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Notes on Geographic Distribution

First record of *Aphanopus microphthalmus* Norman, 1939 (Teleostei: Trichiuridae) from the Indian Exclusive Economic Zone

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Abstract: *Aphanopus microphthalmus* Norman, 1939 is a rare benthopelagic deep-sea species occurring at depths of 810 to 1020 m previously reported from Western Indian Ocean, eastern South Atlantic and South China Sea. Occurrences of this species from the world Oceans are found to be scanty. The present specimens, collected at a depth of 1022 m, represent the first occurrence of this genus in the Indian Exclusive Economic Zone, and first record of this species in the southeastern Arabian Sea.

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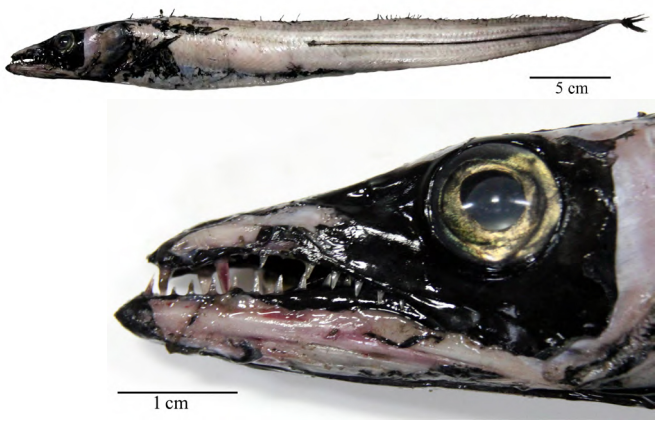
The genus *Aphanopus* (Teleostei, Trichiuridae) comprises seven nominal species (Nakamura and Parin 1993, 2001; Parin 1994) distributed throughout temperate and tropical oceans. All of them are benthopelagic voracious predators on the continental slope, occurring mostly from 400 to 1600 m. The holotype of *Aphanopus microphthalmus* Norman, 1939 (BMNH 1939.5.24.1322), which is popular known as Smalleye Scabbardfish, was collected during the John Murray Expedition in Gulf of Aden at a depth of 1022 m. The species is further known from specimens collected in the western Indian Ocean, eastern South Atlantic (considered a doubtful record) and from South China Sea (Nakamura and Parin 1993, 2001). The genus was not reported from the Indian Exclusive Economic Zone (EEZ) up to this date.

Two specimens of *Aphanopus microphthalmus* (Figures 1 and 2) were collected during the cruise 281 of exploratory deep-sea fishery surveys of FORV Sagar Sampada, conducted by the Centre for Marine Living Resources and Ecology (CMLRE), along the Southwest coast of India (8.6° N, 76.2° E) at a depth of 1000 m, on 24 September 2010 (Figure 3). Specimens were collected by High Speed Demersal Trawl, crustacean version (HSDT-CV), operated at a speed of 3 knots. The specimens were preserved in 5% buffered formaldehyde solution and deposited at the CMLRE Referral Centre, Cochin, India (accession number CMLRE R.C. 281 03 05A and B), and were subsequently identified as *A. microphthalmus* following the original description of Norman (1939). Morphometric measurements were taken from the preserved specimen following Norman (1939) and Nakamura and Parin (1993) (Table 1). All measurements were expressed in terms of percentage of standard length (SL), except snout length, maxillary length, eye diameter, length of first anal spine, which were expressed in terms of percentage of head length (HL). Interorbital width was expressed in terms of percentage of eye diameter.

Morphometric and meristic measurements were compared with the description of the holotype described by Norman (1939) and Nakamura and Parin (1993). No significant differences were found between specimens examined and those descriptions. A few remarks on the morphology of the specimens collected are presented below.

Key characters for identifying this species includes dorsal and anal fin counts; former with 43 spines and 53 soft rays; total 94 elements and latter with two spines; the first is diminutive, completely concealed, the second is very strong, dagger-like; its origin located at vertical through fourth dorsal-fin soft ray. Pelvic fins absent, caudal fin small and forked. Body skin were lacking except in the head portion and along lateral line, where it appears coppery black with iridescent tint. Lateral line starts from the upper margin of the opercle, were it is immediately inclined to the middle of the body, and continues up to the end of the caudal fin. Mouth and gill cavities are black. Maxillary extending below the anterior margin of the eye; lower jaw projected; premaxillary with three large canine teeth anteriorly, followed by smaller teeth; lower jaw also



Figures 1–2. *Aphanopus microphthalmus* (CMLRE R.C. 281 03 05A) captured in Southwest coast of India. 1, entire animal; 2, enlarged portion of head.

