

## First record of two hard coral species (Faviidae and Siderastreidae) from Qeshm Island (Persian Gulf, Iran)

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**Abstract.** Moradi M, Kamrani E, Shokri MR, Ranjbar MS, Hesni MA (2009) First record of two hard coral species (Faviidae and Siderastreidae) from Qeshm Island (Persian Gulf, Iran). *Nusantara Bioscience* 2: 34-37. Two species of hard corals including *Cyphastrea chalcidicum* (Forsk. 1775) (Faviidae) and *Coscinaraea monile* (Forsk. 1775) (Siderastreidae) were collected from the south of Qeshm Island (Persian Gulf, Iran) in the late of 2008. These species were previously reported from southern Persian Gulf, Gulf of Aden, Southeast Africa, and Indo-Pacific. The literature review on the distribution of these two species revealed that these species were firstly recorded from the Persian Gulf. These findings further emphasize the high diversity of coral fauna in the Iranian waters of the northern Persian Gulf.

**Keywords:** first record, *Coscinaraea monile*, *Cyphastrea chalcidicum*, Qeshm Island, Persian Gulf.

**Abstrak.** Moradi M, Kamrani E, Shokri MR, Ranjbar MS, Hesni MA (2009) Rekaman pertama dua spesies karang keras (Faviidae dan Siderastreidae) dari Pulau Qeshm (Teluk Persia, Iran). *Nusantara Bioscience* 2: 34-37. Dua jenis karang keras termasuk *Cyphastrea chalcidicum* (Forsk. 1775) (Faviidae) dan *Coscinaraea monile* (Forsk. 1775) (Siderastreidae) dikumpulkan dari selatan Pulau Qeshm (Teluk Persia, Iran) pada akhir tahun 2008. Spesies ini sebelumnya dilaporkan terdapat di Teluk Persia selatan, Teluk Aden, Afrika Tenggara dan Indo-Pasifik. Tinjauan literatur pada distribusi kedua jenis mengungkapkan bahwa spesies ini pertama kali tercatat dari Teluk Persia. Temuan ini semakin menunjukkan tingginya keragaman fauna karang di perairan Iran di bagian utara Teluk Persia.

**Kata kunci:** catatan pertama, *Coscinaraea monile*, *Cyphastrea chalcidicum*, Qeshm island, Persian gulf.

### INTRODUCTION

The Persian Gulf has a complex and unique tropical marine ecosystem, especially coral reefs, with relatively low biological diversity and many endemic species (Price 1993). In this area, the coral reef communities are occurred in the form of non-reef setting (Riegl 1999) and surrounded by some of the driest landmasses in the world, such that continental influences are limited (Price 1993). While large parts of the region are still in a pristine condition, several anthropogenic threats notably habitat destruction, over-exploitation, and pollution are ever-increasingly disturbing the coral reef communities. The coral reef communities in the Persian Gulf are less diverse than that of Indian Ocean (Price 1993). This is due to the high salinity; high daily amplitude of temperature (Coles and Fadlallah 1991) and occasional extreme low tides (Reynolds and Marisco 1993) that make the environmental condition is unfavorable to coral reef communities.

The largest island in Persian Gulf is Qeshm Island (ca. 122 km long, 18 km wide on average, 1,445 sq km). This island is located a few kilometers off the southern coast of

Iran (Persian Gulf), about 22 km south of Bandar Abbâs and not far from Bandar Khamir (DHI 1976).

A study was conducted to explore the species diversity of hard corals in Qeshm Island, in order to bridge the gap of knowledge on species inventory of hard corals in this area. The results of the study have been presented in detail elsewhere (Moradi et al., in prep.) and this paper presents only the new recordings of two hard coral species from Qeshm Island (Persian Gulf, Iran).

