

New report of *Protankyra pseudodigitata* Semper, 1867 (Holothuroidea: Apodida) from Persian Gulf, Bushehr

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(Received: 15 December 2017; Accepted: 10 June 2018)

This paper is a new report of a Holothuroidea (Apodida: Synaptidae: Protankyra) *Protankyra pseudodigitata* from Persian Gulf. Specimen was collected by a Van Veen Grab from subtidal soft bottoms in May 2016. The specimen recorded was small measuring 12 mm in length, body worm-like in shape with 12 digitate tentacles encircles the mouth. Podia are lacking in the Apodida but skin papillae are present. Ossicles consist of Anchor plates, Anchors and Miliary granules. Anchors are variable in development and each arm or one of them with one to 10 teeth and some of them without any teeth. The present study describes the taxonomic diagnoses of identified species bases on morphological characters.

Key words: *Holothuroidea*, *Protankyra pseudodigitata*, *ossicles*, *Persian Gulf*.

INTRODUCTION

The class Holothuroidea, comprising approximately 1500 living species, in particular the tropical species (Conand, 2006; Pawson, 2007) and new species being recorded each year with an increase of interest on this class (Massin & Hétérier, 2004; Mjobo & Thandar, 2016; Samyn & Berghe, 2000; Samyn *et al.*, 2001; Uthicke *et al.*, 2004). Nearly, 25 species of Holothuroids were reported from Persian Gulf, mainly were recorded from intertidal zone and subtidal hard bottoms. The dominant order there was Aspidochirotida (Dabbagh *et al.*, 2012a; Dabbagh *et al.*, 2012b; Dabbagh, 2011; Heding, 1940; Price, 1983). Individuals of order Apodida are scarcely rare Holothuroids and they are not commercially important. Therefore they have attracted little attention to themselves.

This paper is a Re-report of *Protankyra pseudodigitata* Semper, 1867 (Apodidae: Synaptidae) from Persian Gulf. *P. pseudodigitata* reported from this area by Heding (1940) and followed by Price (1983). Although previous studies in the Persian Gulf were without digital images and SEM photos, in this paper we decided to re-describe the taxonomic features of *P. pseudodigitata* to provide a better picture of this species.

MATERIAL AND METHODS

In May 2016, one species of Protankyra (Holothuroidea: Apodida: Synaptidae) was haphazardly collected from 8.5 m depth (28° 57' 19.0" N and 50° 45' 00.0" E) during an Investigation on soft sediment fauna in Northwestern Persian Gulf, Bushehr harbor. Bushehr harbor is located in latitude between 28° 55' 21.0" N and 50° 48' 35.0" E (Fig. 1). Sediments were collected with a van Veen Grab (0.022 m²). In the sample area substrate was dominated by silt (99 %), salinity 45 ppt, Temperature 27°C.

