

Emmelichthys marisrubri, a new rover from the southern Red Sea (Teleostei: Emmelichthyidae)

by

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Abstract. – *Emmelichthys marisrubri* sp. nov. is described from three specimens, which were trawled off Eritrea in the southern Red Sea. The species is characterised by the spinous and soft-rayed portions of dorsal fin separated by a gap containing four short isolated spines, which are protruding over the dorsal surface of the body; depth of body 16.5–20.2% SL; lateral-line scales 80–83; dorsal-fin spines 12–13; dorsal-fin soft rays 8; pectoral-fin rays 18–20, total gill rakers 26–31. A revised key to the species of *Emmelichthys* is presented.

Résumé. – *Emmelichthys marisrubri* (Teleostei: Emmelichthyidae), une nouvelle espèce du sud de la mer Rouge.

Emmelichthys marisrubri sp. nov. est décrite à partir de trois échantillons qui ont été pêchés au large de l'Érythrée, dans le sud de la mer Rouge. L'espèce est caractérisée par une nageoire dorsale dont les parties épineuses et rayonnées sont séparées par un espace qui contient quatre épines courtes et isolées, saillantes à la surface dorsale du corps ; une hauteur du corps égale à 16,5–20,2% de la longueur standard ; 80–83 écailles sur la ligne latérale ; 12–13 épines et huit rayons à la nageoire dorsale ; 18–20 rayons à la nageoire pectorale ; 26–31 branchiosteges. Une clé actualisée des espèces du genre *Emmelichthys* est présentée.

Key words

Emmelichthyidae
Emmelichthys marisrubri
Red Sea
Systematics
New species

The rover family Emmelichthyidae is a group of fishes living in marine waters of all oceans between 40°N and S. They are found on soft bottom at depths of 100–400 m; they

probably all feed on larger zooplankton (Heemstra and Randall, 1977).

The family Emmelichthyidae was first described by Jordan (1923), according to Laan *et al.* (2013). Schultz (1945) revised the Emmelichthyidae and included several genera previously attributed to Maenidae, Centranchidae, Dipterygonotidae etc., but Heemstra and Randall (1977) restricted the family to the three genera *Emmelichthys*, *Erythrocles* and *Plagiogeneion*, with a total of 11 species-group taxa, while Nelson (2006) distinguished 15 valid species, and Eschmeyer and Fong (2013) listed 16 species. The family is now characterised by the following combination of characters (Nelson, 2006): jaws toothless or nearly so, very protractile; maxilla expanded distally, scaled, and not covered by preorbital bone when mouth closed; supramaxilla well developed; rostral cartilage large; dorsal fin with XI–XIV spines and 9–12 soft rays; anal fin with III spines and 9–11 soft rays; caudal fin forked, with the two lobes folding in scissor-like fashion; seven branchiostegal rays; 24 vertebrae (10 + 14).

Within the family, the three genera are mainly distinguished by the shape of the dorsal fin (Nelson, 2006): dorsal fin continuous but with slight notch (*Plagiogeneion*), divided to base (*Erythrocles*), or with an apparent gap with intervening isolated short spines visible or not (*Emmelichthys*). The genus *Emmelichthys*, as revised by Heemstra and Randall (1977), contained five species-group taxa: *E. nitidus* with two subspecies: *E. nitidus* Richardson, 1845 from the southern Indo-West Pacific and *E. nitidus cyanescens* (Guichenot, 1848) from the southeastern Pacific; *E. karnellai* Heemstra & Randall, 1977 from the western and southern Pacific; *E. ruber* (Trunov, 1976) from the central Atlantic; *E. struhsakeri* Heemstra & Randall, 1977 from the western Pacific. Subsequently, Kotlyar (1982) described *E. elongatus*, fifth species of the genus, from the Nazca Ridge, southeastern Pacific. *Emmelichthys nitidus cyanescens* is elevated to species level in the present paper on the basis of a different count of lateral-line scales, raising the species number in the genus to six.

In 1957, three specimens were trawled during an Israeli southern Red Sea expedition by Adam Ben-Tuvia and initially identified as ariommatids. During a recent re-examination of the material, it was discovered that they were misidentified, and rather represent an unknown species of the genus *Emmelichthys*, which is described in the present paper.

