

Review of the *Lepidotrigla* gurnards (Teleostei: Scorpaeniformes: Triglidae) in the Bay of Bengal and Andaman Sea off Myanmar with a description of a new species

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Abstract. A 2015 trawl survey along the coast of Myanmar provided an opportunity to assess species of the triglid genus *Lepidotrigla* occurring in the country. Three species, *L. longipinnis* Alcock, 1890, *L. omanensis* Regan, 1905, and an undescribed species, were identified among the 15 voucher specimens retained. A formal description of the unnamed species, as well as descriptive accounts of the other two are provided. *Lepidotrigla psolokerkos*, new species, based on two specimens, resembles *L. alcocki* Regan, 1908 described from the Saya de Malho Bank in the central Indian Ocean, differing from it in having fewer oblique scale rows between the anal fin origin and the lateral line and broader covering of dark pigmentation on the inner surface of the pectoral fin. The known geographical ranges of *L. longipinnis*, reported in the literature as *L. riggsi* Richards & Saksena, 1977, and *L. omanensis* are extended to the Andaman Sea off south-eastern Myanmar. A key is provided for the three species occurring in the survey area.

Key words. Indian Ocean, taxonomy, ichthyology, geographical distribution, depth range

INTRODUCTION

The gurnard genus *Lepidotrigla* Günther, 1860 is by far the most speciose of the family Triglidae with species variously occurring in coastal waters of all of the world's major oceans (Richards, 1992). In their revision of Indian Ocean species Richards & Saksena (1977) were forced to focus on material from the western and northwestern parts of the ocean basin because of the paucity of specimens available in museum collections collected elsewhere. Of the seven species they recognised, only one *Lepidotrigla riggsi* Richards & Saksena, 1977 was listed as even questionably occurring east of India. The follow-up publication by Richards (1992) reporting specimens that had been collected subsequently expanded these ranges little to the east.

In 2015, the EAF-Nansen Project of FAO in cooperation with the Myanmar government conducted a trawl survey using the R/V DR. FRIDTJOF NANSEN off the coast of Myanmar to obtain biological and environmental information in the study area and identify species diversity within the country as a basis for a FAO marine species identification guide intended for fishery purposes. Among the material retained were series of three species of *Lepidotrigla*, two of

which featured in Richards & Saksena (1977) and a third, which has not appeared in existing literature. We provide a name and description of the last, along with more detailed descriptions of the two named species to document details of features not touched on in previous publications. The ranges of these two are also now known to extend to continental shelf waters of south-eastern Myanmar, and in the case of *L. longipinnis* off the west coast of Sumatra, Indonesia. Diagnostic and descriptive accounts for each of the species are based on Myanmar specimens with broader ranges in meristic and morphometric characters provided by Richards & Saksena (1977) and Richards (1992) noted in Table 1.

Based on current studies of Australian and other western Pacific species, museum specimens are often difficult to identify once life colours have faded due in part to the variability of even the most diagnostic features. As a consequence, geographical distributions of species presented here are based on specimens examined for this study or by authors of revisionary studies like that of Richards & Saksena (1977) and Richards (1992) we consider reliable.

MATERIAL & METHODS

Counts and measurements mostly follow Richards (1992: 45–46). Measurements including the Standard Length (SL), head length, snout length and upper jaw length beginning at the anterior end of the specimen are measured from the center of the upper jaw; head length is measured from the center of the upper jaw to the posteriormost edge of the opercular membrane; body depth is the depth at the origin of the first dorsal fin; head depth is the depth at the posterior extent of the orbit; the orbital diameter is the horizontal distance

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Table 1. Selected counts and measurements (% SL) for species of *Lepidotrigla* in the Bay of Bengal and Andaman Sea off Myanmar with comparable values presented by Richards & Saksena (1977).

Morphological Features	<i>L. longipinnis</i>		<i>L. omanensis</i>		<i>L. psolokerkos new species</i>	
	Myanmar	Richards & Saksena, 1977	Myanmar	Richards & Saksena, 1977	Holotype	Paratype
Meristic	N = 8	N = 16–43	N = 7	N = 14–252		
First dorsal fin	VIII–IX	VIII–IX	VIII	VIII–IX	IX	IX
Second dorsal fin	15–16	14–15	14–15	12–15	16	16
Anal fin	14–16	14–15	14–15	13–15	17	15
LL scales	56–61	57–62	55–58	52–60	61	62
Scales above LL	3	3			3	3
Scales below LL	13–15	16–19	12–13	10–15	16	15
Predorsal scales	5–6		4–6		7	6
Dorsal fin bucklers	23–24		22–23		24	24
Precaudal vertebrae	11–12		11–12		11	11
Caudal vertebrae	19–21		18–20		22	21
Total vertebrae	30–32	30–31	30–31	29–31	33	32
Morphometric						
Standard Length (mm)	64.1–117	41.0–125	69.5–107	38.9–125	128	142
(%SL)						
Body depth	24.4–28.2		25.4–29.2		24.9	23.2
Caudal peduncle length (dorsal)	11.3–15.7		10.4–16.1		13.9	11.5
Caudal peduncle length (ventral)	11.8–16.6		12.5–14.4		13.8	11.2
Caudal peduncle depth	5.8–6.2		5.1–6.5		4.8	4.2
Head length	35.1–39.8	35.2–51.0	38.5–42.9	38.2–43.1	33.9	33.0
Head depth	22.6–24.7		23.9–38.9		22.9	21.3
Orbital diameter	9.2–11.2	7.5–12.4	10.1–11.5	8.1–12.3	9.8	9.0
Interorbital width	6.2–7.6	5.6–7.6	8.4–10.0	7.3–8.9	7.1	6.3
Interorbital depth	1.2–2.2		1.4–2.8		1.3	1.1
Snout length	14.5–17.5		16.1–19.0		16.1	14.0
Upper jaw length	13.2–16.2		16.0–17.9		14.5	13.2
1st dorsal fin base length	17.7–21.5		19.0–24.3		19.8	20.1
2nd dorsal fin base length	30.8–34.7		30.0–34.1		31.3	28.5
1st dorsal fin spine length	13.3–16.6		14.6–17.7		15.5	14.7
2nd dorsal fin spine length	16.2–19.7		17.1–19.1		19.0	20.4
3rd dorsal fin spine length	16.0–21.1		16.5–20.5		20.0	18.7
Dorsal fin ray 1 length	7.3–11.3		9.7–12.4		10.0	8.1
Dorsal fin ray 2 length	11.9–16.8		12.8–15.0		11.9	10.5

