial process only helps for relatively low bacterial concentrations. Technologic advances haven't been applied to this purification process and many question still unsolved, such as virus, some bacteria, biotoxins and metals elimination.

Keywords: Shellfish, bacterioplankton, food safety, bacterial contamination, depuration.

2007 BDUA – Journal of Biology, 2: 233. T0603CassiaGongora30012007
Title: **Distribution and abundance of Phosichthyidae larvae in the southeastern Brazilian Bight**
Authors: Cássia Gôngora Goçalo & Mario Katsuragawa

DISTRIBUTION AND ABUNDANCE OF PHOSICHTHYIDAE LARVAE IN THE SOUTHEASTERN BRAZILIAN BIGHT

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ABSTRACT
Larval Phosichthyidae was studied to investigate the relation between oceanographic events and spatial and temporal variations in the distribution and abundance of fish larvae, on the southeastern Brazilian Bight, between São Tomé Cape (Lat: 22°S; Long: 41°W) and São Sebastião Island (Lat.: 24°S; Long: 45°W). Collections of ichthyoplankton and hydrographic data were made at 137 stations, during two oceanographic cruises performed in Jan/2002 (summer) and Aug/2002 (winter).
Phosichthyidae larvae represented 3% of the total fish larvae collected in the summer and 2% in the winter. In average, the larval fish was more abundant in the summer (mean = 128.18 larvae.m^{-2}; sd = 130.26 larvae.m^{-2}) than in the winter (mean = 66.42 larvae.m^{-2}; sd = 83.90 larvae.m^{-2}), and for Phosichthyidae larvae the mean of the abundance was 4.20 (sd = 9.30 larvae.m^{-2}) in the summer and 1.62 (sd = 3.43 larvae*m^{-2}) in the winter. Regarding the spatial distribution, Phosichthyidae larvae were almost absent in shallow waters (0 – 100 m), and most of positive stations were found from the shelf break (200 m isobath) toward the open ocean.
Probably, the occurrence of larval Phosichthyidae was associated with Tropical Water mass and its distribution patterns might be defined by the hydrographic structures in the region, mainly the Brazil Current circulation pattern.

Keywords: Fish larvae, Phosichthyidae, Distribution, Abundance and Brazil Current.

2007 BDUA – Journal of Biology, 2: 234. T0604EduardoMartinelli31012007
Title: **Detection of toxigenic serogroups of *Vibrio cholerae* on zooplankton *taxa* in Santos Bay and adjacent continental shelf (Southeastern Brazil)**
Authors: José Eduardo Martinelli Filho, Rubens Mendes Lopes & Irma N.G. Rivera

DETECTION OF TOXIGENIC SEROGROUPS OF *Vibrio cholerae* ON ZOOPLANKTON *TAXA* IN SANTOS BAY AND ADJACENT CONTINENTAL SHELF (SOUTHEASTERN BRAZIL)

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ABSTRACT
Vibrio cholerae is an autochthonous bacterium in the marine environment and may cause serious health problems when water having the pathogenic serogroups is ingested. Several *Vibrio* species are chitinolytic and produce enzymes that aid adherence to arthropod carapaces. The bacteria are found associated with copepods in concentrations up to a thousand times higher than the free *V. cholerae* in the water. A single copepod may have enough bacteria necessary for human infection.
As part of the ECOSAN project, which focus on the influence of the continental input of Santos Bay on biological processes ashore, zooplankton (>300 µm) sampling was carried out in Santos Bay and the adjacent shelf, and the prevalence of *V. cholerae* O_1 and O_{139} assessed in whole samples and on the most abundant zooplankton *taxa*. Toxigenic serogroups were detected by the DFA and DVC-DFA (Direct Viable Count and Direct Fluorescence Assay) methods. Briefly, both formalin-fixed and fresh samples were grinded and preserved in a sterilized buffer solution previously to the experiments. The presence of these bacteria in selected zooplankton was correlated with abiotical parameters of the seawater.
High values of detection were found for both serogroups. For the estuarine region, these values were higher than those found in literature (> 75% of the samples). For the adjacent shelf, values were smaller (between 50 to 75%) probably because of higher salinity and smaller density of zooplankton. This study suggests the existence of an inshore-offshore gradient in toxigenic *Vibrio cholerae* attachment to zooplankton in coastal waters.

Keywords: *Vibrio cholerae*, toxigenic, zooplankton, Santos Bay.

2007 BDUA – Journal of Biology, 2: 235. T0605SantangeloBozelliManca30012007
Title: **Disturbance by salinity increase and resilience of zooplankton communities: the role of the egg bank in a Brazilian coastal lagoon**
Authors: J.M. Santangelo, R.L. Bozelli & M. Manca

DISTURBANCE BY SALINITY INCREASE AND RESILIENCE OF ZOOPLANKTON COMMUNITIES: THE ROLE OF THE EGG BANK IN A BRAZILIAN COASTAL LAGOON

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ABSTRACT
Resting eggs of zooplankton are commonly viewed as temporal refuges against harsh conditions. In freshwater coastal systems, unpredictable salinity increases represent a huge disturbance to zooplankton communities. In this study it was assessed (1) the spatial variation in the egg bank of Imboassica lagoon (Rio de Janeiro, Brazil) and (2) the effects of increased salinities on hatchling numbers and species richness from the egg bank.
In each case, the resting eggs from 100 g of wet sediment were isolated trough the sugar flotation method and incubated in artificial media. Eggs were exposed to salinities of 4.0, 8.0, 16.0 and 32.0 psu besides a control (freshwater).
The four sampling stations analyzed differed statistically (ANOVA, $p < 0.0001$) considering species richness and abundance of hatchlings. The sampling station near the sandbar showed statistically lower species richness and abundance of hatchlings (Tukey Test, $p < 0.01$). Species richness and numbers of hatchlings also differed between salinities (ANOVA, $p < 0.0001$). Salinities of 16.0 and 32.0 psu reduced species richness and abundance of hatchlings (Tukey Test, $p < 0.05$). Results confirm the existence of an active egg bank in Imboassica lagoon. Many species can depend on the egg bank to return after salinity decreases. However, increased salinities inhibit the hatching of many eggs and could interfere negatively on their viability. The consequences of frequent and intense salinity disturbances could lead to the extinction of some populations in the long-term, especially if populations do not have enough time to re-establish the egg bank.

Keywords: Resting eggs, zooplankton, disturbance, resilience, salinity.

2007 BDUA – Journal of Biology, 2: 236. T0606Enide30012007
Title: **Growth, chlorophyll *a* and biochemical composition from *Chaetoceros muelleri* Lemmerman (Bacillariophyta) in alternative culture media**
Authors: Alfredo Matos Moura Júnior, Evaldení Guiomar Moreira & Maria Luise Koening

GROWTH, CHLOROPHYLL *a* AND BIOCHEMICAL COMPOSITION FROM *Chaetoceros muelleri* LEMMERMAN (BACILLARIOPHYTA) IN ALTERNATIVE CULTURE MEDIA

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ABSTRACT
This work aimed to determine *Chaetoceros muelleri* Lemmerman productivity in different culture media.
Microalgae were cultivated in carboy in three media: F2 Guillard (F2), cattle dung extract (EEG) and earthworm dung extract (EEM) under constant light and temperature (22 ± 1 ºC) conditions. Productivity was measured by cellular density, chlorophyll *a* and biochemical composition contents (total Nitrogen, carbohydrate, lipids and proteins).
Cellular density was 18.53 ± 0.43 x 10^6 cell.mL^{-1} in EEG; 21.61 ± 0.24 x 10^6 cell.mL^{-1} in F2 and of 23.06 ± 10^6 cell.mL^{-1} in EEM. Chlorophyll *a* value 0.0016 ± 0.000023 mg.m^{-3} in F2, followed to 0.0017 ± 0.000059 mg.m^{-3} in EEG and 0.0018 ± 0.000091 mg.m^{-3} in EEM. The Total Nitrogen values were 1.79 ± 0.05 mL.g^{-1} for EEG; 2.30 ± 0.05 mL.g^{-1} for F2 and 3.35 ± 0.06 mL.g^{-1} for EEM. Total carbohydrate content was 1,278.29 ± 55.19 mg g^{-1} for F2; 1,370.47 ± 38.23 mg g^{-1} for EEG and 1,723.34 ± 6.04 mg g^{-1} for EEM. Total Lipid content was 7.63 ± 0.04 mg g^{-1} for EEG; 7.88 ± 0.03 mg g^{-1} for EEM and 8.61 ± 0.11 mg g^{-1} for F2. Total protein values were 5.87 ± 0.05 mg.g^{-1} for EEG; 8.54 ± 0.06 mg g^{-1} for F2 and 11.07 ± 0.61 mg g^{-1} for EEM.
Chaetoceros muelleri showed to be most efficient in EEM alternative medium reaching better results in most analyzed parameters.

Keywords: Growth, culture, chlorophyll *a*, biochemical composition, *Chaetoceros muelleri*, alternative media.