### MATERIALS AND METHODS

The coral survey was conducted in August 2008. Hard coral specimens were collected by SCUBA diving from two sites (Naz and Zeitoon) within shallow non-reef settings (6 to 10 m deep) with hard ground substrate in the south of Qeshm Island, (Iran, Northern Persian Gulf). The geographical positions of the sampling sites were N 26° 49' 19.4" and E 56° 07' 23.1" for Naz station, and N 26° 55' 40.15" and E 56° 15' 54.82" for Zeitoon Station (Figure 1). The coral specimens were bleached using hydrogen peroxide and photographed showing the whole

specimen and the corallite structures. Identifications were performed using available references, especially Veron (2000), and through communication with Prof. Charles Sheppard at the Dept. of Biological Sciences, Warwick University for further checking. The materials are deposited in at the Faculty of Marine Biology, University of Hormozgan, Iran.

## RESULTS AND DISCUSSION

### Results

Twenty-one species of hard corals belonging to 8 families were identified and with resulting Poritidae and Faviidae as the dominant families. Two species, *Coscinaraea monile*, (Forsk. 1775) (Family: Siderastreae) and *Cyphastrea chalcidicum* (Forsk. 1775) (Family: Faviidae) were new records from northern Persian Gulf.

*Coscinaraea monile* (Forsk. 1775)

Kingdom Animalia

Phylum Coelenterata Frey and Leuckart 1847

Subphylum Cnidaria Hatschek 1888

Class Anthozoa Ehrenberg 1831

Subclass Zoantharia de Blainville 1830

Order Scleractinia Bourne 1900

Family Siderastreae (Vaughan and Wells, 1943)

Genus *Coscinaraea* (Forsk. 1775)

*Coscinaraea monile* (Forsk. 1775) (Figure 2)

Taxonomic references: Scheer and Pillai (1983)

Material examined: Qeshm Island, Naz Island, depth 8-11m, collector M. Moradi, 24 August 2008.

Diagnosis characters: Colonies are encrusting or massive, 10-30 cm in diameter sometimes larger. Corallites are 2.5 to 3.5 millimeters in diameter and form a linear series in meandroid valleys. In some cases, there is no demarcation between adjacent corallites and others. There is an irregular, low, thin wall marking the boundary. In massive colonies, calyces are 2-4 mm in diameter; in explanate corolla, calyces are 3-6 mm in diameter. Up to 30 septa occur at the wall, but only 8-9 reach the columella due to fusion of adjacent septa; septa and septocostae are lightly granulated and the margins are divided into sharp dentations.

Color: Light brown

Habitat: Abundant in 8-10 meter depths

Distribution: This species is confined to the Indian Ocean and is most common along the shores of the southern Persian Gulf, Oman Sea, Red Sea, Gulf of Aden (Veron 2000) and Southeast Africa, (Riegl 1996).

*Cyphastrea chalcidicum* (Forsk. 1775)

Family Faviidae (Gregory, 1900)

Genus *Cyphastrea* (Forsk. 1775)

*Cyphastrea chalcidicum* (Forsk. 1775) (Figure 3)

Taxonomic references: Veron, Pichon, and Wijisman-Best (1977), Wijisman-Best (1980).

Material examined: Qeshm Island, Zeyton Park, depth 2-5 m, collector M. Moradi, 19 June 2008.

Diagnosis characters: Colonies are encrusting to massive, usually about 20-35 cm in diameter. Corallites are round, variably exsert, usually about 1.5-2.5 mm diameter, budding is extratentacular. There are 20-26 septa arranged in 2 orders, inner septal margins of primaries and secondaries carry rounded dentations and descend into the calyces at about 45-degree angle. All primaries reach the columella, some secondaries do not. Septa are sparsely granulated and septa are not continuous with those of adjacent corallites. Septocostae are sub-equally exsert about 0.5 mm above the wall. Costae are equally exserted, the columella is small less than 0.4 mm in diameter composed of tangled by synapticular ring. The coenosteum is covered with short tapering spines.

Color: Usually uniform brown, green or cream with corallite walls and calyces of contrasting colors.

Habitat: Abundant in 3-meter depths.

Distribution: This species is confined to the Indian Ocean and are most common along the shores of Red Sea, Gulf of Aden (Veron 2000) and Southeast Africa (Riegl 1996).

