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Sponges from Clipperton Island, East Pacific

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Abstract

Twenty sponge species (totalling 190 individuals) were collected during the 1938, 1994 and 2004/5 expeditions to the remote island of Clipperton in the East Pacific Ocean. Seven species are widespread Indo-Pacific sponges; nine species comprise sponges new to science; four species were represented only by small thin patches insufficient for proper characterization and could be only determined to genus. The new species may not be necessarily endemic to the island, as several show similarities with species described from elsewhere in the East and West Pacific. Four species: *Tethya sarai* Desqueyroux-Faúndez & Van Soest (1997), *Callyspongia (Callyspongia) roosevelti* **n.sp.**, *Spongia (Spongia) sweeti* (Kirkpatrick, 1900) and *Suberea etiennei* **n.sp.** were found commonly occurring in localities around the island in depths between 10 and 55 m, growing on dead corals, under overhangs and rubble stones. The remaining sponges were either rare or were thinly encrusting on coral fragments. The latter may be more abundant than appears from the present study as they are probably not easily observed. The sponge fauna of Clipperton Island shows strongest affinities with the Central and West Pacific regions and only two or three species are shared with the East Pacific region.

Key words: Clipperton, East Pacific, sponges, new species, endemism

Introduction

Clipperton Island (10°17–18'N 109°11–13'W) is the only true atoll in the Eastern Pacific, formed around an extinct volcanic base now largely eroded away above the sea surface. The island has a circumference of 11.8 km and a landmass of 1.7 km^2 enclosing a central brackish lagoon (Fig. 1, Kaiser 2007). Clipperton is the easternmost atoll of the Pacific Ocean situated in the middle of the East Pacific Barrier (Glynn *et al.* 1996). Clipperton is a French 'public domain' resorting under the authority of the High Commissioner of French Polynesia (Salvat *et al.* 2008).

Clipperton barely breaks the surface of the sea. Most of the atoll is coral rock and sand, only a few meters above sea level. Clipperton Rock, the only emergent volcanic rock remnant and the highest point, is about 30 meters above sea level. The atoll is situated in the inter-tropical convergence zone between two major ocean currents which pass by about 500 km to the north (the westward trending North Equatorial current, at about 15° N) and 500 km to the south (the eastward flowing Equatorial Countercurrent, at about 5° N). It is generally out of the path of most tropical storms which mostly track westward to the north of the island along the North Equatorial Current. However, the inter-tropical convergence zone produces convection clouds that commonly build throughout the day resulting in a high amount of rainfall. Physically, the nearshore environment around the atoll consists of a fringing coral reef that receives a near constant pounding from waves generated around the Pacific Ocean. This breaks up the reef into coral rock and sand, especially in areas close to the shore less than 5 meters deep. Living coral heads are interspersed with dead coral flats and coral sand along a gentle slope to seaward from about 5–20 meters depth. At a depth of about 20 meters, the substratum slopes more steeply down to about 50 meters where it levels out into a platform. Presumably, this platform was cut into the reef by waves during the lower sealevel stands of the Pleistocene.

Clipperton is extremely isolated from other land masses, with the Islas Revillagigedo at 1000 km distance to the north, the mainland Mexico coast at 1100 km to the east. To the southeast at longer distances are the Galápagos archipelago (2300 km) and the Cocos (2500 km) and Malpelo islands (3100 km). The nearest archipelago of the Central Pacific (the Marquesas) is almost 4000 km away. This isolation yielded a number of endemic species (fishes: approx. 5–20%: Robertson & Allen 1996; Béarez & Séret 2008; molluscs 2.6%: Kaiser 2007; possibly two coral species: Glynn *et al.* 1996; the only barnacle species: Zullo 1969), but the majority of taxa apparently are widespread tropical Indo-Pacific and East Pacific species. Many invertebrate groups were already studied (e.g. molluscs, crustaceans, holothurians (Hertlein & Emerson 1957).

Two sponge species originating from Clipperton Island were previously mentioned in a small paper on sponges from the East Pacific by De Laubenfels (1939). They were collected on a cruise made by Captain G. Allan Hancock on board the motor cruiser *Velero III*. The species De Laubenfels identified were the Californian *Haliclona enamela* De Laubenfels (1930) and the West Indian *Callyspongia vaginalis* (Lamarck, 1814). The specimens were donated to the collections of the United States National Museum (Smithsonian Institution). A small collection of sponges was obtained by the Clipperton 1994 Expedition, organized by K.L. Kaiser and J.D. Jackson; this collection was equally divided among the Zoological Museum of Amsterdam and the California Academy of Sciences.