



DIVERSITY AND DISTRIBUTION OF SEA-ANEMONES (CNIDARIA : ACTINIARIA) IN THE ESTUARIES AND MANGROVES OF ODISHA, INDIA

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INTRODUCTION

Actinarians, popularly called as 'Sea-Anemones', belongs to the phylum Cnidaria form an important group of intertidal invertebrate distinguished by their habit, habitat and beautiful colouration. This group was not elaborately studied from India. However Annandale (1907 & 1915), Carlgren (1925 & 1949), Parulekar (1968 & 1990), Seshyia and Cuttress (1971), Misra (1975 & 1976) and Bairagi (1998, 2001) worked on this group and a total 40 species of sea anemones belongs to 33 genera and 17 families so far recorded from India. During the recent faunal survey (2010-2011) of Estuaries and Mangrove fringed coastal districts of Odisha, the authors encountered a quite good number of specimens of this group. After proper identification these reveals 5 species belonging to 4 genera and 3 families. Earlier recorded four species are also included in this paper. A short description, habitat-choice and distribution of a total of 9 species are provided in this paper.

MATERIALS AND METHODS

As the species are burrowing, the collection was done by inserting spade into the muddy or sandy substrata without disturbing the animals and lever up to the mud along with the Anemone. Specimens were picked up carefully and brought to the camp laboratory in estuarine water. Giant

anemone *Paracondylactis sinensis* (Carlgren) was collected by digging the sandy mud 20-25 cm around the specimens up to depth of about 70-120 cm depending on the size of the anemone. The animals were detached from the substratum by lifting the basal disc manually and narcotized with 1% formalin for the period of 6-8 hours. The narcotized anemones with fully expanded condition were preserved in 10% formalin for further studies.

SYSTEMATIC ACCOUNTS

Phylum CNIDARIA

Class ANTHOZOA

Subclass HEXACORALLIA

Order ACTINIARIA

Family EDWARDSIIDAE

1. *Edwardsia jonesii* Seshaiya & Cuttress, 1969

2. *Edwardsia tinctorix* Annandale, 1915

Family HALIACIIDAE

3. *Pelocoetes exul* Annandale, 1915

4. *Phytocoetes gangeticus* Annandale, 1915*

Family DIADUMENIDAE

5. *Diadumene schilleriana* (Stoliczka, 1869)

Family HALCAMPIDAE

6. *Mena limnicola* (Annandale, 1915)*

7. *Mena chilkaeae* (Annandale, 1915)*

Family NEVADNEIDAE

8. *Nevadne glauca* (Annandale, 1915)*

Family ACTINIIDAE

9. *Paracondylactis sinensis* (Carlgren, 1949)

* Not collected by the authors, diagnosis is given here from the literature.

Key to the Species

- Scapus covered by rusty-red cuticle.....1
 cuticle absent.....2
1. Tentacles 12*Edwardsia jonesii*
 Tentacles 16.....*Edwardsia tinctorix*
2. Tentacles branched.....*Pelocoetes exul*
 Tentacles simple.....3
3. Column short*Diadumene schilleriana*
 Column narrow and slender.....4
4. Column smooth and elongated5
 Column short and rough.....6
5. Tentacles 36 in number, base narrow, physa like
*Phytocoetes gangeticus*
 Tentacles 96 in number, base flattened and distinct
*Partacondylactis sinensis*
6. Columns with no stinging warts....*Nevadne glauca*
 Columns with stinging warts7
7. Stinging warts arranged in 12-16 longitudinal
 rows.....*Mena limnicola*
 Stinging warts arranged in 24 longitudinal rows
*Mena chilkaeae*

1. *Edwardsia jonesii* Seshaiya & Cuttress, 1969

1971. *Edwardsia jonesii* Sheshaiya & Cuttress, 1969.
J. mar. biol. Ass. India, **11(1 & 2)**: 73, Figs.1, 2.

1995. *Edwardsia jonesii* Misra, *Wetland Ecosystem Series I*
: Fauna of Chilka Lake : 230.

1998. *Edwardsia jonesii* Bairagi, *Cnidaria: Sea anemone.*
Fauna of West Bengal, state fauna series, 3(Part-11): 33.

2001. *Edwardsia jonesii* Bairagi, *Cnidaria: Sea anemone.*
Fauna of Godavari Estuary, Estuarine ecosystem series,
4: 12.

