

Shallow-Water Holothuroidea (Echinodermata) from Hormuz Island in the Persian Gulf, Iran

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Abstract: Although the first record of Echinodermata species from the Persian Gulf dates back to 1758, information on its sea cucumber species is still incompletely known. Thus, this paper was investigated to identify sea cucumbers of intertidal localities in the Hormuz Island in 2010. All specimens were collected by hand technique and species identification was done based on morphological keys and reviewing dermal ossicles. Six sea cucumber species belonging to family Holothuroidea and genus *Holothuria* were identified: *Holothuria arenicola*, *H. leucospilota*, *H. scabra*, *H. parva*, *H. pardalis* and *Holothuria* sp.

Key words: Sea Cucumber • *Holothuria* • Intertidal Zone • Species Identification • Hormuz Island

INTRODUCTION

Echinoderms are one of the oldest and most important groups of marine organisms which play an important role in the marine ecology [1-3]. Echinoderms are a big group of organisms including sea star, brittle star, sand dollar, sea urchin, sea lillie, feather star, Concentricycloidea and sea cucumbers [4] found in seas and oceans worldwide [1-3]. Sea cucumbers have widespread distribution among coral reefs, rocks, muddy and sandy flats [5] and are commercially and industrially valuable [6], they are poorly known in some areas of the world like the Persian Gulf. Although sea cucumbers in the southern part of the Persian Gulf have been well studied [7-11], information on the sea cucumbers of the northern part is limited

During 1937 and 1938, Danish scientific investigators, Mortensen & Heding and Gislen [12, 13] studied the Iranian waters of the Persian Gulf and Gulf of Oman. In the course of this expedition which was mainly in the Persian Gulf, extensive collections were gathered and deposited in the Zoological Museum University of Copenhagen. They reported 14 *Holothuria* species from Iranian coasts.

Although few less valuable reports of just one or two sea cucumbers from some Iranian Islands were published in the recent years [14-18], but generally information on sea cucumbers of the Strait of Hormuz including Hormuz Island is rare [19]. Therefore in this paper we reported *Holothuria* species around the island in 2010.

MATERIALS AND METHODS

Intertidal zone of Hormuz Island where is located in the Persian Gulf was studied in five stations based on substratum type (Fig. 1 & Table 1) to identify Holothuroidea species from February to October 2010. All specimens were sampled by hand technique and fixed in 70% ethanol. Species identification was done in laboratory using morphological specifics and the shape of their ossicles of body wall, tube feet and also tentacles. A small piece of tissue was cut from the specimen and then the soft tissue was removed with using of liquid household bleach [20]. Finally, the precipitated ossilces were examined with a microscope at 40X magnification.

