Japanese Journal of Ichthyology
Vol. 29, No. 1 1982

魚類学雑誌
29巻1号 1982年

Lepidopus calcar, a New Trichiurid Fish from the Hawaiian Underwater Ridge

Nikolay V. Parin and Sergei V. Mikhailin

(Received July 11, 1981)

Abstract A new trichiurid, *Lepidopus calcar*, is described. The species was discovered from the Colahan Seamount of the Hawaiian Ridge at a depth between 270 and 350 m. It is characterized by a stout spur-like second anal spine not developed in adults of other species of *Lepidopus*. Number of vertebrae and dorsal fin-rays is less than in *L. caudatus* (Euphrasen) and more than in both *L. xantusi* Goode et Bean and *L. dubius* Parin et Mikhailin.

According to Tucker (1956) the trichiurid genus *Lepidopus* contains two species—*L. caudatus* (Euphrasen, 1788) and *L. xantusi* Goode et Bean, 1896; recently one more species, *L. dubius*, was tentatively placed in the same genus by the authors (Parin and Mikhailin, 1981). Of these species *L. caudatus* occurs in the eastern North Atlantic and in the Mediterranean as well as in the Southern Hemisphere off South and Southwest Africa, South Australia and New Zealand (Parin and Bekker, 1973), *L. xantusi* is known from the eastern Pacific from California (Hubbs et al., 1979) to Peru (Chirichigno, 1974), and *L. dubius* is restricted in its distribution by the Gulf of Guinea and adjacent waters. In this paper a new species obtained from the Colahan Seamount of the Hawaiian Underwater Ridge in the North Pacific is described.

Lepidopus calcar sp. nov.
(Figs. 1, 2)

Holotype. ZIL (Zoological Institute in Leningrad, Academy of Sciences of the USSR) 45723, a ripe female, 787 mm in standard length; Colahan Seamount (31°01′N, 175°53′E) at 270 m, October 21, 1979; bottom otter-trawl; coll. L. A. Boretz.

Paratypes. ZMMU (Zoological Museum of the Moscow State University) P–15675, two specimens: a female, 609 mm in SL, and a male, 561 mm in SL; Colahan Seamount (31°02′N, 175°53′E) at 270～350 m, October 14, 1979; bottom otter-trawl; coll. L. A. Boretz.

All type specimens in rather good condition but dorsal and anal rays mostly damaged; holotype with an old scar below the 29th dorsal ray and with caudal peduncle partially broken.

Diagnosis. A species of *Lepidopus* with elongated and stout spur-like second anal spine, with a median sagittal crest atop the head completely confined to the nape, with slightly concave interorbit, with 98～100 vertebrae, 91～93 dorsal fin-rays, and II, 44～47 anal fin-elements.

Description of the holotype (data in parentheses refer to paratypes 609 and 561 mm in SL). D 93 (91, 92); A II, 47 (44, 46); P_1 12; P_2 I, 1. Vertebrae 43+57 (44+54, 43+57).

Body elongate and strongly compressed, its width 3.4 (3.2, 3.5) in depth at level of anus. Upper profile of head oblique-concave, rising gently from above snout tip to the middle of orbits and then more steeply to the dorsal origin. Ethmo-frontal region not elevated. Interorbit slightly concave. Frontal ridges very low, converging posteriorly before the level of rear margin of eye. Their confluence elevated to support a short sagittal medial crest at the nape which continues into a ridge formed by first dorsal pterygiophore. Eye large, barely entering upper profile and slightly bulging laterally. Lower posterior margin of opercle almost straight.

