A new species of *Lepidotrigla* (Scorpaeniformes, Triglidae) from the waters off Queensland (Australia)*

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SUMMARY: A new species of the family Triglidae, *Lepidotrigla larsoni* sp. n., from the waters off Queensland (Australia) is presented. The new taxon is compared with its similar morphological relatives and also with those which, moreover, are found in the australian area belonging to the genus *Lepidotrigla* Günther, 1860. Those are: *L. alata* (Houttuyn, 1782), *L. argus* Ogilby, 1910, *L. bentuviai* Richards and Saksena, 1977, *L. bispinosa* Steindachner, 1898, *L. deasoni* Herre and Kauffman, 1952, *L. oglina* Fowler, 1938, *L. omanensis* Regan, 1905, *L. punctipectoralis* Fowler, 1938, *L. riggsi* Richards and Saksena, 1977, *L. russelli* del Cerro and Lloris, 1995, *L. sayademalha* Richards, 1992 and *L. umbrosa* Ogilby, 1910. Brief comments on the genus *Lepidotrigla* Günther, 1860 are included.

Key words: Triglidae, *Lepidotrigla larsoni* sp. n., Taxonomy, Descriptions, FAO Fishing Area 71, Eastern Australia.

RESUMEN: NUEVA ESPECIE DE *LEPIDOTRIGLA* (SCORPAENIFORMES, TRIGLIDAE) DE LA COSTA DE QUEENSLAND (AUSTRALIA). – En este trabajo se describe una nueva especie de la familia Triglidae, *Lepidotrigla larsoni* sp. n., procedente de las aguas del estado de Queensland (Australia). El nuevo taxon se compara con las especies morfológicamente próximas así como con aquéllas presentes en el area australiana y pertenecientes al género *Lepidotrigla* Günther 1860. Éstas son: *L. alata* (Houttuyn, 1782), *L. argus* Ogilby, 1910, *L. bentuviai* Richards and Saksena, 1977, *L. bispinosa* Steindachner, 1898, *L. deasoni* Herre and Kauffman, 1952, *L. oglina* Fowler, 1938, *L. omanensis* Regan, 1905, *L. punctipectoralis* Fowler, 1938, *L. riggsi* Richards and Saksena, 1977, *L. russelli* del Cerro and Lloris, 1995, *L. sayademalha* Richards, 1992 y *L. umbrosa* Ogilby, 1910. Finalmente, se incluyen breves comentarios sobre el género *Lepidotrigla* Günther 1860.

Palabras clave: Triglidae, *Lepidotrigla larsoni* sp. n., Taxonomía, Descripciones, Área de Pesca F.A.O. No . 71, Australia Oriental.

INTRODUCTION

A large number of specimens collected in different parts of the world have been examined as part of a general study on the systematics of supra-specific taxa of the family Triglidae. One parcel of material examined contained a large number of specimens coming from Indonesia and Australian waters. Several interesting taxa were found with one clearly belonging to the genus *Lepidotrigla* Günther, 1860 but being impossible to assign to any known species.

An accurate analysis of the whole loan yielded a total number of 6 specimens sharing differential characters and we concluded to describe those atipic specimens as new herein.

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The new taxon is compared with its similar morphological relatives after a grouping method previously used by the authors [del Cerro and Lloris (1997)] and explained in greater detail in the DISCUSSION. The new species described is also compared to other species of the genus *Lepidotrigla* Günther, 1860 not belonging to the new species' group but present in the waters of Australia and adjacent regions and accepted as valid by Richards (1992). These species are: *L. alata* (Houttuyn, 1782), *L. argus* Ogilby, 1910, *L. bentuviai* Richards and Saksena, 1977, *L. bispinosa* Steindachner, 1898, *L. deasoni* Herre and Kauffman, 1952, *L. oglina* Fowler, 1938, *L. omanensis* Regan, 1905, *L. punctipectoralis* Fowler, 1938, *L. riggsi* Richards and Saksena, 1977, *L. russelli* del Cerro and Lloris, 1995, *L. sayademalha* Richards, 1992 and *L. umbrosa* Ogilby, 1910.

METHODOLOGY

The terminology for the location of the head spines follows mainly Teague (1951) as well as Allis (1909). The terminology of the squamation follows Russell *et al.* (1992).

