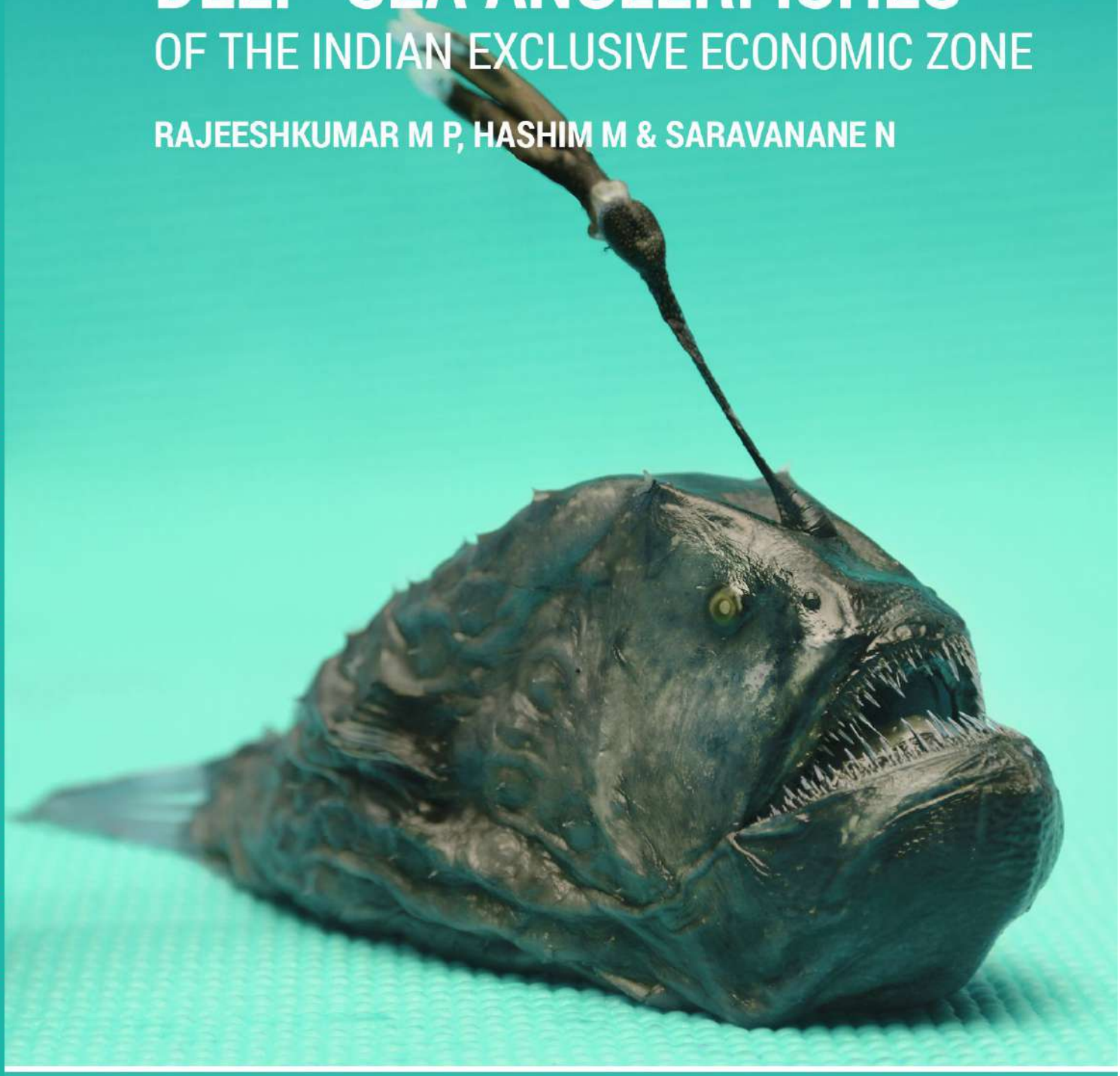
DEEP-SEA ANGLERFISHES
OF THE INDIAN EXCLUSIVE ECONOMIC ZONE

RAJEESHKUMAR M P, HASHIM M & SARAVANANE N



सत्यमेव जयते

Centre for Marine Living Resources & Ecology
Ministry of Earth Sciences
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डॉ.जी वी एम गुप्ता
निदेशक
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DIRECTOR

भारत सरकार
पृथ्वी विज्ञान मंत्रालय
समुद्री सजीव संसाधन एवं पारिस्थितिकी केंद्र
GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
CENTRE FOR MARINE LIVING RESOURCES AND ECOLOGY

FOREWORD

The deep ocean is the largest biome on Earth by volume and also remains as one of the planet's most understudied environments. The biodiversity of the deep ocean has not been fully explored nor the distribution and biology of many deep-water species were well understood, because of its remoteness and technological challenges. Despite our limited knowledge of deep-water fauna and the ever-increasing pressure due to climate change on them, several species are commercially exploited beyond the sustainable levels of recovery. Therefore, documentation of the biodiversity of this region is of paramount importance for devising an integrated approach that helps conservation and restoration of the ecosystem. India being a signatory to several treaties and conventions, is obliged to carry out assessments of marine biodiversity, which will not only assess the status of the marine living resources of the country but also remain as a source of information on the genetic resources with bio-prospecting avenues.

The present catalogue "Deep-sea Anglerfishes of the Indian Exclusive Economic Zone" is a step towards documenting the large unknown biodiversity from the deep-sea region of the country. As the catalogue provides a comprehensive taxonomic account of deep-sea anglerfishes collected during the expeditions of FORV Sagar Sampada along with photographs and maps of sampling locations, it will serve as a field guide for researchers and students interested in the identification of these lesser-known groups. I believe that the information provided in the catalogue will significantly help enhance existing knowledge on this least studied group, and I congratulate the team for bringing out this catalogue.

GVM Gupta
Director

CONTENTS

PREFACE

A comprehensive systematics and distribution report of Order Lophiiformes (anglerfishes) from Indian seas is presented. As part of the exploration of living resources from the Indian seas, extensive trawl surveys were carried out on board Fishery Oceanographic Research Vessel *Sagar Sampada* during the years 2013 to 2018. The present study used the specimens of lophiiformes collected during these trawl operations of 19 cruises covering 78 stations at the depth range 200-1337 m in the Indian EEZ of Arabian Sea, Bay of Bengal and the Andaman Sea. A total of 22 species were recorded and documented in the course of the present study period under 6 families and 13 genera which includes 1 new species, 10 first report from Andaman Sea, 7 and 4 from Arabian Sea and Bay of Bengal respectively.

INTRODUCTION

DEEP-SEA exploratory surveys in India were carried out by the Royal Indian Marine Steamer *R.I.M.S. Investigator* during 1884-1914. Lt. Col. A. W. Alcock, through his publication "A Descriptive Catalogue of the Indian deep-sea fishes in the Indian museum" (1889, 1898 and 1899), described many new deep-sea fishes. This catalogue is the first detailed document of Indian Deep-sea fishes. Later, *Valdivia* expedition (1898-1899) at depths ranging from 300 to 2500 m; John Murray expedition (1933-1934; up to 5000 m depth); the trawler Golden Crown (1908- 1909) surveyed many areas in Bay of Bengal and published the details as *Report on the Fishes taken By the Bengal Fisheries Steamer 'Golden Crown'*. Annandale and Jenkins (1910) added much more information to the ichthyofauna of India. The major studies based on FORV SS collections includes Sivakami et al. (1989, 1998, 1990); Raman and James (1990); Karuppasamy et al. (2007); Balachandran and Abdul Nizar (1990); Raman et al. (1990); James and Pillai (1990); Khan et al. (1996); Mathew et al. (1996); Kurup et al., (2005); Ninan et al. (1992); Jayaprakash et al. (2006); Somvanshi et al. (2009); Sajeevan et al. (2009); Venu (2009, 2013); Hashim (2012); Bineesh 2015. However, previous studies didn't pay much attention on the systematics or distribution of the least studied lophiiformes fishes.

The Order Lophiiformes contains highly diverse groups of marine fish that primarily inhabit both shallow and deep-water environments. Commonly referred tto as anglerfishes, the group is strikingly characterized by the structure of the first dorsal-fin spine (known as illicium),

typically placed out on the tip of the snout and modified to serve as a luring apparatus

The order consists approximately 348 living species, under 71 genera and 18 families. These 18 families are distributed among five suborders (Pietsch and Orr 2007; Pietsch 2009): namely the Lophioidei, containing a single family, four genera, and 28 valid species of relatively shallow-water dorso-ventrally flattened forms, commonly referred to as the goosefishes or monkfishes (Caruso 1981, 1983); the Antennarioidei, with four families, 20 genera, and about 65 species (Pietsch 2009; Arnold 2013) that are nearly laterally compressed, shallow- to moderately deep-water and benthic forms, with a host of common names such as frogfishes, sea-mice, sea-toads, warty anglerfishes and handfishes the Chaunacoidei or coffinfishes, represented by one family and two genera and 25 nominal species (Ho et al., 2013, Ho and Ma 2016) of more or less globose, deep-water benthic forms; the Ogcocephaloidei or batfishes comprising of a single family and ten genera and some 70 species of dorsoventrally flattened, deep-water benthic forms (Bradbury 1967; Ho and Shao 2008) and the Ceratioidei, the deep-sea anglerfishes, containing 11 families, 35 genera and 166 species (Pietsch and Orr 2007; Pietsch 2009)

MATERIALS & METHODS

Bottom trawl operations were conducted on onboard Fishery Oceanographic Research Vessel Sagar Sampada (FORV-SS) in the continental slope areas of Indian EEZ (12 cruises and 33 stations in the Arabian Sea; 2 cruises and 13 stations in the Bay of Bengal; 5 cruises and 32 stations in the Andaman Sea; Figure 1& 2). Before conducting the trawling, suitable grounds were identified through acoustic scanning of sea bottom using the multi-frequency echo sounder SIMRAD EK 60 (frequency 38, 120 and 200 kHz). Trawling time (net dragging time) varied depending upon the nature of the bottom or water currents. Three types of bottom trawl nets, namely High-Speed Demersal Trawl- Crustacean Version (HSDT II CV), EXPO-Model trawl and High Opening Trawl (HOT-I) were employed. Taxonomic identifications were made based on morphometric and meristic counts followed by appropriate taxonomic keys or other published illustrations. All the specimens photographed by first author.

Fig.1: Fishery Oceanographic Research Vessel Sagar Sampada. Photo by S. Dixit

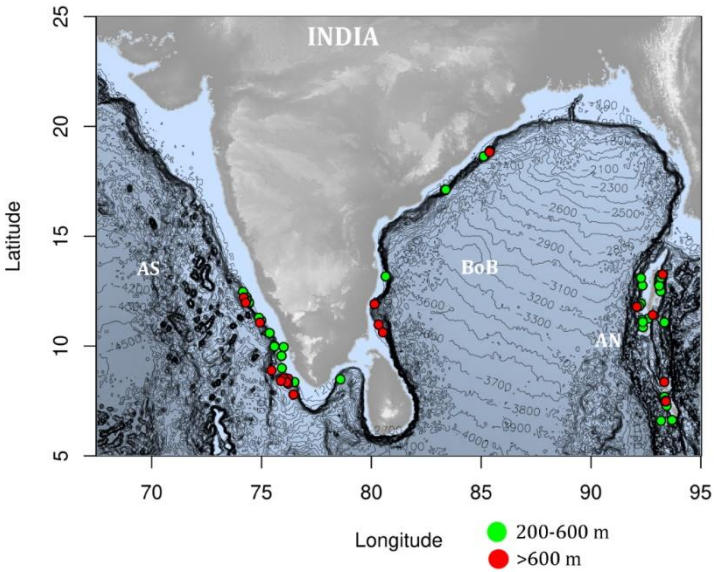


Fig. 2. Explains sampling locations; green dots represent station depth between 200-600m; red dots represent >600 m up to 1337 m; AS- Arabian Sea; BoB- Bay of Bengal and AN- Andaman Sea

SYSTEMATICS

Suborder—LOPHIOIDEI

Family—LOPHIIDAE Rafinesque, 1810.

