

S14: Effects of Ocean Acidification on organisms and communities

Acid-base physiology of the Antarctic sea urchin *Sterechinus neumayeri*: differences according to environmental conditions?

Di Giglio Sarah ¹, Antonio Agüera¹, Bruno Danis¹, Marc Eléaume², Jérôme Fournier³, Cyril Gallut⁴, Philip Jane⁵, Loïc Michel⁶, Francesca Pasotti⁷, Ricardo Sahade⁸, Ann Vanreusel⁷, Dubois Philippe¹

¹ Laboratoire de Biologie marine CP160/15, Université Libre de Bruxelles, 50 av. Roosevelt, B1050 Bruxelles, Belgium

E-mail: phdubois@ulb.ac.be

² Institute of Systematics, Evolution & Biodiversity, UMR 7205, Muséum National d'Histoire Naturelle, Rue Cuvier 57, F75005 Paris, France

³ UMR7208-BOREA, Département Milieux et Peuplements Aquatiques, Muséum National d'Histoire Naturelle, BP 225, F29182 Concarneau Cedex, France

⁴ Institute of Systematics, Evolution & Biodiversity, UMR 7205, Concarneau Biological Marine Station, Université Pierre and Marie Curie, Quai de la Croix, F29900 Concarneau, France

⁵ Aquarium de Paris – Cinéaqua, Avenue Albert de Mun 5, F75016 Paris, France

⁶ Laboratory of Oceanology, University of Liège, B6C, Allée du 6 Août 15, Quartier Agora, Sart-Tilman, B4000 Liège, Belgium

⁷ Marine Biology Laboratory, Ghent University, Krijgslaan 281/S8, B9000, Gent, Belgium

⁸ Institute of Animal Diversity and Ecology, CONICET, Fac.Cs. E.F. y Nat. National, University of Cordoba, Cordoba, Cordoba, Argentina

Increasing atmospheric carbon dioxide concentration alters the chemistry of the oceans towards more acidic conditions. Polar oceans are particularly affected due to their low temperature, low carbonate content and mixing patterns, for instance upwellings. Tolerance to ocean acidification (OA) in metazoans is first linked to acid–base regulation capacities of the extracellular fluids. It has also been suggested to depend on the environmental history of the organism. Organisms living in variable environments would be more adapted or acclimated to changes in sea water pH. To address these questions, we investigated the response of the Antarctic regular euechinoid *Sterechinus neumayeri* from shallow populations in Adélie Land (Ile des Péterels) and the Antarctic Peninsula (King George Island), the former region having stable conditions while the second is showing a fast rate of warming due to global change and seasonally variable conditions. The sea urchins were submitted to a 14-days acidification experiment carried out, respectively, in Dumont d'Urville and Carlini bases in the frame of the vERSO BELSPO and REVOLTA IPEV projects. Two (8.0, 7.7) or three (8.0, 7.7, 7.4) seawater pH-T were tested. The pH, total alkalinity and dissolved inorganic carbon of the coelomic fluid, the main extracellular compartment, were measured, allowing to characterize the acid-base status and its response to a short term acidification.