2007 BDUA – Journal of Biology, 2: 237. T0607TerezinhaSantos30012007
Title: **Phytoplanktonic study in pond culture of marine shrimp *Litopenaeus vannamei* in oligohaline environment**
Authors: Terezinha Lúcia dos Santos, Dilma Bezerra Fernandes de Oliveira, Lourdes Bernadete Santos Campos, Renata Araújo Panucci & Ezequias Viana de Moura

PHYTOPLANKTONIC STUDY IN POND CULTURE OF MARINE SHRIMP *LITOPENAEUS VANNAMEI* IN OLIGOHALINE ENVIRONMENT

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ABSTRACT
Between August/2005 and July/2006 three cycles of shrimps (*Litopennaeus vannamei*) culture were studied, with the objective of analyzing the phytoplanktonic organisms and its correlation with abiotcs factors.
In shrimp pond supplied with oligohaline water from the Ceará-Mirim River, in Rio Grande do Norte/BR. Water samples were collected weekly from the pond and the place of supplying, for hydrological parameters analysis (nitrite, nitrate, phosphates, silicate, ammonia, chlorophyll, turbidity and pH) and quali-quantitative phytoplankton analysis.
The presence of the Bacillariophyceae, Chlorophyceae, Dinophyceae and Cyanophyceae groups were registered in the supplying, predominating the Bacillariophyceae, with relative abundance from 18% to 100%. In the pond, the presence of Euglenophyceae and Raphidiophyceae were also registered, which is considered rare. The Cyanophyceae predominated in most of the samples, being registered relative abundance varying from 10% to 100%, independent of its behavior in the supply, which is justified by the eutrophic conditions of the culture environment. The Chlorophyceae were abundant in the first weeks of the first cycle of the culture. The phytoplanktonic composition was constituted of 52 *taxa* for the supply water and 47 *taxa* for the pond. The genera with 100% of frequency of occurrence in the water of supply were: *Cylindrotheca*, *Cyclotella*, *Navícula*, *Oscillatoria*, *Scenedesmus* and *Surirella* in the supply; *Cyclotella, Coelastrum*, *Navicula, Merismopedia, Nitzschia* and *Planktothrix* in the pond.
In the first cycle there were significant correlations in the pond between *a* chlorophyll and turbidity and ammonia, as well between phytoplankton and turbidity.

Keywords: *Litopenaeus vannamei*, microphytoplankton, pond, chlorophyll.

2007 BDUA – Journal of Biology, 2: 238. T0608MonicaErache01022007
Title: **Potentialities of Cyclopoids Copepods efficacy in controlling mosquito larvae (*A. aegypti*, Diptera: Culicedae) in Uruguay**
Authors: M. Gómez Erache, K. Sans & D. Calliari

POTENTIALITIES OF CYCLOPOID COPEPODS EFFICACY IN CONTROLLING MOSQUITO LARVAE (*A. aegypti*, DIPTERA: CULICIDAE) IN URUGUAY

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ABSTRACT
Cyclopoids copepods are known to be good mosquito controllers, especially as regards the larvae of the dengue vectors *Aedes aegypti*. *Mesocyclops* and *Macrocyclops* genera have demonstrated to be effective control agents adapting themselves to climatic changes, different receptacles and available feeding in their habitats. A team of scientists of the Faculty of Sciences in Uruguay has being working at this topic from the 1999 until present.
Three species of copepods have been identified as potentially predators on mosquito larvae and their presence have been registered in different habitats in this country. *Mesocyclops longisetus*, *Macrocyclops albidus* and *Acanthocyclops robustus* were selected and cultivated in laboratory under controlled conditions of temperature, lighting and feeding. This copepods predatory efficiency was tested as potential control agents of mosquitoes in laboratory microcosms and in field conditions. The three predators were efficient in controlling 1-4-d mosquito larvae, and *M. longisetus* reached close to 90% reduction in larval survival. Also, laboratory assays demonstrated that these species were resistant to chemical larvicides.
These copepod species are promising candidates for control of mosquito larvae because they are widespread and highly effective predators that are capable of establishing and maintaining populations under a wide variety of field conditions. The use of this method in areas where trained employees or community members could act as monitors is suggested. Environments such as cemeteries, public parks, closed condominiums and school campuses could be greatly benefited by this attract and kill method of mosquito control.

Keywords: mosquito control, copepods, Uruguay.

2007 BDUA – Journal of Biology, 2: 239. T0610NunoMelo14022007
Title: **Characterization of zooplanktonic from fishponds of the Castanhal freshwater aquaculture experimental station (Pará – Brazil)**
Authors: Rayette Souza da Silva, Caio Aguiar Rodrigues Ramos, Silvia Helena Oliveira dos Reis, Atilla Melo do Nascimento & Nuno Filipe Alves Correia de Melo

CHARACTERIZATION OF ZOOPLANKTONIC FROM FISHPONDS OF THE CASTANHAL FRESHWATER AQUACULTURE EXPERIMENTAL STATION (PARÁ – BRAZIL)

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ABSTRACT
This presenting study has as purpose to analyze ono rainy period in the zooplankton composition on December, 2006.
The material was collected from Castanhal (UFRA) freshwater fishculture Experimental estation. Its total area is 70ha, where it's cultivated: tambaqui (*Colossoma macropomum*), tambacu (hybrid tambaqui with pacu), curimatã (*Prochilodus nigricans*), pirarucu (*Arapaima gigas*) and tucunaré (*Cichlas ocellaris*). The stations were in six fishponds and in the dam that supply them with water, being in of total 7 stations. The samples were collected with a dragnet, which mesh is 64 µm, being used in the horizontal on the sub-surface. The sample was kept in propylene bottles and preserved with formalin 4% for following lab analyses. In the laboratory was used suitable literature to taxonomic studies.
The water surface temperature varied from 32.2 to 34.0 ºC and the dissolved oxygen varied from 6.4 to 7.3 mg.L^{-1}. *Keratella americana*, *Lecane papuana, Lecane leontina and Macrochaetus collinsi of* rotífera; nauplius/copepodits, *Notodiaptomus paraensis* and *Thermocyclops* sp., of copepoda; *Alonella* sp., *Moinodaphnia macleayi* and *Moina micrura* of cladocera; *Vorticella* sp. were the species found: *Moinodaphnia macleayi* (dominant in fishponds with many species of, Tucunaré, Curimatã and Tambacú), *Notodiaptomus paraensis* (dominant in fishponds of fish larvae culture) and *Keratela americana* (dominant in fishponds of Piraruru) were the species that show the highest density. It is evident that zooplanktonic composition varied in order to the type of cultived fish.

Keywords: Amazon, Cladocera, Coepoda.

2007 BDUA – Journal of Biology, 2: 240. T0611NunoMelo14022007
Title: **Ichthyoplankton composition of Guajará-Miri estuary (Vigia, Pará, Brazil)**
Authors: Mayuime Silva Kawamoto, Cristiane Teixeira Contente, Glauber David Almeida Palheta, Nuno F.A. Correia de Melo, Caio A.R. Ramos & Atilla M. Nascimento

ICHTHYOPLANKTON COMPOSITION OF GUAJARÁ-MIRI ESTUARY (VIGIA, PARÁ, BRAZIL)

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ABSTRACT
The present work was developed in Vigia's estuary, in Pará-Brazil, in the course of October/2004 until October/2005. With intention to evaluate the ichthyoplankton community, it was tried to determine possible periodical variations in the distribution and occurrence and to evaluate this estuary as a helpful environment for the ichthyoplankton growing.
In the estuary, temperature, salinity, pH, conductibility and dissolved oxygen were measured. In the laboratory, the samples were fixed in 4% neutral formalin and then selected and identified up to family level. The samples were obtained from 36 sampling stations, during low tide and flood-tide, by horizontals trawls in the sub-superficial water, lasting 3 minutes and using a conical plankton net with 500 µm of mesh aperture.
6,513 larvae and 84 eggs were collected, being ten families identified, predominating the Engraulidae Family (86.1%), succeeded by Gobiidae and Carangidae (61.1%), Clupeidae (55.5%), Sciaenidae (27.8%), Pleuronectidae (19.4%), Tetraodontidae (16.7%), Elopidae (8.3%) and Blenniidae and Auchenipteridae (2.8%). Regarding the abundance, the most commons were Engraulidae (39.8%) and Gobiidae (39.7%). Clupeidae, Sciaenidae, Carangidae, Auchenipteridae, Tetraodontidae, Elopidae, Blenniidae e Pleuronectidae families reached less than 3% of abundance. From the total collected larvae, 900 weren't identified because they were or in the firsts larvae stages or heavily damaged. Among the 10 families recorded in this research, 7 have commercial importance.
The continuous presence of eggs and larvae, throughout the year, proves the permanent spawning of fishes, the larvae breading and growing, confirming, then, the utilization of Vigia's estuary as a nursery area.

