

A new deep-sea anglerfish of the genus *Linophryne* (Teleostei, Ceratioidei) from the Central Equatorial Pacific Ocean

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Abstract—*Linophryne andersoni* n. sp., a deep-sea anglerfish of the family Linophrynidae, is described from a single female, 32 mm SL; this species is characterized by having a short-based, multi-stemmed barbel, with a large, proximal swelling on the anterior surface of its base; a barbel composed of a pair of lateral and a single median primary branches divided into secondary branches; bud-like photophores on secondary barbel branches; an escal bulb with two simple lateral and four distally-branched posterodorsal appendages; a mid-lateral and a ventrolateral series of subdermal melanophores on caudal peduncle; and two vomerine teeth. *Linophryne andersoni* is most similar to *L. parini* Bertelsen.

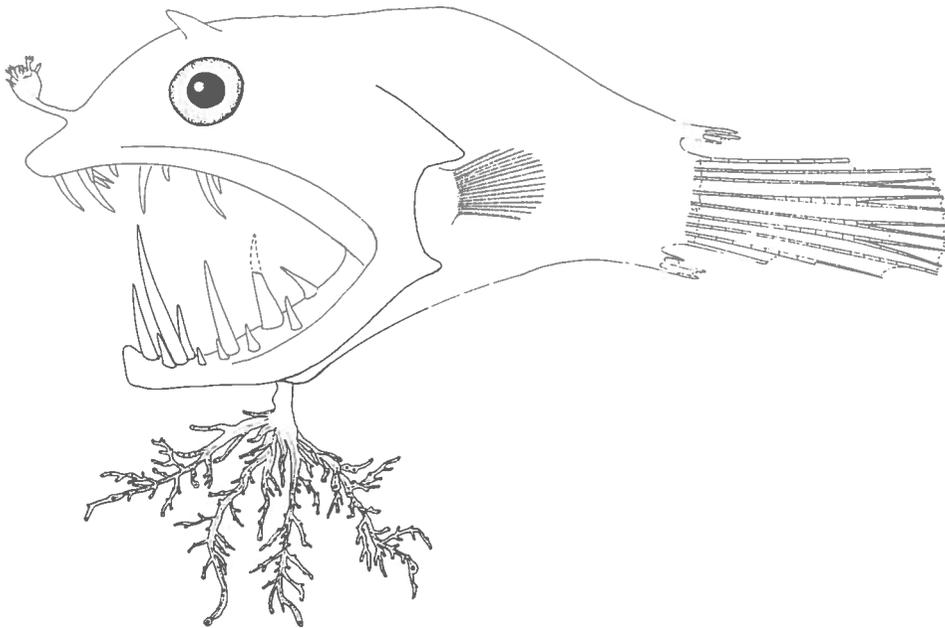


Figure 1. *Linophryne andersoni* BPBM 24512, holotype, female, 32 mm SL, NE of the Line Islands.

Introduction

Members of the deep-sea anglerfish genus *Linophryne* are small to medium size fishes that are rarely collected. Of the 21 known species, eight were each described from a single metamorphosed female. The genus is divided into three subgenera, the monospecific *Stephanophryne*, and the multispecific *Rhizophryne* and *Linophryne* (Bertelsen 1982).

An anglerfish identified as a female of the genus *Linophryne* was among fishes donated to the Bernice P. Bishop Museum (BPBM), Hawaii, by the United States National Marine Fisheries Service (NMFS) laboratory in Honolulu. This specimen, collected in the Central Equatorial Pacific Ocean, represents an undescribed species that appears to resemble *L. parini* more than any other lino-phrynid species.

Bertelsen (1982) included *L. parini* in the subgenus *Rhizophryne* because it shares with the females of other members of this group a similar pattern of subdermal melanophores on the caudal peduncle, a multi-stemmed barbel, and a symphyseal spine on the lower jaw. He pointed out, however, that *L. parini* differs from other members of this subgenus in having a single series of subdermal melanophores instead of two, as well as in the arrangement and length of secondary branches on the barbel, and appendages on the esca.

Barbel length was measured from its base to the tip of the longest secondary branch. Illicium length was measured from its base to the tip of the dorsal ex-

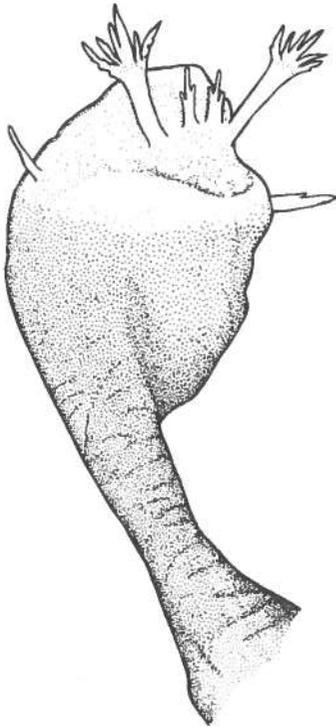


Figure 2. Esca of the holotype of *Linophryne andersoni*, left posterolateral view.



