

Chapter 5

Coral-associated exosymbionts of northeast Madagascar

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INTRODUCTION

Our best estimates of global biodiversity are poor. Even getting within the correct order of magnitude has proven to be a difficult goal. Entomologists working in rainforests have provided the best working estimates of terrestrial diversity. Based on the correlation between structural species (trees) and host specific symbionts (herbivorous insects), they have estimated global insect abundance at 2-50 million species. Symbioses are ubiquitous on coral reefs, yet a similar approach has not been taken with regard to estimating the numbers of host-specific reef associates, and the further extrapolation to estimates of reef diversity. This work will build up a working collection of marine structural species (hexacorals, octocorals, etc.) and their associated species (families of crabs, shrimp, barnacles, gastropods, bivalves, amphipods etc.) that in the future may contribute to deriving a total biodiversity estimate for the region.

METHODS

Standard collecting methods were used - searching structural species in the field for externally visible exosymbionts or anomalies in the surface texture. Sampling sites are shown on Table 1 in the "Report at a Glance" section on page 13. If visible exosymbionts or anomalies were seen, samples of the host were collected and later rinsed in ethanol and preserved for museum collections. Coral genetic samples were preserved in 95% ethanol and dimethyl sulphoxide (DMSO). Skeletal specimens were dried in the sun. Octocorals were preserved in ethanol. The associated fauna separated from the skeletons was preserved using ethanol. Sampling was opportunistic throughout the RAP survey, creating one database, not site-specific inventories.

RESULTS

In all, 105 samples were taken, comprising approximately 51 structural species (i.e. Operational Taxonomic Units, OTUs), of which 6 were Antipatharia (black corals), 16 were Octocorallia (soft corals) and 83 were Hexacoralia (hard corals) (see appendices A, B and C). Among these, a preliminary list of 66 different exosymbionts was distinguished. Preliminary sorting in the field showed a high degree of specificity of hosts and symbionts (figure 5.1), with a small number of hosts and symbionts being highly polyvalent. Of the 66 exosymbionts, 51 (77 %) were found in a single host species (fig. 5.1, left), with only 2 taxa being found in more than 5 host taxa. Of the 51 host taxa, 30 (59 %) were found with a single symbiont species (fig. 5.1, right), with only 5 host taxa having more than 5 symbiont taxa. More detailed taxonomic sorting will require several years of work to achieve satisfactory assignment to species.

Several of the most well known families of exosymbionts proved to be of interest. Both *Trapezia* (Pocilloporid associated crabs) and *Tetralia* (*Acropora* associated crabs) were abundant,