Material examined : 3 ex; Balaramgadi, Burha
 Balanga estuary, Balasore District, Odisha;
 13.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No.
 P3628/1; 2 ex, Talsari, Subarnarekha estuary,
 Balasore District, Odisha; 16.iv.2011, S. Mitra &
 J.G. Pattanayak, Reg. No. P3629/1.

Diagnosis : Tentacles 12, smooth and arranged
 in two cycles of six each. Body distinctly divided

into capitulum, scapulus, scapus and inflatable
 physa without cuticle. Capitulum thin-walled,
 almost transparent, smooth and without cuticle.
 Scapus thick-walled, covered with thick shaggy
 rusty-red cuticle. Actinopharynx with 8
 longitudinal ridges, siphonoglyph indistinct.

Habitat : Burrowing forms in soft muddy
 substratum of Intertidal zone.

Distribution : India : East coast : Subarnarekha
 estuary, Chilika Lake (Odisha), South 24 Parganas
 (West Bengal), Andhra Pradesh, Tamilnadu; West
 coast : Sunkeri (middle reaches of Kali river
 estuary), Karnataka.

Remarks : *Edwardsia jonesii* Seshaiya &
 Cuttress, 1969 is fairly distributed in east coast of
 India.

2. *Edwardsia tinctorix* Annandale, 1915

1915. *Edwardsia tinctorix* : Annandale, *Mem. Indian Mus.*,
5: 92, pl. 16, fig. 3; pl.7, fig. 55a; pl.7a, fig. 5; text figs.
 7a-c.

1968. *Edwardsia tinctorix* : Perulekar, *J. Bombay nat. Hist.*
Soc., **65(1)**: 140, pl. figs. 1.

1995. *Edwardsia tinctorix* : Misra, *Wetland Ecosystem Series*
I : Fauna of Chilka Lake : 229.

Material examined : 1 ex, Subarnapur,
 Subarnarekha estuary, Balasore District, Odisha;
 15.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No.
 P3630/1

Diagnosis : Tentacles 16, smooth and arranged
 in two cycles of six each. Body distinctly divided
 into capitulum, scapulus, scapus and inflatable
 physa well developed at the aboral end.
 Capitulum thin-walled, almost transparent,
 smooth and without cuticle. Scapus thick-walled,
 covered with thick shaggy rusty-red cuticle.
 Actinopharynx with 8 longitudinal ridges,
 siphonoglyph indistinct. Nemathoboms in 8
 longitudinal rows on the column.

Habitat : Burrowing forms in soft muddy
 substratum of Intertidal zone.

Distribution : Endemic in India : East coast :
 Subarnarekha estuary, Chilika lagoon (Odisha),
 Hugli-Matla Estuary (West Bengal) ; West coast :
 Goa and Maharashtra; Sunkeri (middle reaches of
 Kali river estuary), Karnataka.

Remarks : *Edwardsia tinctoria* Annandale, 1915 is fairly distributed in east coast and west coast of India.

Family HALIACTIIDAE

3. *Pelocoetes exul* Annandale, 1915

1915. *Pelocoetes exul* Annandale, *Mem. Ind. Mus.*, 5:86, pl.6, fig.1; pl.7, figs. 3, 3a, 3b; text fig.5.

1995. *Pelocoetes exul* : Misra, *Wetland Ecosystem Series I : Fauna of Chilka Lake* : 230-231.

2001. *Pelocoetes exul* : Bairagi, *Estuarine Ecosystem Series, 4: Fauna of Godavari Estuary* : 12

Material examined : 2 ex; Bandar, Devi river estuary, Puri District, Odisha; 02.iv. 2011, S. Mitra & J.G. Pattanayak, Reg. No. P3631/1; 2 ex; Balaramgadi, Burha Balanga estuary, Balasore District, Odisha; 13.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No. P3632/1; 4 ex, Subarnapur, Subarnarekha estuary, Balasore District, Odisha; 15.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No. P3633/1.

Diagnosis : Basal disc reduced. Bluntly tapering and without physa. Column elongated. Longitudinal rows of nematocyst batteries alternating with cinclides on column. Tentacles are branched hexamerously arranged (6 + 6+12+24+48, the last cycle more or less complete) oral disc lobed.

Habitat : Soft mud burrowing form in the Intertidal zone, found at mudflat just beside the narrow creeks of the middle tidal area.