Morphological Features	<i>L. longipinnis</i>		<i>L. omanensis</i>		<i>L. psolokerkos</i> new species	
	Myanmar	Richards & Saksena, 1977	Myanmar	Richards & Saksena, 1977	Holotype	Paratype
Dorsal fin ray 3 length	12.0–14.6		13.8–16.2		12.3	9.8
Anal fin base length	29.3–35.8		29.9–34.2		35.1	33.0
Pectoral fin length	34.5–44.4	35.0–51.0	30.1–37.1	29.2–45.4	34.8	31.4
Free pectoral ray 1 length	28.3–33.5		26.3–31.4		27.9	25.3
Free pectoral ray 2 length	22.3–28.5		24.5–27.8		22.9	21.1
Free pectoral ray 3 length	18.4–23.4		18.8–22.4		18.3	16.2
Pelvic fin length	28.0–31.4		28.2–30.4		26.4	24.6

between the anterior and posterior extremes of the orbit; The interorbital width is the narrowest width of the interorbit; the interorbital depth is measured as a perpendicular from the bottom of the deepest portion of the interorbit to a transverse plane at the upper edge of the raised supraorbital bones on either side; the caudal peduncle length (dorsal) is measured from the base of the last dorsal fin ray to the center of the hypural crease, while the caudal peduncle length (ventral) is measured from the base of the last anal fin ray to the center of the hypural crease; and, lengths of the bases of the dorsal and anal fins are the distances between the bases of the first and last elements (spines or rays). For discussion purposes the length of the opercular spine is measured from the posterior margin of the opercle; the lengths of other spines are measured from the points where they become free from the adjacent surface and are no longer the ridges or crests from which they arise basally. Vertebral numbers obtained from radiographs are presented as precaudal + caudal (including the terminal centrum) = total elements. Scales above the lateral line are the number of oblique scale rows counted vertically below the origin of the second dorsal fin to but not including the lateral line, while scales below the lateral line are the number of oblique scale rows counted vertically above the origin of the anal fin to but not including the lateral line; predorsal scales are the number of scales on the dorsal midline between the origin of the first dorsal fin and the posterior edge of the bony surface of the head. Strongly modified scales at the base of the dorsal fins, often bearing sickle-shaped spines, are referred to as bucklers. Lateral line scales posterior to the hypural edge diminish in size and continue dorsoposteriorly on the caudal fin; as they are easily rubbed off during capture no attempts were made to record those beyond the hypurals remaining on specimens. Following Richards & Saksena (1977), the “interpelvic” is the ventral surface of the body between the origins of the pelvic fins and the posterior ends of the underlying pelvic girdle, while the “belly” is the surface between the interpelvic and the anus. The ventral most three rays of the pectoral fin in all members of the family Triglidae are not connected by fin membranes to each other or to the eleven rays above that are interconnected by membranes. The unconnected rays are referred to as “free rays” and numbered from dorsal most to ventral most. The “Description” of the new species is based

on the holotype, with variations observed in the paratype placed in parentheses. Specimens examined for the study are listed with species accounts or at the conclusion of the paper. Institutional abbreviations are as listed by Sabaj (2016).

Key to species of *Lepidotrigla* in the Bay of Bengal and Andaman Sea off Myanmar

- Opercular spine prominent, pungent, raised laterally as bony ridge basally. Corner of mouth posterior to vertical through anterior edge of orbit. First dorsal fin with 8 (rarely 9) spines. Inner surface of pectoral fin black basally and black with dark olive green tint distally, the areas separated by somewhat diagonal narrow pale blue band angled from near base dorsally toward distal margin ventrally *Lepidotrigla omanensis*
 - Opercular spine small or nub-like, not especially raised laterally. Corner of mouth anterior to vertical through anterior edge of orbit. First dorsal fin with 9 or 10 spines. Inner surface of pectoral fin either olive green with prominent black oval area ventrally at base, superimposed with pale blue spots, or blackish overall 2
- Anterior margin of rostral process with broad obtuse angle or straight, with prominent forward directed blade-like spine at each corner often mounted on somewhat triangular base. Second dorsal fin with 14 or 15 (rarely 16) soft rays. Inner surface of pectoral fin olive green with prominent black oval area posteriorly at base superimposed with pale blue spots.... *Lepidotrigla longipinnis*
 - Anterior margin of rostral process with broad medial notch edged with small spines becoming progressively longer on each side, none especially prominent. Second dorsal fin with 16 soft rays. Inner surface of pectoral fin blackish overall. Upper two-thirds of caudal fin broadly grey distally, red below *Lepidotrigla psolokerkos* new species

SYSTEMATICS

Lepidotrigla longipinnis Alcock, 1890 Proposed vernacular: Stellar Gurnard

(Figs 1A, 2A, B, 3A, B, 4, Table 1)

Lepidotrigla spiloptera var. *longipinnis* Alcock, 1890: 429 (new variety based on specimen from Bay of Bengal); Alcock, 1899: 68 (description).

Lepidotrigla riggsi Richards & Saksena, 1977: 215 (replacement name due to incorrect perceived homonymy of *longipinnis* with *Lepidotrigla longispinis* Steindachner & Döderlein, 1887; diagnosis and distribution); Fischer & Bianchi, 1984: vol. V, unpaged (taxonomy, fisheries and distribution); Richards, 1992: 63 (nominal species, selected characters); Krishnan & Mishra, 1993: 220 (survey list); del Cerro & Lloris, 1997: 51 (comparison with new species).

Lepidotrigla longipinnis: Alcock & McArdle, 1900: pl. 31; Manilo & Bogorodsky, 2003: S103 (check list); Eschmeyer, et al, 2017: accessed 4 Sep 2017 (catalogue of nominal species).

Diagnosis. Lateral profile of body with gradual convexly curved taper to caudal peduncle; distinctive postorbital notch above and behind each eye but not extending across top of head as occipital groove; rostral process with broad obtuse angle or straight when viewed from above, with prominent forward directed blade-like spine at each corner often mounted on somewhat triangular base; scales moderately adherent; lateral line with 56–61 pored scales; 13–15 oblique scale rows below lateral line; first dorsal fin with 8 or 9 spines, second with 15 or 16 rays; anal fin with 14–16 rays; pectoral fin reaching sixth to tenth anal fin ray. Caudal fin mostly red with white transverse band near base; inner surface of pectoral fin with large black oblong patch ventrally superimposed with scattered pale blue spots, remainder greenish with reddish margins dorsally, ventrally and basally.

Description. (see Table 1 for additional morphometric characters). Dorsal fin VIII–IX, 15 or 16 (usually IX, 15); anal fin 14 to 16 (usually 15); pectoral fin 11 + 3; pelvic fin 6; lateral line 56–61; vertebrae 11 or 12 + 18–21 = 30–32 (usually 11 + 20 = 31).

Lateral profile of body with slight, convexly curved taper to moderately slender caudal peduncle, caudal peduncle depth 5.8–6.2% SL. Head of moderate size (Fig. 2A, B), length 35.1–39.8% SL. Snout moderately elongate, dorsal profile slightly concave in front of eye with 45° incline; corner of mouth just anterior to vertical through anterior edge of orbit; eye of moderately size, orbital diameter 9.2–11.2% SL; interorbit of moderate width, width 6.2–7.6% SL, and depth, 1.2–2.2% SL; anterior edge of rostrum with broad obtuse angle to nearly straight when viewed from above, corners sometimes produced into slightly trapezoidal bases for prominently but not often greatly enlarged, anteriorly to slightly anterolaterally directed flattened sword-like apical spine, anterior edge of rostral bases sometimes with several additional much smaller teeth, lateral edge with slightly enlarged denticles; small diamond-shaped naked space immediately posterior to middle of rostral edge reaching about one-fifth of way to orbits. Surface of head mostly smooth with fine vermiculations; two very small to obsolete preocular spines; postocular spines small or absent, sometimes with slightly larger spine mesially; deep postorbital groove not extending mesially past mesial side of raised superorbital bone at rear of interorbital space. Posttemporal and opercular spines moderately short preceded by barely raised ridge; cleithral spine moderately short preceded by low ridge; preopercular spine blunt to obsolete preceded by extremely low to obsolete