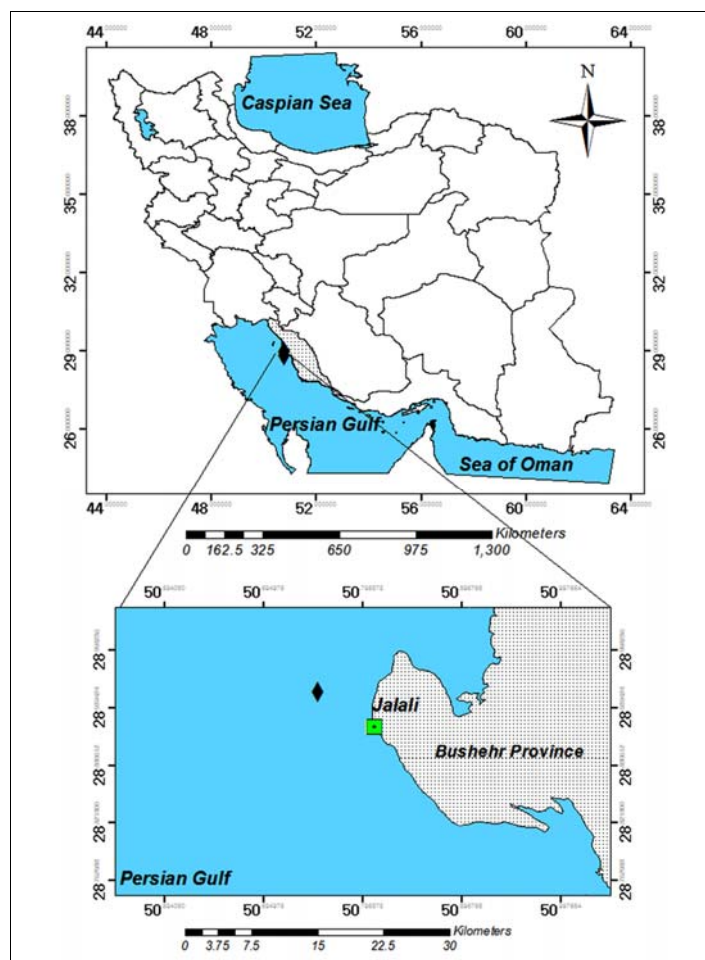


FIGURE 1. Sea cucumber collection site in Persian Gulf, Bushehr harbor.

Samples were sieved over a 0.5 mm mesh-sized sieve and stained with Rose Bengal. Later on, individuals preserved with ethanol 70%. Dried specimen was photographed. For exact identification, small sections of tissue from the body wall (mid-body wall, anterior and posterior body wall) was sampled and dissolved in household bleach, Washed three times with distilled water (three times) and with ethanol 96% (two times), air-dried. The extracted ossicles were studied by light microscopy and photographs and measurements of the ossicles were taken.

Specimen of *Protankyra pseudodigitata* (Semper, 1867) identified according to the key provided by Woodward and Barrett (1858), James (1982), Price (1983) and Ong et al (2016). Later on confirmed by Professor Andrew R. G. Price, School of Life Sciences, University of Warwick.

RESULTS

Taxonomy

Order Apodida Brandt, 1835

Family Synaptidae Burmeister, 1837

Genus *Protankyra* Östergren, 1898

Protankyra pseudodigitata Semper, 1867, Fig. 2

Morphology

Body vermiform, no respiratory tree, body wall thin, warty and rugose, 12 digitate tentacles encircle the mouth, all tentacles are the same size, each tentacle with 4 digits (two pairs of digits), Podia are lacking in the Apodida but skin papillae are present. Body 12 mm long. This species was brought to my attention after preservation the samples and I have not had the opportunity to see the live species and I couldn't record its live colour but other researchers reported the living individuals are translucent white (Price, 1983; Ong et al., 2016). In the photo of present paper, this specimen is reddish because the Rose Bengal (Fig. 2, a).