The monkfishes or goose fishes

The family, Lophiidae contains four genera (*Sladenia* Regan, 1908; *Lophiodes* Regan, 1908; *Lophiomus* Gill, 1883 and *Lophius* Linnaeus, 1758) and 28 valid species worldwide. Two genera and five species are represented in the Indian EEZ of which 4 species are new records from the study area.

Genus— *Lophiodes* Goode and Bean, 1896

Diagnosis—*Lophiodes* is unique among the lophiidae in having a moderately depressed head and body and two well-developed articular spines, placed anterior and posterior to jaw joint. Frontal ridge smooth without spines or knobs; gill openings extending below, behind and in front of pectoral fin base; esca variable in size and shape; cephalic portion of spinous dorsal fin have three spines; post cephalic portion of spinous dorsal fin variable, consisting of one to three spines, some or all of which may be imbedded or absent; soft dorsal fin with eight to nine rays; anal fin with six rays; sphenotic spine present, inner one is well developed, outer one is blunt; quadrate with single lower spine; subopercular with single spine; interopercular with one or two spines; humeral spine well developed, but variable in shape. Genus represents 17

valid species of which 4 species are represented in Indian waters.

Lophiodes lugubris (Alcock, 1894)

Synonyms—*Lophius lugubris* Alcock, 1894

Syntypes—ZSI F13467 (1) (Lost), 670/1 (1), 671/1 (1), 13.5 miles north 64° west of Columbo Light House, Sri Lanka; Investigator station 151, 259-731 m. (Alcock 1894).

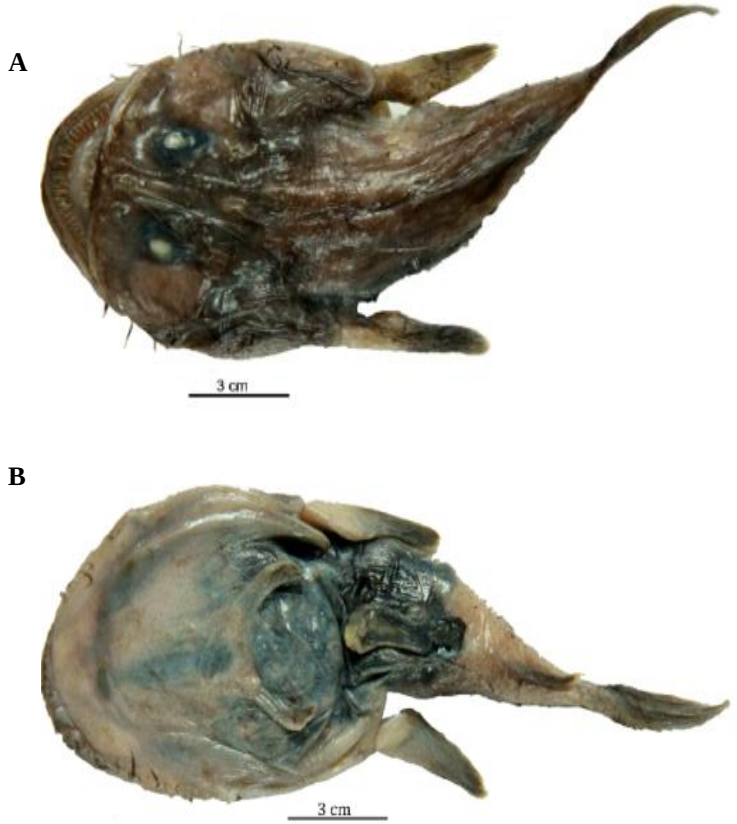
Materials Examined—2801731, SL-153 mm, Andaman Sea, 11.15° N, 92.33° E; off South Nicobar, 514 m., EXPO, September 2010; 2801531, 165 mm SL,12.81° N, 93.08° E, 323 m., EXPO, September 2010, 2928312 A & B (SL-132 mm, 135 mm) Andaman Sea 6.84° N, 9.05° E, 337 m., HSDT- CV, December 2011; 2920613 A & B (SL-185, 152 mm), 11.15° N, 92. 39° E, 526 m., EXPO, November 2011; 34910 (SL-136 mm), 11.18° N, 92.34° E, 520 m., HSDT-CV; April 2016. 32207 (SL-100 mm) Arabian Sea,15.13° N, 80.55° E, 230 m., EXPO, January 2014; 34906, 95 mm SL, 12.7° N, 93.1° E, Andaman Sea, 332 m., HSDT, April 2016. 34502, 1000 m., 5 specimens (SL- 115mm, 92 mm, 65 mm, 79 and 68 mm) Arabian Sea. 29115, 55 mm SL, 70 mm SL, 10.6° N, 80.5° E, Bay of Bengal, 648 m., EXPO, November 2011. 29117 70 mm SL, 11.9° N, 80.3° E, 700 m., EXPO, November 2011.

Diagnosis—A species of *Lophiodes* genus, moderately depressed head and body, cephalic portion with III dorsal fin spines and post cephalic with I slender spine.

Colour—Uniform light to dark brown on dorsal and ventral surface; all fins are pigmented as body (dark brown), small darker, brown cirri present along the lateral margins of the

head and body, ventral pale; buccal floor pale brown or white, peritoneum black.

Distribution—Arabian Sea and Andaman Sea at depth of 230-1000 m (new records). Indo-West Pacific, recorded from off Sumatra, Indonesia, Taiwan, Australia, Tasman Sea and South Africa at depth of 230-526 m.



Figs. 3. *Lophiodes lugubris*

A—dorsal view, **B**—ventral view

Lophiodes triradiatus (Lloyd, 1909)

Synonyms—*Lophius triradiatus* Lloyd, 1909; *Lophiodes infrabrunneus* Smith and Radcliffe, 1912; *Lophiodes abdituspinus* Ni, Wu and Li, 1990

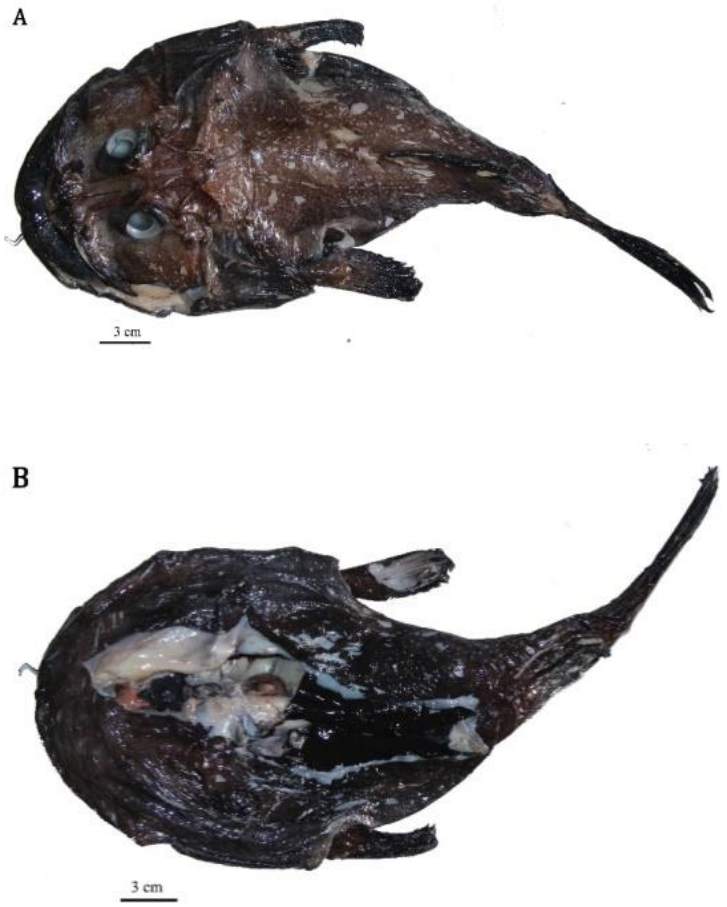
Holotype—ZSI 878/1, 10.1° N, 75.6° E, Laccadive Sea, Investigator station 259, 549 m. (Lloyd 1909).
Materials examined—3212003A, 271 mm SL, 8.50° N, 76.02° E, off Trivandrum, Arabian Sea, 1043 m., HSDT CV, December 2013; 3212003B, SL-245 mm, 9.3° N, 76.15° E, off Trivandrum, Arabian Sea, 1050 m., HSDT CV, December 2013; 2810311, 243 mm SL, 8.51° N, 76.21°, Arabian Sea, 995 m, October 2010; 34909B, SL-121 mm, 11.93° N, 92.28°E, Andaman Sea, 290 m, HSDT CV, April 2016; 36715, 470 mm SL, 11.9° N, 92.09° E, Andaman Sea, 646 m, HSDT CV, November 2017.

Diagnosis—A species of *Lophiodes* with three dorsal spines, postcephalic spine absent; illicium relatively short with a leaf-like esca; tendrils present on the 3rd dorsal fin spine; anal fin reaches beyond the base of the caudal fin; peritoneum black.

Colour—Both dorsal and ventral surface having uniform dark brown colour; all the fins are much darker than body colour; mouth cavity pigmented like body colour.

Distribution —Andaman Sea (new record) and Arabian Sea. Northwestern Australia, the Philippines, South China Sea, East

China Sea, Japan, and western Indian Ocean, at depths 208–1412 m.