Measurements and counts of body parts are a combination of the methods of Hubbs and Lagler (1958), Teague (1951), Richards (1968), Richards and Saksena (1977) with the exception of the following characters: the length of the cleithral spine is measured from the posterior edge of the opercular flap to its rear tip, the lengths of the pectoral fin and free rays are measured from their respective superior axils to their respective posterior tips and the length of the ventral fin is measured from the inner axil to the posterior end of the longest ray.

None of the measurements and proportions given here include the length of the rostral projections which are measured separately. Their length is measured from their tips to the premaxillary symphysis and the absolute values are also given in Table 1. The head depth is measured vertically from the posterior edge of the orbit to the base of the head. The body depth is measured vertically in front of the first anal ray and does not include the crests at the bases of the dorsal fins.

The abbreviations on body measurements used in this paper are the following: TL, total length; SL, standard length; HL, head length; OD, longitudinal diameter of orbit, ML, maxillary length; CH, cheek height; IO, interorbital width and PO preorbital length.

SYSTEMATICS

Material Examined: The specimens studied in this paper were collected by Ms. Helen K. Larson in Australian waters, at the east of Dunk Island (Queensland). They are deposited in the collections of the Museum and Art Gallery of the Northern Territory, Darwin, Australia (NTM), the Australian Museum, Sydney, Australia (AMS), the National Museum of Victoria, Melbourne, Australia (NMV) and the Institut de Ciències del Mar (C.S.I.C.), Barcelona, Spain (IIPB), and catalogued with the following numbers:

Holotype: NTM-S-11746-024 of 125.5 (92.9) mm of TL and SL respectively. Caught 1st. August, 1986 in the east of Dunk Island (Queensland, Austratia), at a depth of 220 m. Other capture data unknown.

Paratypes: 5 specimens, whose Total and Standard lengths (the latter in parentheses) range between 108.5 TL (87.9 SL) and 127.6 TL (104.8 SL) mm: NTM-S-11746-033, 2 specimens of 123.5 TL (99.3 SL) and 118.1 TL (96.0 SL) mm, 1st. August, 1986 in the east of Dunk Island (Queensland, Australia), at a depth of 220 m. Other capture data unknown. AMS-I-37166-001, 1 specimen of 114.9 TL (92.3 SL) mm, NMV-A-16823, 1 specimen of 108.5 TL (87.9 SL) mm and IIPB-1/1996, 1 specimen of 127.6 TL (104.8 SL) mm, and captured 11th. January, 1986, east of Dunk Island (Queensland, Australia), at a depth of 298-300 m. Other capture data unknown.

Other Material

Other specimens used for comparison have been the following:

1 specimen of *L. alata* (Houttuyn, 1782), NTM-S-12099-011 collected at Mimasi, Shikoku Island, Japan at 60 m deep, July 17th., 1985, 104.6 (85.8) mm.

5 specimens of *L. argus* Ogilby, 1910, NTM-S-11672-028, collected in the northwest shelf of Australia at 82-86 m deep, June 2nd., 1985, lengths ranging from 104.3 (86.0) to 112.6 (95.0) mm.

2 specimens of *L. bispinosa* Steindachner, 1898, MNHN-1966-397, collected in the Red Sea, depth unknown on December 8th., 1928, lengths ranging from 111.7 (88.5) to 145.0 (117.0) mm.

1 specimen of *L. omanensis* Regan, 1905, MNHN- 1992-219, location, date and depth of capture unknown, 106.6 (84.1) mm.

1 specimen of *L. punctipectoralis* Fowler, 1938, NTM-S-10752-015, coltected at South Lombok, depth and date of capture unknown, 122.4 (105.4) mm.

1 specimen of *L. sayademalha* Richards, 1992 (paratype), MNHN-1992-217, collected in the Indian Ocean, Saya de Malha Bank, Lat. 10° 17.5' S - Long. 061° 12.3' E, 20th. May 1986, R/V Zvezda Kryma Cr. 6 Tr. 6 in 50-60 m deep, 93.3 (74.8) mm.

1 specimen of *L. spiloptera* Günther, 1880 (Holotype), BMNH-1879.5.14.269, collected in the Kai Islands, depth and date of capture unknown, 126.8 (102.7).

