

## Revision of the geographical range of *Actinopyga capillata* Rowe & Massin 2006 (Echinodermata: Holothuroidea)

Frédéric Ducarme<sup>1</sup>

### Abstract

This paper updates the geographical range of the holothurian species *Actinopyga capillata* (Rowe & Massin 2006), first described as endemic from the Mascarene Islands with one ectopic record from Philippines. New observations confirm the presence of this species in different regions of the Philippines, thereby extending its range westward to Madagascar and the Comoro Islands, suggesting a wide but discontinuous Indo-Pacific range. Neither fishing nor trade of this species has yet been recorded.

### Introduction

Sea cucumbers (Holothuroidea) constitute a group of marine invertebrates experiencing important and still poorly regulated fisheries and an international trade that is, essentially, aimed at Southeast Asian markets (Eriksson et al. 2015; Conand, in press). Therefore, knowledge on their distribution and population dynamics is paramount, as many populations have already been jeopardised even before sound scientific knowledge was made available (James and Manikfan 1994). *Actinopyga capillata* (Rowe & Massin 2006) is the most recently described species of one genus of commercially important sea cucumbers, hence a potential target for trade and conservation; 10 years after its description, we propose here an update on its geographical range.

### Geographical re-assessment

The “hairy sea cucumber” *Actinopyga capillata* was described in 2006 (Rowe & Massin 2006) from specimens collected in La Réunion (holotype) and Rodrigues (paratypes), both islands of the Mascarenes archipelago in the southwest Indian Ocean. The original publication also mentioned visual observations from Mauritius (third island of the Mascarenes) and, farther away, the Philippines. No other observations have been recorded since then, according to the International Union for Conservation of Nature (IUCN) (Conand et al. 2013). Visual observations were considered safe by authors as this species displays very characteristic morphological traits preventing any ambiguity: “the shape of the body, together with the distinctive arrangement of the elongate, modified dorsal tube feet, and the ossicle complement, all set this species apart from others in the genus *Actinopyga*. The live colour pattern is also distinctive for *A. capillata* n. sp., within the genus” (Rowe and Massin

2006), the genus being already quite readily identified thanks to its distinctive anal teeth (Samyn et al. 2006). These traits allow the confirmation of new records of this species based on visual observations or good photographs without sampling, yet keeping in mind that in the absence of DNA analysis the west Pacific, specimens might still belong to a morphologically identical sister taxa, which can happen in echinoderms.

Field investigations at Mayotte Island (Comoros archipelago) allowed the observation of several unambiguous specimens of *A. capillata*, recording its presence in the area on shallow inner reefs at night (Fig. 1). This constitutes a first record in the region, as this species is absent from previous local inventories such as Eriksson et al. (2012). We consider that the absence of this species from previous inventories is more likely due to sampling methods or natural abundance variations.

Photographs taken in Madagascar by Fabrice Rozier, and confirmed by experts, suggest the presence of this species in the region of Toliara, southwest of Madagascar, perhaps with a gene flow between the neighbouring archipelagos of the Comoros and Mascarenes.

Photographs taken in the Philippines by Oliver Robillo, and uploaded onto the *iNaturalist* website and confirmed by experts, confirm the presence of *Actinopyga capillata* at Talikud Island, south of the Philippines (Davao region). Another photograph was taken by Sylvain Le Bris at Siquijor Island, central Philippines (Central Visayas region), and posted on the French diving forum DORIS, as an answer to a call for observations. No other photograph could be found on naturalist websites from surrounding regions such as Indonesia, Thailand, Australia, New Caledonia or the Pacific Islands.

<sup>1</sup> Muséum National d’Histoire Naturelle, Centre d’Ecologie et des Sciences de la Conservation (UMR 7204).



**Figure 1.** Specimen of *Actinopyga capillata* observed in Mayotte (Sakouli inner reef, 1 m depth at night). (Image: F. Ducarme).

Recent sea cucumbers inventories from the Indian Ocean (e.g. Ducarme 2016 in the Maldives; Conand et al. 2015 in the Scattered Islands) did not record any specimen of *A. capillata*, suggesting either a particularly cryptic behaviour in some countries, or a discontinuous geographical range. The nocturnal behaviour of *Actinopyga capillata* (already documented by Rowe & Massin 2006 and confirmed here) could also prevent this species from being observed, as well as its modest size compared with other species of the same genus (rarely more than 15 cm, compared with over 40 cm for many other *Actinopyga*). Scientists and marine naturalists from surrounding regions contacted in the frame of this work did not mention any observation in their field works. To date, no observation has been reported from African coasts, but the species might have some populations there, in continuity with the Comoros and Madagascar, as happens for many sea cucumber species in the region (there is no significantly more important biological barrier between Comoros and east Africa than between Madagascar and the Mascarenes).

## Discussion

The current confirmed geographical range of *Actinopyga capillata* extends from Mayotte to Mauritius, with a separate population in the Philippines; however, we can hypothesise a theoretical range extending from east Africa to the western Pacific Ocean, with potential discontinuity.

Although it is a recently described species, *Actinopyga capillata* may be already known by local fishermen in many countries. As part of the high commercial value genus *Actinopyga*, it may also constitute a potential target for the beche-de-mer fishery and trade, even if it is not currently cited among the commercially important sea cucumbers of the world (Purcell et al. 2012). This species does not seem to be present on Asian markets so far (C. Conand, pers. comm.), perhaps because it is a rather small species and is rarely abundant in its range, and often observed isolated (despite reported higher densities in Mauritius according to Rowe & Massin 2006). This species is still considered to be “data deficient” by the IUCN (Conand et al. 2013), and more investigations are needed to assess its population dynamics; however, this range extension and the absence of evidence for fishing or trade suggest that this species may not be threatened in the short term. Little is known about its ecology, and the new observations gathered here tend to confirm the original description (i.e. inhabiting shallow areas and being nocturnal).

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