Figs. 4. *Lophiodes triaradiatus*
A—dorsal view**, B**—ventral view

Lophiodes mutilus (Alcock, 1894)

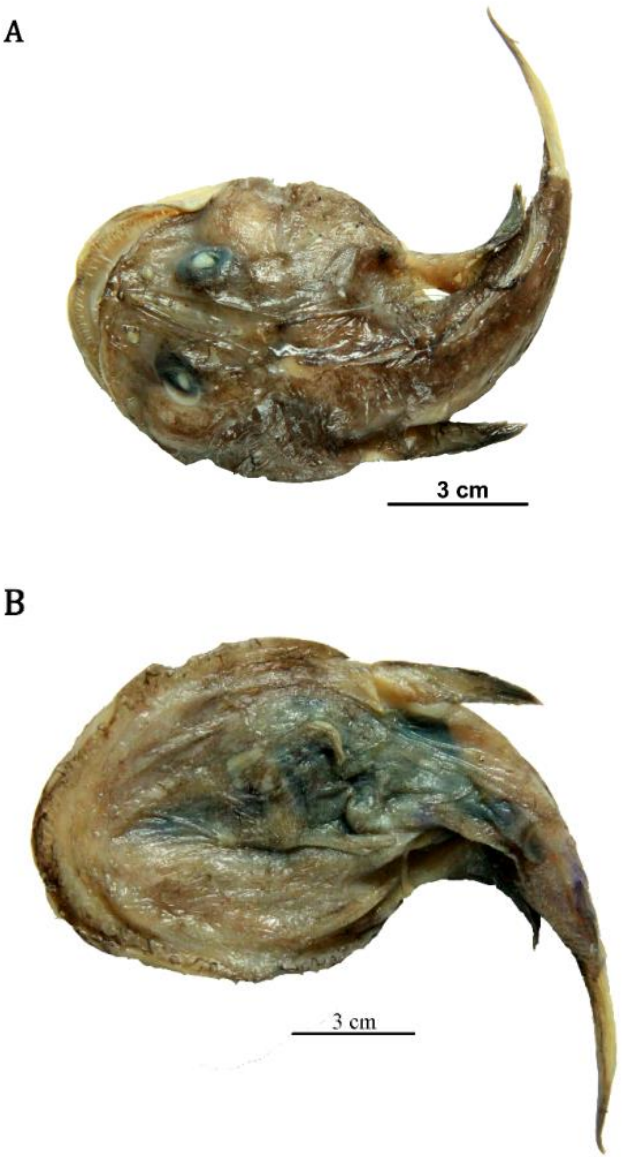
Synonyms—*Lophius mutilus* Alcock, 1893; *Chirolophius mutilus* (Alcock, 1894); *Chirolophius apanicus* Kamohara, 1938.

Holotype—ZSI 13438 (lost), 88.3 mm, 15.0° N, 80.4° E, Investigator station 137, Bay of Bengal, 234 m. (Alcock 1894). *Materials examined*—2911516, SL-230 mm, 10.62° N, 80.52°E, Bay of Bengal, 650 m, EXPO, Nov. 2011; 34909A, SL-115 mm, 11.93° N, 92.28° E, Andaman Sea, 290 m, HSDT CV, April 2016; 36708, 200 mm SL, 13.26° N, 93.26° E, Andaman Sea, 635 m. HSDT, November 2017; 34503, 138 mm SL, Off Kollam, 9.5° N, 75.9°, 330 m., Arabian Sea, October 2015.

Diagnosis—Species of *Lophiodes* with moderately depressed head and body; well-developed 3 cephalic and 2 post cephalic dorsal fin spines, peritoneum black.

Colour—Head and dorsal surface of the body uniform light brownish black, ventral having same colour as dorsal, but lighter. All the fins are brownish black, pectoral fins with pale tips. In preservative, dorsal surface having uniform pale brown and whitish ventral; all the fins are
pale.

Distribution—Arabian Sea, Bay of Bengal and Andaman Sea (new record). Indo-West Pacific, Philippines, East Africa and Australia at depth of 230-650 m.



Figs.5. ***Lophiodes mutilus***
A—dorsal view, **B**—ventral view

Lophiodes gracilimanus (Alcock, 1899)

Synonyms—*Lophius graclimanus* Alcock, 1899

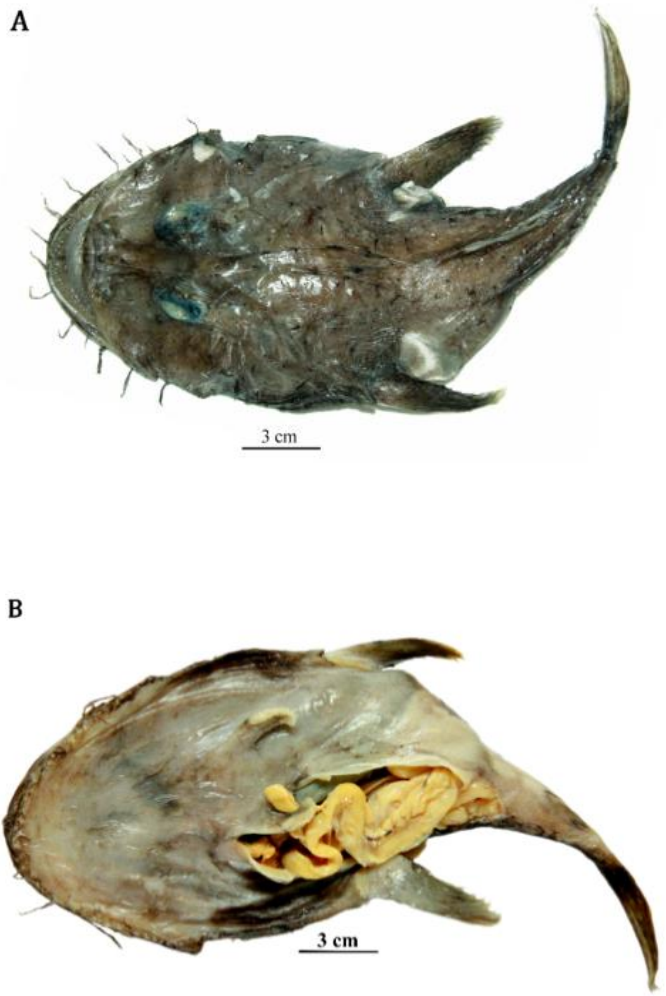
Lectotype— *Lectotype*—ZSI 490/1, 68.1 mm; Paralectotypes: ZSI F488/1-489/1 (2), F672/1 (1) Malabar coast of India, 124-270 m.

Material examined—349 02A, ♀, 270 mm SL, off Andaman Coast of India, 7.5° N, 93.4° E, April 2016, 650 m. 367 05, ♀,185 mm SL, 12.49° N, 93.17° E, 314 m, Andaman Coast of India, HSDT, December 2017.

Diagnosis—A species of *Lohiodes* with characters of *L. naresi* species group. Esca with pennant- like flap, long cirri, translucent bulb, and usually with dark, stalked, eye like appendages, cephalic and post cephalic portion of spinous dorsal fin with well-developed spines, III cephalic and III post cephalic fin spines; peritoneum light.

Colour—Head, dorsal surface of the body and pectoral fins uniform dark brown; ventral surface light brown; ray tips light colour except caudal fin.

Distribution—Known from Arabian Sea, off the Malabar Coast of India and Andaman Sea (new record) at depth range of 125 to 650 m. Also occurs in Indonesian waters.



Figs. 6. *Lophiodes gracilimanus*

A—dorsal view, **B**—ventral view

Genus *Lophiomus* Gill, 1883

Diagnosis— *Lophiomus* genus is unique among the lophiidae in having the frontal ridge and outer surfaces of the maxilla dentary. Head and body strongly depressed and broad; gill openings extending below and behind pectoral fin base; spinous dorsal fin of six spines, cephalic and postcephalic portions well developed; inner and outer sphenotic spines well developed, a third posterior sphenotic spine frequently present; epiotic spines well developed; articular with a single spine anterolateral to jaw joint; quadrate with a single lower spine; subopercle with a single spine; interopercle with two spines; humeral spine well developed. Genus is monotypic.

Lophiomus setigerus (Vahl, 1797)

Synonyms—*Lophius viviparus* Bloch and Schneider, 1801; *Lophiomus longicephalus* Tanaka, 1918 (type lost) *Lophius indicus* Alcock, 1889*; Chirolophius laticeps* Ogilby, 1911; *Chirolophius malabaricus* Samuel, 1963 (specimen lost).

Syntypes— AMS I.25832-004 (Vahl, 1797). syntypes: MNHN 1890-0341 (1), ZSI F12450-51 (2), 261/1-263/1 (3), 12504 (1), 13216 (1), 413/1 (1); Investigator station 43, Bay of Bengal. 45-78 m. (Alcock 1889).

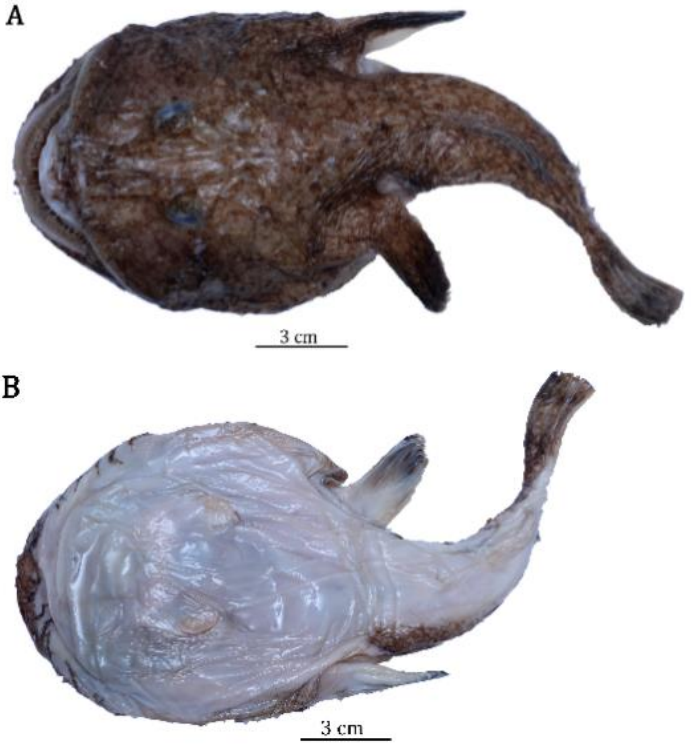
Materials examined—3170113, 191 mm SL, 9.95° N, 76.00° E, Arabian Sea, 200 m., HSDT, August, 2013; 27807, 130 mm SL, 11.1° N, 74.9° E, 200 m. Arabian Sea, August 2010; 2881718, 180 mm SL, 9.99° N, 75.6° E, 200 m, Arabian Sea, October 2011.

Diagnosis—A species of *Lophiomus* with strongly depressed head and body; frontal ridge and outer surfaces of the maxilla dentary; esca with leaf like flap and two black bulb like

appendages; peculiar pattern (small ring like) on the dorsal body.

Colour—Dorsal surface dark brown; with small circular pattern; All fins are dark brown (same as body colour) with black tips, ventral surface light brown; mouth cavity same as body colour. In preservative body retains the pattern and colour as fresh, but faded.

Distribution—Bay of Bengal, Arabian Sea and Andaman Sea. Widespread in Indo-west Pacific Ocean, Japan, Indonesia, east coast of Australia, off New South Wales, Madagascar at depth ranges of 72-970 m.



Figs. 7. *Lophiomus setigerus*

A—dorsal view, **B**—ventral view

Suborder—CHAUNACOIDEI
Family—CHAUNACIDAE Gill, 1863

Sea toads or coffinfishes

The family Chaunacidae is a group of medium sized, benthic fishes found from 200 m to more than 2000 m depths along the continental slopes of major oceans. At present the family comprise two genera (*Chaunacops* Garman, 1899 and *Chaunax* Lowe, 1846) and 29 species (4 *Chaunacops* and 25 *Chaunax* species respectively). Three species were represented from Indian waters

Genus Chaunax Lowe, 1846

Diagnosis—Anal-fin rays 6 or 7 (usually 7); 12 dorsal fin-rays; relatively high number of lateral -line neuromast counts; usually thickly packed dermal spinules; narrow intersphenotic space.