The comparison with the other morphologically similar species or present in adjacent geographical areas (*L. deasoni* Herre and Kauffman, 1952, *L. oglina* Fowler, 1938, *L. riggsi* Richards and Saksena, 1977 and *L. umbrosa* Ogilby, 1910) was based in the written descriptions existing in the literature of the group. Obviously, even in those species where we have been able to study any specimen, the literature was also used.

Absolute measurements as well as some meristic data of the specimens studied are given in Table 1 for the new species.

Lepidotrigla Günther, 1860

Lepidotrigla larsoni, sp. n. (Figs. 1, 2, 3, 4 and 5)

Diagnosis: Post-orbital groove (occipital or postfrontal groove of some authors) incomplete, reduced to form a short furrow just behind the eyes. The preopercular spine is wanting and the preopercular keel, if exists, is low and inconspicuous. The length of the pectoral fin is somewhat longer than that of the head. The body is covered with large but weakly attached scales, ctenoid superiorly and cycloid inferiorly. The throat, chest, breast and belly are scaleless.

Description: General counts and measurements of holotype and paratypes are given in Table 1.

Body robust anteriorly, slender posteriorly and covered with large and weakly attached scales, which are ctenoid superiorly and cycloid inferiorly. The number of scale rows along the lateral line is 58 in holotype (59-61 in paratypes) with their tubes single, and the lateral line extending into the caudal fin forming a bifurcation. Both sides of the dorsal fin bases are armoured with 23 erect crests (22-23 in paratypes), not flattened in front, with 7 erect crests (7-8 in paratypes, modally 7) at the base of the first dorsal and 15 at the base of the second dorsal fin (13-15 in paratypes, modally 14). Some specimens have one or two interdorsal crests.

Head rather large (3.1 times in SL) (3.1-3.3, in SL in paratypes), and slightly spinulated. The post-orbital groove is incomplete, not crossing the top of the head and being thus reduced to a furrow behind the eyes. Nape scaled. Snout slightly longer than orbit (3.8 in HL; 1.6 in OD) (2.9-4.3 in HL; 1.1-1.8 in OD in paratypes), with the profile scarcely concave. The rostral projection is much longer than half the length of orbit (4.5 in HL; 1.8 in OD) (3.2-4.1 in HL; 1.3-1.5 in OD, in paratypes). This rostral projection is produced in a long, acute, translucid, diverging and somewhat flat spine arising from the base. The outer but mostly the inner margin are armoured with much smaller spines. Orbit rather large, slightly longer than the height of the cheek (2.5 in HL; 0.6 in PO), except one paratype which is about the same length (2.3-2.7 in HL; 0.5-0.9 in PO, in paratypes). Interorbital space somewhat concave (3.4 in HL) (3.6-4.2 in HL, in paratypes) and much narrower than orbit (1.4 in OL) (1.4-1.6 in OL, in paratypes). Maxillary clearly reaching to below the eyeball (2.2 in HL) (2.4-2.7 in HL, in paratypes). Teeth on both jaws villiform; vomer and palatines toothless.

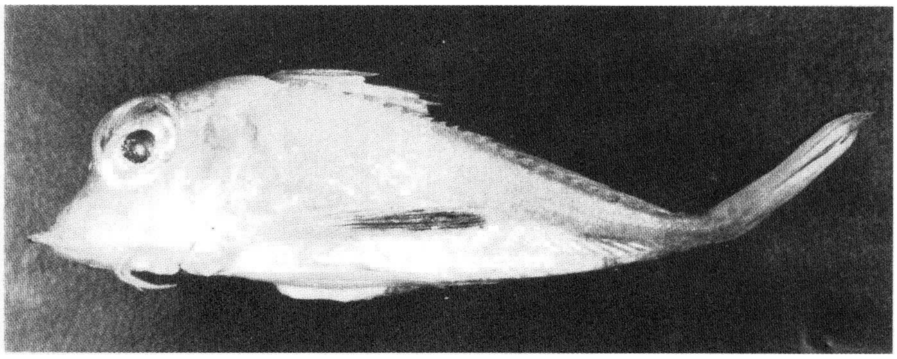

FIG. 1. – Lateral view of the holotype NTM-S-11746-024 of *L. larsoni*. The total length is 125.5 mm and the standard length is 92.9 mm.