Keywords: Ichthyoplankton, estuary, Vigia, composition.

2007 BDUA – Journal of Biology, 2: 241. T0612NunoMelo14022007
Title: **Nycthemeral variation of composition and abundance of ichthyoplankton in the Maracanã estuary in rayni season (Pará, Brazil)**
Authors: Cristiane Teixeira Contente, Mayuime Silva Kawamoto, Nuno F.A. Correia de Melo, Glauber D.A. Palheta, Caio Aguiar Rodrigues Ramos & Cao Güttler Demarchi

NYCTHEMERAL VARIATION OF COMPOSITION AND ABUNDANCE OF ICHTHYOPLANKTON IN THE MARACANÃ ESTUARY, IN RAINY SEASON (PARÁ, BRAZIL)

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ABSTRACT
The ichthyoplanktonic community of an estuary in Maracanã, North of Brazil was studied on March/2006, rainy period in Amazon region.
Ichthyoplankton samples were collected in one fixed station of the estuary, in intervals of 3 hours, during 24 hours each, embracing flood-tide and low tide. Sub-superficial trawl were realized in the water column, for 3 minutes, using a conical plankton net measuring 500 µm of net aperture, in which a flowmeter was coupled, then the samples were fixed with 4% neutral formalin. In the Aquatic Biology Laboratory, in UFRA, the samples were selected and the fish larvae were separated from the other organisms.
162 fish larvae were found and they were distributed in 7 families (Engraulidae, Elopidae, Sciaenidae, Tetraodontidae, Carangidae, Gobiidae and Hemiramphidae) and 139 juvenile fishes. In terms of frequency, the Engraulidae family and the juveniles were dominant The Carangidae family was constant (50%) and the others were secondary (33%) and rare (17%). As for the abundance, the juvenile fishes were more common, and the Engraulidae family was low abundant. The remaining ones were sporadic. Regarding to the variation throughout the period of 24 hours, the sampling collected about 11:00 a.m. presented more larvae (56). The lesser number of larvae was found in the sampling collected about 2:00 a.m., with 14 samples.
The conclusions were that estuaries are of great importance as estuarine species' nursery.

Keywords: Ichthyoplankton, estuary, Amazon.

2007 BDUA – Journal of Biology, 2: 242. T0613NunoMelo14022007
Title: **Ichthyoplankton composition of an estuary in city of Maracanã, Pará, Brazil**
Authors: Cristiane T. Contente, Nuno F.A. Correia de Melo, Fábio F. Cardoso, Mayuime S. Kawamoto, Glauber D.A. Palheta, Caio A.R. Ramos & Melissa do Socorro Fonseca da Silva

ICHTHYOPLANKTON COMPOSITION OF AN ESTUARY IN CITY OF MARACANÃ, PARÁ, BRAZIL

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ABSTRACT
A study about the composition of the ichthyoplankton through an estuary in Maracanã, Pará, Brazil, was performed.
The samples were collected on March/2006, in four fixed stations of the estuary, during flood-tide and low tide. For catching the biological samples, sub-superficial trawl were realized in the water column, for 3 minutes, using a conical plankton net measuring 500 μm of net aperture, in which a flowmeter was coupled, then the samples were stained with 4% neutral formalin. The fish larvae were selected from the samples and then utilized to analyze the taxonomical composition of ichthyoplankton.
Fifty larvae, distributed in eight families, were counted (Engraulidae, Carangidae, Gobiidae, Sciaenidae, Elopidae, Hemiramphidae, Sygnathidae and Tetraodontidae) and 103 juvenile fishes. Regarding to their frequency, the Engraulidae family and the juvenile were the majority, in the present work, with 83% from the larvae' total. The Tetraodontidae and Elopidae families were constant (50%) and the others were secondary (33%) and rare (17%). As for the abundance, the juvenile were more common, with 67% and the Engraulidae family was low abundant (14%). The remaining ones were sporadic, with less then 3%. The Engraulidae family is essential to the local population's feeding and, joined with the Gobiidae, they also own ecological importance because they are fundamentals in the tropical estuaries' food chain.
Based in the ichthyoplankton composition, the conclusions were that estuaries are of great importance as estuarine species' nursery.

Keywords: Amazon, Ichtyoplankton, Estuary.

2007 BDUA – Journal of Biology, 2: 243. T0614Manoel14022007

Title: **Phytoplankton diversity in areas of the native oysters cultivation in the Alagoas – Brazil**

Authors: Fernanda G.M.C.C. Baracho, Manoel M.S. Costa, Ágata C.H. Giancoli, Euripedes A. da Silva Filho, Fábio N. Colin, Alinne D.R. da Silva, Everton C. da Silva Amorim & Élica A.C. Guedes

PHYTOPLANKTON BIODIVERSITY IN AREAS OF THE NATIVE OYSTERS CULTIVATION IN THE ALAGOAS - BRAZIL

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ABSTRACT

The use of microalgae as food is the most important factor for the success in fishes, mollusks and crustaceans cultivations. This work objective was to evaluate the biodiversity of phytoplankton in oysters cultivations in the Alagoas State.

The results were presented in the rainy period (May - August 2005) and dry (September - November 2005) in three districts from Alagoas: Roteiro, Passo de Camaragibe and Coruripe. Simultaneously the phytoplankton collections, measures of temperature the air and water were made. These varied among between 25 - 32 ºC, pH was a little acid and the light coefficient extinction varied 0.02 – 0.06. The phytoplankton community was represented by 205 species distributed in the Phylum Bacillariophyta 69.26%, Chlorophyta 18.04% Cyanophyta 8.78%, Dinophyta 2.92%, Chrysophyta and Euglenophyta 0.48%. *Coscinodiscus centralis* Ehrenberg and *Coscinodiscus* sp. Ehrenberg were the species more found in Phyllum Bacillariophyta. The species presented similar distribution '>0.50' in Passo do Camaragibe in the 1 point in high tide, in Roteiro in the 2 point and Coruripe in the 3 point, both in the low tide. A high phytoplankton's diversity was verified '> 3 bits cel^{-1}' in Passo do Camaragibe in the 2 point in low tide, Roteiro in the 1 point and Coruripe in the 2 point, both in the high tide, during the drought period where happens larger light readiness and sea water.

The presented data suggest that these points were favorable to the beginning the oysters' cultivation.

Keywords: Phytoplankton, biodiversity, oyster cultivation.

2007 BDUA – Journal of Biology, 2: 244. T0615IaraCampos15022007
Title: **Maintenance and amplification of the "Algae Bank" of the Rio Doce State Park – MG, at the Limnology Laboratory, ICB/UFMG**
Authors: Iara Christina de Campos, Débora Chaves Moraes, Maíra Oliveira Campos & Francisco Antônio Rodrigues Barbosa

MAINTENANCE AND AMPLIFICATION OF THE "ALGAE BANK" OF THE RIO DOCE STATE PARK-MG, AT THE LIMNOLOGY LABORATORY, ICB/UFMG

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ABSTRACT
This project has as aim the in-laboratory (ICB-UFMG) isolation and maintenance of monospecific cultures of microalgae collected from the Rio Doce State Park lakes, MG, for their use as test-organisms in bioassay and toxicological evaluations. Nowadays the Algae Bank has eleven unialgae cultures of chlorophyceae and cyanophyceae. Amongst those, the genera were: *Microcystis*, *Merismopedia* and *Cylindrospermopsis*, containing potentially toxic species. The crops were maintained in a germination camera at 25°C and at a 12h light/ 12h dark photoperiod, simulating natural conditions. The cultures were obtained by inoculating the water collected from the lakes amidst a sterile culture (WC, generalist and ASM-1, for cyanobacteria), followed by the isolation of the species that developed better in these conditions. The techniques employed that presented the best results were: the consecutive lavage in medium, followed by the capillary pipette in inverted microscope. The verification of growth was made through microscopic and spectrophotometric measurement. With the infrastructure available, it is already possible to supply good cultures for the realization of molecular and physiological studies. The prospect of increasing the number of species cultivated, through the use of different culture mediums and of new techniques, will allow for the realization of even more diversified studies. Current cultures are already being used as test-organisms in research pilots with organophosphate pesticides and heavy metals, as well as in genetic studies. This way, it will be possible to develop applied projects. From such will result solutions and products for many environmental problems.

Keywords: Cultivation, biossay, unialgae cultures, microalgae.

