

## A Report on the Isopods of the Coastal Waters of the Persian Gulf: the Hengam Island

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### Abstract

The materials of this study were collected from intertidal and shallow subtidal habitats of the Hengam Island coasts from May 2013 to May 2014. A total of 10 species representing eight genera and four families are reported as follows: *Sphaeromopsis persikolpos* Khalaji-Pirbalouty and Wägele 2009, *S. sarii* Khalaji-Pirbalouty and Wägele 2009, *Sphaeroma khaliffarsi* Khalaji-Pirbalouty and Wägele 2010, *Dynamenella granulata* Javed and Ahmed 1988, and *Cymodoce waegelei* Khalaji-Pirbalouty & Raupach, 2014 (Sphaeromatidae); *Baharilana kiabii* Khalaji-Pirbalouty and Wägele 2010, *Atarbolana exoconta* Bruce and Javed 1987, and *A. makranensis* Khalaji-Pirbalouty, Naderloo and Keikhosravi 2015 (Cirolanidae); *Ligia persica* Khalaji-Pirbalouty and Wägele 2010 (Ligiidae); *Olibrinus cf. antennatus* Budde-Lund 1902 (Olibrinidae).

Keywords: *Isopoda*, *Sphaeromatidae*, *Ligiidae*, *Cirolanidae*, *Hengam Island*, *Persian Gulf*

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### 1. Introduction

The order Isopoda includes an abundant group of species of the crustacean superorder, Peracarida. The isopods comprise over 10,000 described species which are found in all environments from the deepest oceans to alpine terrestrial habitats. Isopods are important elements of marine ecosystems with variety of life styles (e.g., herbivory, carnivory, necrophagy, parasitism, filter-feeding). Isopods of the coastal zones are predominantly cryptic usually living under rocks, within cervices, empty shells and worm tubes, and among sessile and sedimentary organisms like algae, sponges, hydroids, ectoprocts,

mussels, urchins, barnacles, and ascidians (Brusca et al., 2001; Schotte et al., 2008).

The isopod fauna along the Iranian coasts of the Persian Gulf has received more attention compared to other coasts of the region (Khalaji-Pirbalouty and Wägele, 2009; 2010a, 2010b, 2010c, 2011; Khalaji-Pirbalouty et al., 2013; Khalaji-Pirbalouty and Raupach, 2014).

Although, limited studies have been carried out on the islands, study performed on the marine isopod fauna of the Hengam Island is lacking. The present study investigated the coastal isopod species and their abundance in the island to be applied to characterizing the isopod fauna of the entire Persian Gulf in future.

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## 2. Materials and Methods

Hengam Island (GPS coordinates 26°36'43" – 26°41'15"N, 55°54'40" – 55°54'55"N) is a small island located 2 km south to Qeshm Island in the Strait of Hormuz. The island has approximately an area of 50 km<sup>2</sup> (Rezai et al., 2010). Sampling were carried out at 18 stations from May 2013 to May 2014 (Fig. 1). Specimens were collected by digging and hand collecting from various habitats including sandy beaches, mud flats, beneath stones as well as subtidal sand, mud, and seagrass beds., sieved to remove sand and washed off of algae and sea grass. Samples from sandy beaches were collected by sieving. Inter-tidal algal turf, sponges, and seagrasses were collected in a large plastic bag and then rinsed under a sea-water

hose with washings passing through a sieve to extract the isopod specimens. All specimens collected were deposited in Zoological Museum of Shahrekord University, Iran (ZMSU).

## 3. Results and Discussion

A total of 10 species were identified belonging to eight genera (Table 1, Fig. 2). The dominant family is Sphaeromatidae with five species (*Sphaeromopsis persikolpos* Khalaji-Pirbalouty and Wägele 2009, *S. sarii* Khalaji-Pirbalouty and Wägele 2009, *Sphaeroma khalijfarsi* Khalaji-Pirbalouty and Wägele 2010, *Dynamenella granulata* Javed and Ahmed 1987, and *Cymodoce waegelei* Khalaji-Pirbalouty and Raupach 2014).

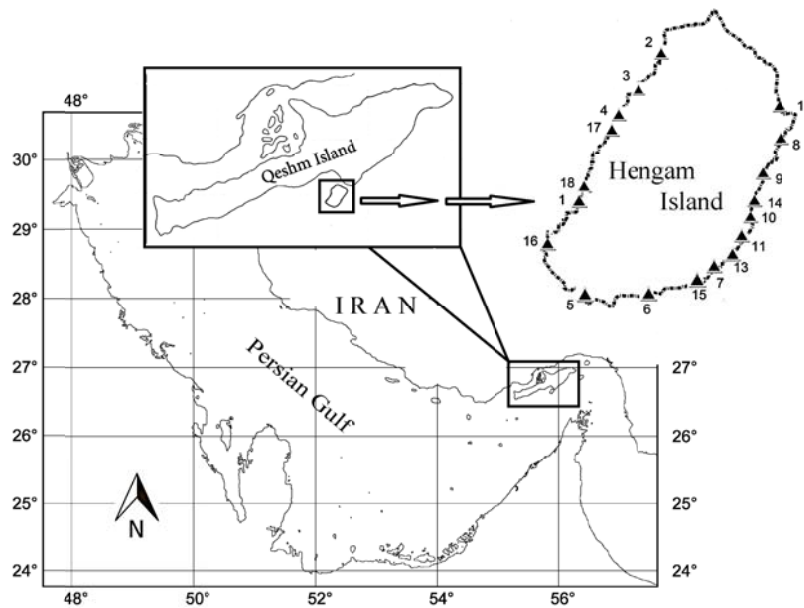


Fig. 1: Map showing the sampling sites at Hengam Island, the Persian Gulf.

