

## A CHECKLIST OF SPONGES FROM PAKISTAN COAST AND FIRST RECORD OF THE OCCURRENCE OF DEMOSPONGE *AXINELLA DONNANI* (BOWERBANK, 1873)

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### ABSTRACT

Knowledge about marine sponges of Pakistan is extremely limited. During recent collection, a marine sponge *Axinella donnani* (Bowerbank, 1873) was collected for the first time from the coast of Pakistan. In addition to their collection from various places along the coast of Pakistan, this species was photographed by SCUBA divers at Churna Island along Balochistan coast indicating the diversity of marine life along the coral habitat around this island. Vase sponge (*Axinella donnani*) has typical funnel shaped body was observed to different colouration ranging from bright orange to yellow and even having red tinge. The paper also provides a checklist of known species of sponges from Pakistan coast.

**Key-words:** Sponges, Pakistan, *Axinella donnani*, vase sponge, demosponge, Churna Island, checklist.

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### INTRODUCTION

Information about sponges along Pakistan coast is highly limited. It was Kumar (1923) who has reported sponge for the first time from Karachi which is followed by Kumar (1924) reported *Chondrilla australiensis*, *Tethya ingalli* (as *Donatia ingalli*), *Cinachyrella australiensis* (as *Cinachyra isis*), *Haliclona* (*Gellius*) *fibulata* (as *Gellius fibulatus*), new genus and new species belonging to family Haploscleridae (subfamily Gellinae), *Amphimedon delicatula* (as *Pachyalina delicatula*), *Chalinula confusa* (as *Chalina confusa*), *Tedania* (*Tedania*) *anhelans* (as *Tedonia digitata*), *Spongisorites* sp., *Axinella* sp. and *Suberites* sp.

Khan (1923) also studied sponge from Karachi whereas Lal (1928) submitted master thesis at the University of the Punjab dealing with sponges of Karachi with special reference to subfamily Spirastrillinae and section Cyamonaе. Kumar and Dayal (1932) reported sponges from Karachi belonging to subfamilies Renerinae, Gellinae, Phloeodictyinae, Esperllinae, Ectyoninae, Section Cymonaе and some sponges of Suberitina.

In recent review, Kazmi, *et al.*, (2020) reported 14 species from Pakistan coast *Asclatis gardineri* (as *Clathrina gardineri*), *Leucetta* sp., *Ianthella flabelliformis*, *Luffariella variabilis*, *Phyllospongia lamellose*, *Dysidea cinerea*, *Tethya* cf. *aurantium*, *Tethya ingalli*, *Polymastia pachymastia*, *Suberitidae* sp., *Liosina paradoxa*, *Thrombus challengerii*, *Geodia* cf. *mesotriaena*, *Haliclona* sp. Recently Jabeen *et al.* (2018) reported *Liosina paradoxa* from Sandspit Backwaters, Karachi. Despite record of 34 species, the information about sponges from Pakistan is highly limited. Most of the species are not known to generic and species levels. The present paper reports a list of known species of sponges from Pakistan as well as reports *Axinella donnani* for the first time from Pakistan.

### MATERIALS AND METHODS

The study based on review of literature on sponges from Karachi. In addition, samples of sponges collected from various parts along the coast of Pakistan were also examined. In almost all cases sponges were air dried and kept without any preservatives. Some of the underwater photograph taken by SCUBA divers from Churna Island and other areas were also examined.

### RESULTS

#### Checklist of Marine Sponges Known from Pakistan

Review of the literature revealed that there are 34 species of marine sponges occurring in Pakistan (Table 1). There are a number of sponges that were not identified to specific or even generic levels.

Table 1. Species of Marine Sponges known from Pakistan.