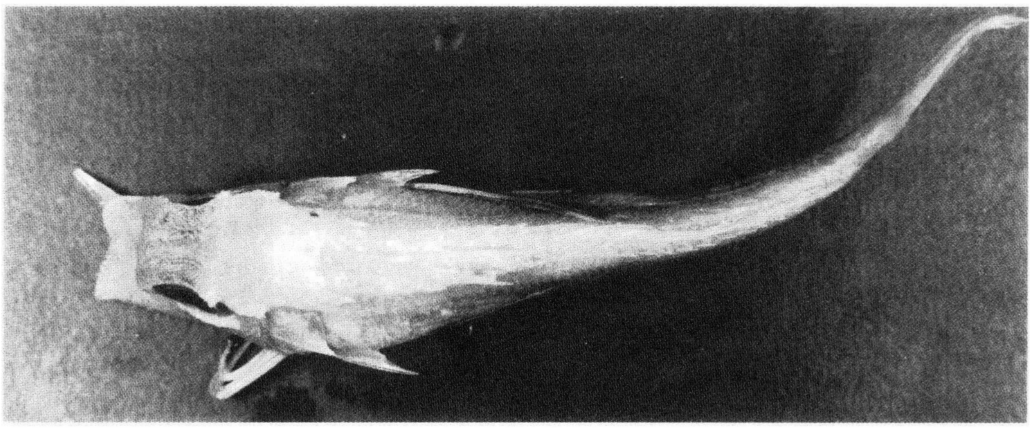

FIG. 2. – Dorsal view of the holotype NTM-S-11746-024 of *L. larsoni.*

TABLE 1: Absolute values of morphometric and meristic variables of the specimens of *L. larsoni.* The asterisk means broken.

Catalogue Number	NTM-S-11746-024	NTM-S-11746-033	NTM-S-11746-034	AMS-I-37166-001	NMV-A-16823	IIPB-1/1996
MORPHOMETRICS						
Total Length (T.L.)	125.5	123.5	118.1	114.9	108.5	127.6
Standard Length (S.L.)	99.2	99.3	96.0	92.3	87.9	104.8
Head Length (H.L.)	31.7	29.9	30.5	28.4	28.3	33.3
Length Rostral Append.	7.1	3.5*	6*	9.0	7.8	8.2
Preorbital Length (P.O.)	8.3	9.3	8.5	6.6	9.6	10.3
Orbit Length (O.D.)	12.9	12.7	13.2	11.9	10.4	12.3
Interorbital Length (I.O.)	9.2	8.3	8.2	7.4	7.6	8.0
Postorbital Length	10.6	10.1	10.2	9.9	8.4	10.1
Maxillary Length (M.L.)	14.2	11.7	11.4	11.8	11.6	12.1
Cheek Height (C.H.)	11.5	10.9	10.2	10.7	10.6	11.5
Pre-D1 Length	32.8	30.9	29.7	29.8	28.0	35.8
D1 Base Length	22.0	21.1	20.0	20.3	19.3	19.7
D2 Base Length	34.5	33.8	31.1	30.2	29.2	32.6
Pectoral Fin Length	37.2	34.0	31.8	33.7	32.5	34.4
1st. Free Pectoral Ray Length	15.5	16.5	15.2	14.4	15.8	13.8
2nd. Free Pectoral Ray Length	19.4	19.4	17.6	17.8	19.2	19.0
3rd. Free Pectoral Ray Length	19.7	20.0	18.6	18.3	19.2	18.9
Pelvic Fin Length	54.0	53.3	50.5	49.8	47.1	56.0
Preanal Length	37.2	34.0	31.8	33.7	32.5	34.4
Anal Fin Base Length	32.7	33.0	32.2	30.3	29.0	35.6
Cleithral Spine Length	11.6	12.6	10.9	10.6	10.2	12.7
Head Height	25.6	25.4	24.6	23.6	21.5	25.6
Body Height	21.8	22.1	20.6	20.0	15.8	18.8
MERISTICS						
D1 Spines	8	8	8	8	9	8
D2 Rays	15	15	14	15	15	14
Anal Rays	15	14	15	15	15	15
Pectoral Rays	10	10	11	11	11	11
Gill-rakers 1st. Arch	6+2R	6+4R	6+1R	6+1R	6+2R	7+1R
Preocular Spines	2	0	0	2	0	0
Postocular Spines	2	1	2	2	1	2
Sphenotic Spines	1	0	0	0	0	0
Parietal Spine	0	0	1	0	0	0
Lateral Line Scales	58	61	59	59	59	60
Total Dorsal Crests	23	23	22	23	23	23
Crests in D1 Base	7	7	7	7	8	7