preopercular ridge; sphenotic and parietal crests low to very low, sphenotic crest directed laterally. Ventral preopercular angle varying from broadly obtuse to nearly 90°. Scales moderately adherent; moderately small; scales on dorsal half of sides finely ctenoid, others cycloid; predorsal scaled with 5 or 6 scales on dorsal midline; prepelvic and interpelvic naked; belly fully scaled; scales above lateral line 3; scales below lateral line 13–15; lateral line scales much larger than adjacent scales with about 6 or 7 tubular branches; base of dorsal fins with 23, infrequently 24, bucklers, last 19–21 with sickle-like spines, first few rugose dorsally, periphery of third or fourth serrated. First to fourth dorsal fin spines with extremely finely serrate leading edge; second slightly longer than first, about subequal to third. Caudal fin truncate. Pectoral fin reaching to about sixth to tenth anal fin ray, fifth ray longest; first free pectoral fin ray reaching well short of pectoral fin tip, reaching tip of pelvic fin; pelvic fin reaching second anal fin ray. Maximum length of specimens examined 119 mm SL; largest specimen reported in literature 125 mm SL (Richards & Saksena, 1977: 216).

Fresh colouration. Dorsal half of body and head pinkish mottled with orange, underside of head and lower half of sides white; first dorsal fin orange-pink with elongate red spot covering distal three quarters between third and seventh spines, outer half of second dorsal fin orange, white basally; anal fin white; distal half and base of caudal fin reddish orange separated by whitish transverse band, posterior margin broadly pink; pelvic fins pinkish to white (Fig. 1A). Inner surface of pectoral fin with large black oval spot covering all but dorso-distal third of fin to margin, black area variously dotted with moderately small pale blue spots, narrow pale reddish dorsal and ventral margins basally (Fig. 3A, B); outer surface mostly white with pinkish orange dorsal and ventral margins.

Pigmentation of preserved specimens. Head and body pale. Inner surface of pectoral fin dark to distal margin, dorsal and basal edges narrowly pale, ventral margin below seventh ray pale. Other fins pale.

Etymology. Initially proposed as a varietal name, *longipinnis* is an amalgamation of the Latin “*longus*” for long and “*pinna*” for fin, in reference to the longer pectoral fin that was considered by Alcock (1890) to distinguish what is now recognised as a distinct species from *L. spiloptera* Günther, 1860.

Distribution. Confined to coastal waters of the northern Indian Ocean, from at least Bombay, India to just south of the equator off the west coast of Sumatra, Indonesia (Fig. 4) at depths of 70 to at least 107 m.

Remarks. In reporting new shore fishes from the Bay of Bengal, Alcock (1890) commented on a specimen that agreed with Günther’s (1880) description of *Lepidotrigla spiloptera* in all but the greater length of its pectoral fin, which reached the ninth anal ray. Günther’s type specimen of *L. spiloptera* was collected by H.M.S. CHALLENGER in the Kai Islands in southeastern Indonesia. Alcock offered a new varietal name

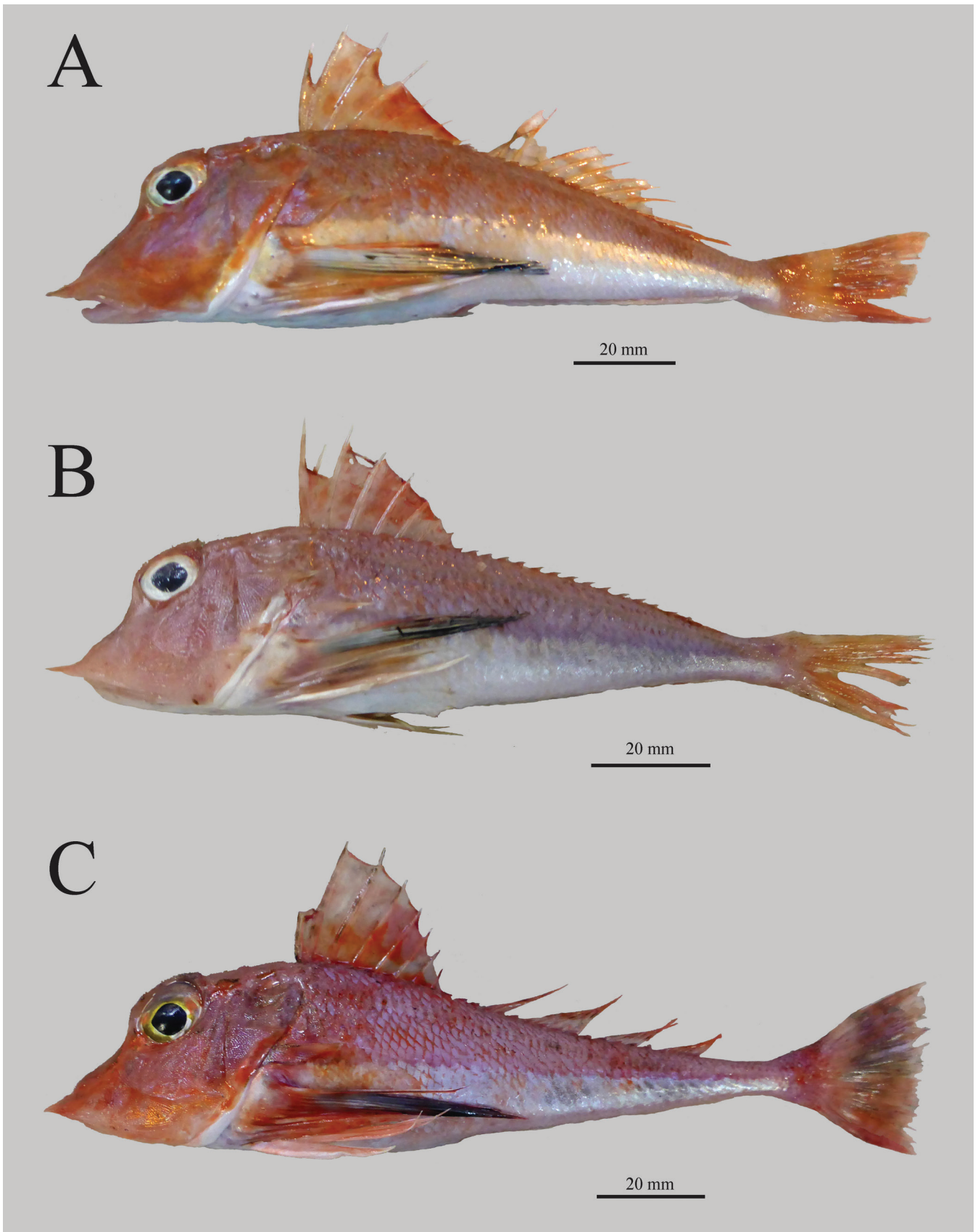


Fig. 1. Myanmar species of *Lepidotrigla*. A, *Lepidotrigla longipinnis*, NMV A31696-001, 121 mm SL, Myanmar, off Ayeyarwady Delta, 14°22.28'N, 96°33.85'E, 111–104 m; B, *Lepidotrigla omanensis*, NMV A31691-001, 110 mm SL, Myanmar, off Ayeyarwady Delta, 14°14.73'N, 95°45.47'E, 149–164 m; C, *Lepidotrigla psolokerkos* new species, holotype, NMV A31698-001, 135 mm SL, Myanmar, off Ayeyarwady Delta, 14°1.96'N, 96°9.21'E, 147–156 m.

