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First record of two deep water fishes: *Meganthias filiferus* Randall & Heemstra 2008 (Perciformes/Percoidei/Anthiadidae) and *Ceratoscopelus townsendi* (Eigenmann & Eigenmann 1889) (Myctophiformes/Myctophidae), from Andaman Islands, India

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Abstract

The present paper reports the occurrence of two deep-water fishes from the Andaman and Nicobar Islands, India. The Filamentous anthiine, *Meganthias filiferus* Randall & Heemstra, 2008, is recorded based on a single specimen (24.8 cm SL) collected by hook-and-line off the eastern side of South Brother Island at a depth of 170 m. and Dogtooth lampfish, *Ceratoscopelus townsendi* (Eigenmann & Eigenmann 1889), is reported from a single specimen (6.0 cm SL) recovered from the gut of a Ruby Snapper caught off East of South Brother Island at a depth of 130 m. Detailed descriptions of both species are provided, and their distribution in the eastern Indian Ocean is summarized.

Introduction

The Andaman and Nicobar Islands, located in the Bay of Bengal between 6°45′–13°45′N and 92°10′–94°15′E, comprise 352 islands and 220 islets. Extending about 775 km in a north–south direction, these islands have a total coastline of 1,962 km and confer upon India an Exclusive Economic Zone (EEZ) of approximately 600,000 km². The shelf topography of the region exhibits frequent elevations that support extensive coral reef formations—fringing reefs along the eastern coast and barrier reefs along the western coast. In addition to coral reefs, the coastal environment includes rocky and sandy shores, as well as extensive mangrove swamps. Geographically, the Andaman group of islands represents the undersea continuation of the Arakan Yoma Range of Myanmar, whereas the Nicobar group forms a part of the Sunda Islands "Hot Spot." Situated along the eastern margin of the Bay of Bengal Large Marine Ecosystem, these islands support a diverse assemblage of coastal fish fauna exhibiting affinities with the Andaman Sea, Western Pacific, and Indian Ocean regions. Altogether, 1,601 valid species of fishes belonging to 585 genera and 165 families have been reported from the Andaman and Nicobar Islands (Rajan & Mishra, 2020).

Nelson et al. (2016) recognized 75 genera and 538 species in the family Serranidae, distributed across three subfamilies: Serraninae, Anthiinae, and Epinephelinae. Subsequently, Anderson (2018) presented a checklist of valid species within the subfamily Anthiinae. Later, Parenti & Randall (2020) published an annotated checklist of the Serranidae, in which they recognized three subfamilies—Anthiinae, Epinephelinae, and Serraninae—comprising a total of 231 species in 29 genera. However, the subfamily Anthiinae has since been elevated to family rank (van der Laan et al., 2025), and the family Anthiadidae currently includes 32 genera and 249 species worldwide (Fricke et al., 2025a). The percoid fishes of the family Anthiadidae, commonly known as fairy basslets or streamer basses, occur in all oceans, though the majority inhabits tropical reef ecosystems. These fishes are generally small, brightly colored, often in shades of red, and are popular in the aquarium trade. Many species form large shoals. Most anthias are protogynous hermaphrodites, meaning individuals are born female but have the ability to change sex later in life (Coleman, 1981). When the dominant male dies, the largest female in the group typically transforms into a male to assume his role. Of the 32 genera currently recognized, the genus *Meganthias* Randall & Heemstra comprises only four species (Fricke et al., 2025b). According to Rajan & Mishra (2020), the family

Serranidae is represented by 64 species under 10 genera in the waters surrounding the Andaman and Nicobar Islands, including only one genus, *Pseudanthias* Bleeker, with six species belonging to the family Anthiadidae.

On the other hand, mesopelagic fishes (inhabiting depths of 200–1000 m) represent the most numerically dominant vertebrate component of the world's oceans, exhibiting circumglobal distribution, remarkable biodiversity, and a suite of adaptations to cope with the challenges of the deep sea (Gjosaeter & Kawaguchi, 1980; Irigoien et al., 2014; Nelson et al., 2016). These adaptations include low metabolic rates, high tolerance to environmental fluctuations, and sophisticated visual and bioluminescent systems (Priede, 2017). Many species form dense aggregations at depths of around 500 m during the daytime, seeking refuge from predators (Sutton, 2013), and ascend to epipelagic layers (0–100 m) at night to feed, following the diel vertical migration of zooplankton (Merrett & Roe, 1974). Over time, these fishes have become among the most abundant and diverse groups in the ocean, playing crucial roles in ecosystem processes such as carbon sequestration, nutrient regeneration, and fisheries production. Despite their ecological importance, the mesopelagic zone remains poorly understood in terms of its physical, biogeochemical, and ecological characteristics (Martin et al., 2020). Lanternfishes (family Myctophidae) constitute a prominent group of such small mesopelagic fishes. The family comprises 34 genera and 253 species distributed across five subfamilies. The subfamily Lampanyctinae includes nine genera and 74 species, one of which is *Ceratoscopelus* Günther, encompassing only three recognized species (Fricke et al., 2025b). In the Andaman and Nicobar Islands, the family Myctophidae is represented by one species of *Benthosema* Goode & Bean and six species of *Diaphus* Eigenmann & Eigenmann (Rajan and Mishra, 2020).