### Discussion

Harger (1984) reported 19 species of corals at Hormuz Island in the east of Qeshm Island, Persian Gulf. Staghorn corals (*Acropora* sp.) were found to be the dominant species around the islands in the Persian Gulf (Sheppard and Sheppard 1991), whereas the massive corals (Poritidae, Faviidae) are dominant corals at present. Staghorn corals are defined as disturbance-adapted types for their rapid growth rate and fragility (Done 1982; Karlson and Hurd 1993). Massive and submassive corals being defined as stress-tolerators (Veron 1986; Rogers 1990) are shown to tolerate to the high sedimentation and/or eutrophication. Presence of massive corals in Qeshm Island suggests that the reef corals reefs in this island are likely subjected to high sedimentation and/or eutrophication. The species found in the present study are massive types that are confined to the Indian Ocean, most common along the shores of Persian Gulf, Oman Sea, Red Sea and Gulf of Aden (Veron 2000). *Cyphastrea chalcidicum* (Forsk. 1775) was reported from Southeast Africa (Riegl 1996), Gulf of Aden, Indo-Pacific and Indian Ocean (Veron 2000) and *Coscinaraea monile* (Forsk. 1775) was reported from Northern Red Sea (Riegl and Velimirov 1994), Southeast Africa (Riegl 1996), Dubai, (Riegl 1999), Oman sea (Coles 1996), Gulf of Aden, Indo-Pacific and Indian Ocean (Veron 2000).

The shift in coral diversity from disturbance-adapted types (*Acropora* branching corals) in the past to stress-tolerators (*Favia* and *Porites* massive and submassive corals) at present indicates that coral species composition in Qeshm Island has been altered over three decades (1984 to present). The corals in Persian Gulf have recently experienced multiple bleaching events (1996, 1998, 2002) (Pilcher et al. 2000; Wilkinson 2004; Wilson et al. 2002; Rezaei et al. 2004) causing mass mortality of *Acropora* corals in the entire region. The climatic change revealed in