Mouth large, maxilla sheathed by preorbital, ending just before anterior margin of orbit. Lower jaw slightly projecting, with a moderate cartilaginous process. Nostril as a subvertical slit, about one-fifth snout-length before eye. Teeth flattened, lanceolate, their margins entire, without barbs. Anterior maxillary fangs immovable, strong, one on a left, two on a right side. Outer tooth row of 4～5 (5～6) small teeth lateral to fangs and 10～12 (9～12) teeth

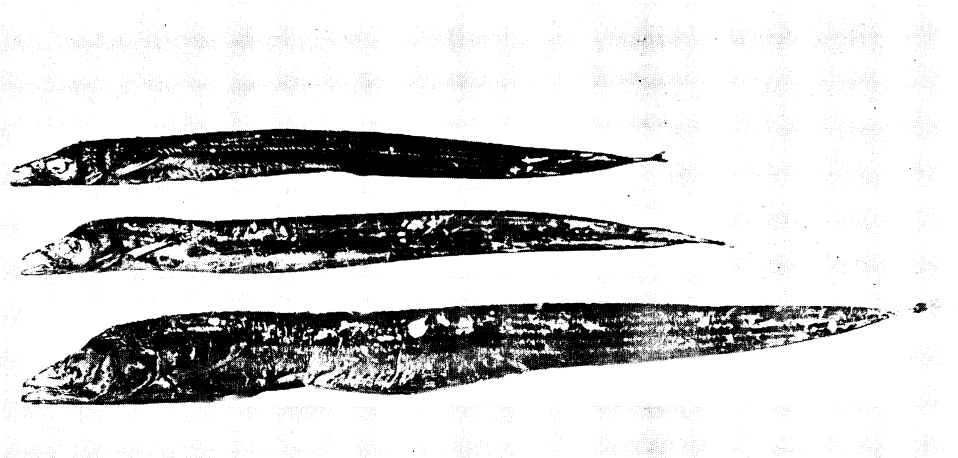

Fig. 1. *Lepidopus* calcar, sp. nov. Lateral views (below to above) of holotype SL 787 mm, ZIL 45723 from the Colahan Seamount (31°01′N, 175°53′E) and two paratypes SL 609 and 561 mm, ZMMU P-15675, also from the Colahan Seamount.

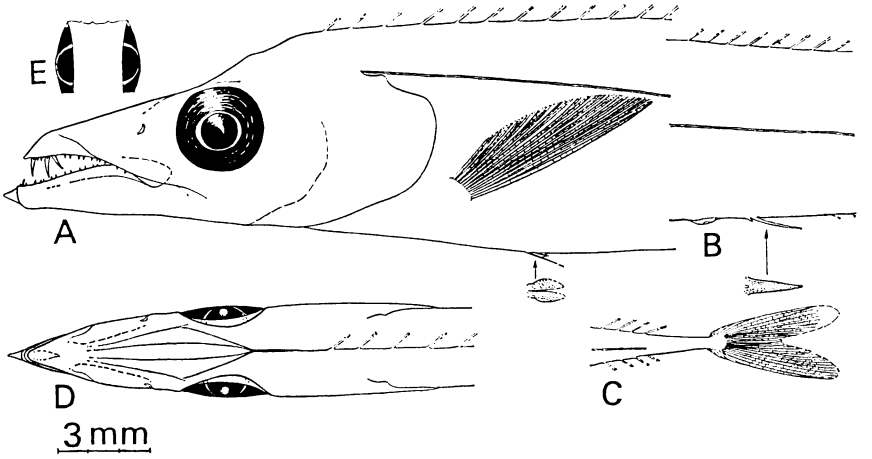

Fig. 2. Diagrammatic drawings of the holotype of *Lepidopus calcar*: lateral views of head and fore-part of body (A), middle part of body (B) and caudal part of body (C); dorsal view of head showing bony crests (D); upper portion of cross section through orbits (E).

posteriorly. Dentary with 15～16 (16～19) teeth. A longitudinal series of 6 and 10 (8～10) teeth on palatines. Gill rakers lanceolate, 5 or 6+1+9 (3 to 5+1+7 to 10) without rudiments. (Pyloric caeca 18 in paratype SL 609 mm).