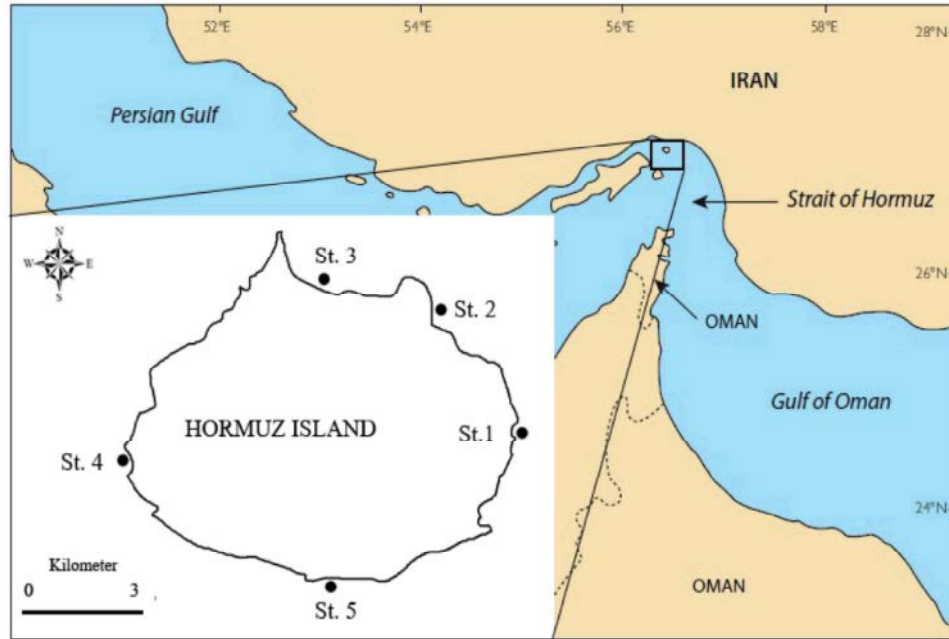


Fig. 1. Map of Hormuz Island in the Persian Gulf, showing the sampling sites

Table 1: Position and type substrata of sampling sites

Station	Sea bed	Lat.	Long.
Station 1	Sea anemone with Mud	27 03 21.7N	56 30 06.7E
Station 2	Sandy	27 05 24.3N	56 29 09.3E
Station 3	Mud with Grabble	27 05 24.3N	56 27 43.0E
Station 4	Grabble	27 03 26.9N	56 25 19.0E
Station 5	Rock with Mud and Grabble	27 04 25.0N	56 04 25.0E

RESULT AND DISCUSSION

Systematic:

Phylum : Echinodermata, Klein 1734
 Class : Holothuroidea, de Blainville, 1834
 Order : Aspidochirotida, Grube, 1840
 Family : Holothuria, Linnaeus 1767
 Genus : Holothuria, Linnaeus, 1767
 Species : *Holothuria arenicola* (Fig. 2)
 Species : *Holothuria leucospilota* (Fig. 3)
 Species : *Holothuria scabra* (Fig. 4)
 Species : *Holothuria parva* (Fig. 5)
 Species : *Holothuria pardalis* (Fig. 6)
 Species : *Holothuria* sp. (Fig. 7)

Description: *Holothuria (Thymiosica) arenicola* Semper 1868 (Fig. 2)

Holothuria (Thymiosica) arenicola; [21] 145,147; [22] 178, pl. 28, fig. 3; [23] 224-225, 232, fig 4a; [10] 94, fig 50; [24] fig. 1a & b & c & d



Fig. 2: *Holothuria arenicola* (Preserved specimen with spicules of dorsal body)



Fig. 3: *Holothuria leucospilota* (live specimen with spicule of dorsal body)

Remarks: A medium-sized of *Holothuria* which is known as the Sand Sea Cucumber, is a circumtropical species was found from under intertidal rocks to depth 30m. body approximately cylindrical in shape with the posterior and sometimes the anterior end distinctly tapering; mouth and



Fig. 4: *Holothuria scabra* (Preserved specimen with spicules of dorsal body)



Fig. 6: *Holothuria pardalis* (live specimen with spicules of dorsal body)



Fig. 5: *Holothuria parva* (live specimen with spicules of dorsal body)

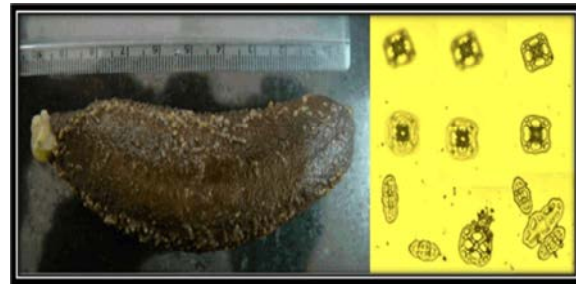


Fig. 7: *Holothuria* sp. (Preserved specimen with spicules of dorsal body)

anus approximately central; tentacle 20 in number, leaf-shaped; color in live creamish; however, it can be golden to light brown with paired black markings along the dorsal side; spicules small and fairly numerous, consisting of table with a square disc having four large central holes in addition to the much small and fairly compact cluster of spinlets; buttons smooth, with usually three pair of small holes.

Collection Sites: Stations 3 & 5

Distribution: Islands of West Indian Ocean to Red Sea, the Persian Gulf, Maldives' area and bay of Bengal eastwards to Hawaiian Is.

Holothuria (Mertensiothoria) leucospilota: Brandt 1835
Stichopus (Gymnochirota) leucospilota (Fig. 3)

Holothuria (Mertensiothoria) leucospilota; [12] 121; [22] 176, figs 87i & 87i', pl. 28, fig. 19; [23] 225, 233-234, figs 4f & 7g; [10] 92, fig. 49; [20] 78, fig. 64a-h; [21] 148-149, fig. 14;

Remarks: A medium-sized species of *Holothuria*, body approximately elongate; mouth and anus more or less ventral, surrounded by 18-20 black tentacles; calcareous ring with large radial pieces and triangular interradials. This species can release a lot of white sticky threads

when being threat. It's uniformly black in color and mainly found on substrata (Not cryptic). It has low commercial value. Its tables are not strongly development and from above showing ring of apical spines on spire; table occasionally degenerate or incomplete; buttons irregular, sometime incomplete.