S. No.	Species	Reference
1	<i>Clathrina gardineri</i> (Dendy, 1913)	Kazmi <i>et al.</i> (2020)
2	<i>Leucetta</i> sp.	Kazmi <i>et al.</i> (2020)
3	<i>Ianthella flabelliformis</i> Linnaeus, 1759	Kazmi <i>et al.</i> (2020)
4	<i>Luffariella variabilis</i> (Polejaeff, 1884)	Kazmi <i>et al.</i> (2020)
5	<i>Phyllospongia lamellosa</i> (Esper 1794)	Kazmi <i>et al.</i> (2020)
6	<i>Dysidea cinerea</i> Keller, 1889	Kazmi <i>et al.</i> (2020)
7	<i>Tethya</i> sp near <i>aurantium</i> (Pallas 1766)	Kazmi <i>et al.</i> (2020)
8	<i>Tethya ingalli</i> Bowerbank, 1858	Kazmi <i>et al.</i> (2020), Kumar (1924) as <i>Donatia ingalli</i>
9	<i>Polymastia pachymastia</i> de Laubenfels, 1932	Kazmi <i>et al.</i> (2020)
10	Suberitidae sp.	Kazmi <i>et al.</i> (2020)
11	<i>Liosina paradoxa</i> Thiele, 1899	Kazmi <i>et al.</i> (2020), Jabeen <i>et al.</i> (2018)
12	<i>Thrombus challenger</i> Sollas 1866	Kazmi <i>et al.</i> (2020)
13	<i>Geodia</i> cf. <i>mesotriaena</i> Lendenfeld, 1910	Kazmi <i>et al.</i> (2020)
14	<i>Haliclona</i> sp.	Kazmi <i>et al.</i> (2020)
15	<i>Chondrilla australiensis</i> Carter, 1873	Kumar (1924)
16	<i>Cinachyrella australiensis</i> Carter, 1866	Kumar (1924) (as <i>Cinachyra isis</i> )
17	<i>Haliclona</i> ( <i>Gellius</i> ) <i>fibulata</i> (Schmidt, 1862)	Kumar (1924) (as <i>Gellius fibulatus</i> )
18	Haploscleridae (subfamily Gellinae)	Kumar (1924)
19	<i>Amphimedon delicatula</i> Dendy, 1889	Kumar (1924) (as <i>Pachyalina delicatula</i> )
20	<i>Chalinula confuse</i> Dendy, 1922	Kumar (1924) (as <i>Chalina confusa</i> ),
21	<i>Tedania</i> ( <i>Tedania</i> ) <i>anhelans</i> (Vio in Olivi, 1792)	Kumar (1924) (as <i>Tedonia digitata</i> )
22	<i>Spongosorites</i> sp.	Kumar (1924)
23	<i>Axinella</i> sp.	Kumar (1924)
24	<i>Axinella donnani</i> Bowerbank, 1873	Present study
25	<i>Suberites</i> sp.	Kumar (1924)
26	Spirastrillinae	Lal (1028)
27	Cyamonae	Lal (1028)
28	Renerinae	Kumar and Dayal (1932)
29	Gellinae	Kumar and Dayal (1932)
30	Phloeodictyinae	Kumar and Dayal (1932)
31	Esperllinae	Kumar and Dayal (1932)
32	Ectyoninae	Kumar and Dayal (1932)
33	Cymonae	Kumar and Dayal (1932)
34	Suberitina	Kumar and Dayal (1932)

### Vase Sponge from Pakistan

During the study a number of specimens of vase sponge were collected for the first time from Pakistan coast.

*Axinella donnani* (Bowerbank, 1873)

(Fig. 1-2)

### Material Examined

1 specimen collected by Jehan Zaib, WWF-Pakistan's Observer. Sponge No. 112. Marine Fisheries Department's Museum collected on May 09, 2019

1 specimen collected by Jehan Zaib, Observer, WWF-Pakistan's Observer. Sponge No. 123. Marine Fisheries Department's Museum collected on June 12, 2019

1 specimen collected by Jehan Zaib, Observer, WWF-Pakistan's Observer. Sponge No. 143. Marine Fisheries Department's Museum collected on June 26, 2019

1 specimen photograph at Churna Island on February 3, 2016

### Synonymy

*Isodictya donnani* Bowerbank, 1873, p. 28, pi. 6.

*Phakellia donnani* Dendy, 1905, p. 190 ; Dendy, 1921, p. 116.

*Axinella donnani* Dendy, 1887, p. 158, pi. 11, fig. 1; Burton, 1956, p. 134.

### Holotype

BMNH 1873.7.21.9 collected from Pearl Banks, Sri Lanka collected by E.W.H. Holdsworth, Esq. housed in the British Museum Natural History.