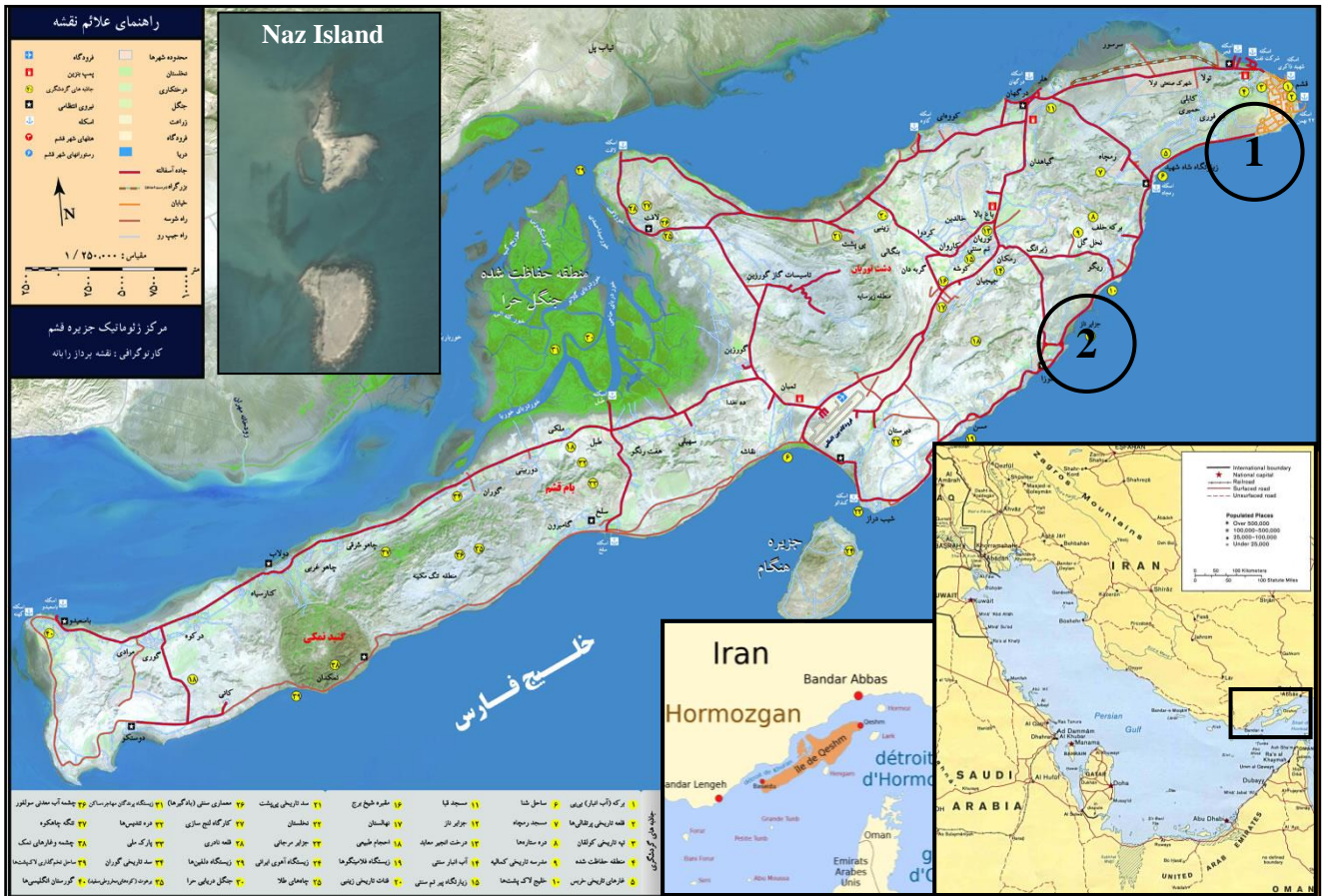


Figure 1. Study area and location of sampling sites, Qeshm Island (Persian Gulf, Iran). 1. Zeyton Park, 2. Naz Island (above insert).

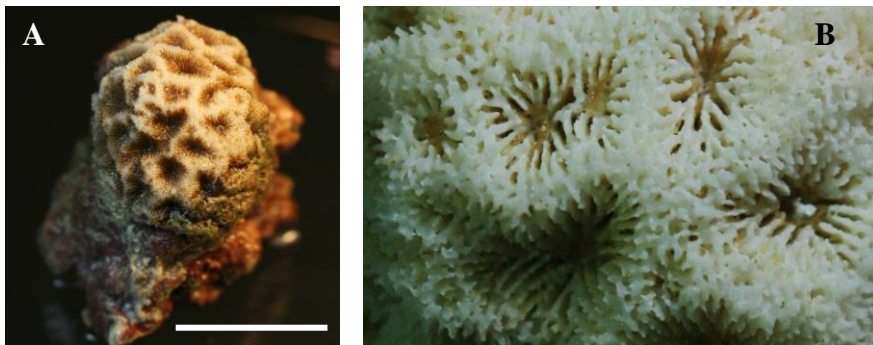


Figure 2. *Concinarae monile*, A: Colony, B: Corallites. Bar = 2 cm

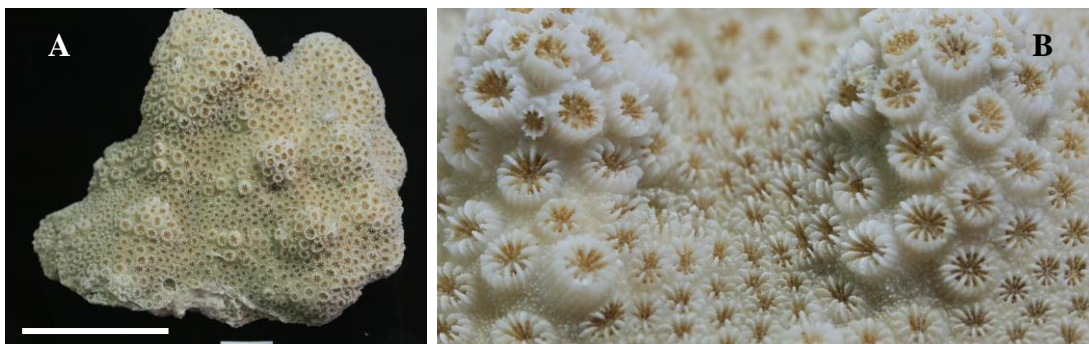


Figure 3. *Cyphastrea chalcidicum*, A. Colony, B. Corallites. . Bar = 2 cm

multiple bleaching events associated with high sedimentation and/or eutrophication in this area may be possible factors altering the coral species diversity in the study area. Further studies are required in the Persian Gulf to reveal the possible effects of climate change on reef corals.