Figure 3. Barbel of the holotype of *Linophryne andersoni*, left anterolateral view; broken branches were left incomplete.

pansion of the escal bulb. The distance between the sphenotic spines was measured between the bases of these spines.

***Linophryne andersoni* n. sp.**

(Figs. 1–5)

HOLOTYPE: BPBM 24512, 32 mm SL, female, NE of the Line Islands, 11°49'N, 144°51'W, Cobb pelagic trawl, 50 m, *Townsend Cromwell*, Cruise 46, Station 9, night, 14 October 1969.

DIAGNOSIS: A species of the genus *Linophryne*, the females of which have a short-based, multi-stemmed barbel composed of a pair of lateral and a single median primary branches; a large, proximal swelling on the anterior surface of the barbel base; bud-like photophores on secondary barbel branches; an escal bulb with two simple lateral and four distally-branched posterodorsal appendages; a mid-lateral and a ventrolateral series of subdermal melanophores on caudal peduncle; and two vomerine teeth.

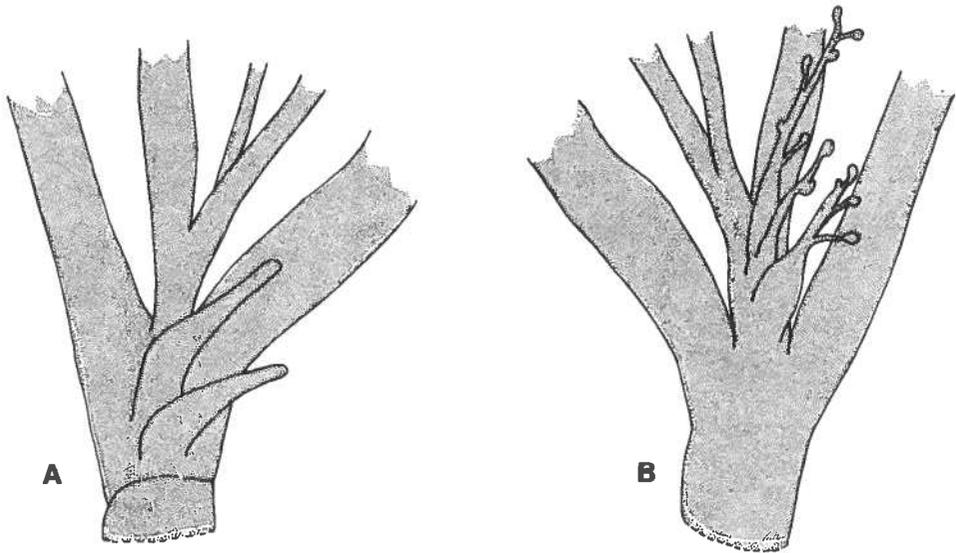


Figure 4. Schematic representation of the base of the barbel of the holotype of *Linophryne andersoni*: (A) anterior view, barbel pressed against body; (B) posterior view, barbel pressed against symphysis of lower jaw.

Table 1. Counts and body proportions (expressed in percent SL) of holotypes of *Linophryne andersoni* and *L. parini* (data for *L. parini* taken from Bertelsen, 1980); IOAN = Institute of Oceanography, Academy of Sciences of the USSR, Moscow.

	<i>L. andersoni</i> BPBM 24512	<i>L. parini</i> IOAN uncat.
Standard Length (mm)	32.0	64.0
Length of head	70.3	55.0
Length of snout	29.4	25.0
Eye diameter	5.3	4.7
Length of premaxilla	51.2	48.0
Length of lower jaw	54.1	50.0
Barbel length	48.6	44.0
Illicium length	18.1	15.0
Distance between sphenotic spines	30.1	20.0
Distance from snout to tip of preopercular spine	68.0	56.0
Dorsal-fin rays	3	3
Anal-fin rays	3	3
Pectoral-fin rays	16/16	14/15
Caudal-fin rays	9	9
Vertebrae	20 or 21	21
Vomerine teeth	2	3

