

Sponges: miniature ecosystems within the reef

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Barrel sponge *Xestospongia* sp., outer reef slope, Chesterfield Islands © IRD/J.-L. Menou

Most divers and snorkelers have observed these colorful and apparently simple animals, probably without knowing what they were. Sponges are still relatively unknown to the general public, with the exception of the traditional bath sponge, which is only the skeleton of particular species. Sponges are widely distributed invertebrates, which inhabit all oceans at all latitudes, from the surface to a depth of 3,000 m. They are among the oldest and most primitive multicellular animals still alive on Earth. The oldest fossils date back to the Cambrian period, 540 million years ago.

Their anatomy is particularly simple, and, unlike most animals, they have no digestive tract, mouth, anus, organs or specialized tissues. They absorb oxygen, nutrients and micro-organisms present in the surrounding environment by filtering water through their pores and can filter several hundred liters of water per day. Sponges are usually attached to a substratum and, for the most part, are unable to move. Their color, texture and consistency vary considerably from one species to another, and their shape varies according to the currents they are exposed to.



Clathria (Thalysias) hirsuta. HOOPER et LÉVI, 1993. © IRD/G. Bargibant



Leiosella ramosa. BERGQUIST, 1995. © IRD/J. L. Menou



Lamellodysidea herbacea. KELLER, 1889. © IRD/E. Folcher

The body of a sponge is like a miniature ecosystem (microcosm). They host many micro-organisms, which can represent up to 50% of their biomass, some of which are symbiotic. The most massive forms also shelter, in their cavities, a variety of mollusks, crustaceans and echinoderms.

Their roles in the reef ecosystem can be very different depending on the species. Some contribute to erosion by perforating coral structures, while others contribute to the food chain. There are some capable of absorbing 99% of the surrounding bacteria and suspended organic matter, and the nitrogen they produce contributes to growth of reef algae. Some species are eaten by turtles, fish, nudibranchs and starfish.

In New Caledonia, about 300 species have been recorded and identified. However, it has been estimated that this is probably only half of the diversity present in the archipelago's lagoons and reefs, most of which could be species new to science. Considering these species, it would raise sponge endemism to 71%.

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New Caledonia World of corals

Scientific direction: Claude E. Payri

IRD Editions

French National Research Institute for Sustainable Development, Marseilles, 2018

Editions Solaris

Translation: Lydiane Mattio
Editorial coordination: Claude E. Payri
Page and cover layout : Pierre-Alain Pantz - Editions Solaris
Printing: Winson Press, Singapour

Cover illustrations

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ISBN : 978-2-7099-2677-5

Recommended citation:

Payri, C.E. (dir.), 2018 – New Caledonia: world of corals. IRD Editions/Solaris, Marseilles/Nouméa, 288 pp.