2007 BDUA – Journal of Biology, 2: 245. T0616RodrigoLeonardo15022007

Title: **Analysis of planktonic diversity of the gastrointestinal content of the crustacean *Macrobrachium amazonicum***

Authors: Rodrigo L.G. de Oliveira, Leonardo S. Feitosa, Manoel P. de Araújo Neto, Rodrigo L. Rodrigues, Bruno E. Chaves, Maria C. de Souza, Francisca N. da Silva Rocha, Valéria S. Sampaio, Aldeney A. Soares Filho & Célia Maria de Souza Sampaio

ANALYSIS OF PLANKTONIC DIVERSITY OF THE GASTROINTESTINAL CONTENT OF THE CRUSTACEAN *Macrobrachium amazonicum*

Rodrigo L.G. Oliveira, Leonardo Schramm Feitosa, Manoel P.A. Neto, Rodrigo Leite Rodrigues, Bruno Edson Chaves, Maria da Conceição de Souza, Francisca N.S. Rocha, Valéria da Silva Sampaio, Aldeney Andrade Soares Filho, Célia Maria de Souza Sampaio

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ABSTRACT

Crustaceans are organisms that have plankton in their alimentary diet. Through of the study about gastrointestinal content of crustaceans, can infer indirectly the planktonic community of crustacean's habitat. The identification of the planktonic diversity in the stomachal content of the species in study, meanly the presence of cyanobacteria (bioindicators of water), became a extreme relevante work, because the cyanotoxins, produced for the same ones, can give a bad flavor to prawns. These work objectives were: to identify the planktonic diversity and to quantitatively and qualitatively analyze the gastrointestinal content, making comparisons with the year's periods.

For the study it has been chosen the specie *Macrobrachium amazonicum*, a fresh water exotic specie present in Ceará. The prawns were collected monthly at Catu's Lagoon(Aquiraz/Ceará), in the period from May/2006 to February/2007. Twenty males and 20 females were captured, selected and identified, being carried for Carciniculture Laboratory-LACAR. All digestive tracts were removed and fixed with formalin 4% for posterior identification.

The quantitative analyse was made by a numeric method using four techniques: a) occurrence frequency, b) dominancy, c) numeric participation and d) point system. It has been observed, with great incidence, the presence of the genus *Oscillatoria, Closterium, Staurastrum* in May/2006; *Aulacoseira, Closterium, Staurastrum, Oscillatoria* in June/2006 and July/2006; *Aulacoseira, Keratela, Staurastrum, Oscillatoria, Eudorina* in August/2006 and September/2006. An increase of *Oscillatoria* during these months of study was found. The most observed zooplankton species were the class *Copepoda,* being also observed holoplankton's eggs and worms. The works continue in course.

Keywords: Cyanobacteria, Plankton, gastrointestinal content, *Macrobrachium amazonicum.*

THEME 7

Invasion of Plankton. Factors that influence establishment of invasive planktonic species and consequences

2007 BDUA – Journal of Biology, 2: 249. T0702DanielaRimoldi30012007
Title: **Comparative distribution of two copepod species (*Temora stylifera* and *T. turbinate*) in Southeastern Brazilian waters**
Authors: D.R. Cunha & R.M. Lopes

COMPARATIVE DISTRIBUTION OF TWO COPEPOD SPECIES (*Temora stylifera* AND *T. turbinata*) IN SOUTHEASTERN BRAZILIAN WATERS

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ABSTRACT
The vertical and horizontal distribution of copepodids and adults of *Temora stylifera* (a native species) and *T. turbinata* (an invasive species) (Copepoda, Calanidae) were studied on the Southeastern shelf of Brazil during spring and summer, and their abundance compared to available historical data, in attempt to verify whether the abundance and distribution of the native species has been affected by the invasive species, after approximately 20 years of its first record in Brazilian waters.
Zooplankton samples were collected from the surface to the bottom of the water columm every 20m and from the coast to the open sea using a Multinet coupled with a 0.064 mm mesh. The organisms were separated by stages and all individuals were counted and sized.
Temora stylifera was the dominant species both in inshore (maximum of 819 ind.m^{-3}) and offshore stations (maximum of 116 ind.m^{-3}). As a general pattern, both adults and copepodids preferentially inhabited the upper 20m of the water column, and their abundance gradually decreased with depth. *Temora turbinata* occurred as a sub-dominant zooplankter at coastal stations, rarely appearing in offshore areas.
According to previous studies *Temora turbinata* may reach high abundances in estuaries and shallow coastal areas on the southeastern shelf of Brazil. However, the present data do not support the hypothesis that the abundance of the native species has been affected by the presence of the invasive species regardless the shelf area.

Keywords: *Temora*, distribution, exotic species.

2007 BDUA – Journal of Biology, 2: 250. T0703NewtonAquino30012007
Title: **Spatial and temporal variation of the exotic copepod *Pseudodiaptomus trihamatus* Wright, 1937 in Bahia coast, Eastern Brazil**
Authors: Newton Alessandro de Aquino, Rubens Mendes Lopes & Guilherme F. Medeiros

SPATIAL AND TEMPORAL VARIATION OF THE EXOTIC COPEPOD *Pseudodiaptomus trihamatus* WRIGHT, 1937 IN BAHIA COAST, EASTERN BRAZIL

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ABSTRACT
The present study is part of the zooplankton component of the PROMARLAM ("Environmental Monitoring Program of the Estuarine Area near the RLAM refinery") coordinated by CENPES/PETROBRAS together with IOUSP. The aim of this investigation was to analyze spatial and temporal variations of the exotic copepod *Pseudodiaptomus trihamatus*, during summer and winter, at Baía de Todos os Santos (BTS) and Baía de Camamu (BC), two major estuarine systems located on the coast of Bahia State, Eastern Brazil.
The identification and enumeration of copepods collected with a 200 µm mesh size net were performed in aliquots of total samples, but less abundant samples were fully inspected.
All developmental stages were found in analyzed samples. *Pseudodiaptomus trihamatus* occurred mainly at BTS in winter, when salinity was slightly lower (25-33) compared to summer (34-36). Females were more abundant (12 ind.m^{-3}) than males (4 ind.m^{-3}), and 35% of adult females carried egg sacs.
The occurrence of *P. trihamatus* on the Bahia coast might be related to natural dispersion mechanisms (coastal currents) from an original introduction point in Rio Grande do Norte coast where the species has been recorded in shrimp ponds and estuaries. However, an initial introduction from shrimp cultivation facilities in Valença (between BTS and BC) might have occurred in the past, and the species remained unrecorded on the Eastern coast of Brazil until the present study.

Keywords: copepods, *Pseudodiaptomus trihamatus,* Bahia coast, exotic species.

2007 BDUA – Journal of Biology, 2: 251. T0704GuilhermeMedeiros03022007
Title: **Current distributional range of the exotic copepod *Pseudodiaptomus trihamatus* Wright, 1937 on the northeastern coast of Brazil**
Authors: Guilherme Fulgêncio de Medeiros, Rubens M. Lopes, Louise de S. Medeiros, Marco Túlio L. e Carlos, Newton A. de Aquino, Ana Anita A.S. de Castro & Eudes F. Lima

CURRENT DISTRIBUTIONAL RANGE OF THE EXOTIC COPEPOD *Pseudodiaptomus trihamatus* WRIGHT, 1937 ON THE NORTHEASTERN COAST OF BRAZIL

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ABSTRACT
Biological invasions are a major cause of biodiversity loss and other ecosystem perturbations in coastal areas. Marine and estuarine copepods, including their resting eggs, are frequent riders in ballast water tanks of commercial vessels or as accompanying fauna of exported shrimp and fish breeding stocks. The copepod *P. trihamatus*, native from the Indo-Pacific coast, was unintentionally introduced in Northeastern Brazil in Natal (Rio Grande do Norte State, 1977) and Valença (Bahia State, 1984) following the importation of shrimp (*Penaeus monodon* Fabricius, 1798) breeding stocks from Phillipines and the Taiwan. The objective of this study was to analyze the further dispersion of *P. trihamatus* on the Northeastern coast.
Zooplankton samples were collected with a 120 µm mesh size conical net from 2001 to January 2007 at several estuarine and coastal sites covering the entire Northeastern coast except the extreme south of Bahia State, from Camamu Bay (Bahia) to Carutapera (Maranhão).
The observations confirmed that *P. trihamatus* is now largely distributed along estuarine and coastal ecosystems of Northeastern Brazil, being its occurrence confirmed in the following states (and locations): Bahia (Morro de São Paulo, Todos os Santos Bay and Praia do Forte); Sergipe (Aracaju); Alagoas (Maceió); Rio Grande do Norte (Canguaretama, Senador Georgino Avelino, Natal, Galinhos, Diogo Lopes, Macau, Tibau); Ceará (Aracati, Fortaleza, Barroquinha); Piauí (Luis Correia) and Maranhão (Tutóia). *Pseudodiaptomus trihamatus* lives in a wide range of salinities (from 8 to 70 psu) in Northeastern Brazil, which confers the species an additional advantage to successful dispersion in this extensive tropical area.

Keywords: *Pseudodiaptomus trihamatus;* Exotic copepod; Distribution; Northeastern Brazil.