The present paper reports the Filamentous anthiine, *Meganthias filiferus* Randall & Heemstra 2008 (family Anthiadidae) and Dogtooth lampfish, *Ceratoscopelus townsendi* (Eigenmann & Eigenmann 1889) (Family Myctophidae), for the first time from Andaman and Nicobar Islands, India. Both the genera also form first report from the surroundings of these islands, while *C. townsendi* is the first record for India.

Materials and Methods

A single specimen of *Meganthias filiferus* (24.8 cm SL) was collected by hook-and-line off the eastern side of South Brother Island at a depth of 170 m. In addition, a specimen of *Ceratoscopelus townsendi* (6 cm SL) was recovered from the stomach contents of a Ruby Snapper (*Etelis carbunculus*) caught from the same locality at a depth of 130 m. Both specimens were captured on 2 May 2024. The specimens were measured and photographed at the capture site; however, they were not retained. The photographs, along with morphological observations recorded by one of the authors (AM), were subsequently sent to the lead author (PTR) for identification. The identifications were carried out following Randall & Heemstra (2006, 2008); Akhilesh et al. (2009); Heemstra & Heemstra (2022) and Froece & Pauly (2025) for *Meganthias* species, while identification of *Ceratoscopelus townsendi* is based on Hulley (1986), Paxton & Hulley (1999), Chen (2002), and Froece & Pauly (2025). Thus, the present work is majorly based on photographic evidence from eastern side of South Brother Island, Andaman and Nicobar Islands.

Results

Order: Perciformes

Suborder: Percoidei

Family: Anthiadidae

Genus: *Meganthias* Randall & Heemstra 2006

Meganthias filiferus Randall & Heemstra 2008 (Fig. 1)

Description: Dorsal-fin with X spines and 18 rays, 2nd and 3rd ray elongated to a long pointed lobe; anal-fin with III spines and 8 rays, 2nd spine robust, but 3rd one longest; all rays of dorsal and anal fins branched, the last branched to the base; pectoral-fin rays 17, all branched except upper two; gill rakers 12+25; lateral-line scales 43. Body depth 2.1, head length 2.6 in SL. Mouth moderately large, oblique; maxilla reaching posterior edge of eye, its posterior corner slightly rounded; lower jaw projecting; upper jaw with six conical teeth anteriorly as outer row, inner rows with a band of villiform teeth leaving a edentate gap at symphysis; lower jaw with narrower villiform teeth band and a narrower symphysial gap; vomer and palatine

with villiform teeth. Opercle with three flat spines, middle one longest; corner of preopercle angular with crennulate lower edge. Head fully scaled; scales ctenoid all over. Bases of pelvic fins placed anterior to pectoral fin base; caudal fin lunate with extremely elongate lobes.

Coloration: Head and body deep pink, with whitish tinge ventrally; a broad yellow band above lateral-line from behind eye to about base of 5th dorsal spine; three yellow bands extending down form nape – one on edge of opercle to upper opercular flap, one along margin of preopercle, one narrowly surround posterior margin of eye; entire suborbital region yellow; anterior part of spinous dorsal yellow, first three rays yellow distally, rest of dorsal-fin pink with several small red spots surrounded by yellow in distal middle part of fin; anal fin pinkish basally, with yellowish spinous portion and outer half of soft portion; caudal fin orange-yellow with pinkish hue on middle rays; pectoral fins yellow, dark pink distally at middle; spine and outer rays of pelvic fins yellow.

Distribution: This species is known to occur only in the Indian Ocean – off southwest coast of Thailand in the Andaman Sea and southwest coast of India in the Arabean Sea (Anderson 2019). It occurs in moderately deep waters, on rocky substrata on steep slopes. This finding represents first report the species from Andaman waters.