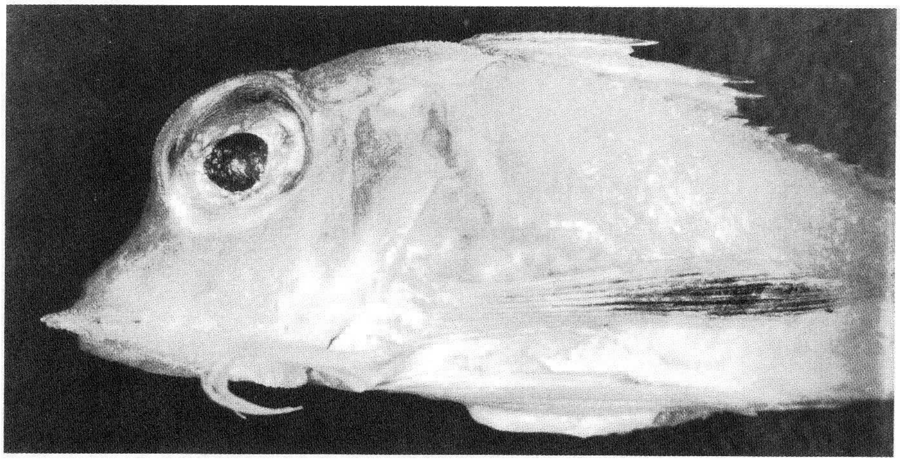

FIG. 3. – Lateral view of the head of the holotype NTM-S-11746-024 of *L. larsoni.*

Gill-rakers on 1st arch tubercle-like and short in shape, close to each other and 6 plus 2 rudiments in number (6-7 plus 1-4 rudiments, in paratypes). Pseudobranchials present. With small rudimentary barbels on each side of the mandibular symphysis as described for *Lepidotrigla jimjoebob* Richards, 1992.

First dorsal fin with 8 spines (8-9 in paratypes, modally 8) reaching to the first ray of the second dorsal when depressed in the holotype and two paratypes, and three paratypes which nearly do, and with the anterior edge of the first ray serrated. Second dorsal fin with 15 soft rays (14-15 in paratypes, modally 15). Anal fin with 15 soft rays (14-15 in paratypes, modally 15), inserted slightly behind the origin of the second dorsal fin. Pectoral fin with 10 soft rays (10-11 in paratypes, modally 11), moderate in length but always longer than head length (0.8 in HL; 0.8-0.9 in HL in paratypes), plus three free rays. The pelvic fin is well developed with one spine and five soft rays, extending to the first anal ray (even more in the paratypes except for one which reaches nearly the first anal ray) (3.6 in SL) (3.7-4.1 in paratypes). The caudal fin is slightly emarginate.

Spination: The cleithral spine is stout, long and compressed dorso-ventrally; its length measured from the posterior edge of the opercular membrane to the tip of the spine is slightly shorter than the length of orbit (2.7 in HL) (2.4-2.8 in HL in paratypes). The opercular spine is short but acute.