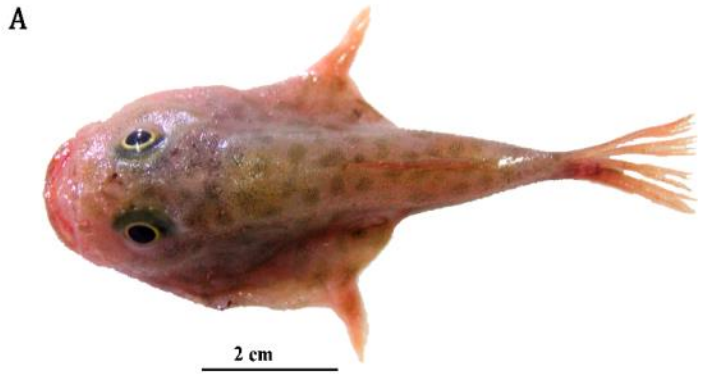
Chaunax multilepis Ho HC, Meleppura RK and Bineesh KK, 2016

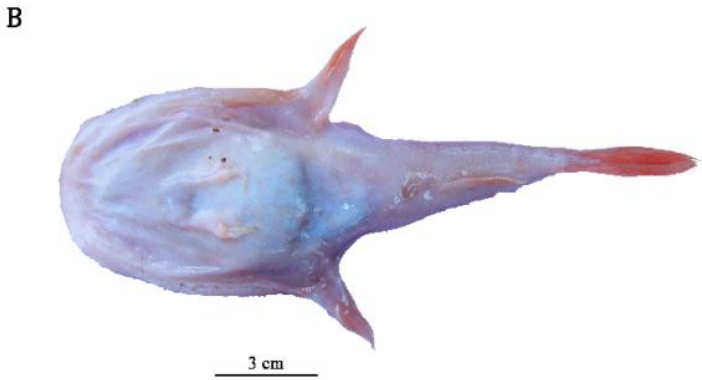
Indian spotted coffinfish

Holotype—CMLRE 2923417A (130 mm SL), 13.26° N, 93.17° E; off North Andaman, Andaman Sea, 295–323 m, FORVSS, EXPO, November 2011. Paratypes- 2923417B (1, 107 mm SL) and 2923417C (1, 105 mm SL), 2923812A & B (140, 126 mm SL), 13.00° N, 93.10° E; Andaman Sea, 325–350 m. 3050 01 (122 SL); 3050503 A and B (134 mm SL, 122 mm SL), 12.22 N, 74.33 E, Arabian Sea; 238-245m. 2911113, 142 mm SL, 11.9° N, 80.1° E, 650 m., EXPO, November 2011. For taxonomic studies more number of specimen were examined. 29111, 3 specimens (80, 85, 101 mm SL), 11.9° N, 80.1° E, 645 m., Bay of Bengal, November 2011.

Diagnosis—*Chaunax multilepis* is a species under *Chaunax abei* species group that is distinguished from congeners in the species group by having a continuous tooth patch on vomer, not divided into two patches, and four or five neuromasts in the lower preopercular series. It can be further separated by the following combination of characters: large green spots on dorsal surface; simple spinules on dorsal surface; 12 pectoral-fin rays; 13–16 neuromasts in pectoral series; 30–37 neuromasts in lateral-line proper; typically, four neuromasts on caudal-fin base; typically, 7 neuromasts in mandible; typically, 12 gill rakers on second gill arch; gill chamber and buccal cavity pale; and peritoneum black.

Distribution—Known from the type series collected in the Andaman Sea at depths of 295–350 m; off the southwestern coast of India, Arabian Sea, between Mangalore and Kollam at depths of 200–350 m and Bay of Bengal (new record).





Figs. 8. *Chaunax multilepis*
A—dorsal view, **B**—ventral view

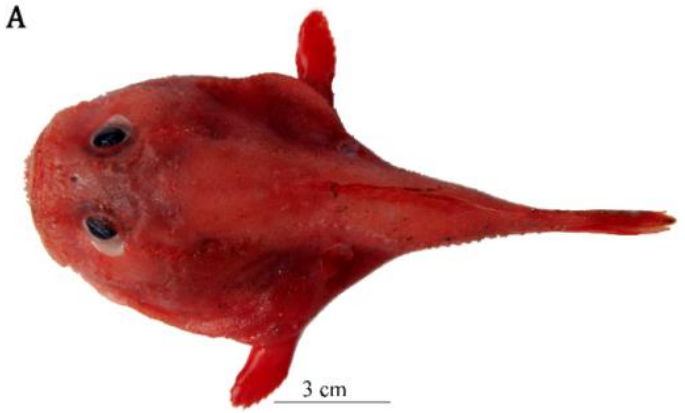
Chaunax apus Lloyd, 1909

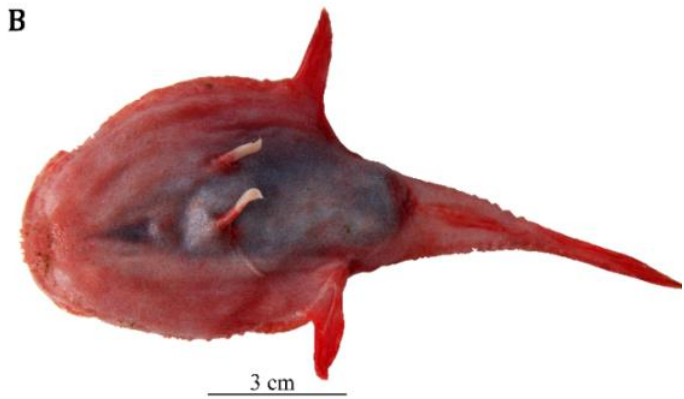
Holotype—ZSI F2404/1; Bay of Bengal, off Akyab coast, Myanmar, Investigator station 379, depth 969 m. (Lloyd 1909). *Materials examined*—34902A and B 225, 195 mm SL 7.5° N, 93.4° E, Andaman Sea, 650 m., HSDT CV, April 2016; 34908A and B, 100, 104 mm SL, 12.1° N, 93.2° E, 411 m., HSDT CV, April 2016 ; 2928324, 138 mm SL, 6.8° N, 93.1° E, 337 m., December 2011; 2910511, 96 mm SL, 18.8° N, 85.4° E, Bay of Bengal, 620m., HSDT CV, October, 2011 ; 3050507 91 mm SL, 12.2° N, 74.3° E, Arabian Sea, 245 m., HSDT CV, August 2011

Diagnosis—Belongs to the *Chaunax abei*-species group, which is characterized by its lack of filaments on the dorsal surface of the head and flap-like cirri laterally on the body associated with the lateral line. Uniform red colour in fresh turning creamy white on preservation. Relatively small head,

dermal spinules slender and curved; long tail, especially TL2 (post anus length 32.4-36.9 5 % SL), relatively short caudal fin; gill rakers on second gill arch; GR ii=11 or 12; lateral-line neuromasts: 3 neuromasts on upper preopercular (BD), 14-17 on pectoral series (GH), 33-38 on body series (BI).

Distribution—Bay of Bengal (type locality), new record from Arabian Sea and Andaman Sea. Widespread in Indo-west Pacific, South and East Africa to Madagascar and Kenya; Myanmar and Indonesian water at a depth ranging from 195–969 m





Figs. 9. *Chaunax apus*
A—dorsal view, **B**—ventral view

Chaunax penicillatus McCulloch, 1915

Synonyms—*Chaunax tosaensis* Okamura and Oryuu, 1984

Holotype—AMS E.5488; paratype: AMS I.13605 (1); type locality: 60 km SW of Cape Everard, Victoria, Australia, depth 293–366 m.

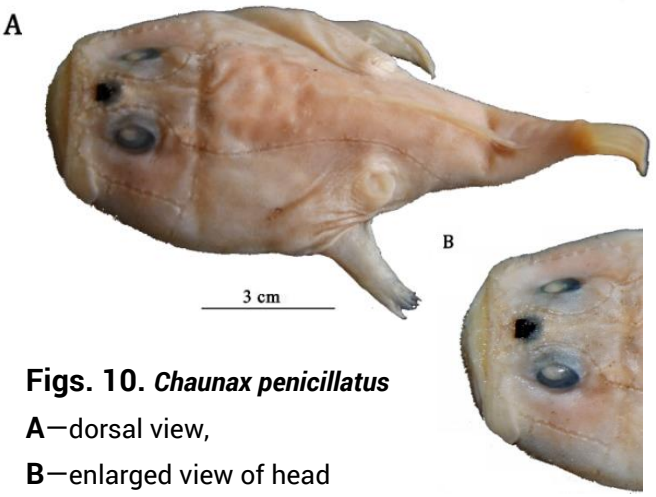
Materials examined—2803730, 113 mm SL (female) 6.6° N, 93.7° E, Andaman Sea, 321 m. September 2010; 2928323 A & B, 165 mm SL and 118 mm SL respectively (female), 6.8° N, 93.1° E, Andaman Sea, 337 m., December 2011.

Diagnosis—A species in the *C. pictus*-species group with a black and very deep illicial trough, an extremely short illicium

and esca. Cirri on esca black anteriorly and bright white posteriorly. Dorsal-fin rays III, 12; anal-fin rays 7; pectoral-fin rays 13. GRi= 12-13, GRii=9; GRiii= 9-10, GRiv=7 and lateral-line neuromasts: BD= mainly 2, GH=10–11 mainly 11, BI=34–35. Body orange in colour with irregular yellowish vermicular patches. Uniform creamy white on preservation.

Colour—Colour of the Indian specimen in fresh, unknown. Preserved specimens uniform creamy white without any retention of markings (may be due to the prolonged preservation) except illicial trough, which is deep black.

Distribution—Andaman Sea, at depths of 321-337 m. (new record from Andaman Sea, Rajeeshkumar et al. 2019). *Chaunax penicillatus* is widespread in the Indo-west Pacific, including Kenya, South Africa, Madagascar, Japan, Taiwan, South China Sea, Australia and New Zealand. Bathymetric range 293–620 m



Figs. 10. ***Chaunax penicillatus***
A—dorsal view,
B—enlarged view of head showing illicium

Suborder—OGCOCEPHALOIDEI
Family—OGCOCEPHALIDAE Gill, 1893

Bat fishes

The family comprises 10 genera and some 70 species. A total of 5 genus and 11 species are represented from India.

Halieutopsis Garman, 1899

Diagnosis—Head moderately to greatly depressed, no teeth on palate, two or more lateral line scales with neuromasts on either side of anus, the illicial bone relatively simple and spine like; its base not perforated by foramina; no teeth on vomer and palatine; teeth on tongue not forming two large patches; gills two. One species reported from Indian waters.

Halieutopsis stellifera (Smith and Radcliffe, in Radcliffe, 1912)

Synonyms—*Dibranchus stellifer* Smith and Radcliffe, 1912

Holotype—USNM 70273, 71.2 mm SL, 05°36′ S, 120° 49′ E, Flores Sea off coast of Celebes, Indonesia, Albatross station 5660, 1266 m.