### CONCLUSION

Two species of hard corals including *Cyphastrea chalcidicum* (Forsk. 1775) (Faviidae) and *Coscinaraea monile* (Forsk. 1775) (Siderastreidae) were firstly recorded from the south of Qeshm Island (Persian Gulf, Iran). These species were previously reported from southern Persian Gulf, Gulf of Aden, Southeast Africa, and Indo-Pacific. These findings further emphasize the high diversity of coral fauna in the Iranian waters of the northern Persian Gulf.

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### REFERENCES

- Coles SL, Fadlallah YH. 1991. Reef coral survival and mortality at low temperatures in the Arabian Gulf: New species-specific lower temperature limits. *Coral Reefs* 9:231-237.
- Coles SL. 1996. Corals of Oman. R. Keech Publ., Thorns, Hawes, UK.
- Deutsches Hydrographisches Institut [DHI] (1976) Handbuch des Persischen Golfs. 5th ed. Deutsches Hydrographisches Institut, Hamburg.
- Done TJ. 1982. Patterns in the distribution of coral communities across the central Great Barrier Reef. *Coral Reefs* 1:95-107.
- Harger JRE. 1984. Rapid survey techniques to determine distribution and structure of coral communities. In: Comparing coral reef survey methods. UNEP-UNESCO Workshop. [Thailand]
- Karlson RH, Hurd LE. 1993. Disturbance, coral reef communities, and changing ecological paradigms. *Coral Reefs* 12: 117-125.
- Pilcher NJ, Wilson S, Alhazeem SH, Shokri MR. 2000. Status of coral reefs in the Persian Gulf and Arabian Sea Region (Middle East). In: Wilkinson C (eds) Status of coral reefs of the world 2000. AIMS Press, Australia.
- Price ARG. 1993. The Gulf: Human impact and management initiatives. *Mar Poll Bull* 27: 17-27.
- Rezaei H, Wilson S, Claerebout M, Riegl B. 2004. Coral reef status in the ROPME Sea Area: Arabian/Persian Gulf, Gulf of Oman and Arabian Sea. In: Wilkinson C (eds) Status of coral reefs of the world 2004. AIMS Press, Australia.
- Riegl B, Velimirov B. 1994. The structure of coral communities at Hurghada in the northern Red Sea. *P.S.Z.N. I: Mar Ecol* 15: 213-231.
- Riegl B. 1996. Hermatypic coral fauna of subtropical southeast Africa: A checklist. *Pac Sci* 50: 404-414.
- Riegl B. 1999. Corals in a non-reef setting in the southern Arabian Gulf (Dubai, UAE): fauna and community structure in response to recurring mass mortality. *Coral Reefs* 18: 63-73.
- Reynolds RW, Marisco DC. 1993. An improved real-time global sea surface temperature analysis. *J Climate* 6: 114-119.
- Rogers CS. 1990. Responses of coral reefs and reef organisms to sedimentation. *Mar Ecol Prog Ser* 62: 185-202.
- Sheppard CRS, Sheppard ALS. 1991. Corals and coral communities of Arabia. *Fauna of Saudi Arabia* 12: 3-170.
- Veron JEN. 1986. Corals of Australia and the Indo-Pacific. Angus and Robertson Publishers, Australia.
- Veron JEN. 2000. Corals of the world. Australian Institute of Marine Science, Australia.
- Wilkinson C. 2004. Status of coral reefs of the world. AIMS Press, Townsville, Australia.
- Wilson S, Fatemi SMR, Shokri MR, Claerebout M. 2002. Status of coral reefs of the Persian Gulf and Arabian Sea Region. In: Wilkinson C, (eds) Status of coral reefs of the world 2002. AIMS Press, Australia.