Entoprocta–sponge associations in the Indian Ocean

Fig. 1 **a** *Clathria* sp. colonized by many entoproct zooids. **b** High magnification of *Petrosia* sp. showing individual entoproct zooids extending their tentacles. **c** Specimen of *Loxosomella* sp. found in association with *Clathria* sp. fg foot gland, gr foot groove

The phylum Entoprocta is one of the most enigmatic groups of living invertebrates, although approximately 200 species are currently recognized (Nielsen 2013). Entoprocts are suspension feeders distributed worldwide, and most species live epizooically on other marine organisms (Iseto 2010). The only association recorded from the Indian Ocean is represented by three species belonging to the genus *Loxosoma*, associated with tube-building polychaetes found in Thailand (Nielsen 1996). During a recent biodiversity survey on Kunfunadhoo Island, Baa Atoll, Maldives (05°07'N, 73°04'E), entoproct zooids were found in association with four genera of sponges—*Cliona*, *Clathria*, *Dragmacidon* and *Petrosia*—at depths of 5–32 m (Fig. 1a, b). Morphological analyses of all sponge-associated entoprocts revealed the presence of a foot-like appendage with a foot gland (fg) and groove (gr) at the base of the stalk (Fig. 1c), which are two distinctive features of the solitary genus *Loxosomella* (Iseto 2010). To the best of our knowledge, this is the first record of an association between *Loxosomella* and sponges in the Indian Ocean, as well as the first discovery of the phylum Entoprocta in the Maldivian archipelago. Organisms such as entoprocts are often overlooked in the field because of their small size (0.2–5 mm). Therefore, we strongly recommend additional ecological investigations of interspecific interactions involving tropical entoprocts and morpho-molecular studies targeted to detect the real diversity of this phylum. Our findings confirm that coral reef-associated biodiversity and the potential benefits and disadvantages of interspecific interactions remain insufficiently explored in the Indian Ocean.

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References

- Iseto T (2010) Comparative morphology of the foot structure of four genera of Loxosomatidae (Entoprocta): implications for foot functions and taxonomy. *J Morphol* 271:1185–1196
- Nielsen C (1996) Three new species of *Loxosoma* (Entoprocta) from Phuket, Thailand, with a review of the genus. *Zool Scr* 25:61–75
- Nielsen C (2013) Entoprocta. *Encyclopedia of life sciences*. Wiley, Chichester. doi:10.1002/9780470015902.a0001596.pub2

A. Giorgi (✉) · M. Monti · P. Galli · S. Montano
Marine Research and High Education Center (MarHE), Magoodhoo Island, Faafu Atoll, Republic of Maldives
e-mail: aurora.giorgi88@gmail.com

P. Galli · S. Montano
Department of Biotechnologies and Biosciences, University of Milan-Bicocca, Piazza della Scienza 2, 20126 Milan, Italy

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