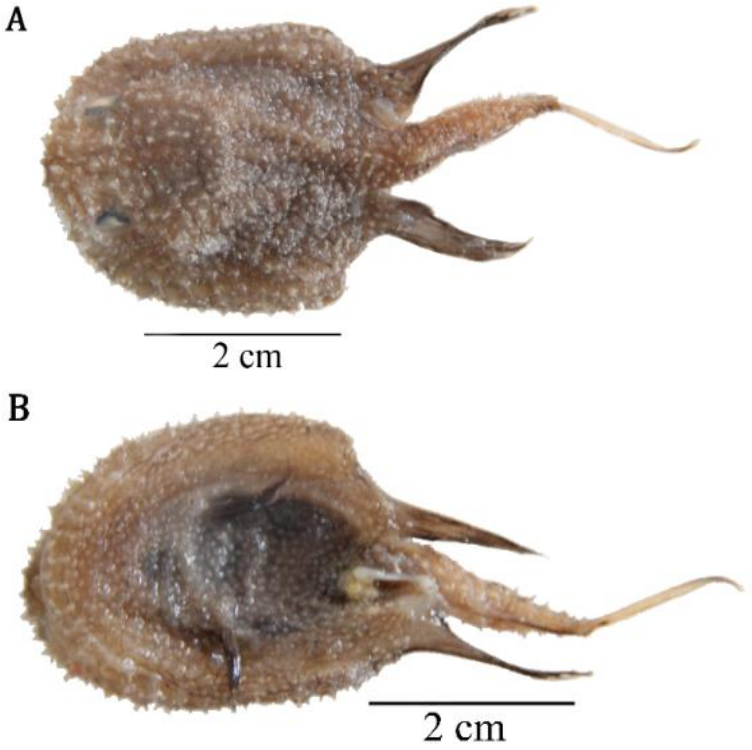
Material examined—2928922 A, B and C, 51, 55, 56 mm SL respectively, 7.53° N, 93.25° E, 480-580 m., HSDT CV, December 2011; 31601, 50 mm SL, 8.3° N, 76.2° E, 1337 m., DSDT CV, July 2017.

Diagnosis—A species of *Halieutopsis* with wide inter-orbital distance, tubercles present on ventral surface of disk, three lateral-line scales on pre-opercular series

Colour—Dorsal surface of the body uniform yellowish brown; all fins are dark brown in fresh. In preserved specimens dorsal

surface of the body uniform dark brown in one specimen and moderately dark brown in the other two specimens. All the fins are dark brown.

Distribution—Andaman Sea (new record, Rajeeshkumar et al. 2013) at depth of 480-580 m. Madagascar; Indonesia to Philippines, north to southern Japan, south to New Caledonia at depth of 410-1372 m.



Figs. 11. *Halieutopsis stellifera*
A—dorsal view**, B**—ventral view

Halieutaea Valenciennes, 1837

Diagnosis—Head relatively or strongly compressed; disk margin is rounded in dorsal view; rostrum may or may not project over the disk; generally, trilobed esca; dorsal surface covered with principle tubercles, these are needle like or stout; in between the principle tubercle tiny spinules may or may not be present; ventral surface covered with granules, small stout spines or naked; teeth on tongue forming two patches, each has an elongated inner projection; body with uniform pinkish to reddish colour when fresh, with or without black pattern or spots of various arrangement on dorsal surface; black bands either present or absent on the fins. Currently comprise 9 valid species and 4 species from India.

Halieutaea stellata (Vahl, 1797)

Minipizza batfish

Synonyms—*Lophius stellatus* Vahl, 1797; *Halieutaea maoria* Powell, 1937.

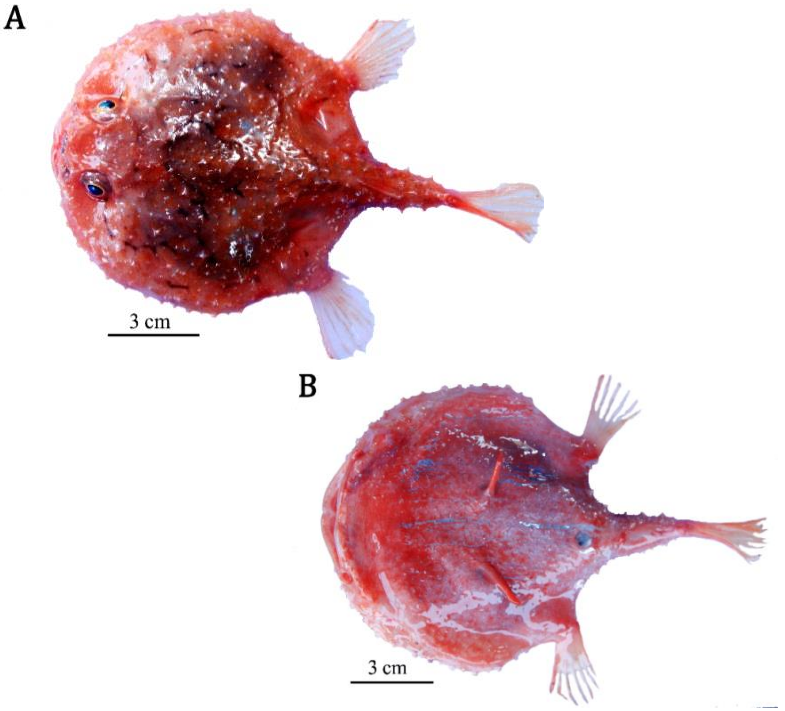
No type known, original from China

*Material Examine*d—34910, 140 mm SL, 11.18° N, 92.34° E, 520 m. HSDTCV, April 2016; 349 01B, 102 mm SL, 12.48 N, 92.39 E, 576 m, HSDT CV, April 2016; 349 06, 118 mm SL, 12.74° N, 93.10° E, 332 m, HSDT CV, April 2016; 34907, 125 mm SL, 13.2° N, 93.2° E, Andaman Sea, 332 m., HSDT CV, April 2016; 317 01, (2) 98, 103 mm SL, 9.6° N, 76.0° E, Arabian Sea, 200 m., HSDT CV, July 2013.

Diagnosis—Dorsal fin rays 5-6; pectoral fin rays 14; caudal fin rays 9 and anal fin rays 4. Dorsal surface having simple major spines and minute spinules giving a velvet appearance; ventral surface with widely distributed spines, peritoneum black.

Colour—Body uniformly pinkish to reddish in colour when fresh with black symmetrical lineate pattern on dorsal surface, all fins with black edge or not. In preservation, both dorsal and ventral with pale colour; symmetric black pattern on dorsal surface. Ventral also pale. Caudal fin with a black stripe on the distal end.

Distribution— Arabian Sea, Bay of Bengal and Andaman Sea (new record) at depth range of 200 -576 m. Widespread in the western Pacific off Japan, Taiwan, South China Sea, the Philippines, Indonesia, New Caledonia, Australia and north New Zealand. Depth 95-474 m



Figs. 12. *Halieutaea stellate*

A—dorsal view**, B**—ventral view

Halieutaea coccinea Alcock, 1889

Scarlet seabat

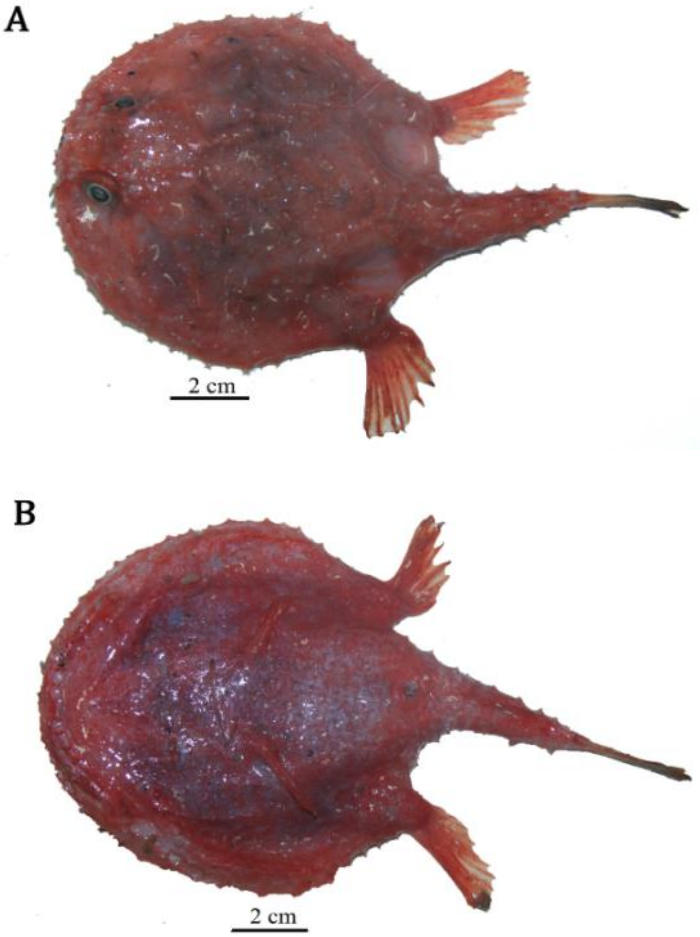
Holotype—ZSI F11741, Andaman Sea, Investigator station 13, 484 m.

Material Examined—Holotype, ZSI, F 11741, Andaman Sea, 338-465 m; 34901A, 112 mm SL, 12.5° N, 92.4° E, Andaman Sea, 576 m. HOT, April 2016; 33401 B, 154 mm SL, 33401C, 117 mm SL, 10.99° N, 92.27° E, Andaman Sea, 363 m, HOT, January 2015; 34905, 6 specimens 5.5-6.5 mm SL, 12.5° N, 93.2° E, Andaman Sea, 300 m, HSDT CV, October 2016; 30501, 130 mm SL, 8.31° N, 76.16° E, Arabian Sea, 1075 m; 288 09, 94 mm SL, 11.99° N, 74.42° E, Arabian Sea, 200 m., August 2011; 29106, 96 mm SL, 18.9° N, 85.4° E, Bay of Bengal, 500 m, HSDT CV, October 2011.

Diagnosis—Dorsal fin rays 5; pectoral fin rays 13-14; anal fin rays 4; caudal fin rays 9. Dorsal surface with simple spines; thickly packed stellate spine on the ventral surface, peritoneum black.

Colour—Body uniformly light reddish in colour when fresh with black symmetrical lineate pattern on dorsal surface, all fins with black edge or not. In preservation both dorsal and ventral with pale colour; symmetric black pattern on dorsal surface. Some specimen retains a black stripe on the distal end of caudal fin.

Distribution—Arabian Sea, Bay of Bengal (new record) and Andaman Sea. South Africa, Madagascar, Indonesia and Australia. 200-1075 m



Figs. 13. *Halieutaea coccinea*
A—dorsal view**, B**—ventral view

Halieutaea indica Annandale and Jenkins, 1910

Indian handfish

Synonyms—*Lophius muricatus* Shaw, 1804; *Lophius faujas* Lacepède, 1798; *Halieutea spicata* Smith, 1965; *Halieutaea spicata* Smith, 1965; *Halieutaea sinica* Tchang and Chang, 1964; *Astrocanthus stellatus* Swainson, 1839.

