[XIV SIEBM - *Simposio Ibérico de Estudios de Biología Marina, Barcelona, 2006]*

Wave Induced water Motion explain the bathymetrics segregation of the three sea urchin species in rocky reefs of the eastern Atlantic.

Tuya, F. (1) Cisneros, J. (2) Ortega.Borges , L. (3)

(1) School of Natural sciences, Center for Ecosystem Managament, Edith Cowan University, Joandalup WA Australia (2) Dept of Physics Marine Sciences (Faculty Campus Tafira, las Palmas de Gran Canaria.

Quantifying the effects of the wave-induced forces on the distribution and abundance patterns of marine organisms, and how they vary in space and time, is key to understand the evolutionary and ecological consequences of morphological designs, and the subsequent effects of wave-driven forces on the structure of benthic systems. We examined whether three sea urchins species (Diadema aff. antillarum, Arbacia lixula, and Paracentrotus lividus) exhibit a depth-dependent partitioning in rocky reefs of the Canarian Archipelago (eastern Atlantic). Unidirectional-flow experiments were carried out to quantify the resistance to flow-induced dislodgement in the three species. We tested the hypothesis that the differential biomechanical adaptations to wave action can result in habitat partitioning among these urchins. Abundances of D. antillarum increased in a down-shore direction. In contrast, A. lixula and P. lividus showed an opposite zonation pattern, coexisting in high abundances in the shallowest waters (< 7 m), and showing low densities in the deepest part of reefs (> 7 m). Both A. 1.36) had greater adhesion-surface± 1.64) and P. lividus (4.20 ±lixula (4.98 0.54). Similarly, A. lixula and±to body-height ratios than D. antillarum (1.41 P. lividus showed a greater ability to resist flow-induced dislodgement compared with D. antillarum. The mean 'velocity of dislodgement' was ~ 50% and 300% greater for A. lixula and P. lividus, respectively, with regard to D. antillarum, for any particular size. As a result, A. lixula and P. lividus are better fitted to life in high-flow environments compared with D. antillarum. We conclude that the risk of dislodgement by water motion play a relevant role in the vertical distribution patterns of these sea urchins.