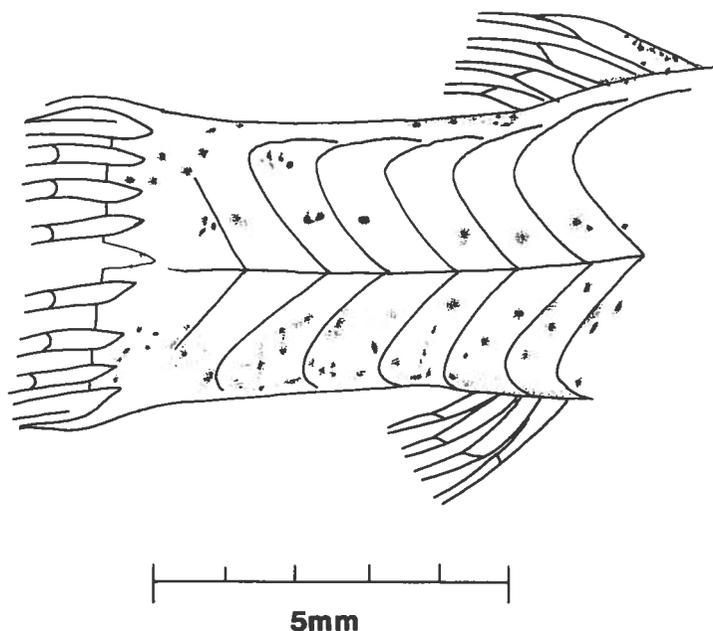


Figure 5. Subdermal melanophores on the caudal peduncle of the holotype of *Linophryne andersoni*.

DESCRIPTION: Morphometric measurements and meristics are presented in Table 1. Escal bulb (Fig. 2) with two short, simple lateral appendages and four distally branched posterodorsal ones, the inner pair shorter; branched appendages at base of a small dorsal expansion of escal bulb. Barbel multi-stemmed (Figs. 3, 4), with a short, robust base; anterior surface of barbel base with large, proximal bulbous swelling, followed distally by two relatively short and thick branches (Figs. 3, 4A); posterior surface of base smooth (Fig. 4B); barbel divided into a pair of lateral and a single median primary branches, each of which is split further to form 2–4 secondary branches, each bearing photophores either on stems or as “buds” attached on branch itself (Fig. 3); median primary branch with two short posterior secondary branches at its base (Figs. 3 (broken line), 4B); all secondary and tertiary branches end with a photophore. Symphyseal spine on lower jaw. Large subdermal melanophores of caudal peduncle arranged in an irregular ventrolateral series and a mid-lateral series just above mid-line of body; some melanophores present near bases of uppermost caudal rays (Fig. 5).

In alcohol, color of head and body dark brown, fins pale. Stem of illicium and proximal half of escal bulb dark brown; distal half of esca, including appendages, pale (Fig. 2).

REMARKS: The character combination of (1) two lateral series of subdermal melanophores on the caudal peduncle, (2) two vomerine teeth, (3) the presence

of a symphyseal spine on the lower jaw, (4) the short, conical prolongation of the escal bulb, and (5) the pattern of the multi-stemmed barbel, relate *Linophryne andersoni* to the subgenus *Rhizophryne* Bertelsen (1982).

Within the subgenus *Rhizophryne*, *L. andersoni* is most similar morphologically to *L. parini* Bertelsen, 1980. Despite the general resemblance in escal and barbel morphology, significant differences exist between the two species. In the esca, *L. andersoni* has six appendages, two simple lateral ones and four distally branched posterodorsal ones (Fig. 2); *L. parini* has only two distally branched posterolateral appendages. The distal prolongation of the esca is similar in both species, but smaller in *L. andersoni*. In the barbel, the median, unpaired primary branch of *L. andersoni* is divided into two long and two short secondary branches (Fig. 4) whereas the same primary branch of *L. parini* is split into six secondary ones of which five are more or less of the same length and one is short (Bertelsen 1980). Moreover, the barbel of *L. parini* lacks the bud-like photophores found on the secondary branches of *L. andersoni* and has no swelling on the anterior surface of its base. In *L. andersoni*, the median branch of the barbel is longest, but in *L. parini* the lateral ones are longest. The series of subdermal melanophores found above the midline of the body of *L. andersoni* (Fig. 5) is absent in *L. parini*. *Linophryne andersoni* appears to be an intermediate form between *L. parini* and the remaining members of the subgenus *Rhizophryne*.

Most of the differences between *L. andersoni* and *L. parini* (Table 1) are probably an expression of both the difference in size between the two holotypes and intraspecific variation rather than interspecific ones. In the course of ontogeny, the escal appendages of *L. andersoni* are likely to grow longer and further branching may occur as evident from the inner, smaller pair of appendages (Fig. 2). In the event that the bud-like photophores on the barbel develop a stem in older age, the resulting pattern of branching of the barbel of *L. andersoni* will be more complex than the pattern of *L. parini*.

The males of *L. andersoni* and *L. parini* are unknown.

ETYMOLOGY: *Linophryne andersoni* is named for M. Eric Anderson of the J.L.B. Smith Institute of Ichthyology, South Africa, in recognition of his contributions to deep-sea ichthyology.

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