

High latitude, high coral diversity at Rapa, in southernmost French Polynesia

Received: 27 November 2008 / Accepted: 14 February 2009 / Published online: 5 March 2009
© Springer-Verlag 2009



Fig. 1 Satellite image of Rapa. The large inlet on the eastern side is Haurei Bay (NASA Data Buy Purchase Program)



Fig. 2 A diversified coral assemblage of Haurei, with several *Acropora* species (photo by Yves Lefèvre, BIOSPHOTO)

Rapa (27°28'S, 144°20'W), in the southern Austral Archipelago, is a small (~40 km²) volcanic island. Mean SSTs are 20–23°C, and this accounts for a reduced process of reef accretion. A gently sloping submarine platform (2.0–4.5 km width) surrounds the island and its steep, rugged coastline has several bays (Fig. 1). Coral distribution is sparse on the volcanic platform to 20 m depth, where dense macroalgae dominated by *Sargassum* occur; however, more diversified and abundant coral assemblages occur below this to 55 m, and in shallower habitats inside bays.

The BIODIV Expedition (November 2002) assessed the diversity of marine organisms in Rapa. Scleractinian corals were collected during 42 dives to a maximum 58 m depth, covering all biotopes. Identification of this collection has revealed an unexpected high coral diversity, of 112 species from 32 genera, including five species new to science (previously, 61 species were recorded from 17 dives to a maximum of 40 m depth; Faure 1985). Most diverse is *Acropora*, with 37 species (Fig. 2), followed by *Montipora* (13 species), *Pavona* (seven species), and *Leptoseris*, *Fungia*, *Favia*, and *Goniastrea* (four species each). This was unexpected not only from Rapa's geographic isolation in the depauperate South Central Pacific (with ca. 170 species, French Polynesia is a low diversity area), but also in comparison with other subtropical islands, such as Kermadec (17 species; Brook 1999) and Lord Howe (83 species; Harriott et al. 1995). The coral fauna of Rapa has strong similarities with that of the Cook Islands (Chevalier 1982). *Goniastrea*, *Hydnophora*, *Merulina*, *Scolymia*, and *Turbinaria* are recorded at Rapa and at other islands in the Australs but nowhere else in French Polynesia (Chevalier 1982). Colonies of *Alveopora*, *Echinophyllia*, and *Leptoria* are particularly abundant at Rapa, whereas *Pocillopora* and *Porites*, which are among the dominant corals in the Society and the Tuamotus, are rare.

Acknowledgments We thank Y. Lefèvre and S. Andréfouët for illustrations, C.E. Payri, UPF, and the Délégation à La Recherche for the organization of BIODIV, and P. Bosserelle and CRIOBE for logistic help.

References

- Brook FJ (1999) The coastal scleractinian coral fauna of the Kermadec Islands, southwestern Pacific Ocean. *J R Soc N Z* 29:435–460
- Chevalier JP (1982) Reef scleractinia of French Polynesia. *Proc 4th Int Coral Reef Symp* 2:177–182
- Faure G (1985) Reef scleractinian corals of Rapa and Marotiri, French Polynesia (Austral Islands). *Proc 5th Int Coral Reef Cong* 6:267–272
- Harriott VJ, Harrison PL, Banks SA (1995) The coral communities of Lord Howe Island. *Mar Freshw Res* 46:457–465

M. Adjeroud (✉)
UMR 5244 CNRS-EPHE-UPVD, Université de Perpignan, 66860 Perpignan, France
e-mail: adjeroud@univ-perp.fr

M. Pichon · C. C. Wallace
Museum of Tropical Queensland, 70-102 Flinders St, Townsville, QLD 4810, Australia

Reef sites

Coral Reefs (2009) 28:459
DOI 10.1007/s00338-009-0486-8