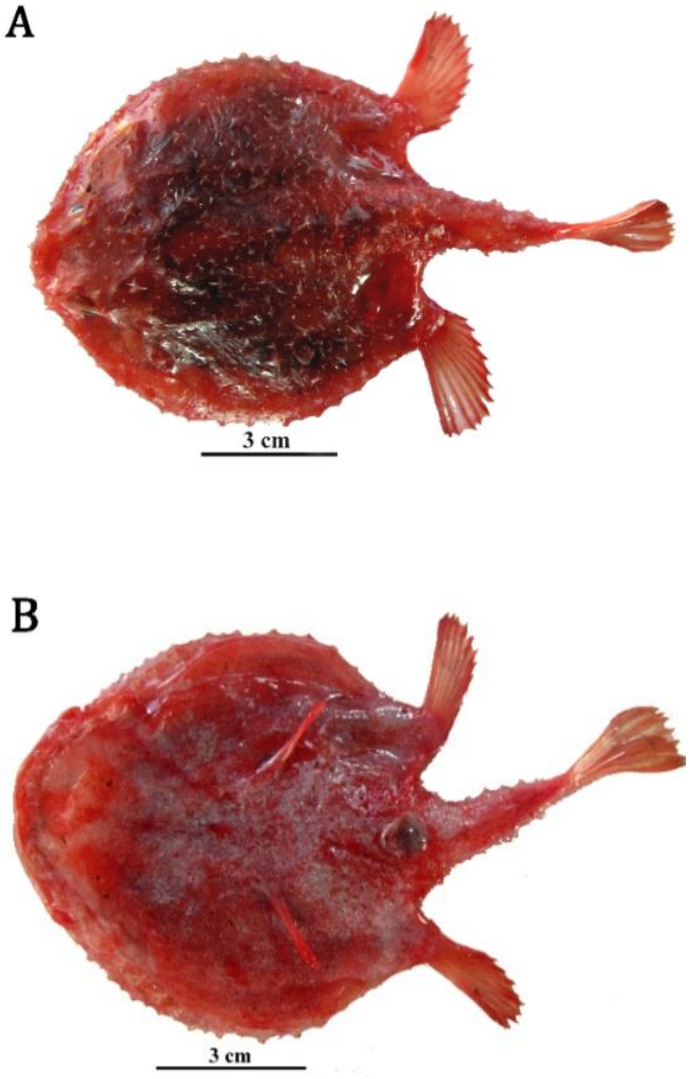
Syntypes—ZMA 112980 (1), ZSI F2207/1, 4142/1, 4143/1, 4145/1, 2205/1, 2206/1, 3545/1, 4192/1. Bay of Bengal. (Annandale and Jenkins 1910).

Material examined—288 09, 74 mm SL, Arabian Sea, 11.99° N, 74.42° E, 200 m., August 2011.

Diagnosis—Dorsal fin rays 4; pectoral fin rays 14; anal fin rays 4; caudal fin rays 9; rostrum projects over the margin of the disk, esca invisible from dorsal view; relatively long spines on the dorsal surface, most of them are bifid; peritoneum white.

Colour—In fresh unknown, according to Annandale dorsal surface having reddish to pink colour with minute black spots which together form lines and recirculated patterns. In preserved specimens uniform creamy colour on both dorsal and ventral surface, dorsal surface retains some black spots.

Distribution— Arabian Sea at a depth of 200 m (new record; Rajeeshkumar et al. 2021). Species were widely distributed in Indo-west Pacific from off South Africa, Madagascar, Seychelles, Western Australia, the Philippines, Indonesia, Taiwan, China and Japan.



Figs. 14. *Halieutaea indica*
A—dorsal view, **B**—ventral view

Halicmetus Alcock, 1891

Diagnosis—Body depressed; disk subtriangular; broader than long, dorsal fin present or absent; lower jaw slightly overhanging upper jaw; entire body covered with minute bucklers with simple, bifid or trifid ends; dorsal surface with or without colour pattern; all fins are either with black bands or completely black. Presently genus contains 4 valid species, only 1 species is represented from India

Halicmetus ruber Alcock, 1891

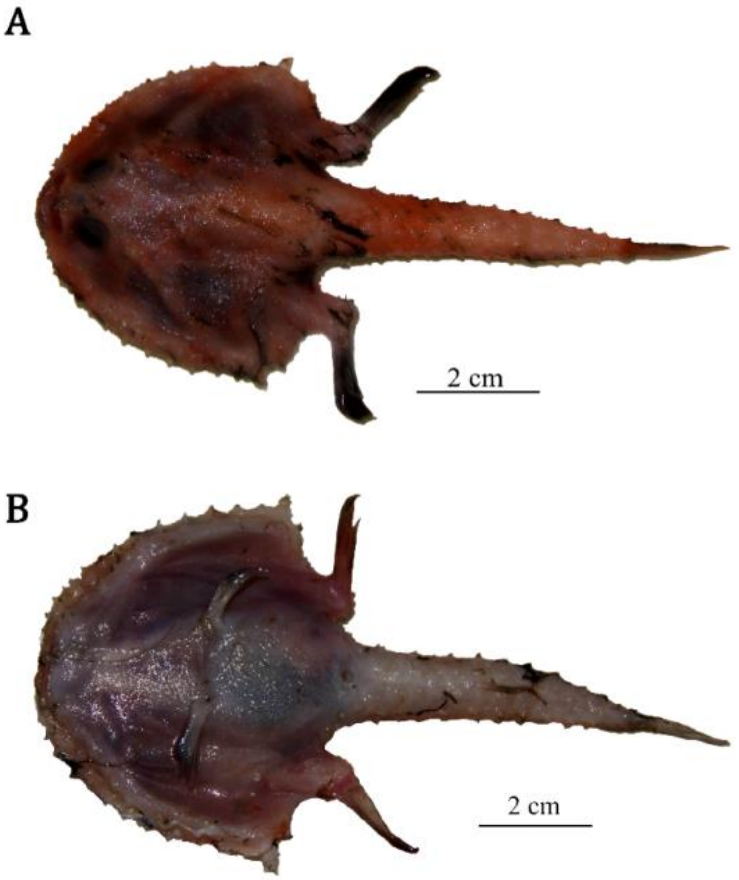
Syntypes—ZSI F13025-26 (2), 11°31'40"N, 92°46'06", Andaman Sea, Investigator station 115, 343-402 m

Material examined—27911A, 97 mm SL, 13.22° N, 80.59° E, Bay of Bengal, 307 m, HSDT CV, August 2010; 32208A, 76 mm SL, 32208 B, 102 mm SL, 8.94° N, 75.46° E, Arabian Sea (SEAS), 1000 m, January 2014; 36603A, 85 mm SL. 36603B, 80 mm SL, 8.36° N, 76.24° E, Arabian Sea, 950 m, October 2017; 2928312 SL-78 mm, Andaman Sea, 6.84° N, 9.05° E, 337 m., HSDT- CV, December 2011.

Diagnosis—A species under *Halicmetus* with absence of dorsal fin; body surface uniformly light pink; single or bifid tubercles present everywhere; relatively small buckler present on dorsal surface especially in the anterior region of the orbit, along the midline and tail; all fins are black; peritoneum black.

Colour—In fresh specimen's dorsal and ventral surface uniformly pale red. All fins are pale pink with black edge. In preservation uniform creamy colour, without any trace of colour. All the fins are white with black edges.

Distribution—Arabian sea, Bay of Bengal (new record) and Andaman Sea at depth ranging from 307 to 1000 m. Indian Ocean at depth 280-1000 m.



Figs. 15. *Halicmetus ruber*

A—dorsal view, **B**—ventral view

Coelophrys Brauer, 1902

Diagnosis—Head box-like, rostrum flat and broad, slightly overhanging on mouth; pelvic fins greatly reduced in size; illicial cavity large, simple tubercle densely covered all over the dorsal body. Presently genus, *Coelophrys* comprises 7 species; 1 represented from India.

Coelophrys micropa (Alcock, 1891)

Synonyms—*Coelophrys micropus* (Alcock, 1891); *Dibranchus micropus* Alcock, 1891; *Halieutopsis micropa* (Alcock, 1891); *Dibranchus micropus* Alcock, 1891.

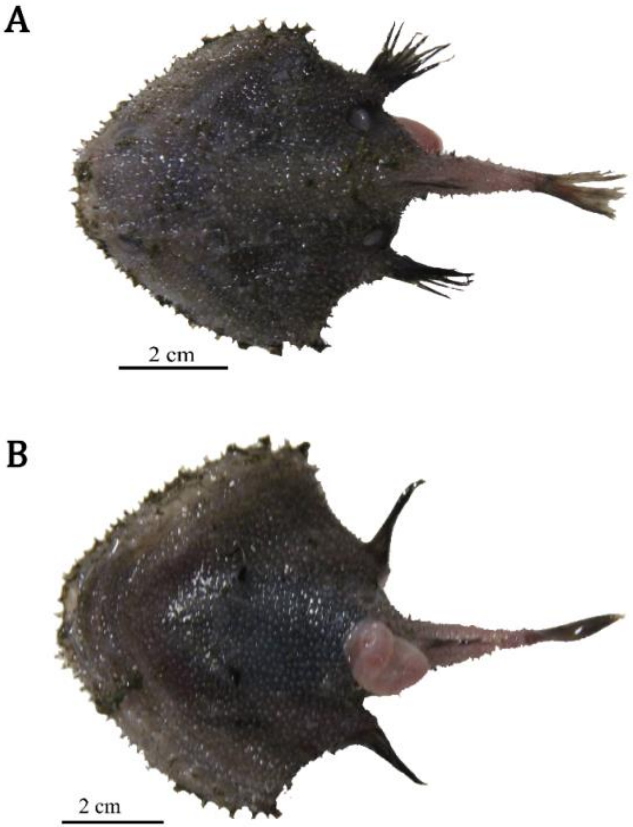
Syntypes—ZSI F13029-30 (2), Bay of Bengal, 15°5 6′ 50″ N, 81° 30′ 30″ E, Investigator station 120, depth 438-504 m. (Alcock 1891).

Material examined—Syntypes- ZSI F13029-30 (2). 34901, 66 mm SL, 12.48° N, 92.39° E, 576 m, HSDT CV, April 2016; 34910A & B (62 mm SL, 25 mm SL) 11.18° N, 92.34° E, Andaman Sea, 520 m., HSDT-CV, April 2016; 31601, 93 mm SL, 8.29° N, 76.21° E, 1300–1350 m, Southwest coast of India (Arabian Sea), July 2013; 29115, 75 mm SL 10.62° N, 80.52° E, Bay of Bengal, 650 m, EXPO, November 2011.

Diagnosis—A species under *Coelophrys* with box-like head, relatively long caudal peduncle; greatly reduced pelvic fins; 5 dorsal fin rays; 14-15 pectoral fin rays; 4 anal fin rays.

Colour—In fresh uniform blue black, all the fins are much darker than body.

Distribution—Arabian Sea, Bay of Bengal and Andaman Sea at depth of 430-1350 m. Off South Africa, Taiwan, Japan, the Philippines, Madagascar and Australia at depth range of 400-1400 m.



Figs. 16. *Coelophrys micropa*
A—dorsal view, **B**—ventral view

Malthopsis Alcock, 1891

Diagnosis—Head and anterior part of the body forming depressed subtriangluar disk; dorsal surface covered with pyramid like principal bucklers, small spinule may or may not be present in between principal bucklers; ventral surface having few small bucklers; rostral spine sharp or blunt, directed forward or upward; subopercle buckler with or without well-developed spines; dorsal surface with or without markings. Currently comprises 13 species and 2 represented from India.

