



## New species of soft corals (Octocorallia) on the reef of Marine National Park, Gulf of Kachchh

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### Abstract

Newly recorded two species, viz., *Carijoa riisei* (Duchassaing & Michelotti, 1860) and *Subergorgia suberosa* (Pallas, 1766) falling under the order Alcyoniidae, family Clavulariidae, and order Gorgonacea Lamouroux, 1816, Family Subergorgiidae Gray, 1859 respectively are described and illustrated from Marine National Park, Gulf of Kachchh. The form of the sclerites in *Carijoa sp.* is mostly slender, rod like, ornamented with thorns and prickles (0.1 mm to 0.4 mm). *Subergorgia sp.* has warty spindles, ovals and flattened spindles (0.05 mm to 0.25 mm). Photomicrographs of the sclerites illustrate their form, size and relative abundance.

**Keywords:** *Carijoa riisei*, *Subergorgia suberosa*, Octocorallia, Marine National Park, Gulf of Kachchh.

### 1. Introduction

The Gulf of Kachchh, one of the world's richest marine biospheres, occupies an area of 7350 sq.km and 42 islands which possess a very interesting heterogeneous group of fauna and flora. Coral reefs cover is estimated to be 284,300 km<sup>2</sup> or just about 1.2 percent of the world's continental shelf area (Spalding *et al.*, 2001). Octocorals are among the prominent components of reef communities in the Marine National Park, Gulf of Kachchh Islands. The anthozoan sub-class Octocorallia is known to be a good source of bioactive compounds.

The taxonomic literature on Octocorals from the Indo-Pacific reefs (Dinesen, 1983; Benayahu, 1985; Lasker, 1988; Yamazato *et al.*, 1981; Alderslade and Shirwaiker, 1991; Ofwegen and Benayahu, 1992; Verseveldt and Ofwegen, 1991 and Benayahu, 1985, 1990, 1993, 1995) have proved their abundance and ecological significance. Taxonomic revision of the major genera of the family Alcyoniidae (Verseveldt, 1980, 1982, 1983) significantly contributes to the soft coral studies. Genera *Clavulariidae* and *Briareidae* have been reported from different places of the world (Thomson, *et al.*, 1931; Bayer, 1973; Gohar, 1948; Alderslade, 2000; Katharina and Alderslade, 2001). Very few comprehensive works are available on the soft corals of Indian waters (Pratt, 1903, 1905; Hickson, 1903, 1905; Thomson and Simpson, 1909; Jayasree *et al.*, 1994; Jayasree *et al.*, 1996; Jayasree and Parulekar, 1997; Venkataraman *et al.*, 2004; Padmakumar *et al.*, 2011; Yogesh Kumar *et al.*, 2012; 2014a,b

In Gulf of Kachchh, Venkataraman *et al.*, (2004) reported 13 species of soft corals. Later on Dixit *et al.* (2010) reported 23 species of octocorals in the consolidated list of alcyonarian soft corals from Gulf of Kachchh. The present work has reported two species new to Marine National Park, Gulf of Kachchh.

## 2. Material and Methods

Specimens were collected by SCUBA diving at Marine National Park, Gulf of Kachchh and preserved in 70% ethanol following Breedy (2001). The specimens were identified based on the morphological characteristics of the colonies and sclerite structure. Sclerites were extracted using 5% Sodium hypochlorite (Bayer, 1961) and examined under the compound microscope, and underwater pictures were taken using Sony DSC – T200 camera.

## 3. Results and Discussion

During the survey in Marine National Park, two species (*Carijoa riisei*; *Subergorgia suberosa*) under two families (Clavulariidae and Subergorgiidae) and two genera (Carijoa and Subergorgia) were reported; not recorded earlier in Gulf of Kachchh waters. They were found mainly attached on reef and rocky substrates at the depths between 2 to 20m in areas with strong currents or wave action. Microscopic observation of the calcareous sclerites confirmed the novelty of the finding.