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METHODS AND MATERIALS

Methods follow Heemstra and Randall (1977). The standard length is abbreviated as SL. In the description, values of holotype are given first, followed by those of the paratype, in parentheses. The genus and species classification follows Eschmeyer (2013), unless otherwise noted; references follow Fricke (2013). Subspecies are not recognised in the present paper (following the method of Fricke *et al.*, 2007); former subspecific taxa are either considered as valid species or synonymised, in order to fulfil the needs of conservation as subspecific names have previously caused much confusion. The museum abbreviations follow Fricke and Eschmeyer (2013).

Emmelichthys marisrubri new species

(Figs 1, 2)

Material

Holotype. - HUJF 5132 (74.4 mm SL), Eritrea, Red Sea, Adam Ben-Tuvia, trawl, 1 Dec. 1957.

Paratypes. - HUJF 20199, 1 specimen (69.8 mm SL), and USNM 410584, 1 specimen (69.6 mm SL), same data as the holotype.

Diagnosis

A species of *Emmelichthys* with spinous and soft-rayed portions of dorsal fin separated by a gap containing 4 or 5 short isolated spines, which are protruding over the dorsal surface of the body; dorsal-fin spines XII or XIII, dorsal-fin soft rays 8; pectoral-fin rays 18-20; lateral-line scales 80-83; total gill rakers 26-31; depth of body 16.5-20.2% SL.

Description

Meristics and morphometrics are given in table I. Characters stated in the diagnosis are not repeated.

Dorsal fin with XII (XIII) spines and 8 (8) soft rays; anterior 8 (8) spines connected by membrane, but penultimate 4 (5) with a short membrane behind each spine, not connected to following spines; membrane of last spine connected to first soft ray. Anal fin with III spines and 10 (11) soft rays. Last dorsal and anal rays not prolonged. Pectoral-fin rays 18 (18, 20), all but upper two and lowermost ray branched; length of uppermost ray three-fifths that of adjoining ray.

Body and head, except for a narrow median dorsal region next to upper lip, completely covered with ctenoid scales; 7 (8, 9) scales from middle of spinous dorsal fin to lateral line; 80 (81, 83) pored lateral-line scales; 8 (8, 9) scales from dorsal-fin origin, and 16 (17, 18) from anal-fin origin, to lateral line; 5 (5, 6) oblique rows of scales on maxilla; 30 (30, 32) circum-peduncular scales. Soft dorsal and anal fins with scaly sheath at base, broadening on last few rays to nearly

full length of rays; no scales on spinous dorsal fin or above basal sheath of soft dorsal and anal fins; pectoral fins scaled basally for 1/8 of the length; ventral side of pelvic fin rays with two rows of small scales; caudal fin with small scales on median basal fleshy part and proximally on rays.

Body depth 5.0 (5.5-6.0), head length 3.5 (3.5, 3.6) in SL; body depth/width = 1.8 (1.5, 1.7); orbit 3.5 (4.1) in head length, greater than snout length and interorbital width. Nostrils small, subequal, about two nostril diameters apart; anterior nostril with a small flap on rear margin not reaching posterior nostril. Maxilla reaching or almost reaching vertical at front edge of orbit. Rear edge of opercle with 2 flat spines. No teeth on vomer or palatines; a few tiny teeth in one row at front of jaws, those of upper jaw extremely small or absent. Gill-rakers 10 + 21 (8 or 9 + 18 or 20); longest gill-raker shorter than longest gill filament.

Pectoral fins reaching to vertical at tips of pelvic fins; pelvic fins short, reaching slightly less than 1/2 distance from their origin to anus; pelvic fin origin slightly posterior to base of pectorals, but anterior to dorsal-fin origin. Anal-fin origin anterior to vertical at first soft dorsal-fin ray. No fin rays produced. Anus well in advance of anal-fin origin; distance from anus to anal-fin origin about 1/2 orbit diameter.

Colouration in preservative (see Fig. 1). Head and body uniformly brownish, eye dark gray.

Distribution

Southern Red Sea (Eritrea). The new species is known only from the type series.

Etymology

Mare (Latin) means Sea, *ruber* (Latin) means red; *Mare ruber* is the Latin name of the Red Sea. The name of the new species refers to the distribution in the Red Sea.

