



Rediscovery of *Lophiodes triradiatus* (Lloyd, 1909), a senior synonym of *L. infrabrunneus* Smith and Radcliffe (Lophiiformes: Lophiidae)

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Abstract

Examination of the holotype and three recently collected additional specimens from the Indian Ocean has revealed that *Lophius triradiatus* Lloyd, 1909 (now under *Lophiodes*) is a valid species and a senior synonym of *Lophiodes infrabrunneus* Smith & Radcliffe, 1912 and *Lophiodes abdituspinus* Ni, Wu & Li, 1990. A detailed description of the additional specimens is provided.

Key words: Pisces, taxonomy, *Lophius triradiatus*, *Lophiodes infrabrunneus*, Indian Ocean

Introduction

Lloyd (1909a) described *Lophius triradiatus* based on a single specimen (ZSI 878/1, 55 mm TL; Fig. 1A) collected from the Laccadive Sea (off Kerala coast, 549 m), India. The species is characterized by having three free dorsal-fin spines in the cephalic position only, lacking the post-cephalic dorsal-fin spines. Caruso (1981) reassigned the species to *Lophiodes*, but designated it a *nomen dubium* due to the very poor condition of the holotype (Fig. 1B). Smith & Radcliffe in Radcliffe (1912) described *Lophiodes infrabrunneus* based on specimens collected from the Philippines that also have only three dorsal-fin spines. Caruso (1981) recognized it as a valid species and diagnosed the species by all three dorsal-fin spines relatively short and other characters.

Ni *et al.* (1990) described a third species with three dorsal-fin spines, *Lophiodes abdituspinus*, from the South China Sea. Ho *et al.* (2009) redescribed *Lophiodes infrabrunneus* and placed *Lophiodes abdituspinus* as its junior synonym.

Although there was a suspicion that *Lophiodes triradiatus* and *L. infrabrunneus* might be conspecific, the validity of *L. triradiatus* was still unknown. Because they were not able to examine the holotype or any additional specimen from India, Ho *et al.* (2009: 67) followed Caruso's (1981) opinion and "redescribed *Lophiodes infrabrunneus* Smith & Radcliffe 1912 rather than resurrecting *L. triradiatus*."

Recently, three specimens lacking post-cephalic dorsal-fin spines collected from near the type locality were found in Indian and South African collections. These specimens are similar to the specimens of *Lophiodes infrabrunneus* examined by Ho *et al.* (2009). We also examined the holotype of *Lophius triradiatus* and determined that it is a valid species of *Lophiodes*, and that *L. infrabrunneus* and *L. abdituspinus* Ni, Wu & Li, 1990 are junior synonyms.

Hence, we resurrect *Lophius triradiatus* Lloyd, 1909 (now under *Lophiodes*) and synonymize two junior synonyms under the Articles 23.1 and 23.2 of the International Code of Zoological Nomenclature (ICZN, 2013, online version). A detailed description of the recently collected specimens is provided.

discovered specimens, and is therefore known from southern India, northwestern Australia, the Philippines, South China Sea, East China Sea, Japan, and western Indian Ocean, at depths 208–1412 m.

Discussion

Caruso (1981) and Ho *et al.* (2009) mentioned that *Lophiodes infrabrunneus* (now *Lophiodes triradiatus*) lacks inner frontal spines whereas the 62-mm specimen examined in the present study has these. The first author reexamined some specimens examined in Ho *et al.* (2009) and found that the inner frontal spines are present in smaller (<100 mm SL) specimens. The inner frontal spines are also present in smaller individuals of *L. mutilus* (Alcock, 1894) and gradually reduce with growth. Thus, this character is revised accordingly.

All known specimens share the following diagnostic characters: absence of post-cephalic dorsal-fin spines, a leaf-like esca, and all three dorsal-fin spines (including illicium) relatively short compared to other congeners. As no other character can be found to distinguish the Indian and western Pacific populations, we herein recognized them as the same species.

It is notable that the 337-mm specimen has 13 pectoral-fin rays on both sides, far less than all other specimens examined, while the two other specimens have 15–16 rays. Lloyd (1909) gave 15 for the holotype, and 16–20 were reported in Ho *et al.* (2009). The variation seems much larger than other congeners (see Caruso, 1981, table 1; Ho *et al.*, 2009, table 1). The proportional measurements of three newly discovered specimens fall within the range of other specimens (see Ho *et al.*, 2009, table 1), except for the following differences. The third dorsal-fin spine of 62 mm specimen is much longer, 29% SL (vs. 9.1–20.6% SL, in Ho *et al.*, 2009). The third dorsal spine is also relatively long in the holotype (Fig. 1A). The head width of 337 mm specimen is somewhat narrower, 59.2% HL (vs. 60.0–93.9% SL). The second dorsal-fin spine is much shorter in the 243 mm specimen, 9.7% SL (vs. 12.2–21.2% SL). The snout width of all three specimens are relatively shorter, 18.6–19.5% HL (vs. 21.7–34.2% HL). These differences may be attributed to allometric growth or individual variation. The proportional ranges are extended accordingly. It is also notable that the Indian specimens have a relatively long caudal fin, about one-third of standard length.

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References

- Alcock, A.W. (1894) Natural history notes from H. M. Indian marine survey steamer, 'Investigator,' Commander C. F. Oldham, R. N., commanding. Series II. No. 9. An account of the deep-sea collection made during the season of 1892–93. *Journal of the Asiatic Society of Bengal*, 62 (pt. 2, no. 4), 169–184.
- Caruso, J.H. (1981) The systematics and distribution of the lophiid anglerfishes: I. A revision of the genus *Lophiodes* with the description of two new species. *Copeia*, 1981 (3), 522–549.
<http://dx.doi.org/10.2307/1444556>
- Ho, H.-C., Séret B. & Shao, K.-T. (2009) Redescription of *Lophiodes infrabrunneus* Smith and Radcliffe, 1912, a senior synonym of *L. abdituspinus* Ni, Wu and Li, 1990 (Lophiiformes: Lophiidae). *Zootaxa*, 2326, 62–68.
- Ho, H.-C., Séret, B. & Shao, K.-T. (2011) Records of anglerfishes (Lophiiformes: Lophiidae) from the western South Pacific Ocean, with descriptions of two new species. *Journal of Fish Biology*, 79 (7), 1722–1745.
<http://dx.doi.org/10.1111/j.1095-8649.2011.03106.x>
- International commission of Zoological Nomenclature (2013) International code on zoological nomenclature. Online version (1 Jan. 2000) Available from: <http://www.nhm.ac.uk/hosted-sites/iczn/code/> (accessed 19 March 2014)
- Lloyd, R.E. (1909) A description of the deep-sea fish caught by the R. I. M. S. ship 'Investigator' since the year 1900, with

- supposed evidence of mutation in *Malthopsis*. *Memoirs of the Indian Museum*, 2 (3), 139–180.
- Lloyd, R.E. (1909) *Illustrations of the zoology of the Royal Indian marine survey ship Investigator. Fishes*. Part X, pl. 44–50.
- Ni, Y., Wu, H.-L. & Li, S. (1990) On a new species of the genus *Lophiodes* (Pisces: Lophiidae) from the South China Sea. *Journal of Fisheries of China*, 14 (4), 341–343.
- Smith, H.M. & Radcliffe, L. (1912) New pediculate fishes from the Philippine Islands and contiguous waters. Scientific results of the Philippine cruise of the Fisheries steamer "Albatross," 1907-1910. No. 16. *Proceedings of the United States National Museum*, 42 (1896), 199–214.
<http://dx.doi.org/10.5479/si.00963801.42-1896.199>