Malthopsis lutea Alcock, 1891

Longnose seabat
Synonyms—*Malthopsis luteus* Alcock, 1891

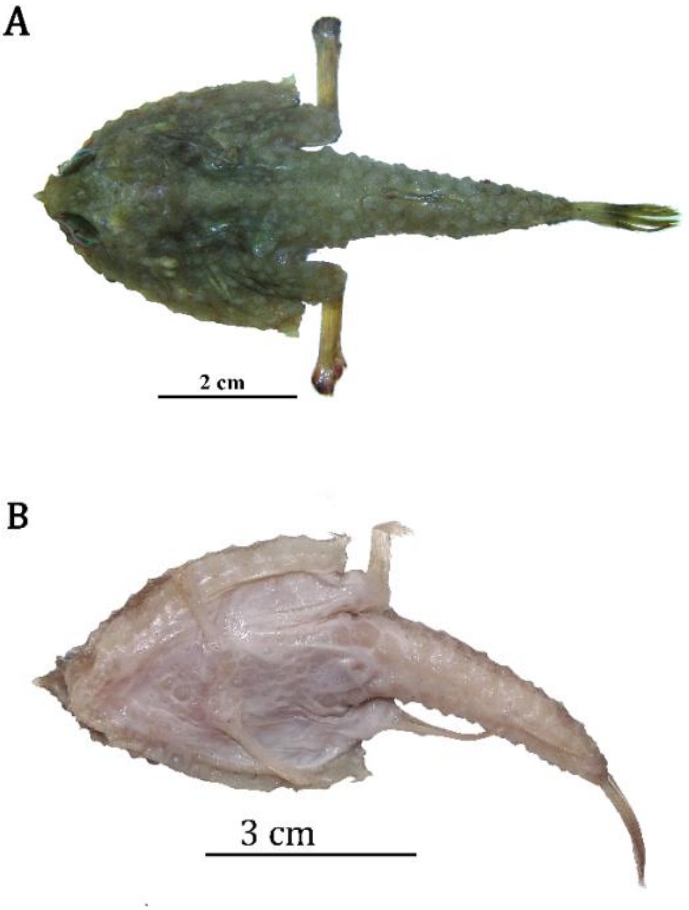
Lectotype—BMNH 1898.7.13.6 [ex. ZSI F13024]. Paralectotypes: BMNH 1891.9.2.2, 51.8 mm SL, Andaman Sea, 11°31′40″N, 92°46′06″E, Investigator station 115, 343-402 m

Materials examined—34909, 55 mm SL, 11.93° N, 92.28° E, 290 m. HSDT, April 2016; 34907, 49 mm SL, 13.23° N, 93.17°E, 332 m, HSDT CV, April 2016; 34902A & 34902B, 62 mm, 56 mm SL, 7.48° N, 93.41°E, Andaman Sea, 650 m HSDT CV, April 2016; 30505, 65 mm SL, 12.2° N; 74.3° E, Arabian Sea, 200-400 m, HSDC CV, August 2017.

Diagnosis—Subopercle buckler with blunt spines; rostral spine small directed upward; 2-3 brown rings present on the dorsal body.

Colour—Dorsal body uniformly brownish with 2-3 yellowish rings, ventral with creamy white.

Distribution—Presently known from Arabian Sea (new record) and Andaman Sea at depth ranging from 290-740 m. Also from off Madagascar, Indonesia, Japan and Taiwan



Figs. 17. *Malthopsis lutea*
A—dorsal view, **B**—ventral view

Malthopsis gigas Ho and Shao, 2010

Giant triangular batfish

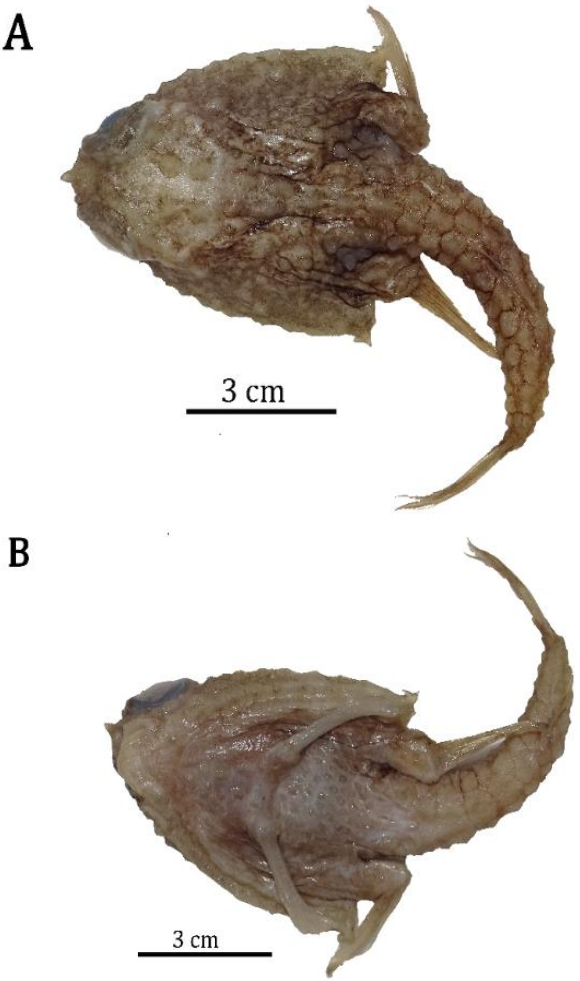
Holotype—ASIZP 63084, 24°48´N, 122°25.2´E, NE Taiwan, 210-340 m.

Materials examined—29234, 68 mm SL, 13.22° N, 93.18° E, Andaman Sea, 300 m, HSDT CV, November 2011; 29238, 62 mm SL, 13.01° N, 93.11° E, Andaman Sea, 308 m, HSDT CV, November 2011.

Diagnosis—Rostral spine directed almost vertically; wide interorbital space; well-developed large bucklers on tail; anal fin reaches beyond caudal fin base when fully laid back.

Colour—In preserved specimen, dorsal surface with uniform light brown colour with one or two small black patches, ventral with pale brown; all fins brown, but anal with white.

Distribution— Andaman Sea (new record) at a depth of 300-308 m. Indian and Pacific oceans off Madagascar, Somalia, Japan, Taiwan, Australia, Fiji, Vanuatu, New Caledonia, French Polynesia and New Zealand at depth ranging from 210-650 m.



Figs. 18. *Malthopsis gigas*

A—dorsal view, **B**—ventral view

Suborder—CERATIOIDEI
Family—CERATIIDAE Gill, 1861

Diagnosis (Based on females)—The Family Diceratiidae is unique in having an extremely exposed second light-bearing, dorsal-fin spine originating from the head directly behind the base of the illicium; two nostrils on each side; eyes small and subcutaneous; mouth large, cleft extending past eye; lower jaw with well-developed symphysial spine, extending slightly beyond upper jaw; supraethmoid present; vomerine teeth present; parietals present; sphenotic spines well developed; articular spine present; angular spine absent; numerous small, darkly pigmented, round shaped papillae on skin; basal half of escal bulb pigmented; many slender, recurved teeth on both upper and lower jaws; body covered with minute dermal spinules; pharyngobranchial I reduced; pharyngobranchials II and III well developed and toothed; pharyngobranchial IV absent; 6 branchiostegal rays; dorsal fin rays 5-7; anal-fin rays 4; pectoral fin rays 13-16; pelvic fins absent; caudal fin rays 9.

Males (based on a single juvenile male 14 mm)- Relatively large eyes; the olfactory organs are well separated from the eye, the premaxillae and dentaries of the male have irregularly resorbed edges; there is a pair of recurved denticular teeth on the snout just posterior to the symphysis of the upper jaw; there are 9 similar denticular teeth lying slightly behind the tip of the lower jaw; the skin is fully covered with tiny conical dermal spinules; fin ray counts same as females; free living, never parasitic.

The Family Ceratiidae contains two genus and four species. *Ceratias* includes *C. tentaculatus* (Norman, 1930), *C. holboelli* Kröyer, 1845, and *C. uranoscopus* Murray, 1877. The genus *Cryptopsaras* contains only *C. cousi* Gill, 1883.

Genus—*Ceratias* Krøyer, 1845

Diagnosis- Unique in absence of a spine on the anterodorsal margin of the subopercle; relatively long illicium; nine caudal fin rays, the lowermost greatly reduced; two club shaped caruncles on the dorsal midline of the trunk just anterior to the origin of dorsal fins. Escal bulb of females with or without one or two distal appendages; if present, escal appendages simple or bearing 1-8 lateral filaments. 2 species were represented from India.

Ceratias uranoscopus Murray, 1877

Synonyms—*Typlopsaras shufeldti* Gill, 1883; *Mancalias xenistius* Regan and Trewavas, 1932; *Manchalias uranoscopus* (Murray, 1877).

Holotype—BMNH 1887.12.7.15, 57 mm, CHALLENGER Sta. 89, between Canary and Cape Verde islands, ca. 20°13′ N, 20°13′ W, 0-4392 m.

Material examined—Andaman Sea, 3341210, ♀, 93 mm SL, 11.4° N, 92.8° E, 850–900 m, HOT, Jan. 2015; 3440412, ♀, 150 mm SL, 8.1° N, 71.8° E, 304-600 m, HOT, Sept. 2015, Cosmos trawl (specimen collected from western Indian Ocean).

Diagnosis—Illicium length 14.0–28.8% of SL; simple esca, escal bulb lacking escal appendages; two club-shaped caruncles on the dorsal midline of the trunk anterior to the origin of the soft dorsal fin, absence of vomerine teeth.

Colour in preservative—Dark black over entire surface of the body except for the distal portion of escal bulb.

Distribution—Andaman Sea (new record, Rajeeshkumar et al. 2016) and Arabian Sea.300-900 m. *Ceratias uranoscopus* is well represented in the Atlantic and Pacific, but little known from the Indian Ocean; one from off Durban, South Africa and the other in the central Arabian Sea

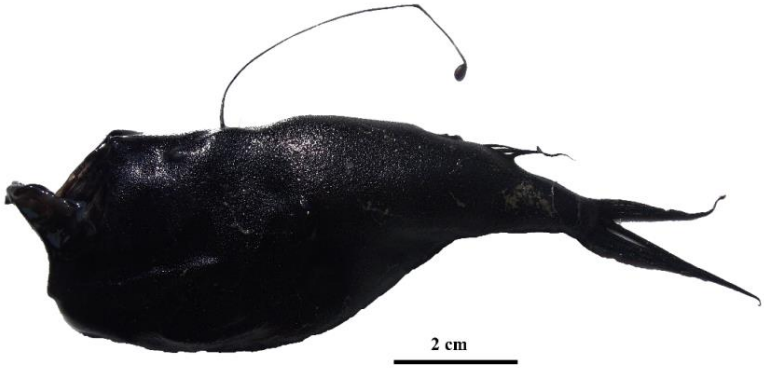


Fig. 19. *Ceratias uranoscopus*

Genus- *Cryptopsaras* Krøyer, 1845

Diagnosis—Unique in having a spine on the anterodorsal margin of the subopercle; illicium reduced to a small remnant nearly fully covered by tissue of the esca; only eight caudal rays; three club shaped caruncles just anterior to the origin of dorsal fins.