Table 1: List Isopoda species found in the Hengam Island

Family	Specie	Stations
Sphaeromatidae	<i>Sphaeromopsis sarii</i> Khalaji-Pirbalouty and Wägele, 2009	1, 3, 7, 8, 9, 11, 13, 16
	<i>S. persikolpos</i> Khalaji-Pirbalouty and Wägele, 2009	1, 3, 7, 8, 9, 11, 13, 16
	<i>Sphaeroma khalijfarsi</i> Khalaji-Pirbalouty and Wägele, 2010	3
	<i>Cymodoce waegelei</i> Khalaji-Pirbalouty and Raupach, 2014	2, 3, 4, 5, 6
	<i>Dynamenella granulata</i> Javed and Ahmed, 1988	8, 9, 11, 12, 13, 15
Cirolanidae	<i>Baharilana kiabii</i> Khalaji-Pirbalouty and Wägele, 2010	16
	<i>Atarbolana exoconta</i> Bruce and Javed, 1987	7, 15
	<i>Atarbolana makranensis</i> Khalaji-Pirbalouty, Naderloo and Keikhosravi, 2015	1, 8, 9, 10, 12, 13, 15, 16
Ligiidae	<i>Ligia persica</i> Khalaji-Pirbalouty and Wägele, 2010	17, 18
Olibrinidae	<i>Olibrinus</i> cf. <i>antennatus</i> (Budde-Lund, 1902)	1, 12, 14

The family, Cirolanidae is represented by *Baharilana kiabii* Khalaji-Pirbalouty and Wägele 2010, *Atarbolana exoconta* Bruce and Javed, 1987, and *A. makranensis* Khalaji-Pirbalouty, Naderloo and Keikhosravi 2015, while each of Ligiidae and low richness Olibrinidae is represented by only one species (*Ligia persica* Khalaji-Pirbalouty and Wägele, 2010, and *Olibrinus* cf. *antennatus* Budde-Lund, 1902). *Atarbolana makranensis*, *Sphaeromopsis sarii*, and *S. persikolpos* are widely distributed in the coastal zone of Hengam Island. Of these, *Atarbolana* species were found on low algal turfs in rocky shores at all locations.

These species are well adapted to rocky shores covered with algae, where they can live in a food-rich environment. *Atarbolana exoconta* Bruce and Javed, 1987 is described from the rocky intertidal coast of Manora Island, Pakistan. This species is widely distributed along the Iranian coasts of the Persian Gulf and Oman Sea as well as the Pakistan coasts (Bruce and Javed, 1987; Khalaji-Pirbalouty and Raupach, 2016). *Atarbolana makranensis* is the dominant species of the Hengam Island, which originally described by Khalaji-Pirbalouty et al., 2015 from the Makran coast.

*Sphaeromopsis sarii* and *S. persikolpos* are widely distributed in the coastal zone of the Hengam Island and also reported from Kish and Qeshm Islands and on the northeastern coast of the Iranian part in the Persian Gulf (Khalaji-Pirbalouty and Wägele, 2009). These species, which are characterized by their small size (approximately 1–4 mm), mainly occur in intertidal tide pools and partly on low algal turfs in sandy beaches. They are well adapted to sandy and rocky shores with small green algae or tide pools, where they can live in a food rich environment, protected of desiccation during periods of low tide and also protected from wave dislodgement because of their small body size. Interestingly, both species are sympatric and in some habitats, they live together even in the same tide pool.

Only a single of *Sphaeroma khalijfarsi* is recorded

at the northwestern coast of the Hengam Island. Specimens of *S. khalijfarsi* were observed living freely under rocks, sandstone, pieces of dead coral skeletons, and within barnacle tests and molluscan shells of mud or sand flats.

The other two species of sphaeromatid were predominantly found at different stations (Table 1) during the study. *Cymodoce waegelei* was found within algae and meadows beds at the depths between 1 and 3 m and *Dynamenella granulata*, was found in different intertidal habitats, in clumps of algae, under of rocks, sandstone, and coral skeletons. Of the three known *Cymodoce* species from the Persian Gulf (*C. fuscina* Schotte and Kensley, 2005, *C. delvarii* Khalaji-Pirbalouty, Bruce and Wägele, 2013 and *C. waegelei*) only *C. waegelei* was found in the subtidal zone of the Hengam Island. *Dynamenella granulata* is originally described by Javed & Ahmed (1988) from the Karachi coast, Pakistan. This species is widely distributed in different intertidal habitats in the eastern coasts of the Hengam Island.