Distribution : India: Subarnarekha estuary (Odisha), South 24 parganas and Gangetic delta (West Bengal), Tamilnadu., Maharastra, Kerala, Goa.

Remarks : This species is very common in the estuaries and found in the muddy shore near the estuarine mouth.

4. *Phytocoetes gangeticus* Annandale, 1915*

1915. *Phytocoetes gangeticus* Annandale, *Mem. Ind. Mus.*, 5: 79, pl.7a, fig.3, 3a & 3b.

1968. *Edwardsia tinctoria* : Perulekar, *J. Bombay nat. Hist. Soc.*, 65(1): 141, pl.1, fig.4.

1995. *Phytocoetes gangeticus* : Misra, *Wetland Ecosystem Series I : Fauna of Chilka Lake* : 231.

Diagnosis : Tentacles simple, slender, 36 in number. Column narrow and slender, smooth with longitudinal rows of cinclides, sphincter not visible. Base narrow physa-like.

Distribution : India : Chilka lagoon (Orissa); South 24 parganas and Gangetic delta (West Bengal), Tamilnadu, Kerala, Goa and Maharastra.

Remarks : This species is very common in the estuaries and found in the muddy shore near the estuarine mouth. But this species is not collected during the present surveys. Diagnosis is incorporated from the literature.

Family DIADUMENIDAE

5. *Diadumene schilleriana* (Stoliczka, 1869)

1869. *Sagaritta schilleriana* Stoliczka, *J. Asiat. Soc. Bengal*, 38(2): 31, pls. 10, 11.

1915. *Metridium schillerianum* : Annandale, *Mem. Ind. Mus.*, 5:76, pl.7 fig.1

1998. *Diadumene schilleriana* : Bairagi, *Fauna of West Bengal*, Part-11 : 37-38, fig. 1-A, B.

Material examined : 1 ex; Bandar, Devi river estuary, Puri District, Odisha; 02.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No. P3634/1; 1 ex; Balaramgadi, Burha Balanga estuary, Balasore District, Odisha; 13.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No. P3635/1; 3 ex, Subarnapur, Subarnarekha estuary, Balasore District, Odisha; 15.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No. P3636/1. 2 ex; Hukitola Light house, Mahanadi Estuary, Cuttack District, Odisha; 02.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No. P3637/1.

Diagnosis : Body divided into Scapus and Capitulum. Capus with Cinclides and Capitulum with collar. Body very short, 12-19 mm. in length and diameter greater than that of column and provided with longitudinal rows of warts, tentacles long and numerous inner tentacles thicker than outer tentacles. Basal disc strong and adhesive. Column divided into scapus and capitulum, tentacle long, numerous, more or less regularly arranged and inner tentacles thicker than the outer, distinct sphincter absent.

Habitat : Occurring in gregarious population on rocks and boulders and submerged trunk of mangroves.

Distribution : India : Devi river estuary, Burhabalanga estuary, Mahanadi estuary and Subarnarekha estuary (Odisha); Canning, Dimond harbour, Sagar Island (West Bengal); Maharashtra.

Remarks : This species often found on living animals like hermit Crabs, horse-shoe crab and sometimes also on plastics bags which are occasionally found as floating in waters.

6. *Mena limnicola* (Annandale, 1915)*

1915. *Halianthus limnicola* Annandale, *Mem. Ind. Mus.*, 5: 89, pl.6 fig.2, pl.7 fig.4, 4a, 4b, text fig. 6.

1925. *Mena limnicola* : Carlgren, *Ark zool.*, 17A(21) : 11, fig.8-11.

1995. *Mena limnicola*: Misra, *Wetland Ecosystem Series I: Fauna of Chilka Lake* : 232.

Diagnosis : Tentacles 12 in number; stinging warts large, arranged in 12-16 longitudinal rows, more scattered and variable in size in the lower part of the column, also present in the central part of the physa; Sphincters very weak; six pairs of macrocnemias, fifth and sixth pairs weaker than the others.

Distribution : Chilka lagoon (Odisha).

Remarks : This species is Endemic to Chilka lagoon (Odisha). But this species is not collected during the present surveys. Diagnosis is incorporated from the literature.

7. *Mena chilkaeae* (Annandale, 1915)*

1915. *Phytocoetes chilkaeus* Annandale, *Mem. Ind. Mus.*, 5:82, pl.7 fig.2, pl.8a fig.4, text-fig. 4.