### Systematic Position

- Phylum** : Cnidaria Hatschek, 1888  
**Class** : Anthozoa Ehrenberg, 1831  
**Order** : Alcyonacea Lamouroux, 1816  
**Sub Order** : Stolonifera Ryland, 1960  
**Family** : Clavulariidae Hickson, 1894  
**Genus** : *Carijoa* F. Muller, 1867)  
**Species** : *Carijoa riisei* (Duchassaing & Michelotti, 1860) (Plate – 1)

**Material Examined:** Colony bushy some time branches form; depth: 2 to 5 meter; Laku point (Lat. 22°24'18.5 N; Long. 69°12'54.8 E) and Pirotan Island (Lat. 22°35'06.9 N; Long. 069°57'48.3 E) Marine National Park, Gulf of Kachchh; Highly turbid, strong water current and reef shaded areas.

**Description:** Colony axial polyps monomorphic, retractile with short body, white or cream colour and stolons are also same in colour (White or cream). Stolons are united basally by a network of anastomosing. Size of the colony is covered upto 20cm tall and in most cases are overgrown by encrusting species of sponge or ascidian.

**Sclerites:** Mostly colourless, average size 0.1 mm to 0.4 mm, the colony contains slender and rod like, ornamented with thorns and prickles often branching and interlocking and sometimes fusing into clump.

### Depth range and Habitat:

2 – 20 m depth; it was observed mostly in turbid environments, most commonly as fouling organisms on jetties and wrecks. In the present study we observed in shaded turbid and strong water current location.

**Distribution:** Western Atlantic Ocean, Florida, Brazil, Caribbean, Chuuk, Palau, Philippines, Indonesia, Australia, Thailand, India: Gulf of Mannar, Gulf of Kachchh, Andaman and Nicobar Islands.

- Order** : Gorgonacea Lamouroux, 1816  
**Family** : Subergorgiidae Gray, 1859  
**Genus** : *Subergorgia* Gray, 1857  
**Species** : *Subergorgia suberosa* (Pallas, 1766) (Plate – 2)