2007 BDUA – Journal of Biology, 2: 252. T0705OttoOliveira15022007
Title: **Geographic distribution and predatory impact of the ctenophore *Mnemiopsis leidyi*: a potential threat to the fisheries and planktonic ecosystems from Brazilian coast?**
Authors: Otto M. P. Oliveira & Antonio C. Marques

GEOGRAPHIC DISTRIBUTION AND PREDATORY IMPACT OF THE CTENOPHORE *Mnemiopsis leidyi*: A POTENTIAL THREAT TO THE FISHERIES AND PLANKTONIC ECOSYSTEMS FROM BRAZILIAN COAST?

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ABSTRACT
The ctenophore *Mnemiopsis leidyi* A. Agassiz, 1865 is an important predator of the planktonic food chains, feeding mainly on carcinoplankton and on fish larvae and eggs. Originally distributed along the American Atlantic coast, the species was introduced into the Black Sea at the early 1980's and expanded its distribution to Azov and Caspian seas at 1990's, performing a massive predation on the fish stocks of these areas. Recently, the occurrence of the species was reported to the North and Baltic seas, apparently in a rapidly increasing abundance. The ecological impact of the species in these areas led to inquiry about the potential predatory impact of *M. leidyi* in the Brazilian coast.
To estimate the distribution and abundance of the species in southeastern Brazilian coast, the occurrence of *M. leidyi* in the São Sebastião Channel, São Paulo, from 2003-2006 and collected specimens in estuarine areas from Rio de Janeiro, Paraná, and Santa Catarina was monitored.
Adult specimens were observed in the São Sebastião Channel all over the year. Juvenile were abundant in the estuarine areas. The specimens' abundance in the samplings was lower than that registered for the non American areas. The presence of natural *M. leidyi* predators in Brazilian waters, as *Beroe ovata* Chamisso & Eysenhardt, 1821 and some Scyphomedusae, seems to be efficient in controlling its abundance.
The introduction of *B. ovata* in the Black Sea improved the decreasing of *M. leidyi* abundance. Other *Beroe* species were expected to control *M. leidyi* abundance in the North and Baltic seas.

Keywords: Ctenophora, Mnemiopsis, Zooplankton, Geographic Distribution, Ecological Impact, Estuaries.

Supporting: FAPESP (Proc. 04/15300-0), CNPq.

THEME 8

Development and testing of new methods for plankton research and advanced techniques on plankton studies. Advances in molecular biology and genetics, HPLC pigment analysis, flow cytometry, remote sensing and optical plankton counters

2007 BDUA – Journal of Biology, 2: 255. T0802HernandezUriel12012007
Title: **Determination of accessory pigments and cellular density of autotrophic picoplankton in the southern Gulf of Mexico**
Authors: Aldo Aquino Cruz & David U. Hernández-Becerril

DETERMINATION OF ACCESSORY PIGMENTS AND CELLULAR DENSITY OF AUTOTROPHIC PICOPLANKTON IN THE SOUTHERN GULF OF MEXICO

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ABSTRACT
Two coastal zones (influenced by the Coatzacoalcos and Grijalva-Usumacinta rivers) and an oceanic one (Campeche Canyon), from the southern Gulf of Mexico, were sampled during “nortes” (February, 2004) and dry (June-July, 2004) seasons.
Violaxanthin was never been detected by HPLC (High Performance Liquid Chromatography) in the southern Gulf of Mexico. The highest concentrations of accessory pigments (fucoxanthin, zeaxantina and divinyl-chlorophyll *a*) and high autotrophic picoplankton (APP) numbers were associated with shallow coastal zones (above 1% PAR_I), except for prasinoxanthin, which also showed high concentrations in the Campeche Canyon. Pigments associated with prokaryotic APP (zeaxanthin and divinyl-chlorophyll *a*) were more distinguishable in the Campeche Canyon than in the coastal zones. Chlorophyll *a* was not directly related to accessory pigments and APP numbers in the majority of the stations studied. Using the index pigments ($F\mu$), it was proven that phytoplankton of the southern Gulf of Mexico was composed by diverse sizes. The highest numbers of APP were found in the region influenced by the river Grijalva-Usumacinta (1.67×10^5 cells.mL^{-1}), following by the region influenced by the Coatzacoalcos river (1.19×10^5 cells.mL^{-1}), and in the Campeche Canyon (1.53×10^5 cells.mL^{-1}). The identity of picoprokaryotic organisms (*Synechococcus* and *Prochlorococcus*) was confirmed by TEM.

Keywords: Accessory pigments, autotrophic picoplankton, *Prochlorococcus*, southern Gulf of Mexico, *Synechococcus*.

2007 BDUA – Journal of Biology, 2: 256. T0803AntonLyakh29012007
Title: **The new method for phytoplankton biovolume and surface area assessment**
Authors: Anton Lyakh

THE NEW METHOD FOR PHYTOPLANKTON BIOVOLUME AND SURFACE AREA ASSESSMENT

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ABSTRACT
The new method for phytoplankton biovolume (BV) and surface area (SA) assessment has been proposed. In the method tree-dimensional phytoplankton cells models are used instead of the traditional similar geometric shapes that allow significantly increase the accuracy of BV and SA estimation. The method is approved on diatom cells. The digitized diatom cells outlines are used for the construction of 3D diatom models. Outlines for every model are get from one to tree orthogonal cell planes – valvar, apical and transapical, – depending on the morphological complexity of a designed cell. The beauty of diatoms is that many diatom species have similar shapes –here named as typical shapes – that allow using digitized outlines for many cells. For considered diatom species the typical outlines have been distinguished, digitized by parametric Bezier curves, placed into the database and are used for further models construction. Every model shape is controlled by dimensional parameters. Each of them determines the size of some model part and corresponds to one of the measured cell dimension. When a parameter is changed, the model is deformed to conform to the shape of the studied cell. In published works authors recommend to use similar geometric models for individual *taxa* – species or genera. This approach is not correct, because cells of one genus and especially species can significantly varies in their morphology. I propose first of all to pay attention to the cell morphology and select a model corresponded to a cell shape and then use cell taxonomy for further model shape refining.

Keywords: Phytoplankton, biovolume, surface area, three-dimensional geometric models, diatoms, cell outlines.

2007 BDUA – Journal of Biology, 2: 257. T0804EmaOrive30012007
Title: **Phytoplankton pigment patterns of unialgal cultures and natural assemblages in a temperate estuary**
Authors: A. Laza-Martínez, S. Seoane, M. Zapata & E. Orive

PHYTOPLANKTON PIGMENT PATTERNS OF UNIALGAL CULTURES AND NATURAL ASSEMBLAGES IN A TEMPERATE ESTUARY

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ABSTRACT
Chromatographic analysis (HPLC) of phytoplankton pigments complemented with microscopic observations of live and preserved cells were used to gain insight into the composition of estuarine phytoplankton.
Biological material consisted in: (1) 37 species belonging to 15 phytoplankton classes isolated from the Nervion River estuary, and (2) 10 field samples selected by the presence in elevated proportions of species with ambiguous pigments or pigments corresponding to other classes as well as some examples of mixed populations. Pigment diversity was highest among prymnesiophyceans, represented by five chemotaxonomic types, which differed by the distribution of the different chlorophylls *c* and the acyloxyderivatives of the carotenoid fucoxanthin. Dinoflagellates belonged to the five pigment types including dinoflagellates with peridinin and others with pigments of diatoms, chlorophytes, haptophytes or cryptophytes. Four species of prasinophyceans were isolated, one with prasinoxanthin as marker carotenoid, two with siphonaxanthin derivatives and the forth with loroxanthin derivatives. The rest of the algal classes were represented by one chemotaxonomic group each one. From the field samples analysis it can be concluded that assemblages dominated by algae other than diatoms can result in chromatograms dominated by fucoxanthin similar to those chromatograms dominated by diatoms. Otherwise, some minor *taxon*-specific pigments could only be detected when those *taxa* appeared in very high concentrations. In field samples of mixed populations, the more specific pigments of the species sharing major pigments with other classes were undetectable, what precludes inferring from pigment analysis alone on the structure of phytoplankton assemblages in estuarine waters.

Keywords: Phytoplankton, unialgal cultures, Carotenoids, Chlorophylls, Chemotaxonomy & Nervión River Estuary.

2007 BDUA – Journal of Biology, 2: 258. T0805BarbaraPietrzak30012007
Title: **Ecological and molecular aspects of aging – *Daphnia* model**
Authors: Barbara Pietrzak

ECOLOGICAL AND MOLECULAR ASPECTS OF AGING – *DAPHNIA* MODEL

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ABSTRACT
Senescence of multicellular organisms is a universal phenomenon. Nevertheless, both its cellular and physiological mechanisms, as well as its evolutionary causes, remain not fully understood. Research on aging concentrates to great extent on explaining genetic background, however lifespan, being a part of the phenotype, is the result of interaction between genotype and environment.
The research aims on answering how certain environmental factors influence the inherited and realized lifespan in *Daphnia* and on linking the effects observed on the level of individual with changes on molecular level, that is defining the role of selected molecular mechanisms in sustaining stress resistance and longevity that follows. The first aim was to explain the influence of predation – the main factor responsible for mortality in populations of freshwater cladocerans – on the evolution of aging in cladocerans differing in predator avoidance strategy. The second aim was to define phenotypic plasticity of lifespan in *Daphnia* and to answer how the measures of fitness change with age in response to environmental factors. The third aim was to link those with changes observed on molecular level: heat shock proteins expression, antioxidants content and free radicals production.
The research using *Daphnia* as a model organism, and ecological and molecular methodology complementing each other, may greatly contribute to the understanding of universal mechanisms of aging.

