

## Chapter 1

### Reef corals of the northwestern lagoon of Grande-Terre, New Caledonia

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#### SUMMARY

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- The northwestern lagoon area of New Caledonia has a diverse coral fauna. A total of 322 named species were observed during the present survey. This compares well with the total of 310 species reported for all of New Caledonia from all previous studies combined. It also compares well with the 303 species in the Calamianes Islands (Philippines); 315 in the Togian and Banggai Islands, Sulawesi, Indonesia; 318 in Milne Bay, Papua New Guinea; and 331 in the Raja Ampat Islands of West Papua, Indonesia which the first author has found in similar marine rapid assessment program (RAP) surveys for Conservation International (CI).
- Species numbers at visually sampled sites ranged from 22 to 117, with an average of 63.8 per site. A similar study by the first author in the southwest lagoon of New Caledonia produced an average of 52.7 species per site. Previous CI RAP's with the same method and the first author as identifier have produced 70 species per site at N. Sulawesi, 92 species per site at Calamianes Islands, Philippines, 81 species per site at Milne Bay, Papua New Guinea and 87 species per site at Raja Ampats, Indonesia. The mean of 63.8 species per site compares well with the mean of 38.5 species per site found by Laboute (2006) in the northeast lagoon of New Caledonia. The mean of 54.9 species which the first author recorded is quite similar to the mean of 52.7 species per site which he found in the southwest lagoon in a previous study, providing little support for the suggestion that there is a north-south diversity gradient.
- *Acropora*, *Montipora*, *Favia*, and *Porites* were dominant genera on New Caledonia reefs, with 77 (including *Isopora*), 24, and 12 species, respectively; the number of *Acropora* species is very high in relation to other areas.
- A total of 61 species that had not been previously reported from New Caledonia were found. Six additional new records were found by the first author on a previous study of the southwest lagoon (Fenner, unpublished). These new records bring the total coral species known from New Caledonia to 377 species, just slightly less than the highest total (411) known from any country (the Philippines) in 1989.
- A total of 43 species were found that extend the known biogeographic range of the species. The most notable was *Acropora pharaonis*, a species described from the Red Sea and known from the Indian Ocean, but not from the Pacific until recently.
- The number of species on the outer slopes of the barrier reef tended to be higher than on other reefs; however, the highest number was recorded on fringing reefs around Yandé Island. The number of species tended to be less in the inshore reefs around the mainland. Reefs with smaller depth ranges tended to have fewer species of coral since deeper habitats were absent, and reefs nearer to shore had smaller depth ranges.
- The number of species tended to increase significantly northwards and away from the mainland which corresponds to a decrease in human impacts such as sediment and nutrient runoff and fishing activity. These trends were statistically significant.
- New Caledonia has the highest total number of coral species known of any similar size area in the southwest Pacific, probably due to more study based on compiled results