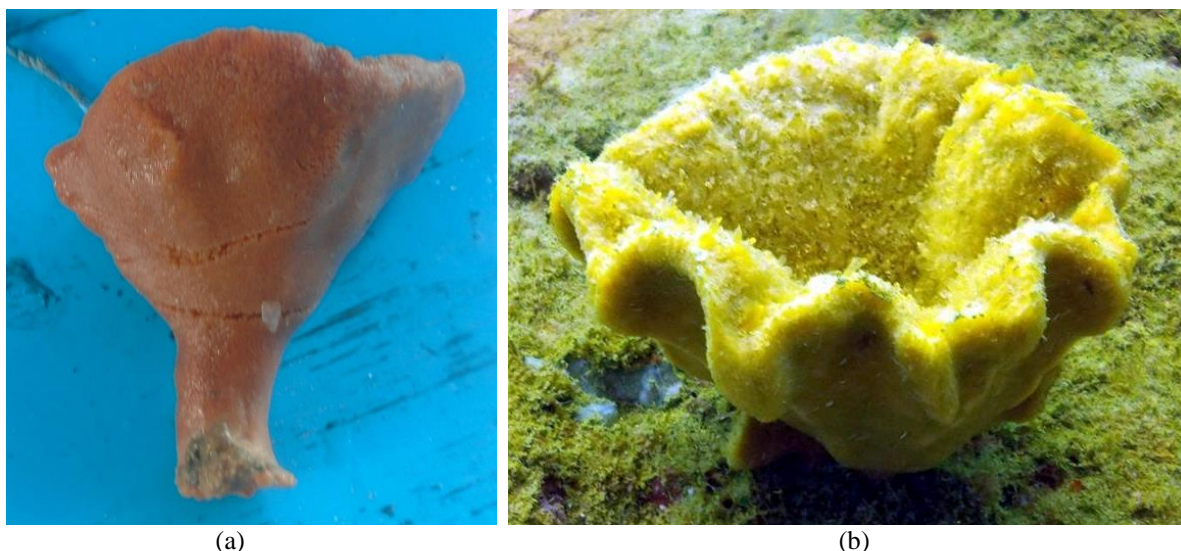


Fig. 1. *Axinella donnani* (a) specimen collected from off Cape Monz by WWF-Pakistan's Observer Gul Zeb on June 12, 2019 (b) specimen photographed by Gul Zeb at Churna Island in February 2015.

### DESCRIPTION (modified after Bowerbank, 1873)

Sponge cup-shaped, parities thick and strong; margin strongly undulated, distal edge finale plicated and internally even, minutely hispid. Osculus arranged in groups in a radiating pattern. Pores are scattered along the surface with slight concentration at the outer part. Dermal membrane abundantly spiculous; spicules the same as those of the skeleton, and very small and slender acuate ones, dispersed. Skeleton-primary lines multispiculous, strongly developed, rather irregular, varying from multispiculous to unispiculous, very numerous; spicula acuate, short and stout. Interstitial membranes abundantly spiculous; tension-spicula acuate, small and slender, dispersed, rather numerous. Sarcode dark amber-coloured.

### Colour

Alive, bright orange; dark purple or black in the dried state.

### Ecology

This species was photographed on a number of occasions along subtidal areas of Churna Island (Balochistan) and found to be associated with coral and related habitat. In additions samples were collected from off Cape Monz and south of Churna Island to a maximum depth of 26 m. This species, therefore, is an associate of coral assemblages and also found on subtidal rocky habitats along Pakistan coast.

### Distribution

India, Red Sea, Indian Ocean, East Africa, Madagascar, Atlantic Ocean (Bowerbank, 1873; Burton, 1956; Dendy, 1887, 1889, 1905, 1922; Pulitzer-Finali, 1993; Thomas, 1970, 1979, 1985, 1981; Vasseur, 1977; Vacelet et al., 1976) and now from Pakistan.

### Remarks

This species was described by Bowerbank (1873) as *Isodictya donnani* from Pearl Banks, Sri Lanka based on a single dry specimen. The type was collected by Mr. Holdsworth who pointed out that this sponge was dark, thick and cup shaped with undulating margin having a uniform bright orange colour which turns into black within an hour or two when taken out of water (Bowerbank, 1973; Dendy, 1887). Similar changes were noticed during present study as colour from yellow or orange in living conditions turned to black or dark purple (Fig. 1-3). Kumar (1924) reported sponge belong to genus *Axinella* from Karachi but it was not identified to species level.

