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New records of marine invertebrates from São Tomé and Príncipe, eastern Atlantic Ocean

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The following species are recorded from the coasts of São Tomé and Príncipe for the first time: the ciliate *Zoothamnium niveum*, the black coral *Antipathella wollastoni*, the zoanthid *Isaurus tuberculari*s, and the shrimp *Latreutes fucorum*. The presence of the black coral *Tanacetipathes spinescens* and of the shrimp *Cinetorhynchus rigens* is confirmed. The presence of the crab *Platypodiella picta* at São Tome Island is confirmed and a possibly undescribed species of *Platypodiella* is recorded from Príncipe Island. Mistaken records of *Stichopathes lutkeni* are corrected: the species at São Tomé and Príncipe is *Stichopathes occidentalis*.

Key words: Gulf of Guinea, Ciliata, Antipatharia, Zoantharia, Decapoda.

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INTRODUCTION

São Tomé and Príncipe are islands in the Gulf of Guinea. The marine fauna of the Gulf of Guinea is one of the least known in the world (Roberts et al. 2002). It is, however, of special interest because the easterly flowing Equatorial currents (the seasonal Equatorial Countercurrent and the subsurface Equatorial Undercurrent) link the western Atlantic to the eastern Atlantic at this latitude and the marine fauna of São Tomé and Príncipe appears to be a mix of the two faunal regions (Scheltema 1971, 1995; Wirtz 2003, 2004, Wirtz et al. 2007).

This paper records five additional marine invertebrate species and clarifies the status of four marine invertebrates mentioned in previous publications.

MATERIAL AND METHODS

Observations were made while snorkelling in shallow water or SCUBA-diving down to 40 m depth. Species were photographed in the field and, where necessary for identification, collected and preserved.

RESULTS

1) "Protozoa" Peritrichia

Zoothamnium niveum (Hemprich & Ehrenberg, 1831)

Z. niveum is a giant, colonial marine ciliate from sulfide-rich habitats; it is covered with chemoautotrophic sulfide-oxidizing bacteria that give a snow-white appearance to the animal; the feather-like colonies reach a size of up to 1.5 cm. The species has been reported from rotting plant material in the Red Sea, from Florida and the Caribbean, from Lanzarote Island in the eastern Atlantic, from Corsica and Giglio Islands in the western Mediterranean Sea and from Cyprus Island in the eastern Mediterranean Sea and from the Pacific Ocean (references in Wirtz 2008 and Bright et al. 2014). It has since also been recorded

from Madeira Island (Wirtz unpublished; photo in researchgate: https://www.researchgate.net/publication/312889917_Zoothamnium_niveum_from_Madeira_Island) and from Cuba and Guadeloupe Islands (M. Bright pers. comm. to PW, 15 Feb 2017).

At the bottom of the uppermost of two large pools at Praia Piscina (0°01´25´´ N, 6°30´45´´ E) , São Tomé Island, in about 1.5 m depth, rotting coconuts were covered with bacterial mats and *Zoothamnium niveum* (Figure 1). This is the first record of the species from the tropical eastern Atlantic.

Fig. 1. *Zoothamnium niveum* and bacterial mats on rotting coconuts in a tide pool.

2) Cnidaria Antipatharia

a) Antipathella wollastoni (Gray, 1857)

This black coral species is common at the Azores, Madeira, the Canary Islands, and the Cape Verde Islands and has recently also been found at Ceuta (south-western Mediterranean) (Ocaña et al. 2007) and at Ascension Island (Opresko 2017). At the dive site "Canyon", about 100 m west of Santana Islet (0°14´43´´ N, 6°44´34´´ E), in 35 m depth, several bushes of this species were seen between colonies of the more common *Tanacetipathes spinescens* (see below).

Morais & Maia (2016) described veritable forests of black coral in front of Lagoa Azul, São

Tomé and write about "a white-coloured species, possibly *Tanacetipathes spinescens*"; the photos, however, show what is almost certainly *Antipathella wollastoni*. The shrimps *Periclimenes wirtzi* d'Udekem d'Acoz, 1996 and *Hippolyte* n. sp. were collected from *A. wollastoni* bushes at "Canyon" in February 2017.

b) Tanacetipathes spinescens (Gray, 1857)
At the dive site "Canyon", about 100 m west of Santana islet (0°14´43´´ N, 6°44´34´´ E), in 35 m depth, colonies of this black coral were common. With a height of almost 1 m they were considerably larger than the *T. spinescens* of the Cape Verde islands. *Tanacetipathes squamosa* (Koch, 1886) from Rolas islet, São Tomé, is very similar if not identical (Opresko 2017); the two species were synoymized by Broch (1920).