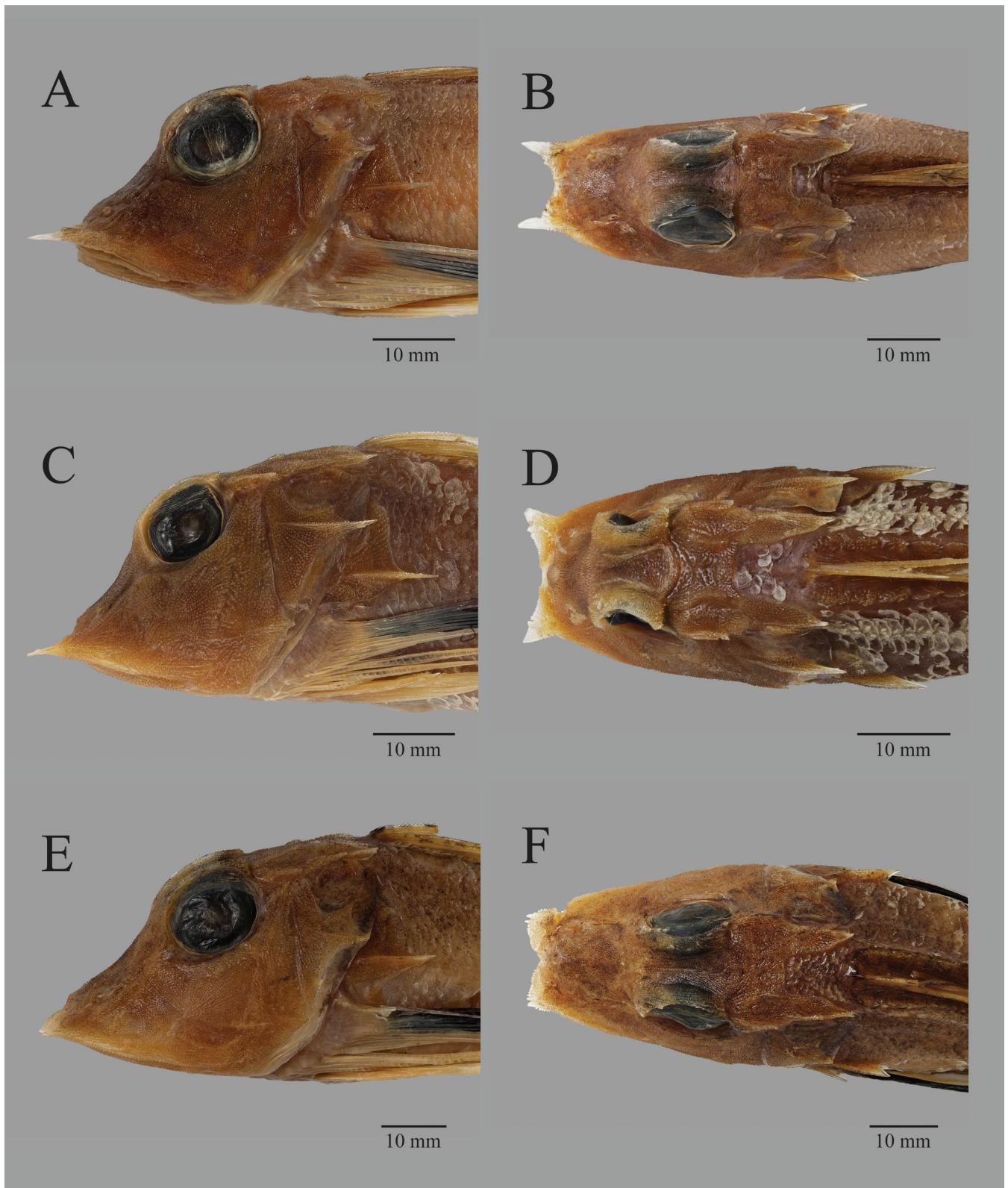


Fig. 2. Lateral and dorsal views of heads of Myanmar species of *Lepidotrigla*. *Lepidotrigla longipinnis*, A & B, NMV A31695-001, 111 mm SL, Myanmar, off Ayeyarwady Delta, 14°22.28'N, 96°33.85'E, 111–104 m; *Lepidotrigla omanensis*, C & D, NMV A31691-001, 110 mm SL, Myanmar, off Ayeyarwady Delta, 14°14.73'N, 95°45.47'E, 149–164 m; E & F, *Lepidotrigla psolokerkos* new species, holotype, NMV A31698-001, 132 mm SL, Myanmar, off Ayeyarwady Delta, 14°1.96'N, 96°9.21'E, 147–156 m. Photographs by T. Hicks.

longipinnis for his specimen and in a subsequent publication (Alcock, 1899: 68) provided additional information about the collection locality for it and four other specimens: “off Ganjam coast, 18 fathoms, Gulf of Martaban, 67 fathoms, Andaman Sea, 55 fathoms, off Malabar coast, 68 to 148 fathoms and 100 fathoms”. The fish was figured by Alcock & McArdle (1900: plate 31) in a compendium of illustrations of deep-sea fishes collected by the survey vessel Investigator. Richards & Saksena (1977) regarded the taxon as a valid species distinct from *L. spiloptera*, but mistakenly thought the name was preoccupied by *Lepidotrigla longispinis* Steindachner & Doderlein, 1887, probably following Fowler (1938: 107), and proposed a replacement name *Lepidotrigla riggsi* for it. Fischer & Bianchi (1984) followed Richards & Saksena (1977) and included the species as *L. riggsi* in the Western Indian Ocean FAO regional guide; Manilo & Bogorodsky (2003: S103) recognised the error and treated the species as *Lepidotrigla longipinnis* in a study of Arabian Sea fishes. The validity of the name is further supported by Eschmeyer et al. (2017).

In addition to its slightly longer pectoral fins, *L. longipinnis* is distinguishable from *L. spiloptera* most noticeably in having more prominent anteriorly directed spines at the corners of the rostrum and pale blue spots on the inner surface of the pectoral fins that are confined to the oblong black area of the fin, the latter species having smaller spines that are slightly splayed at the rostral corners and pale blue to white spots scattered across the entire inner surface of the fin. Both resemble *Lepidotrigla kishinouyei* Snyder, 1911 and *Lepidotrigla punctipectoralis* Fowler, 1938, in having numerous pale spots on the inner surface of the pectoral fin. The fin of the last two species reaches to between about the fourth and sixth anal fin rays, as it appears to in *L. spiloptera*, and the three have somewhat similar rostral spine development. In *L. punctipectoralis*, the inner surface of the pectoral fin has white spots clustered on and around a black oblong patch on the basal half of the fin centrally and pale blue margined white spots arranged in curved rows distal to it, as well as a moderately broad pale blue margin distally, while the pale blue spots on the fin of *L. kishinouyei* are confined like *L. longipinnis* to the black oblong patch. The numbers and positions of the blue spots in *L. longipinnis* vary considerably between individuals with no apparent concordance with size. Images of the two extremes observed in the specimens examined are reproduced as Fig. 3A and B.