**Material Examined:** Laku point (Lat. 22°24'18.5 N; Long. 69°12'54.8 E) 5 m depth, 18 cm specimen height.

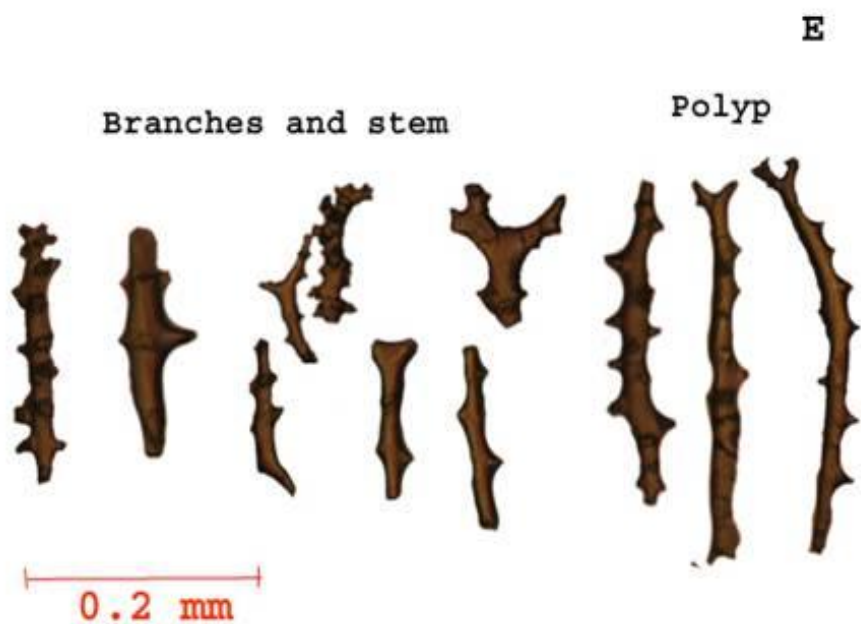
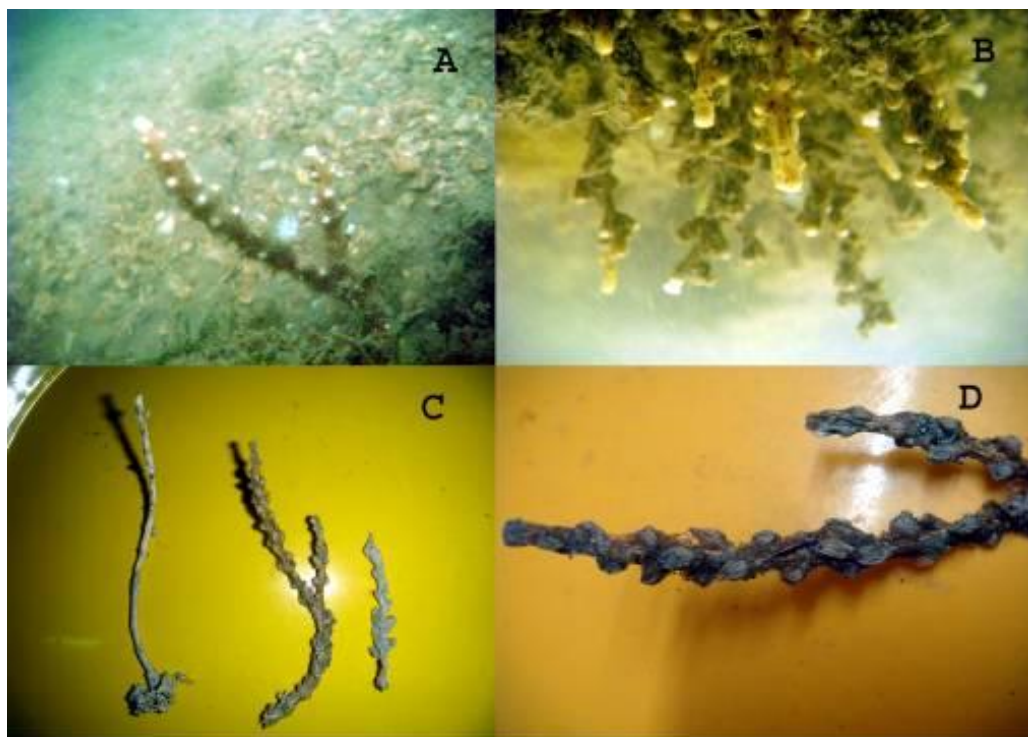
### Description:

Colony brown in colour when live and dried. Size of the colony is up to one meter. The colony is densely branched, developing a few long slender branches, but not forming nets. The polyps are monomorphic, medium in size and arranged down only two sides of the branches.

**Sclerites:** Brownish colour and 0.05 to 0.25 mm in average size. In the outer cortex, the sclerites occur as warty spindles or ovals. The polyps have flattened spindles.