Collection Sites: Stations 1, 4 & 5

Distribution: Tropical Indo-Pacific area

***Holothuria (Metriatyla) scabra* Jaeger 1833 (Fig. 4)**

Holothuria (Metriatyla) scabra Jaeger; [25] 50, 51, 52, 53; [22] 176, pl. 28, fig. 15; [26] figs 5, 1 G, O, 5, 5 A, 5, 7 A, G, 5, 9 I;

Remarks: This species has quite large size, body wall soft, ventral body wall mainly thin, about 1-2 mm. dorsal body wall is thick, about 5-6 mm; mouth ventral, surrounded by 20 short tentacles; anus terminal with anal papillae; dorsal surface black with white spots; ventral surface whit with black spots; large mass of spicules, table well developed, disc smooth, often squarish in outline, terminating in several small spine, buttons simple with moderate size, irregularly arranged knobs; three to six pairs of large holes, never modified into hollow fenestrated spheres.

Collection Sites: Stations 2 & 3

Distribution: Tropical Indo-Pacific area

Holothuria (selenkothuria) parva Krauss in Lampert (Fig. 5)

Holothuria (selenkothuria) parva; [22] 178; [20] 94-95, fig. 72;

Remarks: Cryptic species with the medium size; table absence, buttons never present, rods thorny; body wall soft, usually about 1-2 mm thick. In microscopical examine, was determined that the ossicles are very different in compare with other species of this family.

Collection Sites: Stations 1, 3, 4 & 5

Distribution: Tropical Indo-Pacific area

Holothuria (Lessonothuria) pardalis: Selenka (Fig. 6)

Holothuria (Lessonothuria) pardalis; [20], fig 19, 72-73, fig 61; [22] 178, pl. 28, fig. 11; [23] 233, 239, fig 4e;

Remarks: This species is found as both cryptic and on the substrata. Body wall soft and not very thick, usually 2-3 mm, small size, up to 14 cm, table clumsy, spire low to moderate, dick spinose often turned up to give a cup and saucer appearance to the table in lateral view, pseudobuttons abundant, smooth, usually irregular and often reduced to a single row.

Collection Sites: Stations 3 & 5

Distribution: Tropical Indo-Pacific area *Holothuria* sp.

Remarks: This species is sausage shape and has a white ring around anus. Body wall is about 2 mm thick (Fig. 7).

Collection Sites: Station 5.

CONCLUSION

Identification of sea cucumber in intertidal area of Hormuz Island of the Persian Gulf showed that all individual of sea cucumber are belonging to *Holothuria* genus. Total of these 8 sea cucumbers were reported from the Persian Gulf.

Holothuria leucospilota and *Holothuria scabra* were appearance on substrata. *Holothuria pardalis* was founded appearance and cryptic on the substrata. Another species were cryptic under rock and in the substrata.

Table 2: Distribution of sea cucumber by season

Species	Season		
	Summer	Spring	Winter
<i>Holothuria leucospilota</i>	●	●	●
<i>Holothuria arenicola</i>	●	●	●
<i>Holothuria scabra</i>	●		●
<i>Holothuria</i> sp.			●
<i>Holothuria bacilla</i>	●	●	●
<i>Holothuria parva</i>	●	●	●
<i>Holothuria pardalis</i>	●	●	●

Table 3: Distribution of sea cucumber by site sampling

Species	Station				
	St 5	St 4	St 3	St 2	St1
<i>Holothuria leucospilota</i>	●	●			●
<i>Holothuria arenicola</i>	●		●		
<i>Holothuria scabra</i>			●	●	
<i>Holothuria</i> sp.	●				
<i>Holothuria bacilla</i>	●	●	●		●
<i>Holothuria parva</i>	●	●	●		●
<i>Holothuria pardalis</i>	●		●		

Holothuria parva and *Holothuria bacilla* are very common around Hormuz Island. They have same ecological niche, they were founded usually in substrata which are included mud, mainly under rock, occasionally in deep bed (5-10 cm). Also their ossicles are very different in compare with other species of this family. *Holothuria* sp. was found in the station 5 in winter (Tables 2 and 3). There is no species in spring and summer in station 2.

Holothuria arenicola and *Holothuria leucospilota* have similar table spicule shape. *Holothuria leucospilota* was found on sediment and so was appearance on substrata. Color pattern of *Holothuria scabra* is ventral body light (White to creamish) with a lot of black spots and dorsal body black with a lot of white spot. *Holothuria pardalis* is dominant species in station 3 and 5 (Tables 2 and 3).

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