Comparison

Emmelichthys marisrubri differs from *E. cyanescens* and *E. nitidus* in its 8 dorsal-fin spines which are connected by a membrane (9 or 10 in *E. cyanescens* and *E. nitidus*), 4 or 5 free posterior dorsal-fin spines (2 or 3 in *E. cyanescens* and *E. nitidus*), 8 dorsal-fin soft rays (9 or 10 in *E. cyanescens*, 9-11 in *E. nitidus*), 18-20 pectoral-fin rays (22 in *E. cyanescens*), 26-31 total gill rakers (39-42 in *E. cyanescens*, 37-43 in *E. nitidus*), and 80-83 lateral-line scales (87-98 in *E. nitidus*, 100-105 in *E. cyanescens*); it is distinguished from *E. elongatus* by 4 or 5 free posterior dorsal-fin spines (3 in *E. elongatus*), 8 dorsal-fin soft rays (9 or 10 in *E. elongatus*), 26-31 total gill rakers (34-38 in *E. elongatus*), 80-83 lateral-line scales (61-68 in *E. elongatus*), and the orbit diameter 3.5-4.1 in head length (2.8-3.1 in *E. elongatus*); it differs from *E. karnellai* in its protruding posterior dorsal-fin spines (embedded in *E. karnellai*), 8 dorsal-fin soft rays (10 or 11 in *E. karnellai*), 18-20 pectoral-fin rays (21-23 in

Table I. - Meristics and morphometrics of the holotype and paratypes of *Emmelichthys marisrubri* sp. nov.

	<i>Emmelichthys marisrubri</i> Holotype HUJF 5132	<i>Emmelichthys marisrubri</i> Paratype (Specimen 1) HUJF 20199	<i>Emmelichthys marisrubri</i> Paratype (Specimen 2) USNM 410584
Standard length (mm)	74.4	69.8	69.6
Head length (mm)	21.4	19.5	20.0
Counts			
Dorsal-fin spines	XII	XIII	XIII
Dorsal-fin spines connected by a membrane	8	8	8
Dorsal-fin rays	8	8	8
Pectoral-fin rays	18	18	19-20
Anal-fin rays	III, 10	III, 11	III, 11
Gill rakers (total)	31	26	29
Lateral line scales	80	81	83
Measurements (first as percentage of standard length, second as percentage of head length)			
Predorsal 1 length	39.4, 136.9	36.8, 131.8	36.6, 127.5
Predorsal 2 length	68.3, 237.4	67.6, 242.1	69.5, 242.0
Preanal length	64.9, 225.7	62.8, 224.6	61.5, 214.0
Head length	28.8, 100	27.9, 100	28.7, 100
Snout length	8.2, 28.5	6.9, 24.6	7.5, 26.0
Postorbital length	13.3, 46.3	13.2, 47.2	11.6, 40.5
Upper-jaw length	10.6, 36.9	12.0, 43.1	10.6, 37.0
Body depth	20.2, 66.8	16.5, 59.0	18.2, 63.5
Body width	11.3, 39.2	10.7, 38.4	10.6, 37.0
First dorsal-spine length	14.2, 49.5	15.5, 55.4	15.4, 53.5
First dorsal-ray length	9.5, 33.2	9.1, 32.8	8.6, 30.0
Pectoral-fin length	17.3, 60.3	14.8+, 52.8+	15.2, 53.0
Pelvic-fin length	13.7, 47.7	14.0, 50.3	14.2, 49.5
Caudal peduncle length	19.4, 67.3	16.8, 60.0	18.8, 65.5
Caudal peduncle depth	8.1, 28.0	8.0, 28.7	7.9, 27.5
Eye diameter (bony)	8.2, 28.5	6.7, 24.1	7.0, 24.5
Bony interorbital	6.4, 22.4	6.0, 21.5	5.5, 19.0



Figure 1. - *Emmelichthys marisrubri* new species, Eritrea (holotype, HUJF 5132). Photograph: D. Golani.