The semiterrestrial isopod *Ligia persica* has a patchy distribution in rocky intertidal and supralittoral habitats of the west coast of the Hengam Island. Their patchy distribution is probably related to an adaptation to special habitats, where they can take up water from droplets and puddles by capillarity or from water vapor directly from the air, and hide under rocks and in crevices to minimize water loss and hide from terrestrial, aerial, and marine predators (Carefoot and Taylor, 1995; Khalaji-Pirbalouty and Wägele, 2010). Apparently, *L. persica* is the only species of this genus that has a wide geographic distribution along the southern coasts of the Persian Gulf as well as the northern coasts. Because of high abundance in the harbors and ports of the Persian Gulf, it might be dispersed by ship traffic.

Of the genus *Olibrinus* Budde-Lund, 1913, only one species was found. This genus with approximately 10 nominal species is strictly littoral and distributed along the coasts of the Indian Ocean and the west Pacific (Schmidt, 2002). *Olibrinus* cf. *antennatus*

((Budde-Lund, 1902) is a halophilic species (Taiti et al., 1992), which is found on the muddy bottoms,

under rocks, stones or logs during the high tides in the study area (Fig. 3).

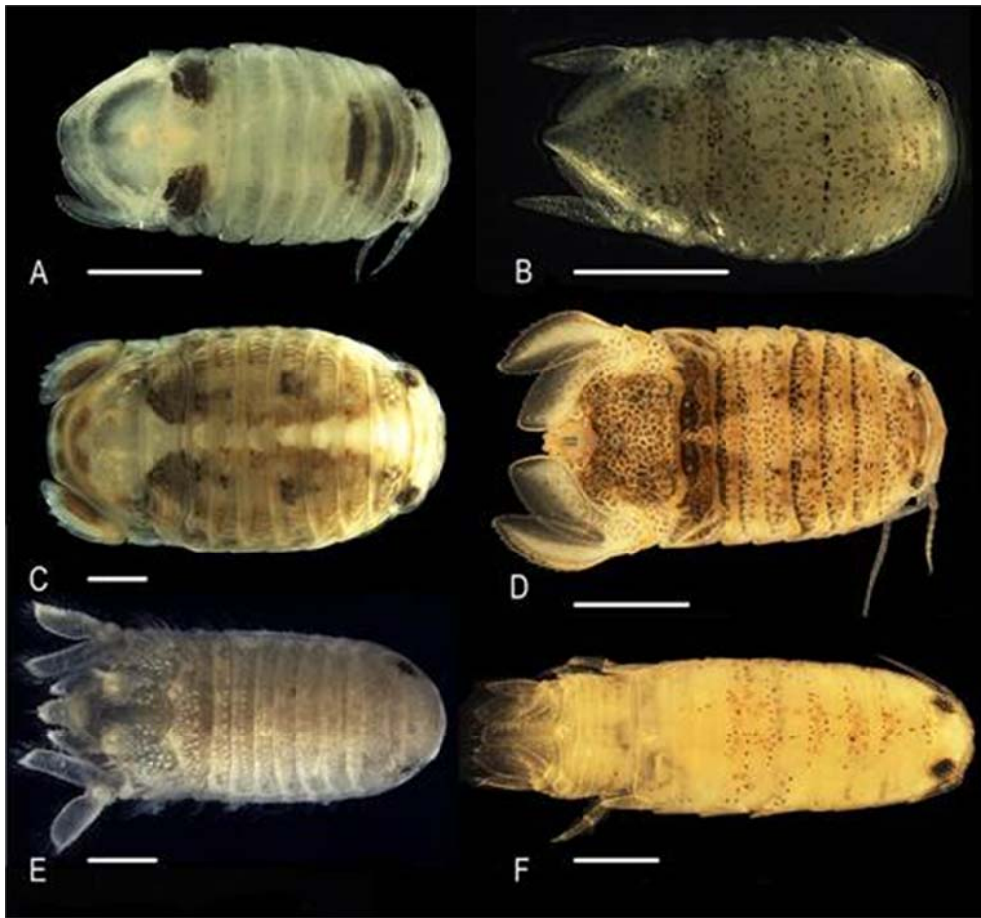


Fig. 2: (A) *Sphaeromopsis sarii* Khalaji-Pirbalouty and Wägele 2009; (B) *Sphaeromopsis persikolpos* Khalaji-Pirbalouty and Wägele 2009; (C) *Sphaeroma khaliffarsi* Khalaji-Pirbalouty and Wägele 2010; (D) *Dynamenella granulata* Javed and Ahmed 1988; (E) *Cymodoce waegelei* Khalaji-Pirbalouty and Raupach 2014; (F) *Baharilana kiabii* Khalaji-Pirbalouty and Wägele 2010. Scale Bar, 1mm.



Fig. 3: (A) *Atarbolana exoconta* Bruce and Javed 1987; (B) *Atarbolana makranensis* Khalaji-Pirbalouty, Naderloo and Keikhosravi 2015; (C) *Olibrinus cf. antennatus* (Budde-Lund 1902); (D) *Ligia persica* Khalaji-Pirbalouty and Wägele 2010. Scale Bar, 1mm.

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