In their description of *L. longipinnis* (as *L. riggsi*), Richards & Saksena (1977: 216, Table 4) gave the numbers of oblique scale rows below the lateral line as 16–19 while our specimens have only 13–15.

In an ongoing genetic study of *Lepidotrigla* species, a comparison of CO1 sequences from two of the six specimens of *L. longipinnis* collected off Myanmar revealed no significant difference. The sequences of the two are more similar to those of species with long pectoral fins, like *L. japonica* (Bleeker, 1854) and *L. callodactyla* Ogilby, 1910 than to *L. spiloptera*.

Material examined. (8: 64.1–117 mm SL.) HUMZ 190741 (104 mm SL) eastern Indian Ocean, Indonesia, off west coast of Sumatra, 1°07'37"S, 98°27'54"E – 1°08'18"S, 98°28'24"E, 170–100 m, 3 October 2004; HUMZ 190742 (83.0 mm SL) same collection data as HUMZ 190741; NMV A31692-001 (64.1 mm SL) Myanmar, off Rakhine coast, 19°35.69'N, 92°46.12'E, 92–93 m, R/V DR. FRIDTJOF NANSEN, stn 5, bottom trawl, 1 May 2015, collected by P.N. Psomadakis; NMV A31693-001 (105 mm SL), Myanmar, off Ayeyarwady Delta, 15°10.42'N, 93°47.63'E, 80 m, R/V DR. FRIDTJOF NANSEN, stn 61, bottom trawl, 9 May 2015, collected by P.N. Psomadakis; NMV A31694-001 (94.0 mm SL), Myanmar, off Ayeyarwady Delta, 14°14.94'N, 94°42.37'E, 105 m, R/V DR. FRIDTJOF NANSEN, stn 78, bottom trawl, 12 May 2015, collected by P.N. Psomadakis; NMV A31695-001 (106 mm SL), Myanmar, off Ayeyarwady Delta, 14°22.28'N, 96°33.85'E, 111–104 m, R/V DR. FRIDTJOF NANSEN, stn 102, bottom trawl, 16 May 2015, collected by P.N. Psomadakis; NMV A31696-001 (117 mm SL) same collection data as NMV A31695-001; NMV A31697-001 (108 mm SL), Myanmar, off Tanintharyi coast, 12°22.33'N, 97°13.17'E, 97–101 m, R/V DR. FRIDTJOF NANSEN, stn 138, bottom trawl, 23 May 2015, collected by P.N. Psomadakis.

***Lepidotrigla omanensis* Regan, 1905** **Vernacular: Oman Gurnard**

(Figs 1B, 2C, D, 3C, 4, Table 1)

Lepidotrigla omanensis Regan, 1905: 324, pl. 2(B) (fig. 2) (new species); Norman, 1939: 96; Blegvad & Løppenthin, 1944: 194 (list, diagnosis, distribution); Richards & Saksena, 1977: 208 (diagnosis and distribution); Fischer & Bianchi, 1984: vol. V, unpaginated (taxonomy, fisheries and distribution); Richards, 1992: 50 (nominal species, selected characters); Eschmeyer et al., 2017: accessed 4 Sep 2017 (catalogue of nominal species).

Diagnosis. Lateral profile of body with gradual convexly curved taper to caudal peduncle; distinctive postorbital notch above and behind each eye and occipital groove across top of head; rostral process with broad medial notch when viewed from above and moderately sized divergent blade-like spine at each corner; lateral line with 55–58 pored scales; 12 or 13 oblique scale rows below lateral line; first dorsal fin with 8 spines, second with 14 or 15 rays; anal fin with 14 or 15 rays; pectoral fins reaching fifth to seventh anal fin ray. Caudal fin mostly red with whitish base; inner surface of pectoral fin with narrow, oblique pale blue band separating black lower and black with dark olive tint upper sections, ventral margin broadly whitish tinged with pink.

Description. (see Table 1 for additional comparative morphometric characters). Dorsal fin VIII, 14 or 15; anal fin 14 or 15; pectoral fin 11 + 3; pelvic fin 6; lateral line 55–58; vertebrae 11 or 12 + 18–20 = 30 or 31.

Lateral profile of body with slight convexly curved taper to moderately slender caudal peduncle, caudal peduncle depth 5.1–6.5% SL. Head of moderate size (Fig. 2C, D), length 38.5–42.9% SL. Snout moderately short, dorsal profile

