Reef sites

Evidence of corallivory by the keyhole limpet *Diodora galeata*

Fig. 1 **a** Cryptic *Diodora galeata* on *Pocillopora damicornis*, **b** an individual *Diodora galeata* found on *Pocillopora verrucosa*, **c** *Diodora galeata* on one of several feeding scars on the coral *Pocillopora damicornis* exhibiting several feeding scars in red circles. Scale bars represent 10 mm. Photographs **a** and **b** taken in situ in the Lizard Island Blue Lagoon at 2 m depth. Photographs **c** and **d** taken in aquaria

A number of gastropod species are known to associate with live coral, depending on the coral as a source of food (Robertson 1970). *Diodora galeata* (Helbling 1779) is a small limpet (up to 20 mm in length; Fig. 1a) belonging to the family Fissurellidae (keyhole limpets). Although mainly herbivorous, grazing on micro-algae, some fissurellids have also been observed to graze on sponges and detritus (Fretter and Graham 1976). However, little is known about the ecology of this family.

The occurrence of corallivory among this family is now reported for the first time. Recent observations were made in the field of *D. galeata* occurring on and apparently consuming the tissue of three pocilloporid corals: *Pocillopora damicornis*, *P. verrucosa* (Fig. 1b, c) and *Stylophora pistillata*. To confirm these observations, 40 colonies of *P. damicornis* were collected from 2–3 m depth within the lagoon of Lizard Island, Australia, and examined in the laboratory. They contained 22 specimens of *D. galeata* ranging from 13–19 mm (Fig. 1c). Although most colonies contained only one individual, two colonies had two individuals. Only colonies on which the animal was present

exhibited areas of recent tissue loss, exposing denuded coral skeleton usually extending down one or more branches. The animals were located within the margins of these feeding scars and were observed actively moving over areas of live coral tissue. Some colonies had several feeding scars, resulting in considerable tissue loss (Fig. 1d).

Algae-covered shells render these animals inconspicuous. They also usually occurred deep within the branches of their coral host. As they have not previously been known to consume coral, they may have been overlooked thus far and their feeding scars attributed to other species. It is also unknown whether these animals occur on non-pocilloporid corals. *Diodora* have a long lifespan (10–20 years) and do not have a planktonic larval phase; thus, dispersion is limited to the immediate vicinity of the adults (i.e., <10 m) (Fretter and Graham 1962), enabling the occurrence of high densities within a given area. As these life history traits could lend this species the potential to be a significant corallivore, future studies need to assess their impact on coral reefs.

Acknowledgments I thank Lizard Island Research Station for logistical support, M. Reid of the Australian Museum for specimen identification, and B. Gordon for photograph assistance.

References

- Fretter V, Graham A (1962) British prosobranch molluscs: their functional anatomy and ecology. Ray Society, London
- Fretter V, Graham A (1976) The prosobranch molluscs of Britain and Denmark. Part I. Pleurotomariacea, Fissurellacea and Patellacea. J Moll Stud Suppl 1:1–37
- Robertson R (1970) Review of the predators and parasites of stony corals with special reference to symbiotic prosobranch gastropods. Pac Sci 24:43–54

J. S. Stella (✉)

ARC Centre of Excellence for Coral Reef Studies, and School of Marine and Tropical Biology, James Cook University, Townsville, QLD 4811, Australia
e-mail: Jessica.Stella@my.jcu.edu.au

J. S. Stella

Australia and Climate Adaptation Flagship, CSIRO, Hobart, TAS 7001, Australia

Received: 24 November 2011 / Accepted: 14 January 2012 / Published online: 5 February 2012

© Springer-Verlag 2012

Coral Reefs (2012) 31:579
DOI 10.1007/s00338-012-0877-0