Dendy (1887) examined four specimens from Chennai, India and noted that all of them were distinctively pedunculate and have the same general appearance, although there were difference in the details of their forms. It was further noted by Dendy (1887) that one of the specimens was cup-shaped, but the wall of the cup, instead of simply undulating, is proliferated outwards into large, branching and anastomosing, vertical lamellae. Dendy (1887) also illustrated a remarkable variation in one specimen which is not cup shaped but consisted of vertical lamellae incline at various angles to one another and attached to a stout peduncle. The surface of these lamellae was observed to have furrows towards the upper margin by numerous deep longitudinal grooves that have numerous minute oscles.

Almost all specimens of *Axinella donnani* collected from Pakistan have cup shaped body and pedunculate attached to rocks and other substrate. The specimens which were examined for details were found to be entangled to the bottom set gillnet deployed for catching demersal fishes. These specimens were collected during July and August. Most of the photographed specimens, however, were taken between October through April.

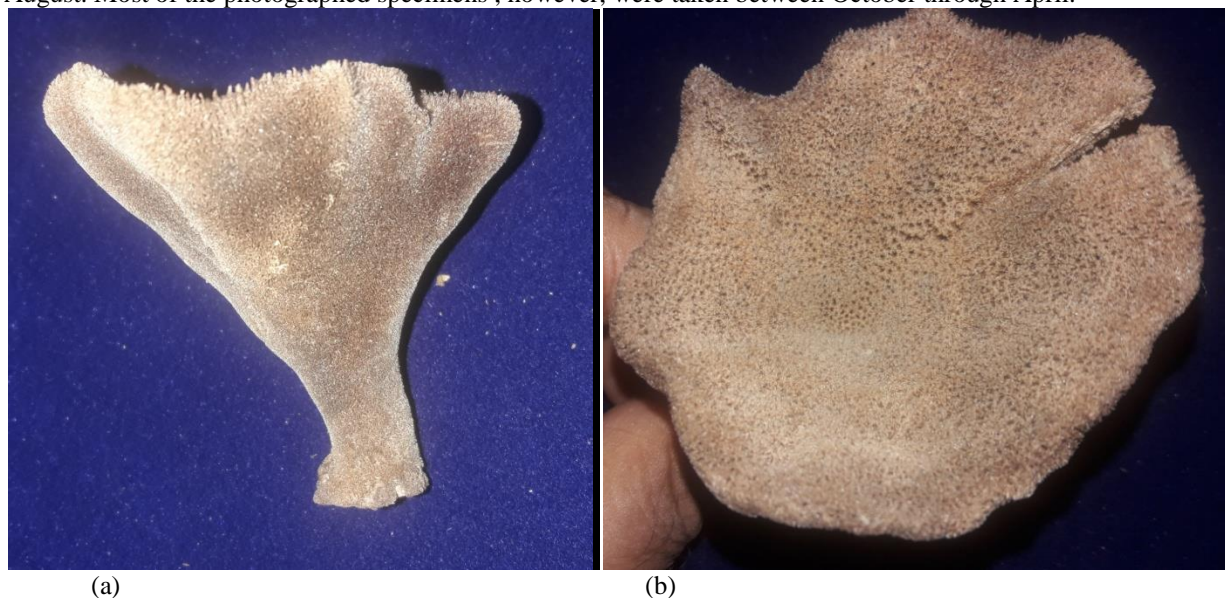


Fig. 2. *Axinella donnani*: specimen collected from off Churna Island by WWF-Pakistan's Observer Gul Zeb on May 09, 2019 (a) showing plicated distal edge (b) hispid surface within the cup of the sponge.

### DISCUSSION

Sponge fauna of Pakistan is not well studied as so far only 34 species are recorded from Pakistan including a number of taxa not identified to species level. A diversified sponge fauna is, however, exists in Pakistan as more and more photographs of subtidal sponges are reported by amateur and professional divers and snorkelers from various subtidal areas of Pakistan. A detailed study of sponges is underway which will be published soon. *Axinella donnani* is one such species which is photographed from Churna Island and recently collected from offshore waters of Cape Monz and other rocks and reef areas. Although all the reported specimens of *Axinella donnani* have typical cup shaped body but a few photographs of specimens which are proliferated outwards into large, branching and anastomosing, vertical lamellae, similar to the one reported by Dendy (1887). However, since the specimens of these are not available for examination, therefore, these were not included in the present paper.

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