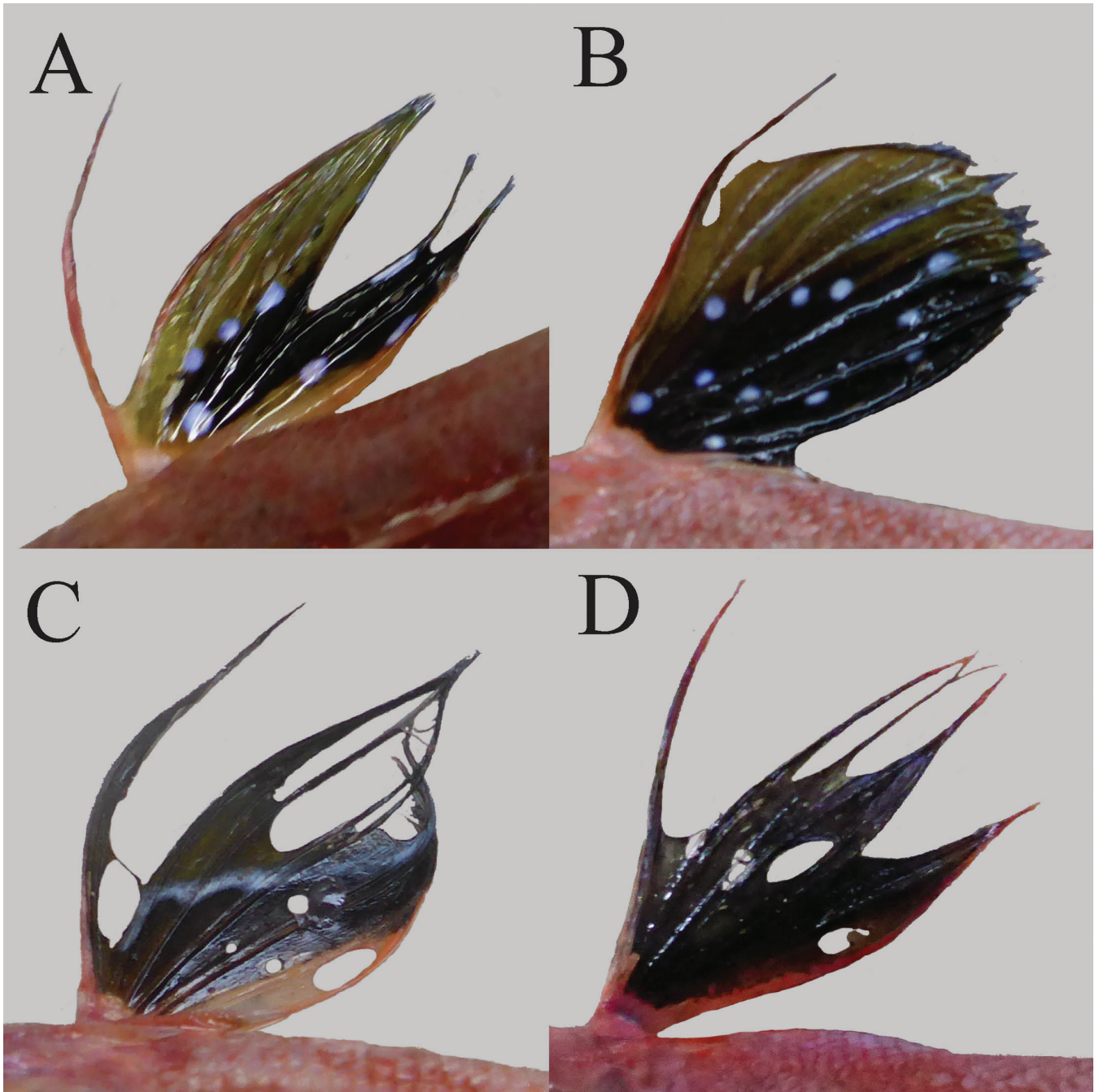


Fig. 3. Inner surface of right pectoral fin (fins damaged during capture). *Lepidotrigla longipinnis*. A, NMV A31695-001, 111 mm SL, Myanmar, off Ayeyarwady Delta, 14°22.28'N, 96°33.85'E, 111–104 m; B, NMV A31694-001, 100 mm SL, Myanmar, off Ayeyarwady Delta, 14°14.94'N, 94°42.37'E, 105 m. *Lepidotrigla omanensis*. C, NMV A31688-001, 76.3 mm SL, Myanmar, off Rakhine coast, 17°6.54'N, 94°14.71'E, 77 m. *Lepidotrigla psolokerkos* new species. D, holotype, NMV A31698-001, 132 mm SL, Myanmar, off Ayeyarwady Delta, 14°1.96'N, 96°9.21'E, 147–156 m.

almost straight with steep incline; corner of mouth distinctly posterior to vertical through anterior edge of orbit; eye of moderate size, orbital diameter 10.1–11.5% SL; interorbit of moderate width, 8.4–10.0% SL, and depth, 1.4–2.8% SL; rostrum concave medially or with very broad obtuse angle when viewed from above, corners more or less produced into diverging trapezoidal bases for slightly but distinctly enlarged anterolaterally directed flattened apical spine, anterior edge of rostral bases with cylindrical to flattened spines decreasing in length mesially, spines adjacent to each other or separated, occasionally splayed; denticles present on lateral edge of rostral lobes; broad diamond-shaped naked

space immediately posterior to middle of rostral edge reaching about one-third of way to orbits. Surface of head slightly rough from vermiculated detail; two small to moderately small preocular spines; postocular spines small; deep postorbital groove extending mesially as shallow continuous depression across rear of interorbital space following V-shaped suture between frontals and parasphenoids; posttemporal, opercular and cleithral spines slender, short or of moderate length, but pungent, opercular and cleithral spines preceded by distinct ridge of moderate depth; preopercular spine very small but distinct, preceded by very low to obsolete ridge; sphenotic and parietal crests very low, but present, sphenotic crest directed

laterally; ventral preopercular corner forming obtuse to right angle. Scales adherent, of moderate size; scales on dorsal half of sides finely ctenoid, others cycloid; predorsal scaled with 4–6 scales on dorsal midline; prepelvic and interpelvic naked; belly fully scaled; scales above lateral line 3; scales below lateral line 12 or 13; lateral line scales large with about five or six tubular branches; base of dorsal fins with 22, infrequently 23, bucklers, last 19 or 20 with sickle-like spines, first three fused and rugose dorsally, periphery of third and fourth serrate. First three dorsal fin spines with finely serrate leading edge, others smooth; second distinctly longer than first and slightly shorter than third. Caudal fin truncate. Pectoral fin reaching to about fifth to seventh anal fin ray, fifth ray longest; first free pectoral fin ray reaching well short of pectoral fin tip, reaching tip of pelvic fin; pelvic fin reaching first to third anal fin ray. Maximum length of specimens examined 125 mm SL, but reported by Richards (1992: 48) to reach 127 mm SL.

Fresh colouration. Head and upper half of body pink mottled with orange, underside of head white, lower third of sides white, orange and white separated by narrow grey stripe with irregular ventral margin on side; first dorsal fin pink with red spot covering distal three quarters between third and sixth spines, second dorsal pink; anal fin white; caudal fin pink with broad, more intense orange transverse band reaching to just beyond middle of fin; pelvic fins pinkish (Fig. 1B). Inner surface of pectoral fin black basally and black with dark olive green tint distally, areas divided by somewhat diagonal narrow pale blue band angled from near base dorsally toward distal margin ventrally; narrow dorsal and broader ventral margins of fin reddish near base (Fig. 3C); outer surface white to pale pink basally, ventrally and as narrow margin dorsally.

Pigmentation of preserved specimens. Head and body pale. Inner surface of pectoral fin dark to distal margin, dorsal edge with narrow pale margin, basal edge broadly pale and ventral margin below sixth ray pale; band visible in fresh material no longer apparent. Other fins pale.

Etymology. Regan's (1905) *omanensis* was named for the collecting locality "the Sea of Oman" for his three type specimens.

Distribution. Occurs in coastal waters of the northern Indian Ocean from the Gulf of Aden to the Andaman Sea off south-eastern Myanmar (Fig. 4) at depths of 41–335 m; apparently excluded from the Persian Gulf.

Remarks. Richards & Saksena (1977) and Richards (1992) summarised the morphological variations of a number of features in *L. omanensis* based on the examination of at least 346 specimens collected as far east as India. The species has a remarkable depth range spanning almost 400 m, but Myanmar specimens were only collected to just over 155 m despite trawling operations during the survey continuing to a depth of over 520 m. A comparison of the Myanmar material with two specimens from the Gulf of Aden collected at 258–326 m revealed differences in orbital diameter of

10.1–11.5 vs 11.1–13.1% SL respectively. The range in variation among the 306 specimens examined by Richards & Saksena (1977: Table 8), which did not include these specimens, ranged from 8.09–12.3% SL. Other features that differ between Myanmar material and the Gulf of Aden specimens include the preopercular spine nub-like or absent preceded by a barely apparent preopercular ridge versus spine sharp and well developed with low but distinct preopercular ridge, parietal crest well developed versus crest low or absent and both opercular and cleithral spines rather long versus cleithral spine considerably longer than a proportionally shorter opercular spine, respectively.

CO1 sequences for four of the seven specimens of *L. omanensis* collected off Myanmar cluster most closely with sequences of the eastern Australian *Lepidotrigla grandis* Ogilby, 1910 in a 36 species sequence dataset. The two are clearly distinct from each other morphologically. The sequences of Myanmar *L. omanensis* also match a sequence of an unidentified specimen of *Lepidotrigla* (GenBank: KR231809) collected at Kollam, Kerala, India (K.K. Bineesh, personal communication 22 September 2017). The voucher, which was unavailable for examination, is likely to be a specimen of *L. omanensis* collected within the species' previously recognised distribution (Richards & Saksena, 1977: 211).