Wirtz and d' Udekem d' Acoz (2008) wrote that "In 45 m depth at Pedra da Galé bushes of a black coral resembling *Tanacetipathes spinescens* (Gray) var. *minor* Brook, 1889 were common" and recorded shrimps of the genus *Hippolyte* from it. Britayev et al. (2014) reported the presence of the polychaete *Parahololepidella greeffi* (Augener, 1918) on this black coral near Rolas islet. The shrimps *Periclimenes wirtzi* d'Udekem d'Acoz, 1996, *Rapipontonia platalea* (Holthuis, 1951), and *Hippolyte* n. sp. were collected from the *Tanacetipathes* bushes at "Canyon" in February 2017.

c) Stichopathes occidentalis Brook, 1889
In a publication on symbiotic shrimps of São Tomé and Príncipe, Wirtz & d' Udekem d'Acoz (2008) called the whip coral occurring there *Stichopathes lutkeni* Brook, 1889. Morais & Maia (2016) used the same name. However, the whip coral there is *Stichopathes occidentalis* Brook, 1889.

3) Cnidaria Zoantharia
Isaurus tuberculatus Gray, 1828
A clump of polyps of this species was seen and photographed in about 10 m depth when diving in Santana Bay (0°14´43´´ N, 6°44´47´´ E). This species has a circum(sub)tropical distribution and has recently also been recorded from Ascension and St. Helena Islands (Brown et al. 2016 and references therein).

4) Arthopoda Crustacea
a) *Cinetorhynchus rigens* (Gordon, 1936)
In a publication on shrimps from São Tomé and Príncipe (Wirtz 2004), in the section dedicated to *Janicea antiguensis* (Chase, 1972), the presence of *Cinetorhynchus rigens* (Gordon, 1936) was mentioned, the author being unaware that this species also had not yet been recorded from the area. *C. rigens* is indeed quite common in the tunnel through Santana Islet.

b) *Latreutes fucorum* (Fabricius, 1798)
This shrimp was collected from bushes of a blue-black hydroid resembling *Macrorhynchia clarkei* (Nutting, 1900) in 15 m depth. This is an amphi-Atlantic species, in the Eastern Atlantic known from the Azores south to the Cape Verde Islands (d´Udekem d´Acoz 1999) but apparently not yet recorded from São Tomé and Príncipe.

c) *Platypodiella picta* (A. Milne-Edwards, 1869) and *Platypodiella* sp.
A specimen of *Platypodiella picta* was collected from below a stone in shallow water in Santana Bay, São Tome Island (Figure 2). It is now deposited in the Zoologische Staatssammlung, Munich with the registration number ZSM-A 20171000.

A different-looking *Platypodiella* species was seen in shallow water near Bom Bom Island, Príncipe (Figure 3) but unfortunately not collected. The Príncipe *Platypodiella* may be an undescribed species but could also be an undescribed colour morph of the extremely variable western-Atlantic *Platypodiella spectabilis* (Herbst, 1794): see the colour photos in Martin & Zimmermann (2007) and in Garcia-Hernandez et al. (2015). There are also some similarities in colour with *Platypodiella georgei* den Hartog & Türkay, 1991 from St. Helena Island. The status of the Príncipe *Platypodiella* remains unresolved until specimens have been collected.

Fig. 2. *Platypodiella picta* from São Tomé Island.

Fig. 3. *Platypodiella* sp. from Príncipe Island.

DISCUSSION

As it grows on short-lived substrates, *Zoothamnium niveum* probably is an r-strategist that has widespread and frequent propagules. Colonization by *Zoothamnium* occurs through a "swarmer macrozooid" dispersal stage (Bright et al. 2014). *Zoothamnium niveum* has now been found at sites in the western Atlantic, the subtropical and tropical eastern Atlantic, the Mediterranean Sea, and the Red Sea. This indicates that the species is probably common throughout (sub)tropical oceans of the world and has simply been overlooked in other areas until now.

Antipathella wollastoni has long been considered an endemic species of Macaronesia *sensus lato* (i.e. not only Madeira, Canary Islands, and Azores but also including the Cape Verde Islands) and indeed the existence of such endemics would argue for Macaronesia *sensu lato* being a true biogeographic unit. *Antipathella wollastoni*, however, has now been shown to live in places far away from "Macaronesia".

The existence of two different species of *Platypodiella* at São Tomé Island and at Príncipe Island could indicate subtle differences in the marine fauna of these two islands, despite their close proximity.