Keyword: Aging, lifespan, Daphnia, stress, HSP, antioxidants.

2007 BDUA – Journal of Biology, 2: 259. T0806GrzesiukMalgorzata30012007
Title: **HSP expression in response to different stress factors in *Daphnia magna***
Authors: M. Grzesiuk, A. Bednarska, P. Bernatowicz, M. Kloc, A. Mikulski, B. Pietrzak & J. Pijanowska

HSP EXPRESSION IN RESPONSE TO DIFFERENT STRESS FACTORS IN *Daphnia magna*

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ABSTRACT
Though Heat Shock Proteins (HSP) were first discovered as produced in reaction to high temperature, it came out later that they may also be produced in response to various biotic and abiotic stress. In numerous laboratory experiments it was examined changes in HSP expression in reaction to salt, fish, cyanobacteria, starvation and other factors in *Daphnia magna*. This freshwater crustacean is a model organism often tested for its reaction to stress, but rarely at molecular level. In this studies it was used HSP from three families: HSP60, HSP70 and HSP90. Observed molecular response to stress in *Daphnia* depended, among others, on kind and intensity of a stress factor and on origin of *Daphnia* clone. The data can turn out to be an important part of a puzzle called: pathways of reaction to stress.

Keywords: Daphnia magna, cyanobacteria, stress, Heat Shock Proteins.

2007 BDUA – Journal of Biology, 2: 260. T0807Enide30012007
Title: **Microphytoplankton cellular volume in Vaza-Barris estuary (Sergipe – Brasil)**
Authors: Alfredo Matos Moura Junior, Enide Eskinazi-Leça & Karine Matos Magalhães

MICROPHYTOPLANKTON CELLULAR VOLUME IN VAZA-BARRIS ESTUARY (SERGIPE – BRASIL)

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ABSTRACT
Cellular volume is one of the main parameters to determine plankton productivity, from framing cellular forms into geometric and mathematical formulas. Vaza-Barris estuary productivity, in Sergipe, Northeastern Brazil, was determined from microphytoplankton cellular volume measurements.
Bimonthly collections were made from Sep/95 to Jul/96 during low tide in three fixed points along the estuary. From 80 liters of water (40 mm smash) filtered from each sample, cellular density was calculated by Uthermöhl's method and from 2 to 50 cells were measured (n=748) to cellular volume measurements.
Diatoms were the most representative group in the estuary (98.21%), with cellular volume average ranging from 265.72 ± 212.63 to 9,046,888.82 ± 4,990,938.60 mm^3 (*Fragillaria capuccina* and *Palmeria hardmaniana*, respectively) followed by Dinophyta (1.57%) and Cyanophyta (0.22%).
Cellular volume determination in optic microscopy was shown to be a relatively cheap and a slow method. It can be easily applied to provide data to taxonomy and ecological studies.

Keywords: Microphytoplankton, cellular volume, Vaza-Barris, estuary productivity, Diatom.

2007 BDUA – Journal of Biology, 2: 261. T0808VioletaSlabakova30012007
Title: **Application of EOS MODIS product to study surface Chlorophyll distribution in the NW Black Sea**
Authors: Violeta Slabakova, Natalia Slabakova, Snejana Moncheva & Valentina Doncheva

APPLICATION OF EOS MODIS PRODUCT TO STUDY SURFACE CHLOROPHYLL DISTRIBUTION IN THE NW BLACK SEA

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ABSTRACT
Use of satellite image data to investigate oceanic process has become an essential component of oceanographic research and monitoring. The MODIS (Moderate Resolution Imagining Spectroradiometer) chlorophyll data set is potentially powerful tool for understanding global – and small -scale ocean processes.
In this case study the MODIS ocean data product was used to estimate Chlorophyll concentration in the Black Sea waters in order to test the hypotheses that remote sensing derived chlorophyll values would be more accurate in coastal shallow than in offshore waters. The difference in the in situ surface concentration and the MODIS image was estimated by RMS. The analysis was based on data collected during the joint JRC, Ispra-Institute of Oceanology, BAS expedition in the NW Black Sea (01 to 17 June 2006) from 66 sampling stations. In addition to ground chlorophyll measurements transparency (Secchi disk depth) was also included into the analysis. An appraisal was made of the applicability of the two types of data for assessment of surface chlorophyll distribution in the Black sea basin.

Keywords: Remote sensing, MODIS, chlorophyll.

2007 BDUA – Journal of Biology, 2: 262. T0809IanJenkinsson15022007
Title: **Plankton-produced extracellular organic matter in the oceans: production, fate and functions**
Authors: Ian R. Jenkinson

PLANKTON-PRODUCED EXTRACELLULAR ORGANIC MATTER IN THE OCEANS: PRODUCTION, FATE AND FUNCTIONS

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ABSTRACT
In the open ocean, extracellular organic matter (OM), dissolved, colloidal and particulate (DOM, COM and POM) is produced, directly or indirectly, mostly by plankton. Chemical, mechanical and image analysis of this OM at appropriate scales was described, and some results were shown. Mechanical analysis of marine OM is still in its infancy. I shall show, however, how a combination of rheological and filtration spectroscopy can elucidate mechanical properties of OM at different scales, and model how plankters, under control of their genes, use colonies, glycocalyxes, and secretion of viscous polymers as well as dissolved non-polymeric substances such as dimethyl sulphide (DMS) to engineer their environment and produce sometimes bigger-scale “collateral” effects. OM moves between DOM, COM and POM phases, by grazing and repackaging, bacterial degradation and spontaneous aggregation. Current working definitions of DOM, COM and POM would then be considered, but alternative definitions will be proposed, that are better adapted to particular physical and biological oceanic processes at molecular to biogeochemical scales. Such processes and their inherent scales, would be illustrated by the formation and destruction of the OM itself, as well as by water movement, diffusion and vertical flux. These process were all partly under genomic control through plankton and the mechanical properties of the COM and POM it produces, reworks and utilises.

Keywords: Extracellular organic matter, genomic control, image analysis, rheology.

2007 BDUA – Journal of Biology, 2: 263. T0810DeboraMoraes15022007
Title: **Toxicity potential of *Merismopedia* sp. isolated from the Carioca lake, Rio Doce State Park – MG**
Authors: Débora Chaves Moraes, Iara Christina de Campos, Maíra Oliveira Campos, Evanguedes Kalapothakis & Francisco Antônio Rodrigues Barbosa

TOXICITY POTENTIAL OF THE *Merismopedia* sp. ISOLATED FROM THE CARIOCA LAKE, RIO DOCE STATE PARK – MG

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ABSTRACT
The eutrophication of aquatic environments favours the massive growth (bloom) of cyanobacteria. They are capable of producing potent toxins (cyanotoxins) that can cause implications to the health of human beings, fishes and other animals. Exotic species were introduced into the Carioca lake, located at the Rio Doce State Park. This resulted in impacts to its planctonic communities. There are 13 species of cyanobacteria in this environment, amongst them the *Merismopedia* sp.. Studies published relate algae of this genus to the production of microcystins and nodularins – two kinds of hepatoxins. This project's aim was to use molecular techniques to analyse the genetic material of the *Merismopedia* sp. algae which was collected from this lake. The genes involved in the microcystin and nodularin production have already been identified being denominated as *mcy* and *nda*, respectively. By knowing the nucleotide sequence of these genes, it is possible to draw oligonucleotides initiators having as aim specific sequences of these genes. This allows for the amplification by PCR and the identification of the potentially toxic cyanobateria. New oligonucleotides will be drawn (more sensitive than the already mentioned) that, together with other already-described "primers", will be used to evaluate whether these algae possess the *mcy* or *nda* genes. If the presence of toxic lineages is observed, it is important to pay more attention to possible variations in the density of *Merismopedia* sp. in the Carioca lake.

Keywords: Cyanobacteria, hepatotoxins, *Merismopedia*, molecular methods, oligonucleotides initiators, PCR.