Material examined. (9: 69.5–125 mm SL) NMV A9962 (2, 96.3–125 mm SL) Gulf of Aden, Somalia, near Ras Salbal, 10.861116°N, 43.94305°E, 258–326 m, 6 September 1986, M/V Beinta; NMV A31685-001 (76.0 mm SL) Myanmar, off Rakhine coast, 18°33.18'N, 93°33.82'E, 88–89 m, R/V DR. FRIDTJOF NANSEN, stn 16, bottom trawl, 3 May 2015, collected by P.N. Psomadakis; NMV A31686-001 (79.0 mm SL) same collection data as NMV A31685-001; NMV A31687-001 (69.5 mm SL) Myanmar, off Rakhine coast, 17°57.75'N, 93°51.29'E, 154–157 m, R/V DR. FRIDTJOF NANSEN, stn 25, bottom trawl, 4 May 2015, collected by P.N. Psomadakis; NMV A31688-001 (74.4 mm SL), Myanmar, off Rakhine coast, 17°6.54'N, 94°14.71'E, 77 m, R/V DR. FRIDTJOF NANSEN, stn 37, bottom trawl, 5 May 2015, collected by P.N. Psomadakis; NMV A31689-001 (88.6 mm SL) Myanmar, off Rakhine coast, 16°0.23'N, 93°41.18'E, 40–42 m, R/V DR. FRIDTJOF NANSEN, stn 50, bottom trawl, 7 May 2015, collected by P.N. Psomadakis; NMV A31690-001 (107 mm SL), Myanmar, off Ayeyarwady Delta, 14°14.73'N, 95°45.47'E, 149–164 m, R/V DR. FRIDTJOF NANSEN, stn 91, bottom trawl, 14 May 2015, collected by P.N. Psomadakis; NMV A31691-001 (98.7 mm SL) same collection data as NMV A31690-001.

***Lepidotrigla psolokerkos* new species**
Proposed vernacular: Skinny Gurnard

(Figs 1C, 2E, F, 3D, 4, Table 1)

Holotype. NMV A31698-001 (128 mm SL) Myanmar, off Ayeyarwady Delta, 14°1.96'N, 96°9.21'E, 147–156 m, R/V DR. FRIDTJOF NANSEN, stn 99, bottom trawl, 15 May 2015, collected by P.N. Psomadakis. **Paratype:** NMV

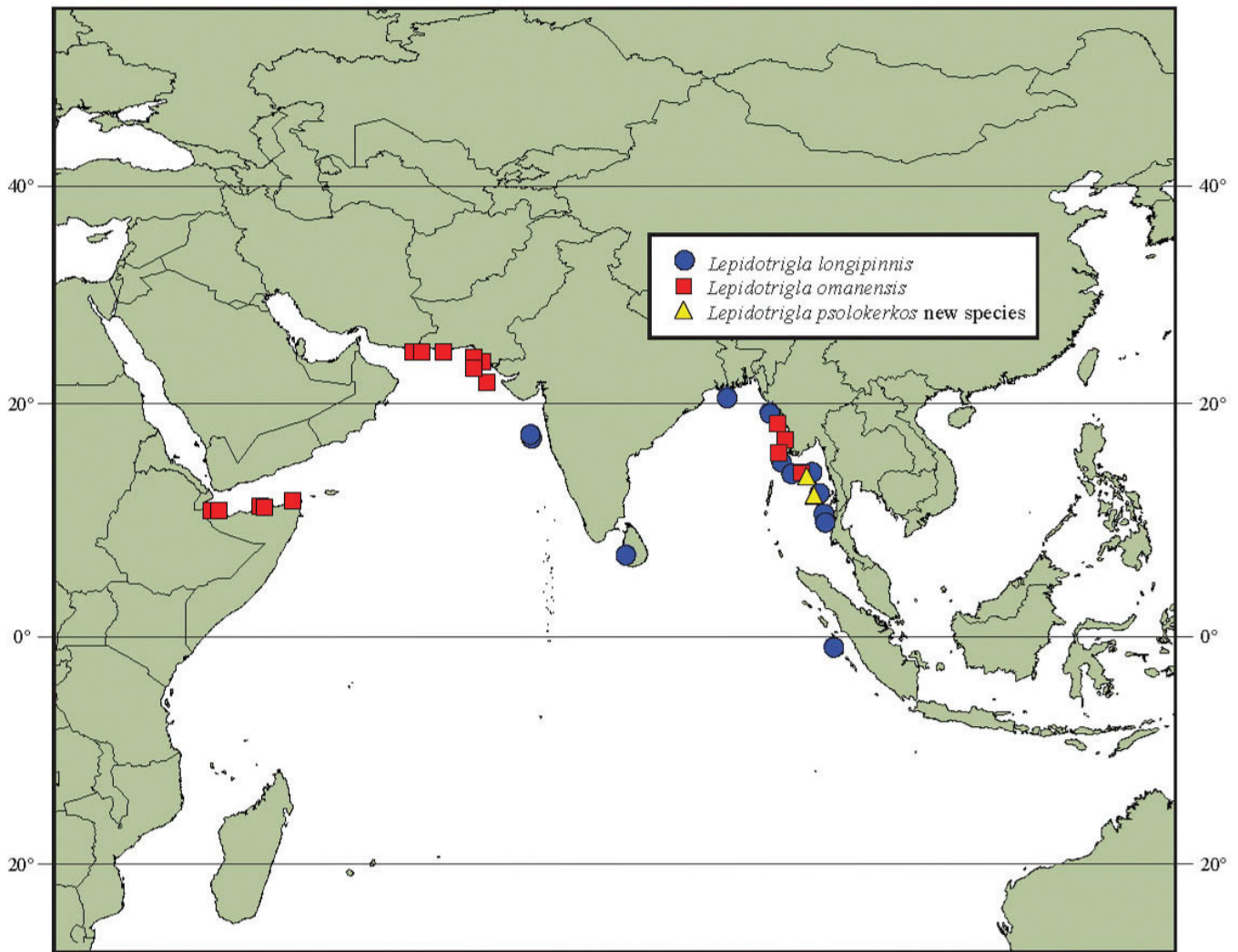


Fig. 4. Overall distributions of species of *Lepidotrigla* occurring in coastal waters of Myanmar based on specimens in collections: *Lepidotrigla longipinnis* (blue circles), *Lepidotrigla omanensis* (red squares) and *Lepidotrigla psolokerkos* new species (yellow triangles).

A31699-001 (142 mm SL) Myanmar, off Tanintharyi coast, 12°21.60'N, 96°51.47'E, 252–257 m, R/V DR. FRIDTJOF NANSEN, stn 136, bottom trawl, 23 May 2015, collected by P.N. Psomadakis.

Diagnosis. Lateral profile of body with straight taper to slender caudal peduncle; distinctive postorbital notch above and behind each eye but not extending across top of head as occipital groove; rostral process with broad medial notch edged with small spines becoming progressively longer to corner on each side when viewed from above; lateral line with 61 or 62 pored scales; about 15 or 16 scales below lateral line; first dorsal fin with 9 spines, second with 16 rays; anal fin with 15–17 rays; pectoral fins reaching about fourth anal fin ray. Upper two-thirds of caudal fin broadly grey distally, red below; inner surface of pectoral fin mostly black with red margin basally, ventrally and along narrow outer edge.

