

**FIRST THAI RECORD OF *Dasyscopelus brachygnathos* (Bleeker, 1856) (Myctophidae)
FROM OFF PHUKET, ANDAMAN SEA**

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ABSTRACT: The first reliable record of *Dasyscopelus brachygnathos* (Bleeker, 1856) distributed in the Andaman Sea of the Indian Ocean is proved based on the three specimens (62.3–64.6 mm standard length) caught from R/V Dr. Fridtjof Nansen trawling cruise survey on 8th September 1980, off the coast of the Andaman Sea, Phuket, Thailand, 300–400 m depth. This species is different from other congeners by their combination of the following characters: body depth 22–27% of standard length; eye diameter 40–50% of head length; gill rakers on first arch 7–9 + 18–21; dorsal margin on operculum smooth; body scales markedly ctenoid; scales over anal organ (AO) photophores without elongate spines; postero-lateral organ (Pol) located before a vertical from origin of base of adipose fin; first supraanal organ (SAO1) situated slightly anterior to fourth ventral organ (VO4); a line through SAO1 and second supraanal organ (SAO2) passing variously through or between second ventral organ (VO2) and third ventral organ (VO3); AO 6–9 + 3–6 = 10–13.

Keywords: lanternfishes, *Myctophum*, *Scopelus*, *Dasyscopelus pristilepis*, R/V Dr. Fridtjof Nansen

INTRODUCTION

The myctophid genus *Dasyscopelus* Günther, 1864 of which type species is *Myctophum asperum* Richardson, 1845 had been synonymized under *Myctophum* Rafinesque, 1810 by many studies (e.g., Bolin 1959; Krefft and Bekker 1973; Paxton 1979). Recently, several studies showed that *Myctophum* is a paraphyletic group based on molecular analyses (Poulsen *et al.* 2013; Davis *et al.* 2014; Denton 2014). Martin *et al.* (2018) showed myctophid interrelationships using molecular data. Based on their results, they recognized *Dasyscopelus* as valid genus consisting of 7 species, i.e., *D. asper* (Richardson, 1845), *D. brachygnathos* (Bleeker, 1856), *D. lychnobius* (Bolin, 1856), *D. obtusirostris* (Tåning, 1928), *D. orientalis* Gilbert, 1913, *D. selenops* (Tåning, 1928) and *D. spinosus* (Steindachner, 1867).

The research vessel Dr. Fridtjof Nansen operates within the EAF-Nansen project of FAO, and carries out fish resources and ecosystems surveys in the

maritime waters of developing countries, particularly in Africa. The surveys are facilitated by FAO and the vessel flies a UN flag. On 8th September 1980, three specimens of species which belongs to Myctophidae were captured from the Andaman Sea, off Phuket, Thailand in the surveys. We identify and describe these specimens in the present study.

MATERIALS AND METHODS

Counts and proportional measurements follow Hubbs and Lagler (1958). Terminology of photophores of myctophids follows Wisner (1976). Standard and head lengths are abbreviated as SL and HL, respectively. Measurements were made to the nearest 0.1 mm with digital calipers. Dorsal, anal and principal caudal-fin rays, and vertebrae were counted from a radiograph. Specimens examined in this study are deposited at Phuket Marine Biological Center, Phuket, Thailand (PMBC) and Naturalis Biodiversity Center, Leiden, the Netherlands (RMNH).

RESULTS AND DISCUSSION

Dasyscopelus brachygnathos (Bleeker, 1856)

Fig. 1

- Scopelus brachygnathos* Bleeker, 1856: 65 (type locality: Manado, Indonesia).
- Dasyscopelus pristilepis* Gilbert and Cramer, 1897: 412, fig. 1 in pl. 39 (type locality: Hawaii).
- Myctophum (Dasyscopelus) asperum*: Bleeker 1870–1875: 159 (in part).
- Myctophum (Dasyscopelus) brachygnathum*: Bleeker 1870–1875: fig. 3 in table 277.
- Myctophum pristilepis*: Weber and de Beaufort 1913: 165, fig. 64 (Macassar Straits; Halmahera Sea; Banda Sea; Arafura Sea); Becker and Borodulina 1976: 132 (tropical area in the Indo-Pacific).
- Myctophum (Myctophum) brachygnathos*: Fraser-Brunner 1949: 1058 (only listed).
- Myctophum brachygnathos*: Sarnas 1954: 399, fig. 6 (Philippines); Paxton 1979: 15 (Manado; Hawaii).
- Myctophum pristilepis*: Sarnas 1954: 402, fig. 7 (Philippines).
- Myctophum brachygnathum*: Kawaguchi and Aioi 1972: 36 (key); Wisner 1976: 65, fig. 60 (eastern Pacific); Gjørseter 1977: 8 (Somalia Peninsula); Becker 1983 (tropical area in the Indo-Pacific); Paxton and Hulley 2000: 594 (South China Sea); Hutchins 2001: 20 (Western Australia); Mundy 2005: 228 (Hawaii); Paxton *et al.* 2006: 526 (Australia); Vipin *et al.* 2011: 8 (Somalia Peninsula); Fricke *et al.* 2014: 30 (Papua New Guinea).
- Dasyscopelus brachygnathum*: Martin *et al.* 2018: 83 (only listed); Psomadakis *et al.* 2019: 230 (Myanmar).