1925. *Mena chilkaeae* : Carlgren, *Ark zool.*, 17A(21) : 9, fig.4-7.

1995. *Mena chilkaeae* : Misra, *Wetland Ecosystem Series I: Fauna of Chilka Lake* : 232

Diagnosis : Tentacles 24 in number; lower sphincter more alveolar with fewer meshes; stinging warts large, arranged in 24 longitudinal rows, more scattered in the lower most part of the column, and absent in the central part of the physa; six pairs of strong macrocnemias.

Distribution : Chilka lagoon (Odisha).

Remarks : This species is Endemic to Chilka lagoon (Odisha). But this species is not collected

during the present surveys. Diagnosis is incorporated from the literature.

Family NEVADNEIDAE

8. *Nevadne glauca* (Annandale, 1915)*

1915. *Gyrostoma glaucum* Annandale, *Mem. Ind. Mus.*, 5:70, pl.7a fig.1, text-figs. 1a,b.

1925. *Nevadne glauca* : Carlgren, *Ark. zool.*, 17A(21) : 3, fig.1-3.

1995. *Nevadne glauca* : Misra, *Wetland Ecosystem Series I : Fauna of Chilka Lake* : 233.

Diagnosis : Pedal disc small; tentacles about 144 in number, arranged in 6 cycles, 4th and 6th cycles being exocoel tentacles. Actinopharynx well developed with weak siphonoglyphes. Mesenteries arranged in four cycles (6+6+12+48), last cycle only in uppermost part of the body. Mesenteries of the three first cycles perfect but those of the second and third order perfect only in uppermost part of actinopharynx.

Distribution : Chilka lagoon (Orissa), Hugli - Matla estuary (West Bengal), Tamilnadu.

Remarks : This species is Endemic Indian in Indian waters. This species is not collected during the present surveys. Diagnosis is incorporated from the literature.

Family ACTINIIDAE

9. *Paracondylactis sinensis* (Carlgren, 1949)

1957. *Paracondylactis indicus* Dave, Study of anthozoa, M.Sc. thesis, Univ. Of Bombay (un published).

1968. *Paracondylactis indicus* Perulakar, Sea-Anemones of Bombay. *J. Bombay. nat. Hist. Soc.* 65:143, pl. II, fig.10.

1998. *Paracondylactis indica* Bairagi, Cnidaria: Sea anemone. *Fauna of West Bengal, State Fauna Series, 3(Part-11)*: 38.

Material examined : 1 ex; Balaramgadi, Budha Balanga estuary, Balasore District, Odisha; 15.xii.2009, S. Mitra & J.G. Pattanayak, Reg. No.P3638/1; 2 ex, Subarnapur, Subarnarekha estuary, Balasore District, Odisha; 15.iv.2011, S. Mitra & J.G. Pattanayak, Reg. No. P3639/1.

Diagnosis : column elongated and tapering. Pseudospherules present on columns. Pedal disc flattend and distinct. Tentacles 96, arranged in 5

Distribution of Sea Anemones in Mangroves and Estuaries of Odisha

Sl. No.	Name of The Species	Mahanadi Estuary	Devi River estuary	Subarnarekha estuary	Chilka Lagoon	Budha Balanga estuary
1.	<i>Edwardsia jonesii</i>	+	-	+	+	+
2.	<i>Edwardsia tinctoria</i>	-	-	+	+	-
3.	<i>Pelocoetes exul</i>	-	+	+	+	+
4.	<i>Phytocoetes gangeticus</i>				+	
5.	<i>Diadumene schilleriana</i>	+	+	+		+
6.	<i>Mena limnicola</i>				+	
7.	<i>Mena chilkaeae</i>				+	
8.	<i>Nevadne glauca</i>				+	
9.	<i>Paracondylactis sinensis</i>			+		+

cycles. Colour of the tentacles and oral disc are white to colourless.

Habitat : Intertidal Sand and sandy mud area.

Distribution : India : East coast: Subarnarekha Estuary, Budha Balanga Odisha, West Bengal; West coast: Maharastra and Karnataka

Remark : This species is endemic to Indian coast.

SUMMARY

The present paper deals with the diagnostic features of 9 species of sea anemones available in

the estuaries and mangroves of Odisha. Chilka lagoon is most diverse in respect of Actiniarians concern, where as Subarnarekha estuary is the second in position.

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