**Depth range and Habitat:** 10 to 30 m; Shallow to reef slope environment.

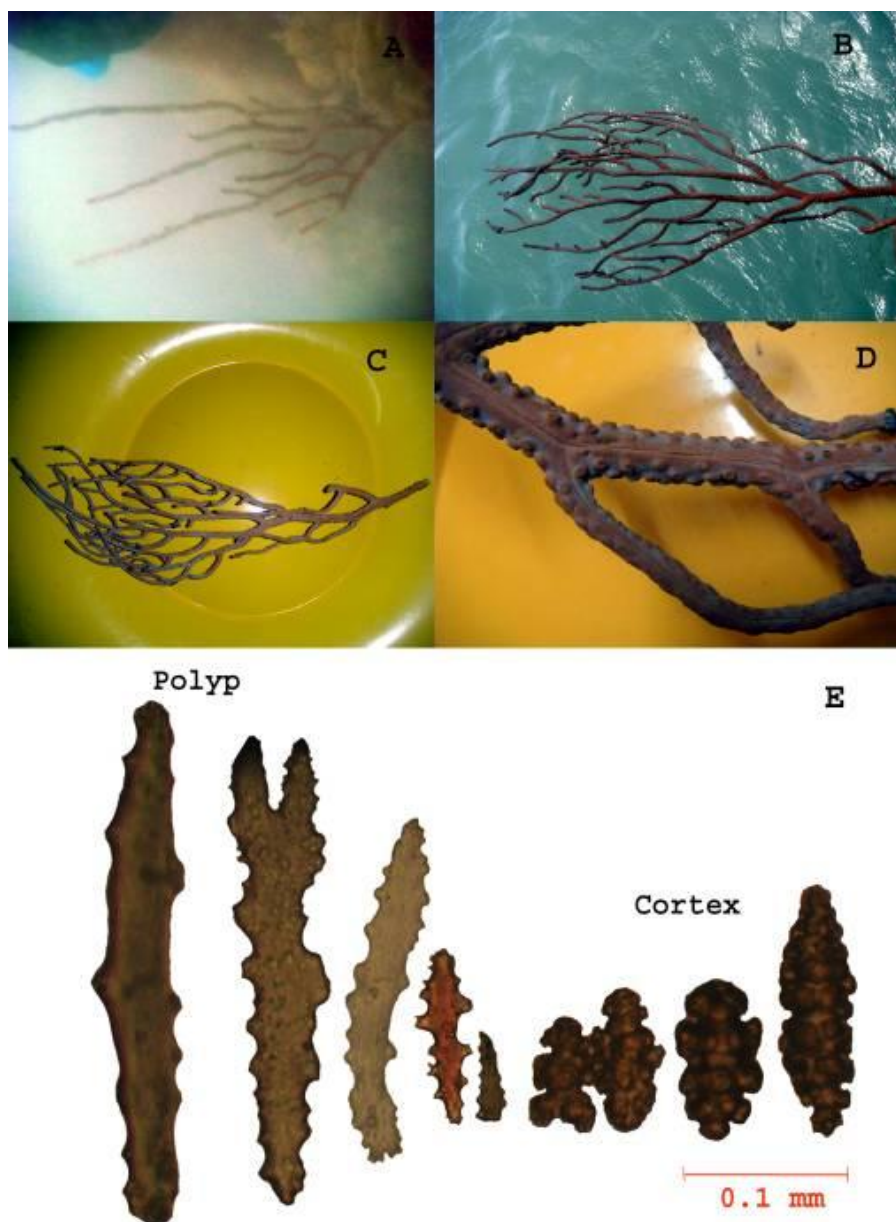
**Distribution:** Tropical Indo Pacific, Northern Red Sea, Central Pacific, and India: Gulf of Mannar, Andaman and Nicobar Islands and Gulf of Kachchh.



**Plate -1**

A – Live colonies with branching; B – Live colonies without branching;

C - Dry Preserved samples; D – Polyps are expanded; E – Different types of sclerites with scale.



**Plate –2**

A & B – Live colonies; C - Dry Preserved samples;  
D – Polyps are expanded; E – Different types of sclerites with scale.

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#### 5. References

1. Alderslade, P. and Shirwaiker, P., New species of soft corals (Coelenterata: Octocorallia) from the Laccadive Archipelago. *The Beagle Records of Northern territory Museum of Arts and Science*, **1991**, 8(1): 189-233.
2. Alderslade, P., Four new genera of soft corals (Coelenterata: Octocorallia), with notes on the classification of some established taxa. *Zool. Med. Leiden*, **2000**, 74 (16): 237-249. ISSN 0024-0672.