Figure 1. *Meganthias filiferus* Randall & Heemstra 2008, 24.8 cm SL

Order: Myctophiformes

Family: Myctophidae

Subfamily: Lampanyctinae

Genus: *Ceratoscopelus* Günther 1864

Ceratoscopelus townsendi (Eigenmann & Eigenmann 1889) (Fig. 2)

Description: Dorsal-fin rays 14, Anal-fin rays 14, Pectoral-fin rays 15, Pelvic-fin rays 8, Gill rakers: 4+10. Body elongate, laterally compressed; mouth large, horizontal; eye diameter greater than snout length; anal-fin origin under a level posterior to middle of dorsal fin; pectoral fins reaching to AOa_2; supracaudal and infracaudal luminous gland present; luminous scales-like tissue present between the pelvic-fin base and the anus, and above the anal fin, with smaller luminous patches elsewhere on the body; luminous tissue of various shapes and sizes on head, scales and caudal peduncle and at bases of various fins. Primary photophores arranged in distinct groups on head and body; no photophores on tongue margin; no luminous tissue above of VO_4 or anus, in between PVO_{1-2} and PO_{2-3}; AO 6+4, VO 5; SAO 3; PVO 2; PO 5; PO_5 slightly higher than other PO photophores; Pol 1; Prc 4. Colour: body almost entirely black; cheeks, opercle and some patches of scales metallic blue; pectorals and vertical fins light; caudal fin translucent with black lines; ventral fins light, spotted black.

Distribution: Widespread in tropical to cold temperate seas (south of 35°N), except for south-eastern Pacific; epipelagic to mesopelagic, migrating between 300 to 600m during the day, and from 25 to 300 at night (Bailey & Robison 1986), but not reaching surface.

Figure 2. *Ceratoscopelus townsendi* (Eigenmann & Eigenmann 1889) 6 cm SL

Discussion

Although ***Meganthias filiferus*** was originally described from a single specimen collected off the southwest coast of Thailand, Andaman Sea (Randall & Heemstra, 2008), a second specimen was subsequently recorded from the southwest coast of India, Arabian Sea (Akhilesh et al., 2009). The present record represents the **third known specimen** of this species. Initially, the specimen was confused with ***Meganthias natalensis***, a species known from the western Indian Ocean—ranging from Kenya to South Africa, Seychelles, Réunion, and Mauritius (Heemstra & Heemstra, 2022). However, upon careful examination, the specimen was found to conform to the diagnostic characters outlined by Randall & Heemstra (2008) and Heemstra & Heemstra (2022). Therefore, its identification as ***M. filiferus*** is confirmed with confidence. Given the rarity of this species, the present record is of considerable significance. In the Andaman waters, the family **Anthiadidae** was previously represented by six species belonging to a single genus, *Pseudanthias* — *P. bimaculatus*, *P. cooperi*, *P. hypselosoma*, *P. ignitus*, *P. pulcherimus*, and *P. squamipinnis* — all earlier placed under the family **Serranidae** (Rajan & Mishra, 2020). The present record represents the seventh species and the second genus of the family in the waters of the Andaman and Nicobar Islands.

As mentioned earlier, the mesopelagic lanternfishes (family *Myctophidae*) remain poorly understood and appear to be less explored in this region. Our current knowledge of myctophids in Andaman waters primarily derives from the checklist of Talwar (1990), which reports seven species: *Benthosoma pterotum*, *Diaphus coeruleus*, *D. diademophilus*, *D. malayanus*, *D. nielseni*, *D. regani*, and *D. suborbitalis*. The present paper adds an additional species, *Ceratoscopelus townsendi*, to the ichthyofauna of the Andaman and Nicobar Islands. Initially, this specimen was identified as *C. warmingii*, a species considered to have a worldwide distribution in tropical and warm-temperate seas (Fricke et al. 2025b). For a long time, *C. warmingii* was treated as a synonym of *C. townsendi*; however, Nafpaktitis & Nafpaktitis (1969) revalidated its species status. Later, Badcock & Araújo (1988) proposed that *C. townsendi* should be regarded as a cosmopolitan species comprising numerous local populations, and that *C. warmingii* should be included among its synonyms.

The taxonomic status of the *C. townsendi*/*C. warmingii* complex remains controversial. Several subsequent studies on the taxonomy and zoogeography of *Myctophidae* published after 1988 continued to recognize three valid species within the genus, with *C. warmingii* used for populations outside the northeastern Pacific—the region to which *C. townsendi* is considered restricted (Linkowski 1997). Consequently, doubts regarding the validity of *C. warmingii* persisted. In the Atlantic Ocean, Sutton et al. (2020) distinguished *C. maderensis* from *C. warmingii* by the presence of a supraorbital spine (absent in *C. warmingii*). More recently, Obata et al. (2024) described *C. townsendi* from the Andaman Sea, off Phuket, Thailand, as possessing a forward-directed supraorbital spine. In the present specimen, recovered from the mouth of *Etelis carbunculus* (ruby snapper) off

South Brother Island, Andaman, no supraorbital spine was observed. Nevertheless, following the diagnostic criteria proposed by Chen (2002), the specimen is identified as *C. townsendi*. Previously, *C. warmingii* was the only species of this genus reported from Indian waters, specifically from the Arabian Sea (06°00′–12°00′N and 69°00′–77°00′E) (Vipin et al., 2011). Therefore, the present record of *C. townsendi* represents the first for both the Andaman and Nicobar Islands and Indian waters.

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