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## Deep-water sponges (Porifera) from Bonaire and Klein Curaçao, Southern Caribbean

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## Abstract

Four submersible dives off the coast of Bonaire (Caribbean Netherlands) and Klein Curaçao (Curaçao) to depths of 99.5–242 m, covering lower mesophotic and upper dysphotic zones, yielded 52 sponge specimens belonging to 31 species. Among these we identified 13 species as new to science. These are *Plakinastrella stinapa* n. sp., *Pachastrella pacoi* n. sp., *Characella pachastrelloides* n. sp., *Geodia curacaoensis* n. sp., *Caminus carmabi* n. sp., *Discodermia adhaerens* n. sp., *Clathria (Microciona) acarnoides* n. sp., *Antho (Acarinia) pellita* n. sp., *Parahigginsia strongylifera* n. sp., *Calyx magnoculata* n. sp., *Neopetrosia dutchi* n. sp., *Neopetrosia ovata* n. sp. and *Neopetrosia eury stomata* n. sp. We also report an eurentid hexactinellid, which belongs to the rare genus *Verrucocoeloidea*, recently described (2014) as *V. liberatorii* Reiswig & Dohrmann. The remaining 18 already known species are all illustrated by photos of the habit, either in situ or ‘on deck’, but only briefly characterized in an annotated table to confirm their occurrence in the Southern Caribbean. The habitat investigated—steep limestone rocks, likely representing Pleistocene fossil reefs—is similar to deep-water fossil reefs at Barbados of which the sponges were sampled and studied by Van Soest and Stentoft (1988). A comparison is made between the two localities, showing a high degree of similarity in sponge composition: 53% of the present Bonaire-Klein Curaçao species were also retrieved at Barbados. At the level of higher taxa (genera, families) Bonaire-Klein Curaçao shared approximately 80% of its lower mesophotic and upper dysphotic sponge fauna with Barbados, despite a distance between them of 1000 km, indicating high faunal homogeneity. We also preliminarily compared the shallow-water (eu-photic) sponge fauna of Curaçao with the combined data available for the Barbados, Bonaire and Klein Curaçao meso-photic and upper dysphotic sponges, which resulted in the conclusion that the two faunas show only little overlap.

**Key words:** Sponge fauna, new species, mesophotic, dysphotic, Caribbean Netherlands, Curasub, manned submersible

## Introduction

We report here results of the Bonaire Deep Reef Expedition 2013 (May 27–June 1, 2013) exploring the mesophotic and upper dysphotic zones surrounding the islands of Bonaire and Klein Curaçao with the aid of the manned submersible ‘Curasub’ of the Substation Curaçao (Becking & Meesters 2014). The shallow-water reefs of the Caribbean are considered a biodiversity hotspot, an area with exceptional diversity of animals, plants and ecosystems (e.g. Roberts *et al.* 2002). The shallow-water reef sponges of Curaçao and Bonaire are relatively well-known from multiple studies by Van Soest and others (e.g. Van Soest 1978, 1980, 1981, 1984a & b, 2009; De Weerdt 2000), yet surprisingly little is known about the biota of the deep reef and the mesophotic and dysphotic zones. This represents a critical knowledge gap for developing future reef policies and management practices. The only previous deep water submarine research conducted on Bonaire and Curaçao took place in May 2000, during which 24 dives were conducted with the Johnson Sealink II submersible of Harbor Branch, FLA, USA, down to depths of 900 m (Reed & Pomponi 2001). The focus of that expedition was on the discovery of biomedically interesting taxa, especially sponges, and did not result in species descriptions, with one exception: a member of the rare hexactinellid genus *Verrucocoeloidea* Reid, 1969, *V. liberatorii* was recently described by Reiswig & Dohrmann (2014).

In order to adequately protect the ecosystem and construct sustainable management plans it is essential to document the biodiversity and to gain an understanding of which processes keep it in place. The Netherlands

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