THEME 9

Climate, global processes and plankton time series. Analysis and comparison of trends of plankton - and climate time series

2007 BDUA – Journal of Biology, 2: 267. T0901EduardoMillan07012007
Title: **Phytoplankton sizes fraction biomass and *Prochlorococcus* distribution in the southern California Current System during winters 2001-2003**
Authors: Eduardo Millán Núñez & Roberto Millán Núñez

PHYTOPLANKTON SIZES FRACTION BIOMASS AND *Prochlorococcus* DISTRIBUTION IN THE SOUTHERN CALIFORNIA CURRENT SYSTEM DURING WINTERS 2001-2003

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ABSTRACT
The measurement of sizes fraction phytoplankton and distribution of *Prochlorococcus* sp. were determined as part of the Januaries 2001-2002 and 2003 IMECOCAL cruises along the southern California Current System.
The nano-microphytoplankton (>5 µm) showed a tendency to decreased the diversity and cellular abundance along the winters 2002-2003 with relation the January 2001. Flow cytometry analysis showed that the picoplankton (<5 µm) distribution were mainly in of coast stations and consisted in: *Prochlorococcus* sp., *Synechococcus* sp., and picoeukaryotes. The spatial and temporal variability of *Prochlorococcus* sp. showed that this community increased in January 2002 with a mean values ~65000 $x10^3$ cells.L^{-1}. The pigments-phytoplankton by HPLC confirmed the presence of *Prochlorococcus sp.* as measured by divinyl chl *a*. Along this surveys, the contribution of the picoplankton at to total production biomass (µg C.L^{-1}) were 16% (2001), 53% (2002) and 98% (2003).
In this study, we were concluded that the phytoplankton community structure of the southern California Current was more similar to that found under an El Niño condition than what occurred in the previous year.

Keywords: Fraction-phytoplankton biomass · El Niño events · California Current System.

2007 BDUA – Journal of Biology, 2: 268. T0902BrianRothschild31012007
Title: **Plankton-Particle Theory**
Authors: Brian J. Rothschild

PLANKTON-PARTICLE THEORY

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ABSTRACT
Many studies of plankton are based on continuum theory, which tells us how plankton concentrations vary in space and time. However, the theory loses information on the distances among the plankton particles. This information is important in studying predator-prey interactions and production of diffusates. Put simply, the dynamics of X plankton M^{-3} is different if they are packed together or randomly distributed in the M^3. This paper discusses plankton particle distribution from 1) a stochastic geometry viewpoint, 2) a renewal process viewpoint, and 3) a particle-swarm viewpoint.

Keywords: Plankton-particle theory, plankton distribution.

2007 BDUA – Journal of Biology, 2: 269. T0903MarinaManca01022007
Title: **The response of pelagic zooplankton to oligotrophication and climate-driven events in Lake Maggiore, Italy**
Authors: Marina Manca, Anna Visconti & Riccardo de Bernardi

THE RESPONSE OF PELAGIC ZOOPLANKTON TO OLIGOTROPHICATION AND CLIMATE-DRIVEN EVENTS IN LAGO MAGGIORE, ITALY

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ABSTRACT
Lake Maggiore, a deep, olo-oligomictic, phosphorus-limited subalpine lake in Italy, underwent a process of re-oligotrophication over the last 20 yr that brought it back to a state of oligotrophy after a stage of eutrophication from the 60s to mid-80s.
The response of planktonic communities, in terms of species richness, community structure, abundance and size, was analysed through historical records, as well as palaeolimnological methods, allowing to discuss predicted/observed response of plankton to a reversal from eutrophication.
After the re-oligotrophication, the effect of climate-driven events, such as complete vertical mixing, exceptional floods, and the occurrence of exceptionally warm years were detected, and the short-term response of planktonic communities analyzed, allowing to test the hypothesis of a larger and clearer impact of climate change in oligotrophic environments.
During exceptionally warm years of the oligotrophic phase, zooplankton yearly pattern resulted overall comparable to that of the mesotrophic phase, thus confirming the hypothesis of a eutrophication-like effect of warming; However, seasonal dynamics appeared to have changed in a way consistent with the effects on zooplankton populations of a water temperature increase, as suggested by laboratory experiments on the effects of water temperature on reproductive and growth strategies.

Keywords: Climate, trophy, plankton.

2007 BDUA – Journal of Biology, 2: 270. T0904MarinaManca01022007
Title: **Long-term changes in the Cladocera assemblage of Lake Maggiore: the impact of climate and trophy reconstructed by means of neo- and paleo limnological techniques**
Authors: Marina Manca, Barbara Torretta, Patrizia Comoli & Piero Guilizzoni

LONG-TERM CHANGES IN THE CLADOCERA ASSEMBLAGE OF LAKE MAGGIORE: THE IMPACT OF CLIMATE AND TROPHY RECONSTRUCTED BY MEANS OF NEO- AND PALEO LIMNOLOGICAL TECHNIQUES

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ABSTRACT
Changes in trophic dynamics in Lake Maggiore from 1943 to 2002 using subfossil cladoceran data from a high resolution sediment record were compared with long contemporary data. During the eutrophication, a major increase occurred in the abundance of *Chydorus sphaericus*, the proportion of planktonic cladocerans and total abundance of cladocerans in the sediment. Since 1980 the abundance declined and subfossil *Eubosmina* mucro length and contemporary *Daphnia* body length increased, most likely as a result of increased invertebrate predation. Changes in the fish stock after fish introduction before eutrophication and a complete fishing ban during oligotrophication could be detected in the community assemblage and size structure of the sediment zooplankton. The good correspondence between contemporary data and the subfossil record suggested that sediment samples could be used to infer past development in trophic dynamics, including predation by fish and pelagic invertebrates in lakes with scarce neolimnological data. The detection in the sediments of meteorological events whose effects on zooplankton had been recorded in the long-term studies also provided evidence that eutrophication tends to override climate signals. A palaeo-neolimnological approach appears as a powerful tool for elucidating past changes in the tropic dynamics of lakes, not least when high resolution sediment records were available.

Keywords: Climate, trophy, plaeolimnology, neolimnology.

2007 BDUA – Journal of Biology, 2: 271. T0905AlexandraTemnykh05022007
Title: **Variability of the zooplankton and long-term changes in the water structure of the Black Sea**
Authors: Alexandra V. Temnykh, V.V. Melnikov, V.N. Belokopytov & Y.A. Zagorodnyaya

VARIABILITY OF THE ZOOPLANKTON AND LONG-TERM CHANGES IN THE WATER STRUCTURE OF THE BLACK SEA

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ABSTRACT
The results of studies of the zooplankton variability and the Black Sea background parameters have been presented. The data on biology and hydrology (195 cruises, 17877 stations) were used for investigation. The significance of hydrological factors on the distribution of plankton in the Black Sea was determined not only by background parameters, but also by actions of climatic factors which determine the evolution of the Cold Intermediate Layer (CIL). The variability of the Black Sea plankton biomass was connected with the long-term variability in the water masses hydrological structure. Dynamics in long-term climate variation leads to changes in the zooplankton dominating groups and determined the variability of the topography of the CIL, which corresponds to positions and development of 9 quasistationary zones of the anticyclonic gyres. These zones, situated over the continental slope, create favourable conditions for the development of many hydrobionts, due to the submergence of the surface aerated waters to the depth of 100-120 m. The significance of particular factors on the distribution of plankton and positions of quasistationary anticyclonic gyres zones of the Black Sea are therefore determined by climatic factors.

Keywords: plankton community, Black Sea, anticyclonic gyres, CIL, climatic factors.

2007 BDUA – Journal of Biology, 2: 272. T0906SCotrim12022007
Title: **Climate variability and planktonic communities: the effect of an extreme (severe drought) in a southern European estuary**
Authors: Sónia Cotrim Marques, Ulisses Miranda Azeiteiro, Filipe Martinho, Miguel Ângelo Pardal

CLIMATE VARIABILITY AND PLANKTONIC COMMUNITIES: THE EFFECT OF AN EXTREME (SEVERE DROUGHT) IN A SOUTHERN EUROPEAN ESTUARY

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ABSTRACT
As a consequence of climate change, flood and drought events are increasing in frequency throughout the world. Nevertheless, knowledge of the effects on zooplanktonic estuarine communities is still scarce. The present study aimed to examine zooplanktonic ecology over two different contrasting environmental conditions: regular years and an extreme dry year, in a shallow temperate southern European estuary, the Mondego Estuary (Portugal).
To fulfil such purpose, monthly samples were carried out during three consecutive years: 2003 characterized as a regular temperate year concerning precipitation and river flow, and an extremely dry period during 2004-05. The spatial and temporal structure of the biological data was evaluated by a three-mode principal component analysis which allowed us to distinguish three distinct ecological areas based on their biological composition and their relationship with hydrologic parameters.
The severe drought in 2004-05 was responsible for spatial shifts in the estuary regarding zooplankton community and interannual variability, with an increase of abundance and diversity during the period of low freshwater flow. This freshwater flow regime influenced the composition of the zooplanktonic community at the most upstream section of Mondego estuary, with a replacement of the freshwater community by one predominantly dominated by estuarine organisms. The occurrence of such estuarine community contributed to the increase in zooplankton abundance which was described to the estuarine species *A. tonsa*. The comparison with previous data obtained for this estuarine ecosystem, demonstrated the occurrence of a different scenario at times of high freshwater flow, being defined the existence of two sub-estuarine systems, the north and south arm, presenting the south one the highest values of abundance.

