



Downwearing rates on shore platforms and rocky coast evolution- bioerosion contribute

Delminda Moura (1), Selma Gabriel (1), Ana Ramos Pereira (2), Mário Neves (2), Jorge Trindade (2), Sofia Gamito (3), Rui Santos (4), Ana Mafalda Tavares (4), Estibaliz Berecibar (4), and Ana Luísa Martins (1)

(1) Marine and Environmental Research Centre-CIMA, University of Algarve Campus de Gambelas, 8005-139 Faro, Portugal (dmoura@ualg.pt / Fax: +351 289800069), (2) Geography Research Centre / IGOT - University of Lisbon. Edifício FLUL, Alameda da Universidade, 1600-214 Lisboa, Portugal, (3) Institute of Marine Research. University of Algarve- Campus de Gambelas, 8005-139 Faro, Portugal, (4) Center of Marine Sciences of Algarve. University of Algarve, Campus de Gambelas, 8005-139 Faro, Portugal

Carbonate rocks are extremely vulnerable to biochemical weathering and, consequently carbonate shores are morphologically complex. Living organisms on hard substrates develop specialized strategies to construct its domicile, to dislodge and to compete by space and food with other species. Those strategies include mechanical and chemical processes, among them, substrate boring, etching, cementation and dissolution (e.g., Trudgill, 1988; Andrews and Williams, 2000; Bromley and Heinberg, 2006). Shore platforms represent available areas to be biocolonized and, the role of biochemical processes have been emphasizes as important mechanisms on platform genesis (e.g., Stephenson and Kirk, 2000).

The current work aims to quantify the role of biological activity in carbonate rocky coast evolution at the centre Algarve (south Portugal). In this area, cliffs expose Miocene carbonate rocks composed by calcarenites and carbonate siltstones.

Two coastal sectors with different exposure to waves were monitored: (i) Galé, a well exposed sector to dominant waves from SW and, (ii) Olhos de Água in a sheltered position exposing softer rocks than in Galé. Shore platforms survey and cross-shore topography profiles were done by using a Differential Global Position System (DGPS). Macroalgae and macrozoobenthos colonizing shore platform in both sites (Galé and Olhos de Água) were sampled and identified and, density and species richness was quantified. Three stations in Galé and two more in Olhos de Água where chosen to downwearing measurements. Each station was divided in two half portions: (i) control area, (ii) area to be monitored. In the later one, rock was maintained bared by monthly adding H₂O₂ to kill organisms. Downwearing rates on bare rock were measured by using a Transverse Microerosion Meter (TMEM) along sixteen months. The control area was measured at the begin of the experience and after sixteen months during which was naturally biocolonized. In addition, density of holes produced by borers as well its volume inside the TMEM stations were estimated either by photo-interpretation and direct measurements. The rocks Schmidt hardness and uniaxial compressive strength were quantified.

The measured downwearing rates correlate positively with borer and etching activities and negatively with the percentage of macroalgae coverage and substrate hardness. Despite we consider the lower value of downwearing rate it is enough to justify a height decrease of 26.13cm during the last 5 kyr when mean sea level was similar to the current one.

Acknowledgments

The present work is supported by the Portuguese Foundation for Science and Technology-FCT, Research Project PTDC/CTE-GEX/70448/2006 (BISHOP)

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