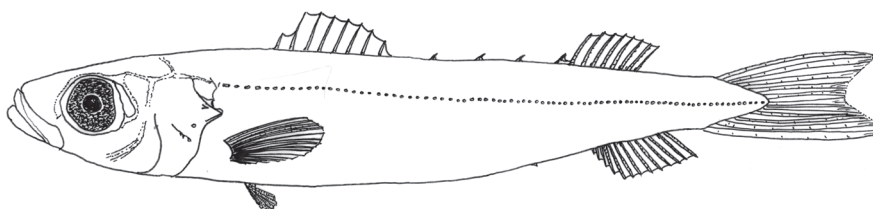


Figure 2. - *Emmelichthys marisrubri* new species, Eritrea (holotype, HUJF 5132). Drawing of lateral view, left side.

Table II. - Comparison of meristics and morphometrics of the species of the genus *Emmelichthys* (differences to the values of the new species are in bold.)

	<i>E. marisrubri</i> sp. nov.	<i>E. cyanescens</i>	<i>E. elongatus</i>	<i>E. karnellai</i>	<i>E. nitidus</i>	<i>E. ruber</i>	<i>E. struhsakeri</i>
Dorsal-fin spines	12-13	13-14	12	12-13	13-14	12-13	11-12
Dorsal-fin spines connected by a membrane	VIII	IX-X	VIII	VIII-IX	IX-X	VII-IX	VIII-X
Free posterior dorsal-fin spines	4-5, protruding	2-3 , protruding	3 , protruding	4-5, embedded	2-3 , protruding	3-5, embedded	1-3 , protruding
Dorsal-fin rays	8	9-10	9-10	10-11	9-11	9-11	10-12
Pectoral-fin rays	18-20	22	18-20	21-23	20-23	19-20	19-21
Anal-fin rays	III, 10-11	III, 10	III, 9-10	III, 9-10	III, 9-10	III, 9-10	III, 9-10
Gill rakers (total)	26-31	39-42	34-38	37-43	37-43	33-38	34-41
Lateral line scales	80-83	100-105	61-68	76-85	87-98	71-74	68-76
Head length in SL	3.5-3.6	–	3.6-3.9	3.7-3.9	3.3-3.9	3.7-4.0	3.4-3.8
Body depth in SL	5.0-6.0	–	5.4-6.8	4.5-5.1	4.1-5.2	4.5-5.2	4.6-6.0
Body depth / body width	1.5-1.8	–	1.3-1.6	1.2-1.6	1.3-1.8	1.2-1.5	1.3-1.6
Orbit diameter in head length	3.5-4.1	–	2.8-3.1	2.7-3.2	2.5-3.8	2.6-3.0	2.7-3.6

E. karnellai), 26-31 total gill rakers (37-43 in *E. karnellai*), head length 3.5-3.6 in SL (3.7-3.9 in *E. karnellai*), and the orbit diameter 3.5-4.1 in head length (2.7-3.2 in *E. karnellai*); from *E. ruber* in having 4 or 5 spines protruding (vestigial in *E. ruber*), in 8 dorsal-fin soft rays (9-11 in *E. ruber*), 26-31 total gill rakers (33-38 in *E. ruber*), 80-83 lateral-line scales (71-74 in *E. ruber*), head length 3.5-3.6 in SL (3.7-4.0 in *E. ruber*), and the orbit diameter 3.5-4.1 in head length (2.6-3.0 in *E. ruber*); and from *E. struhsakeri* in 4 or 5 free posterior dorsal-fin spines (1-3 in *E. struhsakeri*), 8 dorsal-fin soft rays (10-12 in *E. struhsakeri*), 26-31 total gill rakers (34-41 in *E. struhsakeri*), and 80-83 lateral-line scales (68-76 in *E. struhsakeri*).

The principal meristics and morphometrics of the species of *Emmelichthys* are compared in table II. A key to the species of *Emmelichthys* is presented below, updated from the key by Heemstra and Randall (1977).

Remarks

This is the first record of the family Emmelichthyidae and the genus *Emmelichthys* from the Red Sea; the genus is so far unknown from most of the Indian Ocean (except South Africa). The habitat, and even the depth of collection

of the new species remain unknown; the only known information is that the type series was trawled, probably above soft bottom.