3. Bayer, F.M. The shallow water Octocorallia of the West Indian region. A manual for marine biologists. *Martinus Nijhoff, The Hague, Netherlands*, **1961**, 373 pp. pls. I-XXVII.
4. Bayer, F.M., Colonial organization in Octocorals. Animal colonies (ed) Boardman, Cheetham and Olive, Dowden, Hutchinson and Ross, Inc., **1973**, pp. 69-93.
5. Benayahu, Y., Faunistic composition and patterns in the distribution of soft corals (Octocorallia: Alcyonacea) along the coral reefs of Sinai Peninsula. *Proc.5<sup>th</sup> int. coral Reef Cong.*, Tahiti, **1985**, 6: 255-260.
6. Benayahu, Y., Xiniidae (Cnidaria: Octocorallia) from the Red Sea, with the description of new species. *Zool. Med., Leiden.*, **1990**, 64: 113-120.
7. Benayahu, Y., Corals of the Southwest Indian Ocean I.Alcyonacea from Sodwana Bay, South Africa. *Invest. Rep. Oceanogr.Res.Inst.*, **1993**, 67: 1-16.
8. Benayahu, Y., Species composition of soft corals (Octocorallia: Alcyonacea) on the coral reef of Sesoko Bay Island, Ryuku Archipelago, Japan. *Galaxea*, **1995**, 12: 103-124.
9. Breedy, O., A new species of *Pacifigorgia* from the eastern Pacific. *Bull.of the Bio. Soc. Washigton*, **2001**, 10: 181-187.
10. Dineson, Z. Patterns in the distribution of soft corals across the Central Great Barrier Reef. *Coral Reefs.*, **1983**, 1: 229-236.
11. Gohar, H.A.F., A description and some biological studies of a new alcyonarian species *Clavularia hamra* Gohar, Pub. *Marine Biol. Sta. Ghardaqa* (Red Sea), **1948**, 6: 3-33, pls. 1-3.
12. Dixit, A. M., Kumar, P., Kumar, L., Pathak, K.D. and Patel, M.I., Economic Valuation of Coral Reef Systems in Gulf of Kachchh., Final Report., World Bank aided Integrated Coastal Zone Management (ICZM) Project. Submitted to *Gujarat Ecology Commission.*, **2010**, pp. 158.
13. Hickson, S.J. *The alcyonaria of the Maldives*. Pt.I. The genera *Xenia*, *Teleso*, *Spongodes*, *Nephthea*, *Paraspongodes*, *Chironephthea*, *Siphonogorgia*, *Solenocaulon* and *Melitodes*. In: The fauna and Geography of the Maldivian and Laccadive Archipelagoes, Gardiner, S.J. (ed.), **1903**, 2(1): 473-502.
14. Hickson, S.J., *The alcyonaria of the Maldives*. Pt.III. the families Muriceidae, Gorgonethidae, Melitodidae and the genera *Pannatula* and *Eunephthea*. In: the fauna and Geography of the Maldivian and Laccadive Archipelagoes. Gardiner, S.J. (ed.), **1905**, 2(4): 807-826.
15. Jayasree, V., and Parulekar, A.H., The ecology and distribution of Alcyonaceans at Mandapam (Palk Bay, Gulf of Mannar), South India., *J.Bombay Nat. Hist. Soc.*, **1997**, 94: 521-524.
16. Jayasree, V., Bhat, K.L. and Parulekar, A.H., *Sarcophyton andamanensis*, a new species of soft coral from Andaman Islands. *J.Andaman Sci.*, **1994**, 10(1&2): 107-111.
17. Jayasree, V., Bhat, K.L. and Parulekar, A.H., Occurrence and distribution of soft corals (Octocorallia: Alcyonacea) from the Andaman and Nicobar Islands. *J.Bombay Nat.Hist.Soc.*, **1996**, 93: 202-208.
18. Katharina Fabricius and Alderslade, P., *Soft corals and Sea fans*, A comprehensive guide to the tropical shallow water genera of the Central West Pacific, the Indian Ocean and Red Sea. *AIMS, PMB 3*, Australia, **2001**, pp. 1 – 264.
19. Lasker, H.R. The incidence and rate of vegetative propagation among coral reef alcyonaceans. *Proc.6<sup>th</sup> int. coral Reef Cong.*, **1988**, 2: 763-768.
20. Ofwegen Van, L.P., and Benayahu, Y., Notes on Alcyonacea (Octocorallia) from Tanzania. *Zool.Med, Leiden*, **1992**, 66: 139-154.
21. Padmakumar, K., R.Chandran, J.S.Yogesh Kumar and R.Sornaraj., *Carijoa riisei* (Cnidaria: Octocorallia: Clavulariidae) a newly observed threat to Gulf of Mannar coral biodiversity? *Current Science.*, 2011, 100 (1):35-37.
22. Pratt, E.M., The Alcyonarians of the Maldives. II. The genera *Sarcophyton*, *Lobophytum*, *Sclerophytum* and *Alcyonium*. In: Gardiner, S.J.(ed). The fauna and Geography of the Maldivian and Laccadive Archipelagoes., **1903**, 2(1): 503-539.
23. Pratt, E.M., Report on some Alcyoniidae collected by Prof. Herdman at Ceylon in **1902**. In: Herdman, W.A. and Honell, J., Report to the Government of Ceylon on the pearl and Oyster fisheries of the Gulf of Mannar., **1905**, 3(19): 247-268.
24. Spalding, M.D., Ravilious, C. & Green, E.P. **2001**. World Atlas of Coral Reefs. Prepared by the UNEP-World Conservation Monitoring Centre. University of California Press, Berkeley, USA.
25. Thomson, J. A., and L. M. I. Dean. **1931**. The Alcyonacea of the Siboga Expedition, with an addendum to the Gorgonacea. Siboga-Hxped. Monogr., 3d: 1-227, pis. 1-28.
26. Thomson, J.A. and Simpson, J.J., An account of the alcyonarians collected by the Royal Indian Museum Survey Ship "Investigator" in the Indian Ocean. II: *The Alcyonarians of the Littoral area*. Trustees of Indian Museum, Calcutta., **1909**, I-XVIII, 1-39, Pl.1-9.