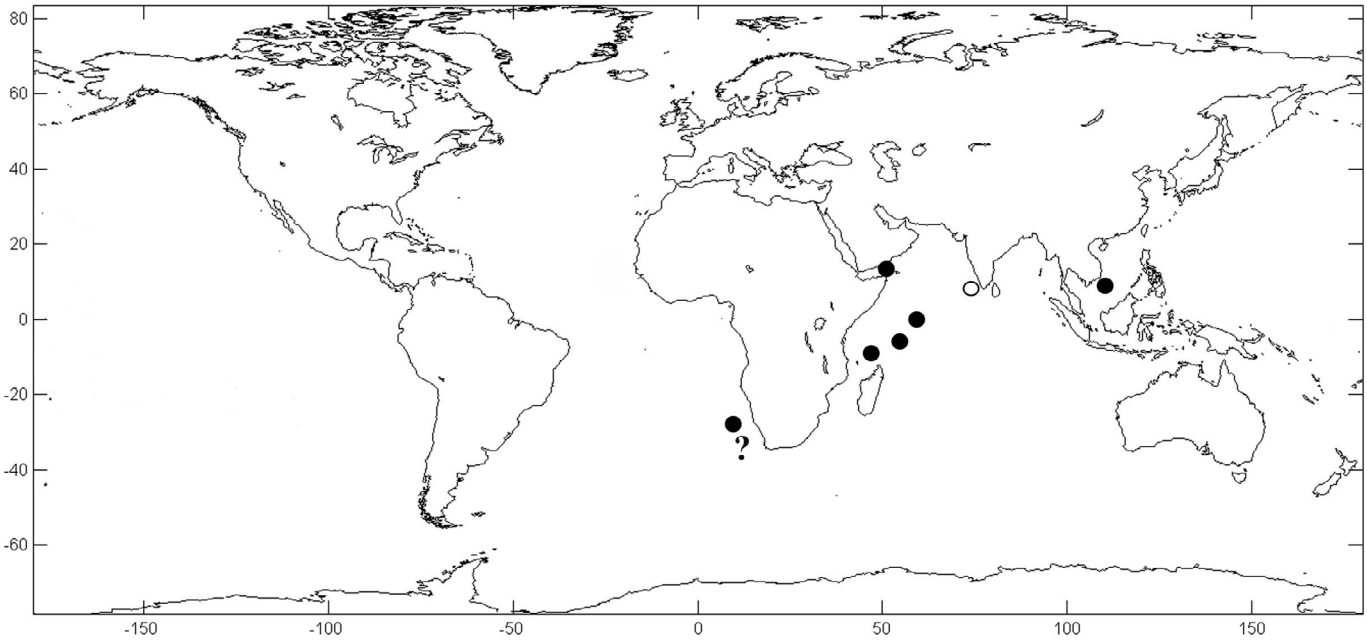


Figure 3. Map of the sampling location and previous distributional records. ○ = capture location of present specimens; ● = capture locations of previous records; ? = doubtful reference.

Table 1. Morphometric and meristic values for *Aphanopus microphthalmus*.

MEASUREMENTS	281 03 05 A	281 03 05 B	MICROPHTHALMUS HOLOTYPE (Norman 1939; Nakamura and Parin 1993)
Total length (cm)	83.5	72	60
Standard length (cm)	80.5	70	—
Weight (g)	655	625	—
Head length (% SL)	4.9	4.7	4.3–5
Snout to anus (% SL)	1.7	1.8	1.8
Snout to anal fin (% SL)	1.6	1.7	—
Body depth (% SL)	10.8	10.6	9.5–12.2
Snout length (% HL)	2.5	2.5	2.2–2.5
Eye diameter (% HL)	5.8	5.7	5.4–6.2
Maxillary length (% HL)	2.1	2.1	2–2.1
In percentage of eye diameter			
Interorbital width	1.1	1	1.1–1.4
Meristic characters			
Dorsal	XLIII, 53	XLIII, 53	XLI–XLIII, 53-55
Pectoral fin	12	12	—
Anal	II + 45	II + 46	II + 43–46

toothed. Gill rakers on first arch spinescent.

Aphanopus microphthalmus is therefore likely to be present throughout the benthopelagic zone of Indian EEZ. It is expected that *A. microphthalmus* may well exhibit similar biological characteristics of other species in the genus; more specimens should required for further studies.

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