KEY TO THE SPECIES OF EMMELICHTHYS

- 1a. Posterior 2-4 dorsal spines vestigial, buried in mid-dorsal musculature 2
- 1b. Posterior dorsal spines short, but protruding distinctly above dorsal body profile 3
- 2a. Lateral-line scales 71-74; pectoral-fin rays 19-20; total gill-rakers 33-38 [Atlantic Ocean (St. Helena, Jamaica, and Bermuda)] *E. ruber*
- 2b. Lateral-line scales 76-85; pectoral-fin rays 21-23; total gill-rakers 37-43 [Pacific Ocean (Hawaiian Islands and Easter Island)] *E. karnellai*
- 3a. Lateral-line scales 61-83 4
- 3b. Lateral-line scales 87-105 6
- 4a. Lateral-line scales 80-83; dorsal-fin soft rays 8 [southern Red Sea] *E. marisrubri* sp. nov.
- 4b. Lateral-line scales 61-76; dorsal-fin soft rays 9-12 5

- 5a. Lateral-line scales 61-68 [Nazca Ridge, southeastern Pacific] *E. elongatus*
 5b. Lateral-line scales 68-76 [Hawaiian Islands, Japan and Australia]. *E. struhsakeri*
 6a. Lateral-line scales 87-98 [New Zealand, Australia, St Paul and Amsterdam Islands, South Africa] *E. nitidus*
 6b. Lateral-line scales 100-105 [Juan Fernandez Islands and Chile]. *E. cyanescens*

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REFERENCES

- ESCHMEYER W.N. (ed.), 2013. - Catalog of Fishes. Electronic version (2 Jul. 2013). Internet publication, San Francisco, California Academy of Sciences. <http://research.calacademy.org/research/Ichthyology/Catalog/fishcatmain.asp>.
- ESCHMEYER W.N. & FONG J.D., 2013. - Species by family/subfamily in the Catalog of fishes, electronic version (2 July 2013). Internet publication, San Francisco, California Academy of Sciences. <http://research.calacademy.org/research/Ichthyology/Catalog/fishcatmain.asp>.
- FRICKE R. (ed.), 2013. - Literature in the Catalog of Fishes, electronic version (2 July 2013). Internet publication, San Francisco, California Academy of Sciences. <http://research.calacademy.org/research/Ichthyology/Catalog/fishcatmain.asp>.
- FRICKE R. & ESCHMEYER W.N., 2013. - A guide to fish collections in the Catalog of Fishes. Online version, updated 2 Jul. 2013. Internet publication, San Francisco, California Academy of Sciences. <http://research.calacademy.org/research/Ichthyology/Catalog/collections.asp>.
- FRICKE R., BILECENOGLU M. & SARI H.M., 2007. - Annotated checklist of fish and lamprey species (Gnathostomata and Petromyzontomorphi) of Turkey, including a Red List of threatened and declining species. *Stuttg. Beitr. Naturk. (A)*, 706: 1-169.
- HEEMSTRA P.C. & RANDALL J.E., 1977. - A revision of the Emmelichthyidae (Pisces: Perciformes). *Aust. J. Mar. Freshw. Res.*, 28(3): 361-396.
- JORDAN D.S., 1923. - A classification of fishes including families and genera as far as known. *Stanford Univ. Publ., Univ. Ser., Biol. Sci.*, 3(2): 77-243.
- KOTLYAR A.N., 1982. - A new species of the genus *Emmelichthys* (Emmelichthyidae, Osteichthyes) from the south-western [sic, south-eastern] part of the Pacific Ocean. [In Russian.] *Byull. Mosk. O-va. Ispyt. Prir., Otd. Biol. [Bull. Moscow Soc. Nat. Biol. Ser.]*, 87(1): 48-52.
- LAAN R. VAN DER, FRICKE R., ESCHMEYER W.N., 2013. - Family Group Names in Fishes. Online version, updated 2 Jul. 2013. Internet publication, San Francisco (California Academy of Sciences). <http://research.calacademy.org/ichthyology/catalog/family/>
- NELSON J.S., 2006. - Fishes of the World. 4th edit., 601 p. New York, John Wiley & Sons.
- SCHULTZ L.P., 1945. - *Emmelichthyops atlanticus*, a new genus and species of fish (family Emmelichthyidae) from the Bahamas, with a key to related genera. *J. Wash. Acad. Sci.*, 35(4): 132-136.