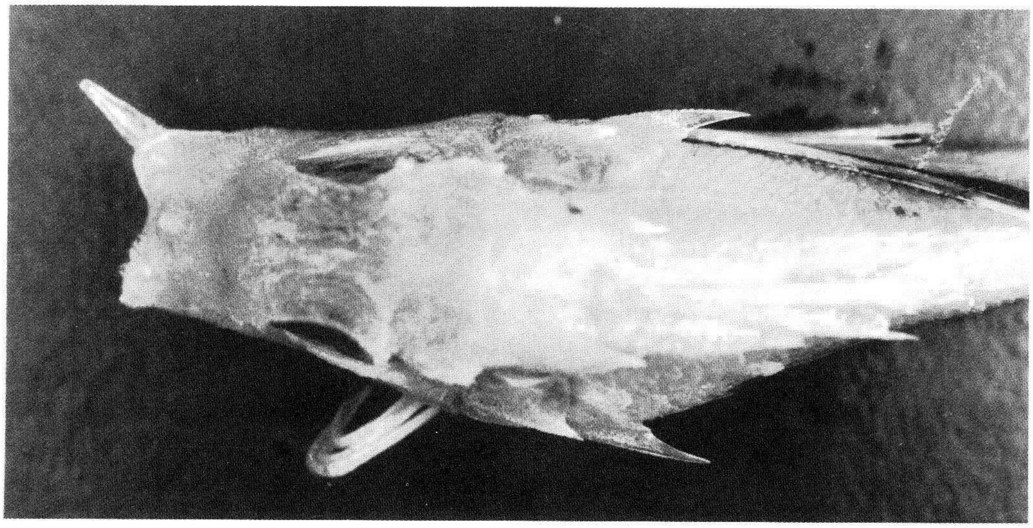

FIG. 4. – Dorsal view of the head of the holotype NTM-S-11746-024 of *L. larsoni.*

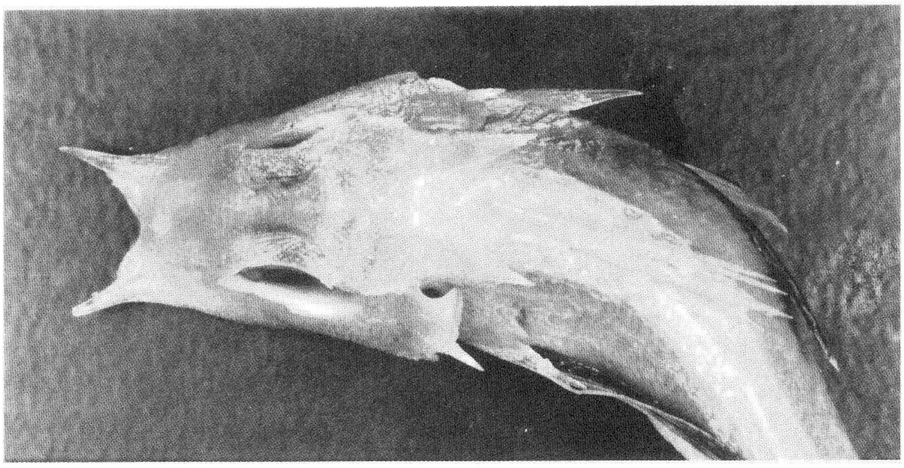

FIG. 5. – Dorsal view of the head of the paratype IIPB-1/1996 of *L. larsoni*. Note the shape and size of the rostral appendages and the cleithral spine.

The preopercular spine is wanting except in one paratype which is small and blunt. The preopercular keel is present and conspicuous. Two preocular spines present (0 or 2 in paratypes, modally 0), two postocular spines present (1-2 in paratypes, modally 2), sphenotic spine present (none in paratypes), pterotic spine present, parietal spine absent (only one paratype with 1 parietal spine) and 1 nuchal spine present. Rostral, preorbital and suborbital spines absent [*sensu* Teague (1951)].

Coloration in alcohol: head and body yellowish brown, being the head somewhat darker than the body. Ventral region whitish. Pectoral fin pale except for a blackish area in the middle of the inner side of the fin. The free pectoral rays are also pale. The dorsal fin is pale without any traces of spots. The other fins are also pale.

Etymology: This species is named *larsoni* after Ms. Helen K. Larson, Curator of Fishes of the Northern Territory Museum of Arts and Sciences (Darwin, Australia) and collector of the specimens described in this paper.

DISCUSSION

During the last years we have been trying to find any common characters which could be useful for the separation of a large genus as is *Lepidotrigla* Günther, 1860 into subgroups, and so make somewhat easier the field identification of the species. Already, we have used this method in previous papers as del Cerro and Lloris (1995) and del Cerro and Lloris (1997) for this purpose. The fact is that combining the type of post-orbital groove and the length of the pectoral fin compared to that of the head, we are able to build four groups into the genus *Lepidotrigla*. We defined these as follows:

GROUP A. Defined by having a complete post-orbital groove and the pectoral fin longer that that of the head.

GROUP B. Defined by having a complete post-orbital groove and the pectoral fin shorter that that of the head.

GROUP C. Defined by having an incomplete post-orbital groove and the pectoral fin longer that that of the head.

GROUP D. Defined by having an incomplete post-orbital groove and the pectoral fin shorter that that of the head.

We have been using this system to facilitate the placement of unidentified specimens into a pool of less number of species and thus reduce the number of species to compare. Obviously, for the identification of the specimens of this paper which, for us, come from a remote area, this system has again been tested and hitherto proved as useful.