Description. (see Table 1 for additional comparative morphometric characters). Dorsal fin IX, 16; anal fin 17 (15); pectoral fin 11 + 3; pelvic fin 6; lateral line 61 (62); vertebrae 11 + 22 = 33 (11 + 21 = 32); gill rakers 1 rudiment on upper limb + 7 rakers and 3 rudiments on lower limb.

Lateral profile of body with straight taper from anterior part of first dorsal fin base to slender caudal peduncle, caudal peduncle depth 4.8 (4.2)% SL. Head moderately small (Fig. 2E, F), length 33.9 (33.0)% SL. Snout moderately elongate, dorsal profile concave with shallow incline slightly greater than 45°, corner of mouth just anterior to vertical through anterior edge of orbit; eye moderately large, orbital diameter 9.8 (9.0)% SL; interorbit of moderate width, 7.1 (6.3)% SL, and depth, 1.3 (1.1)% SL; rostrum with obtuse angular notch edged with numerous small incrementally longer teeth from center of each rounded rostral lobe to lateral corner when viewed from above, apical spine slightly but noticeably longer (less so in paratype), tiny spines present on lateral edge of rostral lobes; broad diamond-shaped naked space immediately posterior to middle of rostral edge reaching about one-third of way to orbits. Surface of head mostly smooth with fine detail; two or three moderately small but obvious anterior preocular spines, postocular spines very small to obsolete; shallow postorbital groove not extending mesially at rear of interorbital space past mesial side of raised superorbital bone. Posttemporal and opercular spines very short preceded by low ridge; cleithral spine moderately short, distinctly raised laterally as ridge; preopercular spine tiny to obsolete, preceded by low to very low but recognisable

ridge; sphenotic and parietal crests very low but present, sphenotic crest directed laterally; ventral preopercular angle broadly obtuse. Scales moderately adherent; moderately small; scales on dorsal half of sides finely ctenoid, others cycloid; predorsal scaled with 7 (6) scales on dorsal midline; prepelvic and interpelvic naked; belly fully scaled; scales above lateral line 3; scales below lateral line 16 (15); lateral line scales large with about five tubular branches; base of dorsal fins with 24 bucklers, last 20 or 21 with sickle-like spines, periphery of first three or four partially subdivided into 2–6 sharp points. First and second dorsal fin spines with strongly serrate leading edge, remaining spines smooth; second distinctly longer than first, slightly longer than third. Caudal fin truncate. Pectoral fin reaching to about fourth anal fin ray; fifth ray longest; first free pectoral fin ray reaching well short of pectoral fin tip, but to tip of pelvic fin; second and third rays progressively and distinctly shorter; pelvic fin reaching anal fin origin. Maximum length based on specimens examined 142 mm SL.

Fresh colouration. Head and body above lateral midline red, underside of head orange, lower half of sides white; irregular row of small dark spots on spiny plates along bases of second dorsal fin; first dorsal fin dirty pink with large red spot covering distal three-fourths between fourth and sixth spines; distal three-fourths of second dorsal reddish, white basally; anal fin white; caudal fin dirty pink with broad orange band covering distal two-thirds, upper half of that band grey; pelvic fins reddish (Fig. 1C). Inner surface of pectoral fin black with fine reddish margin dorsally, distally and ventrally (Fig. 3D); outer surface blackish with reddish basal and ventral margins.

Pigmentation of preserved specimens. Head and body mostly pale; dorsal scale pockets with slightly darker edges; small darker spots at bases of first, fourth, eighth, tenth, twelfth, and last ray of second dorsal fin; first three dorsal fin spines with about three dark dusky evenly spaced blotches; second dorsal fin rays with one or two dusky spots. Upper two-thirds of distal half of caudal fin rather dark. Inner surface of pectoral fin mostly dark, except for rather narrow pale base, broad pale margin below seventh ray and narrow pale outer edge.

Etymology. The name *psolokerkos* is a conjunction of the Greek *psolos* for “dirt” and “*kerkos*” for tail in reference to the distinctive grey blotch dorsoposteriorly on the caudal fin of this species.

Distribution. Known only from the two type specimens collected in the Andaman Sea off south-eastern Myanmar (Fig. 4) at depths of 151–255 m.

Remarks. The new species is distinctive in having a rapidly tapering body, the dorsal profile of which descends in a straight taper from about the middle of the first dorsal fin base to the slender caudal peduncle, as well as a dusky patch distally on the upper half of the caudal fin. Although not unique, the dusky pattern on the caudal fin is rare for species of the genus. Among Indian Ocean species, *Lepidotrigla*

psolokerkos new species most closely resembles *Lepidotrigla alcocki* Regan, 1908 and an apparently undescribed species occurring off the southern coast of Java, with which it shares a similar profile. The new species differs from *L. alcocki* in having a series of anteriorly directed tiny to small contiguous spines increasing in length to the anterolateral corner of each rostral lobe (Fig. 2F) versus four to six subequal, moderately small spines individually splayed perpendicularly forward from the leading edge of each of the rounded rostral lobes (similar to *L. faueri* in Richards & Saksena, 1977: Fig. 5 and *L. longifasciata* in Yatou, 1981: Fig. 2A), fewer oblique scale rows between the anal fin origin and the lateral line, 15 or 16 versus 20–25 (Richards & Saksena, 1977: 220), and much broader distal, basal and ventral pale margins on the inner surface of the pectoral fin and a narrower red marginal band on the second dorsal fin (photos, T. Kawai, personal communication). In his description of the Japanese *L. longifasciata*, Yatou (1981: 265) stated that the inner surface of the pectoral fin of *L. alcocki* is crossed by a broken oblique white stripe on a blackish background, which differs from the solid black inner surface of the pectoral fin of *L. psolokerkos*. Based on the few specimens of both species available, *L. psolokerkos* also appears to differ from *L. alcocki* in having a broader interorbital, 6.3–7.1 vers 4.5% SL, longer first dorsal fin spines, the length of the second dorsal fin spine 19.0–20.4 versus 14.7–15.8% SL and the upper free pectoral fin ray reaching in contrast to not reaching the tip of the pelvic fin, respectively.

In the afore-mentioned genetic study of *Lepidotrigla* species, a CO1 sequence from the paratype of *L. psolokerkos* closely resembles those of the Japanese species *L. guentheri* Hilgendorf, 1879. The two species differ morphologically by the relatively longer second dorsal fin spine of *L. guentheri*, the colour pattern of the inner surface of the pectoral fins, which are greenish overall except for an oval black blotch posterobasally superimposed with irregular blue markings in *L. guentheri* rather than blackish overall and the caudal colouration in which the fin is crossed basally and distally by broad red bands without the dusky blotch dorsoposteriorly characteristic of *L. psolokerkos*.

Comparative material. *Lepidotrigla alcocki* NMV A9964 (112 mm SL) Indian Ocean, Mascarene Ridge, 11°08'S, 62°16'E, 235–239 m, R/V Professor Mesiatzev, TR 476, 7 October 1977.

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