Keywords: Mesozooplankton community, interannual variability, extreme events, three-mode principal component analysis (PCA), estuary.

2007 BDUA – Journal of Biology, 2: 273. T0907FabioPamplona15022007

Title: **Hydrodynamics changes on Itupanema beach, estuarine sector of Pará State, Amazon, during the last millennium**

Authors: Fábio Campos Pamplona Ribeiro, Cristina do Socorro Fernandes de Senna, Brenda Oliveira da Costa & Lezilda Carvalho Torgan

HYDRODYNAMICS CHANGES ON ITUPANEMA BEACH, ESTUARINE SECTOR OF PARÁ STATE, AMAZON, DURING THE LAST MILLENNIUM

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ABSTRACT

The three sediment cores IT1 (42 cm), IT2 (20 cm) and IT5 (44 cm) were collected at tidal plain of Itupanema Beach (01º 31´ 03" S e 48º 43' 27" W), that integrates the estuarine continental sector of Pará State, Amazon.

The diatom analysis revealed 48 *taxa*, whose variations on values of both abundance and frequency data indicated 3 ecozones. In inferior ecozone IT1, (26-42 cm), A.D. 1020 age, the benthic *taxa Staurosira obtusa* (30.7 %) and *Staurosirella pinnata* (19,3%) reached the highest values of abundance, in shallow depositional environment, with high energy. This zone, absent in IT2, corresponds to IT5 interval 20-42 cm, with *S. obtusa* (54%), *Staurosira crassa* (24.7 %) and *S. pinnata* (20.0 %). The intermediary muddy ecozone (26-10 cm) occurred only in IT1, dated A.D. 1430 (20-22 cm). The same subjacent benthic taxa reduced its abundance, while the planktonic *Thalassiosira* sp. (21.7 %), *T. eccentrica* (14,67%) and *Aulacoseira granulata* (18,7%), increased in number, evidencing a calmer depositional environment, within deeper waters. The upper ecozone (10-0 cm/IT1), (20-0 cm/IT2) e (16-0 cm/IT5), subactual age, with organic-clay to organic sediments in the top, *Thalassiosira* sp1 (40,3%), *A. granulata* (28,3%) reached the highest values of relative abundance, in contrast to observed values for benthic taxa, indicating a calmer depositional environment, however with higher energy than the previous one, due to high abundance of *A. granulata*, strongly silicified. Changes in the ratio sand/clay of sedimentary stratus influenced the ratio of the benthic/planktonic species caused probably by local hydrodynamics changes occurred during the last millennium.

Keywords: Diatoms, tidal plain, estuaries, Amazon.

2007 BDUA – Journal of Biology, 2: 274. T0908FabioPamplona15022007
Title: **Diatom analysis on surface sediments of tidal plain, Itupanema Beach, estuarine sector of Pará State, Amazon**
Authors: Fábio Campos Pamplona Ribeiro, Cristina do Socorro Fernandes de Senna, Brenda Oliveira da Costa & Lezilda Carvalho Torgan

DIATOM ANALYSIS ON SURFACE SEDIMENTS OF TIDAL PLAIN, ITUPANEMA BEACH, ESTUARINE SECTOR OF PARÁ STATE, AMAZON

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ABSTRACT
Itupanema Beach integrates the estuarine continental sector of the Pará State, Amazon, where 10 surface-sediments samples were obtained at the tidal plain, within 5 m intervals and diatoms analysis following standard techniques.
The species richness included 58 *taxa*, 82.75 % periphytic and 17.24 % planktonic *taxa*. The more abundant and frequent species were *Staurosirella pinnata*, *Aulacoseira granulata*, *Thalassiosira* sp., *Staurosira obtusa*, *Encyonema silesiacum*, *Gomphonema* sp., *Planothidium lanceolatum, Thalassiosira eccentrica*, *Cyclotella meneghiniana*, *Encyonema minuta*, *Nitzschia amphibia* and *Frustulia rhomboides*. Cluster analysis using Bray-Curtis distance was applied on samples, using species relative abundance data. The results showed that the first smaller cluster of samples included only the mud sample 5, where *A. granulata* and *Thalassiosira* sp1 reached the highest abundances (30.33 and 20.33 %), in contrast to *S. pinnata* (12.67 %) and *P. lanceolatum,* absent. The second cluster (sandy samples 3 and 10) showed that *S. pinnata* e *P. lanceolatum* reached the highest abundances (25.33 and 42 %) and (11.33 and 8.33 %) respectively, while *A. granulata* and *Thalassiosira* sp. were less abundant, with (4.67 and 7.33 %) and (3 and 1.67 %) respectively. The largest cluster was formed by 7 sand-clay samples, where the species *Staurosirella pinnata*, *P. lanceolatum*, *Aulacoseira granulata* and *Thalassiosira* sp. reached together values > 40% of total abundance, indicating similar contents of both sand and clay sediments. The ratio sand/clay in sediments was affected by estuarine hydrodynamics processes, which could cause strong impact on variations of abundance of the planktonic species *A. granulata* and *Thalassiosira* sp. and benthic species *S. pinnata* and *P. lanceolatum*.

Keywords: Diatoms, tidal plain, surface sediments, estuaries, Amazon.

THEME 10

Modelling. Various modelling approaches such as bioaccumulation, spatial analysis and GIS - applications

2007 BDUA – Journal of Biology, 2: 277. T1001PeterZauke25102006
Title: **Toxicokinetic models as predictive tools in biomonitoring of metals in zooplankton**
Authors: Gerd-Peter Zauke

TOXICOKINETIC MODELS AS PREDICTIVE TOOLS IN BIOMONITORING OF METALS IN ZOOPLANKTON

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ABSTRACT
Bioavailable fractions from food and water are important to assess the environmental quality regarding metals in aquatic systems. Both sources are integrated into accumulated concentrations in aquatic invertebrates, which are often varying specifically even in the same water body. A concept is presented to quantify, compare and predict this potential for bioaccumulation regarding polar zooplankton. (1) Toxicokinetic experiments were performed onboard "RV-Polarstern" (ARK-IX/1b) to evaluate models for uptake and elimination of Cd, Pb, Cu and Zn in the amphipod *Themisto abyssorum* (Greenland Sea). Except for Cd, the amphipods responded with metal uptake upon external exposure, but, also eliminated metals significantly during elimination phases. (2) Independent experiments involving a broader range of exposures were performed on the same cruise to verify model predictions from (1). This was successful for Pb, Cu and Zn. (3) Further verifications of these modelling results were obtained by independent experiments performed on cruise ARK-XV/3, again with *T. abyssorum*. Linear regressions between observed and predicted values, yielding slopes around 1, indicated a good agreement. Furthermore, differing slopes were used to quantify differences in the potential for bioaccumulation, e.g. regarding two Antarctic benthic amphipods. (4) Finally, the sensitivity of organisms as biomonitors was evaluated by determining how large an increase of exposure must be to produce a detectable increase of accumulated metal concentrations, involving statistical aspects and a simulation of bioaccumulation using previously derived toxicokinetic parameters and varying exposure levels. This proved to be a powerful tool to predict future bioaccumulation and to compare field data worldwide.

Keywords: Bioaccumulation, polar zooplankton, toxicokinetic models, verification, prediction.

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Title: **Concepts for the application of geostatistics in marine studies: from fisheries to plankton**
Authors: Vanessa Stelzenmüller, Claus-Dieter Dürselen & Gerd-Peter Zauke

CONCEPTS FOR THE APPLICATION OF GEOSTATISTICS IN MARINE STUDIES: FROM FISHERIES TO PLANKTON

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ABSTRACT
In ecological studies random sampling designs are often employed and classical statistical procedures are used for data evaluation. Consequently, observations are assumed to be independent from each other. Any violation of this assumption can lead to a bias in population estimates (means and variances). Thus, methods like geostatistics are required considering the existence of spatial structures. While in fisheries geostatistics is frequently used, this is rarely the case in plankton studies. Two examples from either field to demonstrate the potentials of this methodology were presented. (1) Geostatistics was used to investigate spatial distribution patterns of dab, *Limanda limanda*. A standard survey carried out in a meso-scaled area in the German Bight was modified by additional small-scale sampling. This design reduced the small-scale variability for medium-sized and male fish, as indicated by lower values of the nugget effect and an increased resolution of the spatial dependency with an effective range of 2.6 - 4.8 km in the variogram model. This can be interpreted as the patch size of the fish. (2) Spatial analyses were performed using phytoplankton data from the German Bight (30 m integrated biovolumes). For most species analysed univariate generalized additive models (GAMs) indicated a high proportion of the variability due to pronounced west-east trends. Only for the diatom *Thallassiosira rotula* was found a spatial dependency with an effective range of 28 km. The methods employed allow consideration of additional variables such as salinity or nutrients and are thus a promising tool in future plankton studies.

Keywords: Geostatistics, fisheries, phytoplankton, spatial range, variogram.

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