Thus, and after this procedure, we have placed the specimens here described as new for science into GROUP C, what reduces the number of species to compare to those around the world with the similar features as well as those geographically close to the area of capture. Anyway, and with the aim of continue testing the system, we have compared the specimens of this study with other morphologically similar species of other groups, which are those cited previously in this paper.

L. larsoni sp. n. can be separated from the species above mentioned by several morphometric and meristic characters. The following paragraphs are only a summary of those features easier to observe and which may be useful for the reader to separate it from the others.

L. larsoni sp. n. is separated from:

L. alata (Houttuyn, 1782), by having the rostral projections widely triangular, short and strong, longer preorbital length, wider interorbital space and longer pectoral fin.

L. argus Ogilby, 1910, by having very short and wide rostral projections.

L. bentuviai Richards and Saksena, 1977, by the size of the rostral projections, longer pectoral fin, firmly attached and regularly arranged scales, scales of the lateral line with a retrose spine.

L. bispinosa Steindachner, 1898, by having regularly arranged scales and similar in size.

L. deasoni Herre and Kauffman, 1952, by having the head longer, the preorbital length longer, the eye diameter smaller and the maxillary shorter than the preorbital length.

L. oglina Fowler, 1938, by the shape of the rostral projections and the lack of preopercular keel.

L. omanensis Regan, 1905, by the length of the maxillary which is shorter that the preorbital length, shorter rostral projections and lower number of scales in the lateral line.

L. punctipectoralis Fowler, 1938, by the rostral projections triangular in shape, shorter and flattened, upper free pectoral ray as long as the joined pectoral rays, white spots in the inner side of the pectoral fin, longer dorsal spines and shorter cleithral spine.

L. riggsi Richards and Saksena, 1977, by having pectoral fins somewhat longer and being the head longer and lower.

L. russelli del Cerro and Lloris, 1995, by having the throat, chest and breast scaled.

L. sayademalha Richards, 1992, by having a very long opercular spine, lack of preopercular keel and shorter rostral projections.

L. umbrosa Ogilby, 1910, by having shorter rostral projections, short pectoral fin and armed scales in the lateral line.

For detailed data on morphometric and meristic characters, the reader will find the absolute measurements of the type series in Table 1 which may be used to test the information existing in literature on the species compared with *L. larsoni* sp. n.

After the information given in previous paragraphs to differentiate *L. larsoni* sp. n. from other species of the genus, the reader might believe that this and *L. riggsi* Richards and Saksena, 1977 are very similar species. The latter was a new name given by these authors to a subspecies described by Alcock (1890) as *L. spiloptera* var. *longipinnis*. Revising the description given by Alcock (1890: 429), he writes: "One specimen, answering in every respect, even in the details of coloration, to Dr. Günther's description; but the pectorals reach to the ninth anal ray." We have not been able to study the specimens used by Richards and Saksena to name this species, but if the short description of Alcock is correct and after the study of the holotype of *L. spiloptera* Günther, 1880, it is impossible that *L. riggsi* Richards and Saksena, 1977 be similar or misidentified with *L. larsoni* sp. n.

Finally, we would like to make a brief comment on the diversity of the genus *Lepidotrigla* Günther, 1880. During the last years, we have been able to study a large number of Triglidae from all around the world what has allowed us to build a vague image on the taxonomic and biogeographical status of the family and, more precisely, of the genus *Lepidotrigla* Günther, 1880. The study of two important loans of material from the Indo-Pacific has yielded the extension of the geographical distribution of certain species as well as the description of several new for science, del Cerro and Lloris (1995) and del Cerro and Lloris (1997). Plotting the records of the species of the genus *Lepidotrigla* Günther, 1860 in a world map a clear fact can be seen, which is the large number of species of this genus in the Australasian region. Similar conclusions can be reached taking into account other genera of the family Triglidae. Thus, whether this region is the area of radiation of, at least, part of the groups of the family and considering the low number of exploratory cruises in the region, we are sure that many new taxa will appear in the future. Anyway, it is our opinion that in this particular genus which has such a large number of species when compared with the other genera of the family, we are far from having the valid tool for the clarification of the taxonomic status and the obvious identification of the species. We wonder whether the efforts that the few researchers nowadays working in the family are being done in the right way.

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