27. Venkataraman, K., Jeyabaskaran, R., Raghuram, K.P. and Alfred, J.R.B., Bibliography and Checklist of Coral and Associated Organisms of India. *Zoological Survey of India*, **2004**, pp. 226: 1- 468.
28. Verseveldt, J., A revision of the genus *Sinularia* (Octocorallia, Alcyonacea). *Zool.Verhand.*, Leiden, **1980**, 179: 1-128.
29. Verseveldt, J. A revision of the genus *Sarcophyton* (Octocorallia, Alcyonacea). *Zool.Verhand.*, Leiden, **1982**, 192: 1-91.
30. Verseveldt, J., A revision of the genus *Lobophytum* (Octocorallia, Alcyonacea). *Zool.Verhand.*, Leiden, **1983**, 200: 1-103.
31. Verseveldt, J. and Van ofwegen, L.P., Five new species of the genus *Dendronephthya* Kukenthal (Octocorallia: Nephtheidae) from the Indian Ocean. *Zool. Med.*, Leiden, **1991**, 65: 155-169.
32. Yamazato, K, Sato, M. and Yamashino, Reproductive biology of an alcyonacean coral, *Lobophytum crassum* Marenzeller. *Proc. 4<sup>th</sup> int. Coral Reef Symp.*, **1981**, 2: 7671-7678.
33. Yogesh Kumar, J.S., Raghunathan, C. and Venkataraman, K., Studies on new findings of Gorgoniidae from Ritchie's Archipelago Andaman and Nicobar Islands. *International Journal of Science and Nature*, **2012**, 3(2), 395-405.
34. Yogesh Kumar, J.S., Raghunathan, C. and Venkataraman K., New records of Octocorallia (Order: Pennatulacea) from Indian waters. *International Journal of Applied Biology and Pharmaceutical Technology*, **2014a**, (5) 2; 52-56.
35. Yogesh Kumar, J.S., Raghunathan, C., Geetha, S. and Venkataraman K., New species of soft corals (Octocorallia: Alcyonacea) on the coral reef of Andaman and Nicobar Islands. *International Journal of Integrative Sciences, Innovation and Technology*, **2014b**, (3) 1, 8-11.