Cryptopsaras couesi Gill, 1883

Triplewart Seadevil

Synonyms—*Cryptopsaras couesii* Gill, 1883; *Ceratias carunculatus* Günther, 1887; *Ceratias mitsukurii* Tanaka, 1908;

Cryptopsaras valdiviae Regan and Trewavas, 1932; *Cryptopsaras pennifer* Regan and Trewavas, 1932; *Cryptosparas normani* Regan and Trewavas, 1932; *Cryptopsaras atlantidis* Barbour, 1941.

Holotype—USNM 33558, 30 mm, ALBATROSS Station 2101, Western North Atlantic, 38°18′ N, 68°24′ W, 0-3085 m.

Material examined—30506, ♀, 110 mm SL, 12.2° N, 74.2° E, Arabian Sea, 923 m., HSDT CV, August 2017.

Diagnosis—Unique in having a spine on the anterodorsal margin of the subopercle. Three club-shaped caruncles on the dorsal midline of the trunk just anterior to the origin of the soft dorsal fin and only eight caudal rays.

Colour in preservative—Dark black over entire surface of the body including escal bulb and filament

Distribution—Arabian Sea (new record); occurring in all three major oceans of the world between approximately 63˚ N and 43˚ S.

Fig. 20. *Cryptopsaras couesi*

Family Diceratiidae Regan and Trewavas, 1932

Common name- Doublespine Seadevils

Diceratiidae contains two genera, namely *Bufoceratias* Whitley, 1931 and *Diceratias* Günther, 1887, and is comprised of seven species (Pietsch et al. 2004; Ho et al. 2016). *Bufoceratias* includes *B. shaoi* Pietsch, Ho and Chen, 2004; *B. wedli* (Pietschmann, 1926), *B. thele* (Uwate, 1979) and *B. microcephalus* Ho, Kawai and Amaoka 2016 and *Diceratias* includes *D. bispinosus* (Günther 1887), *D. pileatus* Uwate, 1979 and *D. trilobus* Balushkin and Fedorov, 1986.

Genus—*Diceratias* Günther, 1887

Doublespine Seadevils

Diagnosis- Illicial length 27-47% SL; pterygiophore of the illicium emerging on the snout from between the frontal bone, distance from base of illicium to symphysial cartilage 7-15% SL; pterygiophore elongate with exposed anterior tip; supraethmoid forming 52° angle with horizontal plane of cranium; illicial trough relatively deep.

Diceratias trilobus Balushkin and Fedorov, 1986

Holotype—ZIN 47426, 122 mm *SL*, R/V *Shantar*, trawl 28, E of Honshu, Japan, 38 °20.7′ N, 142°31.9′ E, bottom trawl, 1211–1216 m, 28 March 1975.

Material examined—3160107, , 141.87 mm SL, 8.2° N, 76.2° E, Southwest coast of India (Arabian Sea), 1300–1350 m, July 2013.

Diagnosis—Metamorphosed females of *Diceratias trilobus* having unusually large, laterally compressed esca, greatest

width slightly more than 1.5 times its length (9.6–10.5 % SL); a rounded terminal escal papilla; anterior and posterior escal appendages well developed, each usually bearing one or more tiny, slender terminal filaments.

Distribution—Arabian Sea 1350-1350 m (new record, Rajeeshkumar et al. 2016). Western North Pacific, Australia and eastern Indian Ocean at depths of 1211-1216m.

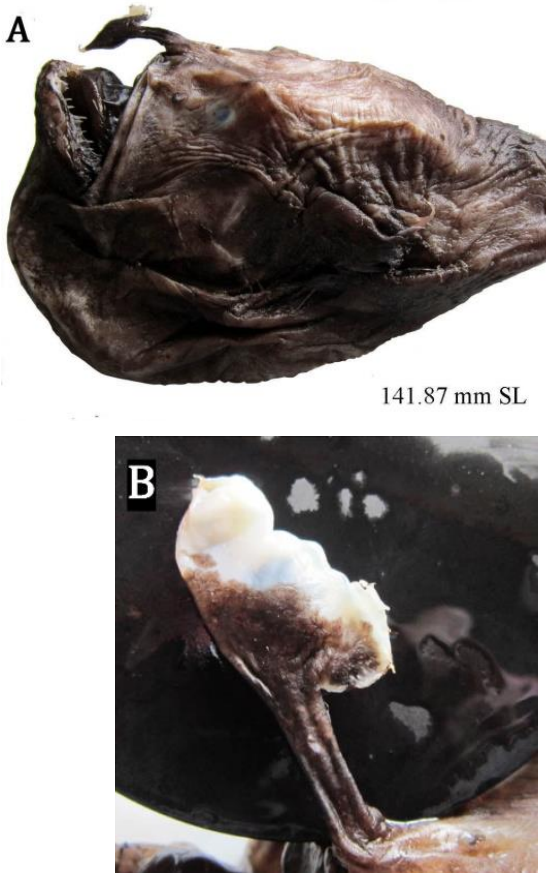


Fig. 21. *Diceratias trilobus*

A—lateral view, **B**—illicial apparatus

Genus *Bufoceratias* Whitley, 1931

Toady Seadevils

Diagnosis—length of illicium 25–225% SL; anterior tip of pterygiophore of illicium covered with skin; illicium emerging from dorsal surface of head at rear of skull (not from the snout); distance from base of illicium to symphysis of upper jaw 29-61 % SL; illicial trough not deep; dermal spines minute.

Bufoceratias shaoi Pietsch, Ho and Chen, 2004

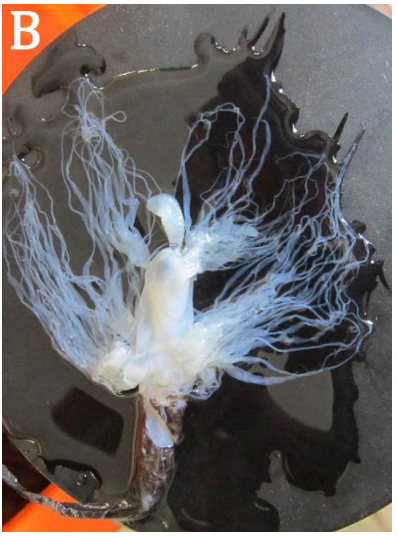
Synonyms—*Phrynichthys thele* Uwate, 1979.

Holotype—ASIZP 61796, 101 mm, off northeast coast of Taiwan, 24°25–50´N, 122°00– 10´E, bottom trawl, 0–800 m, 1999. Paratypes: ASIZP 59952, 2 (56–75 mm), off northeast coast of Taiwan, 24°55´N, 122°04´E, bottom trawl, 0–650 m, 20 March 1998; MNHN 1977–304, 55 mm, Mozambique Channel, 17°36´–22°25´S, 42°59´–43°56.5´E, 0–1200 m.
Material examined—3160210, ♀, 153.67 mm (SL), 7.7° N, 76.4° E, Southwest coast of India, 1300–1350 m. July 2013.

Diagnosis—Metamorphosed females of the *Bufoceratias shaoi* have generally shorter illicium (25–40% SL) and a much larger and more complex esca.

Distribution—Arabian Sea at depth of 1300-1350 (new record, Rajeeshkumar et al. 2016); *B. shaoi* was previously known from only four specimens, three collected from off Taiwan and a fourth in the Mozambique Channel, Western

Indian Ocean and recently from Indonesian Waters. Depth ranges 650-1200 m.



Figs. 22. *Bufoceratias shaoi*
A—lateral view, **B**—illicial apparatus

Bufoceratias thele (Uwate, 1979)

Toady Seadevils

Synonyms—*Phrynichthys thele* Uwate, 1979; *Phrynichthys wedli* Machida and Yamakawa, 990

Holotype—LACM 36077-1; 32.0 mm; type locality: Halmahera Sea, western pacific, Alpha Helix Station- 155; 0° 38.6S, 129° 05.6′ E; 680-850 m, 22 May 1975; Paratype, LACM 36076–1, 22 mm, Alpha Helix station 26, Ceram Sea, 2° 46.0′ S, 127° 53.7′ E, 0–1500 m, 31 March 1975.

Material examined—32202, 72 mm SL, ♀, 11.1° N, 74. 9° E, Arabian Sea, 1000 m., HSDT CV, January 2014.

Diagnosis—A species under the genus *Bufoceratias* with longer illicium and peculiar structure of esca, without any anterior, posterior, and lateral escal appendages.

Colour—Body with uniform black with minute spine (visible only under microscope) all over the body including fin rays; basal half of the escal bulb also pigmented.

Distribution—Arabian Sea, 1000m (new record). Previously known from western Pacific, 680- 850 m; Indonesian water 595-768 m.

Fig. 23. *Bufoceratias thele*

Family—Oneirodidae Gill, 1878

Dreamers

The largest family of suborder Ceratioidei containing 16 genera and 66 species (Pietsch and Sutton 2015; Ho et al. 2016; Rajeeshkumar et al. 2017)

Genus—Oneirodes
Oneirodes sp.

Material examined—30506, 160 mm SL, 12.2° N, 74.2° E, Arabian Sea, 923 m., HSDT CV, August 2017.

Remarks—Specimen totally damaged, photo included

Fig.24. ***Oneirodes*** **sp.**

SALIENT FINDINGS AND SUMMARY

A total of 22 species under 6 families, 13 genera were recorded and documented in the course of the present study period (Figures 3-24). Study described a new species (*Chaunax multilepis* from Andaman waters), 7, 10 and 4 new records from Arabian Sea, Andaman waters and Bay of Bengal respectively. Of the total 22 species 9 species were found in all the three ecosystems. Seven species which was previously reported by varies authors, were not found in any of the 78 hauls, includes *Halieutopsis nudiventer* (Lloyd, 1909); *Malthopsis mitrigera* Gilbert and Cramer, 1897; *Dibranchus nasutus* (Alcock, 1891); *Lohodolos indicus* Lloyd, 1909; *Halieutaea nigra* Alcock, 1891; *Halieutea fumosa* Alcock, 1894 and *Diceratias bispinosus* (Günther, 1887). The status of *Halieutopsis nudiventer* is still uncertain, because the holotype of the species, ZSI 1127/1 is lost. The status of *Dibranchus nasutus* (Holotype- ZSI F13028, poor condition) recorded from 11°31'40" N, 92°46'40" E,

Andaman Sea, Investigator station 115, depth 343-402 m is uncertain, as it resembles *Halieutopsis nasuta* (Alcock, 1891). Lloyd, 1909 described *Malthopsis triangularis* from Andaman Sea (Syntypes- ZSI F1121/1 (1), F1125/1 (1)10°21' N, 92°46' E, Investigator station 332, depth 510 m.), but the same was synonymized as *Malthopsis mitrigera* Gilbert and Cramer, 1897 by later study of Bradbury 1967. Further, the taxonomic status of *Halieutaea nigra* and *Halieutea fumosa* from Indian water remains uncertain. This can be clarified only on obtaining additional specimens. *Diceratias bispinosus* (Holotype- BMNH 1887.12.7.14), Challenger station 194A, Off Banda Island, 659 m and *Lohodolos indicus* (Holotype-ZSI 1024/1, Investigator station 307, off Trivandrum, depth 1624 m) are still remains as valid species.

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