Diagnosis: Body depth 22–27% SL; eye diameter 40–50% HL; gill rakers on first arch 7–9 + 18–21; dorsal margin on operculum smooth; body scales markedly ctenoid; scales over anal organ (AO) photophores without elongate spines; postero-lateral organ (Pol) located before a vertical from origin of base of adipose fin; first supraanal organ (SAO1) situated slightly anterior to fourth ventral organ (VO4); a line through SAO1 and second supraanal organ (SAO2) passing variously through or between second ventral organ (VO2) and third ventral organ (VO3); AO 6–9 + 3–6 = 10–13 (Bleeker 1870–1875;

Gilbert and Cramer 1897; Weber and de Beaufort 1913; Fraser-Brunner 1949; Sarnas 1954; Kawaguchi and Aioi 1972; Wisner 1976).

Materials: PMBC 29929, 3 specimens, 62.3–64.6 mm SL, Andaman Sea, 300–400 m depth, trawl, R/V Dr. Fridtjof Nansen, 8 September 1980.

Description: Counts: dorsal-fin rays 13; anal-fin rays 18; pectoral-fin rays 18; pelvic-fin rays 8; vertebrae 15 + 20 = 35; gill rakers on first arch 7 + 19 = 26; dorsonasal organ (Dn) 0, ventronasal organ (Vn) 0, suborbital organ (So) 0, supraorbital organ (Suo) 0, branchiostegal organ (Br) 3, opercular organ (Op) 2, pectorolateral organ (PLO) 1, pectoroventral organ (PVO) 2, ventrolateral organ (VLO) 1, thoracic organ (PO) 5, VO 4, SAO 3, AO 7 + 4 = 11, Pol 1, precaudal organ (Prc) 2. Proportions as % of SL; head length 28.3–29.2; depth of head 21.8–23.2; body depth 23.2–23.7; snout length 3.3–4.0; eye diameter 11.8–11.9; length of orbit 12.1–12.5; interorbital width 7.9–8.6; length of upper jaw 17.0–18.3; depth of caudal peduncle 8.0–8.9; length of caudal peduncle 17.1–18.6; length of dorsal-fin base 11.7–13.6; height of dorsal fin 14.0–15.7; length of anal-fin base 23.7–24.1; height of anal fin 10.7–16.4; length of pectoral fin 16.4–19.3; length of pelvic fin 9.2–11.7; predorsal length 44.1–48.0.

Body slender, compressed and cylindrical. Snout short. Eye relatively large, eye diameter 2.38–2.47 in HL. Mouth large, upper jaw length 1.57–1.67 in HL. Teeth on jaws very small. Gill rakers slender and well developed. Dorsal margin on operculum smooth. Lateral line well developed. Caudal peduncle shorter than anal-fin base. Anus below mid of dorsal-fin base. Anal-fin origin posterior to posterior end of dorsal-fin base, posterior end of anal-fin base posterior to adipose fin. Dorsal-fin base shorter than anal-fin base. Scales markedly ctenoid; scales over AO photophores without elongate spines.

Op consisting 2 photophores, Op1 situated at level of just below ventral margin of eye, Op2 behind of posterior margin of upper jaw. PLO closer lateral line than pectoral-fin base. PVO1 situated on the straight line connecting between PO1 and PVO2. PO consisting 5 photophores along with ventral margin of body. VLO situated on middle between lateral line and pelvic-fin base. VO consisting 4 photophores, all along with ventral margin of

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body. Straight line passing SAO1 and SAO2 passing between VO2 and VO3. SAO1 situated slightly anterior to VO4. SAO3 just below the lateral line. Space present between anterior anal organ (AOa) and posterior anal organ (AOp) which are along with ventral margin of body. Single Pol situated anterior to adipose fin and below lateral line. Prc including 2 photophores far from lateral line. Supracaudal gland (SUGL) absent, infracaudal gland (INGL) present.

