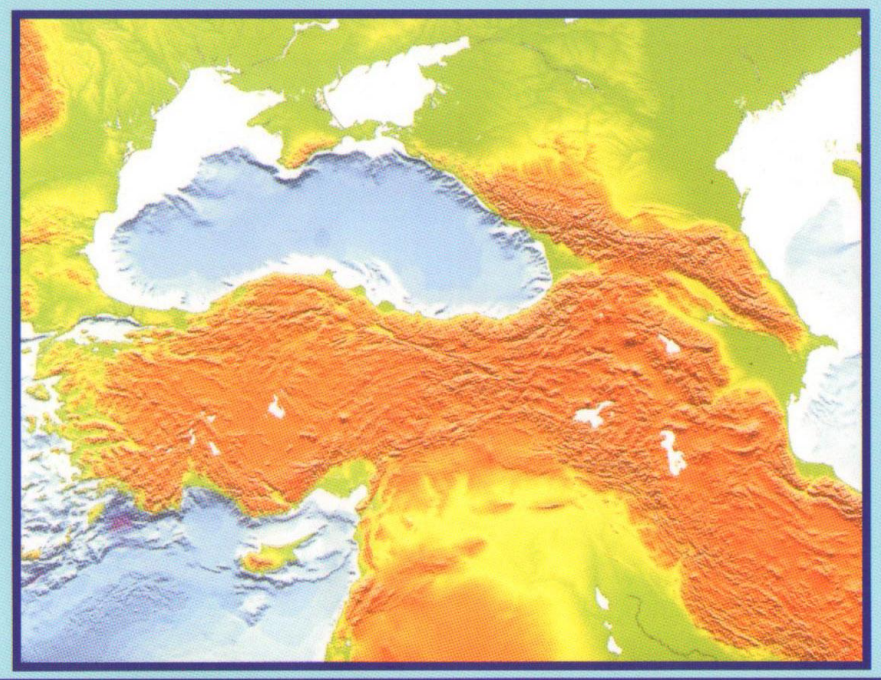
HELLENIC CENTRE FOR MARINE RESEARCH

Hellenic Centre for Marine Research at the Hydrobiological Station of Rhodes, Greece

27 September - 5 October, 2010

INTERNATIONAL GEOSCIENCE PROGRAMME



ABSTRACT VOLUME

IGCP 521 - INQUA 501 Sixth Plenary Meeting and Field Trip

IGCP 521 "BLACK SEA-MEDITERRANEAN CORRIDOR DURING THE LAST 30 KY: SEA LEVEL CHANGE AND HUMAN ADAPTATION (2005 - 2010)

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Beachrock formation in a freshwater lake environment, Lake Iznik coast, Turkey: a preliminary assessment of microanalytical data and optical luminescence ages

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Keywords: beachrock, cementation, freshwater lake environment, Lake Iznik, Turkey

The amalgamation of loose beach sediments by connective carbonaceous material gives rise to the formation of beachrock in the strict sense in intertidal areas of tropical and subtropical environments (Ginsburg, 1953; Bricker, 1971; Vousdoukas et al., 2007). With respect to their morphologic and stratigraphic appearance, beachrocks are composed mainly of seaward dipping cemented beds, however, proper understanding of their environment of formation cannot be elucidated without considering the physico-chemical characteristics of their connective cement in that the precipitated cement effloresces under certain physico-chemical conditions. The four main agents that lead to precipitation of calcium carbonate cement are well-known, i.e., mixing of marine and meteoric waters (Schmalz, 1971), CO_2 degassing of shallow groundwater (Hanor, 1978) evaporation of sea water (Stoddart and Cann, 1965; Taylor and Illing, 1969; Scoffin, 1970; Moore and Billings, 1971; Meyers, 1987), and micro organisms (Krumbein, 1979; Webb et al., 1999; Neumeier, 1999; Khadkikar and Rajshekhar, 2003).

Beachrocks are widely distributed along Turkey's long coastline of 8333 km (Avşarcan, 1997), and exposures have been reported from several coastal parts of the Mediterranean (Bener, 1974; Desruelles et al., 2009) and Aegean Seas (Erol, 1972; Ertek and Erginal, 2003; Erginal et al., 2008; Erginal et al., 2010). In this study, however, we discuss the origin of beachrock in the Lake Iznik area with the aim of contributing to the understanding of beachrock formation in freshwater lake environments. The cementation characteristics and age of the beachrocks are dealt with on the basis of geomorphological observations, microanalytical data (SEM/EDX), and optically stimulated luminescence (OSL) dating estimations. These beachrocks slope slightly toward the lake and outcrop throughout the coastal perimeter of Lake Iznik, located in the eastern Marmara Region of northwestern Turkey (Fig. 1). Beds range between 40 cm and 1.20 m in thickness, and their width can reach up to 30 m with locations a few meters offshore. Based on spectroscopic data, cement materials are composed of high magnesium calcite and, particularly, aragonite, suggesting that processes governing the cementation might have been different from those in present freshwater lake environments. Furthermore, SEM images have revealed that beachrock beds include various diatoms, such as *Amphora* sp. and *Cocconeis* sp., as well as thick micrite envelopes and copious needles of aragonite. OSL results indicate that the beachrocks have different age distributions ranging between 4000 and 500 BP. Based on beachrock composition, precipitation of their cement material from lake waters might have occurred under different geo-chemical and evaporation conditions that would have favored beachrock formation in the late Holocene.

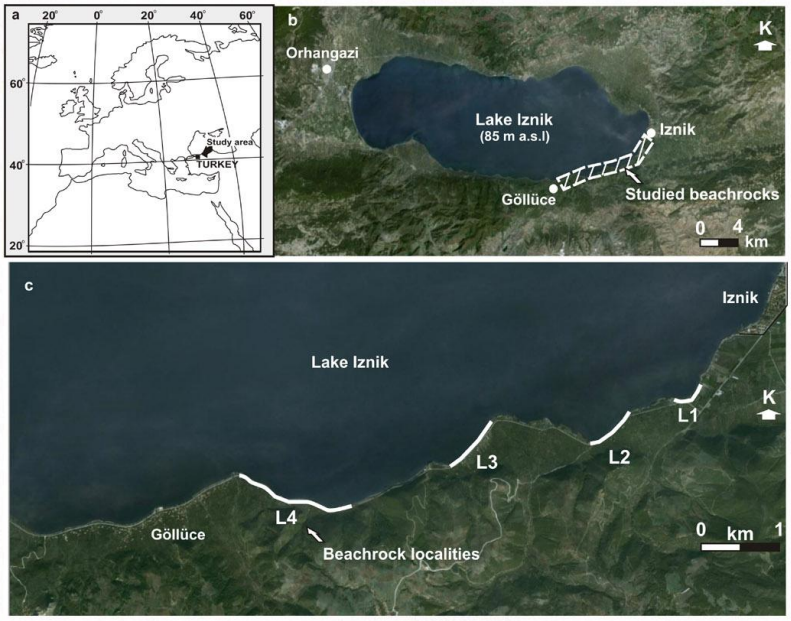


Figure 1. Location map of the study area.

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