Dorsal fin originates above the anterior margin of opercle. None of dorsal rays segmented, the first 10 more robust than the succeeding soft elements. Origin of anal fin behind the middle of body length. First anal spine a minute sharp spinule. Spur-like (or dagger-like) second spine 1.7 (1.7, 1.8) times longer than distance from its origin to anus, stout and flat in cross section, its surface covered by skin. Soft anal fin complete but anterior elements very weak and only about 10 (16～20), last rays joined by a membrane to form a fin. Terminations of dorsal and anal sub-opposite. Rays of both fins precisely correspond to adjacent vertebrae. Caudal peduncle slender, its depth 4.4 (5.0, 5.1) in length. Caudal fin well developed, forked.

Pectoral fins low on body, their lower rays longer than upper. Pelvic fins inserted 0.6 (0.7, 0.6) eye diameter behind posterior end of

pectoral base, represented by a pair of flattened scale-like spines covered by skin, each spine underlain by a minute soft ray.

Lateral line originates at upper corner of opercle, gently descends to midline of body above the anus and to lower third of side before its termination near the end of anal fin base.

Selected proportional measurements in percentage of SL: head 16.9 (15.7, 15.8), eye 3.6 (3.1, 3.1), snout 6.4 (6.2, 6.2), maxillary 6.0 (5.8, 5.6), interorbit 2.0 (1.7, 1.8), maximum body depth (above pelvic) 9.5 (7.8, 7.2), depth above anus 7.4 (7.1, 6.8), caudal peduncle depth 0.5 (0.5, 0.4), snout to dorsal origin 13.4 (12.1, 12.1), snout to anal spine 57.9 (56.3, 55.2), snout to anus 56.7 (55.0, 53.8), snout to pectoral base 17.4 (16.0, 16.4), snout to pelvic insertion 20.8 (19.7, 19.6), length of pectoral fin 8.8 (−, 8.3), length of pelvic fin 1.3 (−, 1.5), length of first anal spine 0.1 (0.2, −), length of second anal spine 2.2 (2.3, 2.5).

Color in ethyl alcohol (after replacement from formalin): body dark brown, much paler below but might be silvery iredescent in life. Opercle black. Inside of mouth and gill cavities black.

Comparison. *Lepidopus calcar* corresponds to Tucker's (1956) definition of the subfamily Lepidopinae in all diagnostic characters: 1) slope of snout gentle; orbits barely entering upper profile of head; posterior confluence of frontal ridges elevated to support a sagittal crest; 2) cartilaginous protuberance at mandibular symphysis weak; 3) lower hind margin of opercle not concave; 4) teeth in main series without barbs; 5) teeth on palatines in a linear series; 6) lateral line descending gently from the shoulder and running in a median position along the body; 7) spinous portion of dorsal fin short, continuous with soft portion of the fin; 8) soft dorsal rays precisely corresponding to adjacent vertebrae; 9) spinous anal of two spines; 10) terminations of dorsal and anal fins sub-opposite; 11) caudal fin normal and forked; 12) pelvic fins composed of a scale-like spine and an internal rudimentary soft ray; 13) pyloric caeca numerous.

Furthermore *L. calcar* is identified as a member of *Lepidopus* by means of the key of genera presented by Tucker (1956) as having the sagittal crest confined to the nape, a concave interorbit and caudal fin present. However, this species is easily distinguishable from *L. caudatus, L. xantusi* and *L. dubius* by its enormous second anal spine which is dagger-like as in *Aphanopus*, a genus of the subfamily Aphanopodinae characterized by absence of sagittal crest atop the head and presence of long spinous portion of dorsal fin divided by a notch from the soft dorsal. Number of vertebrae (98～100) and dorsal fin-elements (91～93) in *L. calcar* is less than in *L. caudatus* (105～114 and 98～109; Mikhailin, 1977) and more than in both *L. xantusi* (82～93 and 78～87; Fitch and Gotshall, 1972; our data) and *L. dubius* (91～96 and 83～89; Parin and Mikhailin, 1981).