Color after fixation. Body and all fins uniformly light brown except for dusky dorsal margin of body and base of caudal fin. Photophores light brown surrounded by black edge. INGL milky white.

Comparative materials: RMNH.PISC 6932, syntypes of *Scopelus brachygnathos* Bleeker, 1856, 2 specimens, 41.7, 53.0 mm SL.

Distribution: Tropical area between about latitude 10 degrees north and 10 degrees south in the Indian Ocean, and tropical area between about latitude 30 degrees north and 20 degrees south in the Pacific east to longitude 130 degrees west (see details in the synonym list of the species).

Identification: The present specimens are different from *D. lychnobius*, *D. obtusirostris* and *D. spinosus* by smooth on dorsal margin of operculum (vs. serrate in the 3 species: Wisner 1976; Fujii 1988; Nakabo and Kai 2013; Robertson and Clements 2015). Also, the specimens differ from *D. lychnobius* and *D. spinosus* by scales over AO photophores without elongate spines (vs. with 1–4 elongate spines: Kawaguchi and Aioi 1972; Wisner 1976; Fujii 1988; Robertson and Clements 2015) and from *D. obtusirostris* by markedly ctenoid scales on body (vs. cycloid or weak ctenoid: Kawaguchi and Aioi 1972; Fujii 1988; Nakabo and Kai 2013). The specimens are distinguished from *D. selenops* in having SAO1 situated slightly anterior to VO4, and slender body, depth 23.2–23.7% SL (vs. SAO1 situated slightly posterior to VO4, and slightly deep body, depth than 29%: Fraser-Brunner 1949; Kawaguchi and Aioi 1972; Wisner 1976; Nakabo and Kai 2013; Robertson and Clements 2015). The

specimens differ from *D. asper* and *D. orientalis* by 7 + 19 gill rakers (vs. 4 + 10–14 in the former species, and 5–6 + 13–16 in the latter: Kawaguchi and Aioi 1972; Wisner 1976; Fujii 1988; Robertson and Clements 2015). In addition, the specimens are separable from *D. asper* by a line through SAO1 and SAO2 passing between VO2 and VO3 (vs. a line through SAO1 and SAO2 passing variously between VO1 and VO2, or before VO1: Kawaguchi and Aioi 1972; Wisner 1976; Robertson and Clements 2015), and from *D. orientalis* by larger eye, diameter 40.5–42.1% HL (vs. ca. 36%: Gilbert 1913; Fraser-Brunner 1949). On the other hand, the specimens well agree with *D. brachygnathos* by diagnostic characters mentioned above (see Diagnosis). Therefore, we identified the specimens as *D. brachygnathos*.

Remarks: In the Indian Ocean, this species had been known from tropical area between about latitude 10 degrees north and 10 degrees south (Becker and Borodulina 1976), off Somalia Peninsula (Gjøsæter 1977; Vipin *et al.* 2011), off northwestern Australia (Paxton *et al.* 2006) and off Myanmar (Psomadakis *et al.* 2019). Becker and Borodulina (1976) showed a distributional map of *Myctophum pristilepis* which is now recognized as a junior synonym of *Dasyscopelus brachygnathos* (e.g., Fraser-Brunner 1949; Becker 1983). Although they indicated that this species collected at Nicobar Islands (see fig. 4 in Becker and Borodulina 1976), they did not show their detail localities whether inside of Andaman Sea or not. Although Psomadakis *et al.* (2019) listed this species from off Myanmar, they also did not indicate its detail localities whether this species was captured from Bay of Bengal or Andaman Sea. Therefore, this report is the first reliable record of *Dasyscopelus brachygnathos* from Andaman Sea. In addition, this is the first record of the species from Thai waters because this species had never been known (e.g., Pokapunt *et al.* 1983; Monkolprasit *et al.* 1997; Satapoomin 2011).

New Thai name of this species is “Pla-Ta-Kiang-Pak-Sun” named after “short-jawed lanternfish” which is English common name of the species.



Figure 1. *Dasy Scopelus brachygnathos*, PMBC 29929, 64.6 mm SL.

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