

INTERACTION BETWEEN CORAL ASSEMBLAGES AND CORALLIVOROUS GASTROPODS ON THE GREAT BARRIER REEF

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As a result of reports of recent outbreaks of drupellid gastropods there is a strong perception of the species as a serious destructive force on coral reefs. On the Great Barrier Reef recent survey work presents a different picture. On mid shelf reefs of the Northern Cairns Section corals damaged by corallivorous gastropods accounted for an average of 18.1% of damaged coral colonies (Ayling, 1991). A pilot survey conducted in this area at Lizard Island in June 1991 detected substantial numbers of *Drupella*, with *Drupella cornus* and *Drupella rugosa* co-occurring. These are members of a coral-associated assemblage of gastropods which includes herbivorous and possibly other corallivorous species.

The picture obtained from the Great Barrier Reef is one of chronic (persistent low-level) effects on the coral communities. The gastropod populations typically feed on corals of certain taxonomic groups (*Acropora* and Pocilloporidae) and growth forms (especially corymbose and bottlebrush), probably because these have closely packed branches which provide good shelter. This leads to the potential for gastropod predation to promote a significant shift in coral community dynamics by selectively removing certain species or growth forms.

The primary aim of this study is to obtain a quantitative overview of the role of these gastropod assemblages in reef community dynamics on the Great Barrier Reef. Initial emphasis is on the effect of *Drupella* populations on coral communities around the Lizard Island area. Initial pilot studies were aimed at understanding the nature of these assemblages, their taxonomy and dynamics and included the following objectives:

- a) Collection of material for a taxonomic survey of the gastropod fauna associated with corals.
- b) Examination of the distribution and abundance of gastropods on a local scale in relation to structural composition of the coral community.
- c) Establishment of longer-term monitoring programs, using permanently marked sites.

Study sites are located at the north-eastern side of Lizard Island, sheltered from the south-east trade winds. All coral colonies found infested by corallivorous gastropods belonged to two groups of fast-growing species, the genus *Acropora* and the family Pocilloporidae. The coral communities consist of a high percentage of Acroporidae, but the Pocilloporidae are relatively rare. Amongst the *Acropora*, there is a high proportion of corymbose and bottlebrush growth forms and these are the growth forms that most commonly harbour corallivorous snails. Corymbose forms are defined as colonies that are composed of horizontal anastomosing branches and short vertical branchlets. Bottlebrush forms are defined as colonies that have short side branchlets projecting out from the main branch.

Line transects were used to characterize the coral communities. 5mx5m plots were used to measure the abundance and distribution of corallivorous gastropods. 10mx3m permanent sites have been photographed, mapped and marked.

In this report results are presented from initial pilot surveys of the gastropod and coral assemblage structures from selected study sites at Lizard Island. There are complex interactions involving a coral assemblage and a gastropod assemblage which require three

levels of description:

- a) the characteristics of the coral community
- b) the pattern of infestation of corals and
- c) the characteristics of the gastropod assemblages.

Average infestation rates were 3-4% of the total coral colonies. This translates to 8-10% of the *Acropora* and Pocilloporidae.