Distribution. *L. calcar* is known only from the type specimens collected from the Colahan Seamounts of the Hawaiian Ridge at a depth between 270 and 350 m. Unidentified specimens of *Lepidopus* and *Lepturacanthus* (?) recorded from the banks of the Emperor Ridge (Novikov et al., in press) may also belong to this species.

Etymology. The name is derived from the Latin *calcar* (meaning "spur") in reference to the characteristic spur-like second anal spine and is to be treated as a noun in apposition.

Acknowledgments

The type specimens were obtained through the courtesy of Dr. Leonid A. Boretz of the Pacific Institute of Marine Fisheries and Oceanography (Vladivostok). G. N. Pokhilskaya and S. M. Dudarev have prepared drawings and photographs. Dr. Richard Rosenblatt has sent a copy of unpublished description of another new species of *Lepidopus* and we partially followed here the format of his description. Dr. Teruya Uyeno kindly reviewed the manuscript. To all these persons we wish to express our most sincere gratitude.

Literature cited

Chirichigno F., N. 1974. Clave para identificar los perces marinos del Peru. Inf. Inst. Mar. Peru-Callao, (44): 5～387, figs. 1～643.

Fitch, J. E. and D. W. Gotshall. 1972. First record of the black scabbardfish, *Aphanopus carbo*, from the Pacific Ocean with notes on other Californian trichiurid fishes. Bull. S. Calif. Acad. Sci., 71: 12～18, figs. 1～3.

Hubbs, C. L., W. I. Follett and L. J. Dempster. 1979. List of fishes of California. Occ. Pap. Calif. Acad. Sci., (113): 1～51.

Mikhailin, S. V. 1977. On the intraspecific variability of the frostfish *Lepidopus caudatus* (Euphrasen). Vopr. Ikhtiol., 17 (2): 226～236, figs. 1～2. (In Russian).

Novikov, N. P., L. S. Kodolov and G. M. Gavrilov. (In press). Preliminary list of fishes of the Emperor underwater ridge. In: Fishes of the open ocean. Inst. Okeanol. Akad. Nauk. SSSR. (In Russian with English abstract).

Parin, N. V. and V. E. Bekker. 1973. Trichiuridae. In: Check-list of the fishes of the north-eastern Atlantic and of the Mediterranean (CLOFNAM). UNESCO, Paris, pp. 462～464.

Parin, N. V. and S. V. Mikhailin. 1981. A new species of scabbard-fish, *Lepidopus dubius* (Trichiuridae) from the eastern tropical Atlantic ocean. Vopr. Ikhtiol., 21 (3): 403～410, figs. 1～3. (In Russian).

Tucker, D. W. 1956. Studies on the trichiuroid fishes-3. A preliminary revision of the family Trichiuridae. Bull. Brit. Mus. (Nat. Hist.)., Zool., 4 (3): 73～130, figs. 1～23, 1 pl.

(NVP: P. P. Shirshov Institute of Oceanology, Moscow 117218, U.S.S.R.; SVM: All-Union Institute of Marine Fisheries and Oceanography, Moscow 107140, U.S.S.R.)

ハワイ海嶺域からのタチウオ類の新種 *Lepidopus calar*

Nikolay V. Parin • Sergei V. Mikhailin

タチウオ類の1新種，*Lepidopus calcar* の記載を行った．本種はハワイ海嶺のコラハン海山の水深 270～350 m のところから採集され，強いトゲ状の臀鰭第2棘を有することで他の *Lepidopus* 属魚類（成魚）と区別できる．本種の脊椎骨数と背鰭鰭条数は *L. caudatus* (Euphrasen) のものより少なく，*L. xantusi* Goode et Bean および *L. dubius* Parin et Mikhailin のものよりも多い．