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REFERENCES

Bright, M., S. Espada-Hinjosa, I. Lagkouvardos & J.M. Volland 2014. The giant ciliate *Zoothamnium niveum* and its thiotrophic epibiont Candidatus Thiobios zoothamnicoli: a model system to study interspecific cooperation. *Frontiers in Microbiology* 5, Article 145. DOI: 10.3389/fmicb.2014.00145

Britayev, T.A., J. Gil, A. Altuna, M. Calvo & D. Martín 2014. New symbiotic associations involving polynoids (Polychaeta, Polynoidae) from Atlantic waters, with redescriptions of *Parahololepidella greeffi* (Augener, 1918) and *Gorgoniapolynoe caeciliae* (Fauvel, 1913). *Memoirs of Museum Victoria* 71: 27–43.

Broch, H. 1920. Antipatharia. *Beiträge zur Kenntnis der Meeresfauna West Afrikas* 3, 18–22.

Brown, J., K. Downes, R. J. Mrowicki, E. L. Nolan, A. J. Richardson, F. Swinnen & P. Wirtz 2016. New records of marine invertebrates from Ascencion Island (Central Atlantic). *Arquipelago*. Life and Marine Sciences 33: 71-79.

den Hartog, J. C. & M. Türkay 1991. *Platypodiella georgei* spec. nov. (Brachyura: Xanthidae), a new crab from the island of St. Helena, South Atlantic Ocean, with notes on the genus *Platypodiella*. *Zoologische Mededelingen* 65/15: 209-220.

Garcia-Hernandez, J.E. , J. D. Reimer & B. W. Hoeksema 2015. Sponges hosting the zoantharia-associated crab *Platypodiella spectabilis* at St. Eustatius, Dutch Caribbean. *Coral Reefs* 35/1: 209.

Martin, J. W. & T. L. Zimmerman 2007. Color Variation in the Caribbean Crab *Platypodiella spectabilis* (Herbst, 1794) (Decapoda, Brachyura, Xanthidae). *Gulf and Caribbean Research* 19 (1): 59-63.

Morais, R.A. & H. A. Maia 2016. Lush underwater forests in mesophotic reefs of the Gulf of Guinea. *Coral Reefs* 36/1: 95.

Ocaña, O., D. M. Opresko & A. Brito 2007. First record of the black coral *Antipathella wollastoni* (Anthozoa: Antipatharia) outside of Macaronsecian waters. *Revista de la Academia Canaria de Ciencias* 18/4: 125-138.

Opresko, D.M. 2017. Antipatharian corals of Ascension Island. *Journal of the Marine Biological Association of the United Kingdom* 97(4): 705–708.

Roberts C.M, C. J. McClean, J. E. N. Veron, J. P. Hawkins, G. R. Allen, et al. 2002. Marine biodiversity hotspots and conservation priorities for tropical reefs. *Science* 295: 1280–1284.

Scheltema, R. S. 1971. The dispersal of the larvae of shoal-water benthic invertebrate species over long distances by ocean currents. Pp. 7-28 *in* P. J. Crisp,

ed. 4th European Marine Biology Symposium, *Cambridge Univ. Press, Cambridge.*

Scheltema, R. S. 1995. The relevance of passive dispersal for the biogeography of Caribbean molluscs. *American Malacological Bulletin* 11: 99-115.

Udekem D'Acoz, C. d' 1999. Inventaire et distribution des crustacés décapodes de l'Atlantique oriental, de la Mediterranée et des eaux continentales au nord de 258N. *Collection Patrimoines Naturels*, 40: 1-383.

Wirtz, P. 2003. New records of marine invertebrates from São Tomé Island. *Journal of the Marine Biological Association of the UK 8*3: 735-736.

Wirtz, P. 2004. Four amphi-Atlantic shrimps new for São Tomé and Príncipe (eastern central Atlantic). *Arquipelago* Life and Marine Sciences 21A: 83-85.

Wirtz, P. 2008. New records of the giant cilate *Zoothamnium niveum* (Protozoa, Peritrichia). *Arquipelago*. Life and Marine Sciences 25: 89-91.

Wirtz, P., C. E. L. Ferreira, S. R. Floeter, R. Fricke, J L. Gasparini, T. Iwamoto, L. A. Rocha, C. L. Sampaio & U. Schliewen 2007. Coastal Fishes of São Tomé and Príncipe – an update. *Zootaxa* 1523: 1- 48.

Wirtz, P. & C. d'Udekem d'Acoz 2008. Crustaceans associated with Cnidaria, Bivalvia, Echinoidea and Pisces at São Tomé and Príncipe islands. *Arquipelago* Life and Marine Sciences 25: 63-69.

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