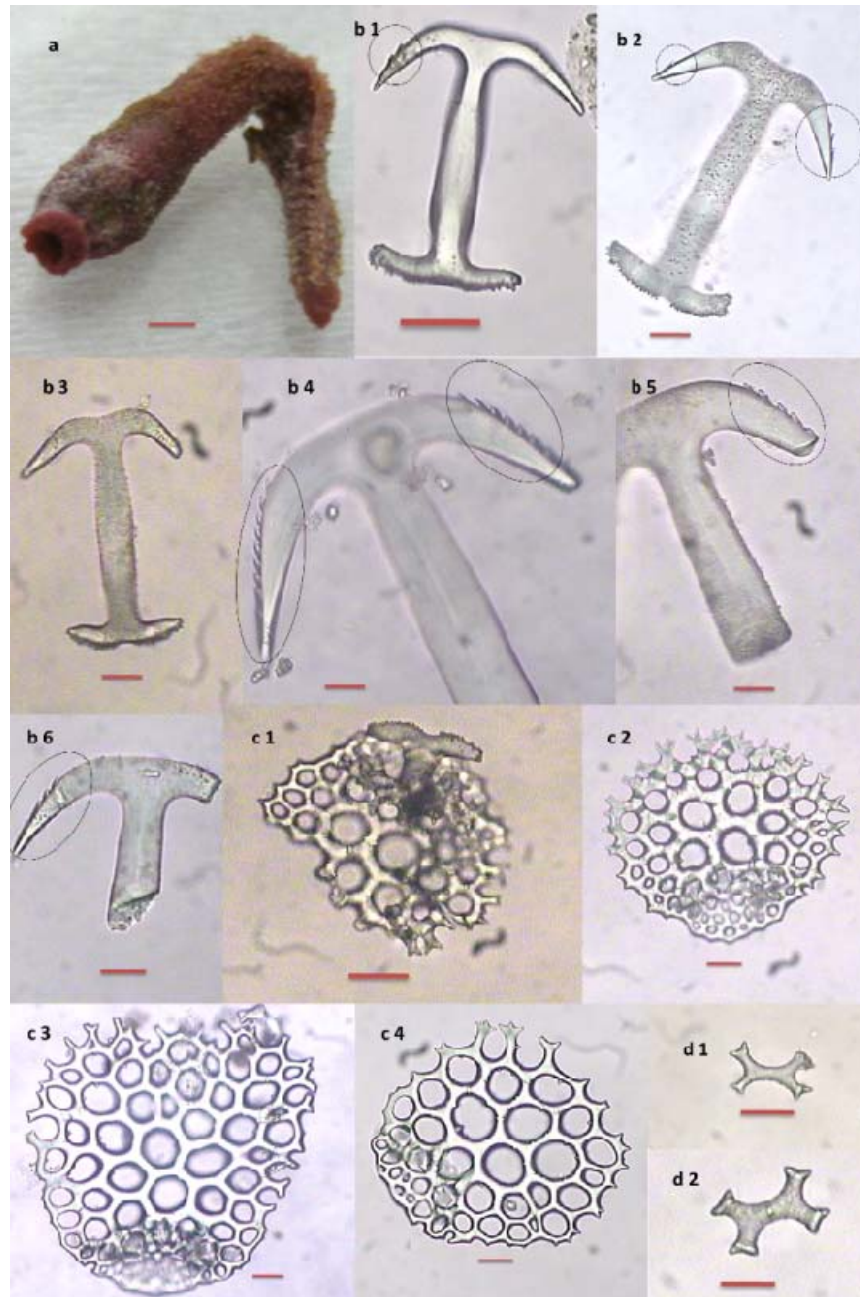


FIGURE 2. Preserved specimen of *Protankyra pseudodigitata* (a); Anchors (b1-6) with point to the teeth; Anchor plates (c 1-3); military granules (d1-2). Scale bars = 1cm (a), 20 μm (b, c, d).

Ossicles: Anchor plates, Anchors and Miliary granules. Anchors are variable in development. Small anchor arms are smooth and large anchor arms are serrated. Some of them are asymmetrical apically, having a long shaft. Each arm or one of them with one to 10 teeth and some of them without any teeth. Stock usually dented. Anchors 63–225 μm in length and 60–175 μm in width (Fig. 2, b1-6). Anchor-plates ovate, irregular, fenestrate, serrated margin and sometimes incomplete. Anchor-plates 80-172 μm in length and 80-180 μm in width (Fig 2, c1-4). Miliary granules are x shaped 23-40 μm in length (Fig. 2, d 1-2).

DISCUSSION

In the Persian Gulf, researches show that there are more than 20 species of Holothorians have been recorded (Basson *et al.*, 1977; Dabbagh, 2011; Dabbagh *et al.*, 2012a; Dabbagh *et al.*, 2012b; Heding, 1940; Price, 1981; Pourvali *et al.*, 2014).

To date, around 10 species of the genus *Protankyra* were reported from Indian Ocean (Deshmukh *et al.*, 2015; James, 1982; Raut *et al.*, 2005; Woodward & Barrett, 1858). These species are similar in outer appearance but they are distinguished by their ossicle morphology. Two species of *Protankyra* have been recorded in the Persian Gulf: *P. pseudodigitata* and *P. magnihamula* (Heding, 1940; Price 1981). The Specimen of *P. pseudodigitata* was collected in the Persian Gulf is small in number and in size (not longer than 14 mm) agrees with the study Heding, 1940 and Price, 1983. Large specimens of *P. pseudodigitata* were recorded from Singapore by Ong *et al.* (2016) and the South China Sea, by Liao (1997), with lengths 20 mm and up to 100 mm respectively. Although the specimen of the species collected in this study is small, the ossicles agree well with the descriptions by Woodward and Barrett (1858), James (1982) and Price (1983). In the present study *P. pseudodigitata* was collected from the soft substrate and it has been reported earlier from the subtidal mud (Price, 1983; Ong *et al.*, 2016). This species also distributed in the Red Sea, Bay of Bengal, East Indies (Clark & Rowe, 1971), South China Sea (Liao, 1997) and Singapore (Ong *et al.*, 2016).

Finally, because the investigation in the subtidal zone in the Persian Gulf is limited and many of species have scarcely been studied in these areas, it seems more samples from different subtidal substrates can cause to record more species that have not recorded yet.

ACKNOWLEDGMENTS

The authors wish to express their gratitude to the Khorramshahr University of Marine Science and Technology and University of Shahid Chamran Authors also express their gratitude to Prof. Andrew R. Price and Joo Yong Ong for their help for species identification and for encouraging us in our study. Authors also express their gratitude to Dr. Pooran Khedri and Dr. Esmat Salimi for their assistance in the sampling.

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