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Orsinigobius milleri n. sp., a new species of freshwater goby from W-Greece (Pisces: Gobiidae)

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(With 3 figures)

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Abstract

A new goby, the second of the genus *Orsinigobius, O. milleri,* is described from the deltaic area of the River Acheron in W-Greece. It differs from the type species *O. punctatissimus* mainly by having VI (instead of VII) rays in the first dorsal fin and a scaled (instead of naked) caudal peduncle. In general morphology and some aspects of bioecology *Orsinigobius* is related to *Knipowitschia.* Species of the two genera in Italy and W-Balkans are similar in habitat selection and free swimming juveniles.

Zusammenfassung

Eine neue Grundel, *Orsinigobius milleri,* die zweite Art der Gattung *Orsinigobius,* wird aus dem Delta des Acheron Flusses in W-Griechenland beschrieben. Sie unterscheidet sich von der Art *O. punctatissimus* vor allem dadurch, daß sie in der ersten Rückenflosse VI (anstatt VII) Strahlen und einen beschuppten (anstatt unbeschuppten) Schwanzstiel hat.

Introduction

In the last years interest increased in taxonomy and biogeography of freshwater fishes, especially of SE-Europe, where several taxonomic and biogeographic problems are still unsolved. A recent revision of freshwater gobies in Italy (GANDOLFI & al. 1986) reported 5 species and 5 genera. In Greece 7 species in 4 genera are known (BIANCO & al. 1987; ECONOMIDIS in lit. 26/6/1987).

The new species was collected in W-Greece, a distinct ichthyogeographic district (BIANCO 1986), where two other species of endemic freshwater gobies live: *Economidichthys pygmaeus* (HOLLY, 1929) and a still undescribed species of the same genus (BIANCO & al. 1988). In addition the widespread *Knipowitschia panizzae* (VERGA, 1841) was found in the River Evinos (BIANCO pers. observ.). The

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new species is very similar to *Knipowitschia,* but lacks the cephalic canals. Recently the monotypic genus *Orsinigobius* (type species *O. punctatissimus*) was described by GANDOLFI & al. It is related to *Knipowitschia,* but lacks the cephalic canals and shows pit lines u and p. The new species from W-Greece was thus placed in the genus *Orsinigobius* GANDOLFI, MARCONATO & TORRICELLI, 1986.

Methods: Count and measurements were taken according to MILLER (1972); terminology used for lateral-line system description follows SANZO (1911).

Abbreviations used: NMW = Naturhistorisches Museum Wien; IZA = Dipartimento di Scienze Ambientali, L'Aquila; SL = standard length; TL = total length.

Orsinigobius milleri sp. nov.

Holotype (Fig. 1): a female 22.6 mm SL (27.8 mm TL); NMW 86065, canal of brackish water (S = 6.0‰) conected with the deltaic part of Acheron River, Epirus, W-Greece (39° 15′ N, 20° 30′ E), 15–20 August 1984, P. G. BIANCO & T. TARABORELLI coll.

Paratypes (Fig. 2): 18 females, 15.1–25.9 mm SL (18.6–31.6 mm TL), and 11 males 16.1–19.2 mm SL (19.8–22.3 mm TL); same locality as holotype, col-

Table 1: Body proportions in the holotype, ranges and (in parentheses) means ± standard errors found in 4 large females (holotype included) of *Orsinigobius milleri* n. sp. (SL = standard length, HL = head length).

parameter	4 large females	holotype
Size range of fishes (standard length, in mm)	20.8–25.1	22.6
SL: Head length	3.09–3.20 (3.14±0.041)	7.2
SL: Head width	4.56–5.51 (4.83±0.194)	4.1
SL: Distance from snout to first dorsal fin	2.39–2.62 (2.47±0.087)	8.6
SL: Distance from snout to second dorsal fin	1.66–1.85 (1.73±0.069)	13.0
SL: Distance from snout to anus	1.67–1.76 (1.73±0.036)	12.8
SL: Distance from snout to anal fin	1.55–1.66 (1.61±0.043)	13.6
SL: Distance from snout to pelvic fin	2.81–3.04 (2.94±0.083)	7.6
SL: Caudal peduncle length	4.17–4.52 (4.40±0.136)	5.1
SL: First dorsal fin-base length	6.27–8.00 (7.21±0.655)	3.6
SL: Second dorsal fin-base length	5.60–6.12 (5.87±0.245)	4.0
SL: Anal fin-base length	6.65–7.38 (7.01±0.283)	3.3
SL: Caudal fin length	3.48–4.26 (3.91±0.291)	5.9
SL: Pectoral fin length	3.67–4.43 (4.00±0.334)	5.1
SL: Pelvic fin length	3.87–4.52 (4.13±0.247)	5.4
SL: Pelvic fin origin to anus	3.64–4.18 (3.84±0.204)	5.4
SL: Body depth at origin of pelvic fin	4.64–5.47 (5.02±0.296)	4.5
SL: Body depth at origin of anal fin	6.27–6.93 (6.48±0.270)	3.6
SL: Caudal peduncle depth	10.04–11.89 (11.03±0.730)	1.9
Caudal peduncle length: Caudal peduncle depth	2.15–2.68 (2.48±0.199)	
Distance from pelvic origin to anus: Pelvic fin length	1.00–1.23 (1.07±0.092)	
HL: Snout length	3.68–4.23 (1.07±0.092)	1.7
HL: Eye diameter	3.94–5.78 (4.50±0.744)	1.7
HL: Postorbital length	1.80–2.03 (1.92±0.089)	3.8
HL: Head width	1.47–1.75 (1.57±0.112)	4.1

lected on 15–20 August 1984 (7, NMW 86066 and 7, IZA 8784) and on 6–12 August 1986 (7, NMW 86067 and 8, IZA 8785).

Description: The following description is based on 30 types. However, one of them, which is very small and quite damaged, has been only partially included in counts. The values given between quotation marks are for the holotype, and are included in ranges and frequencies (f.). For metric data see table 1.

Fin rays: First dorsal fin has "VI", VI–VII (range) unbranched rays (VI f. 29, VII f. 1); second dorsal fin has one unbranched ray followed by 7–9 branched ones "I/7", (7 f. 6, 8 f. 17, 9 f. 7); anal fin "I/7", I/6–9 (6 f. 1, 7 f. 14, 8 f. 14, 9 f. 1); caudal fin (branched rays) "11", 11–12 (11 f. 16, 12 f. 10, 4 have caudal fin damaged); pectoral fin "15", 15–18 (15 f. 7, 16 f. 20, 17 f. 2, 18 f. 1); pelvic fin I/5–I/5, in all types.

Squamation: Ctenoid scales cover sides of body and caudal peduncle; brest, belly, predorsal region and back naked. The scales reach the second dorsal fin at the base of the third to the penultimate articulated ray. The region around anus and the begin of the analis is also naked. The scales reach analis between third and sixth articulated ray. "32", 30–35 scales in lateral series (30 f. 10, 31 f. , 4, 32 f. 9, 33 f. 3, 34 f. 1, 35 f. 2); "4", 4–8 in transverse series (from below anterior end of second dorsal fin to anal fin) (4 f. 5, 5 f. 8, 6 f. 7, 7 f. 7, 8 f. 1).

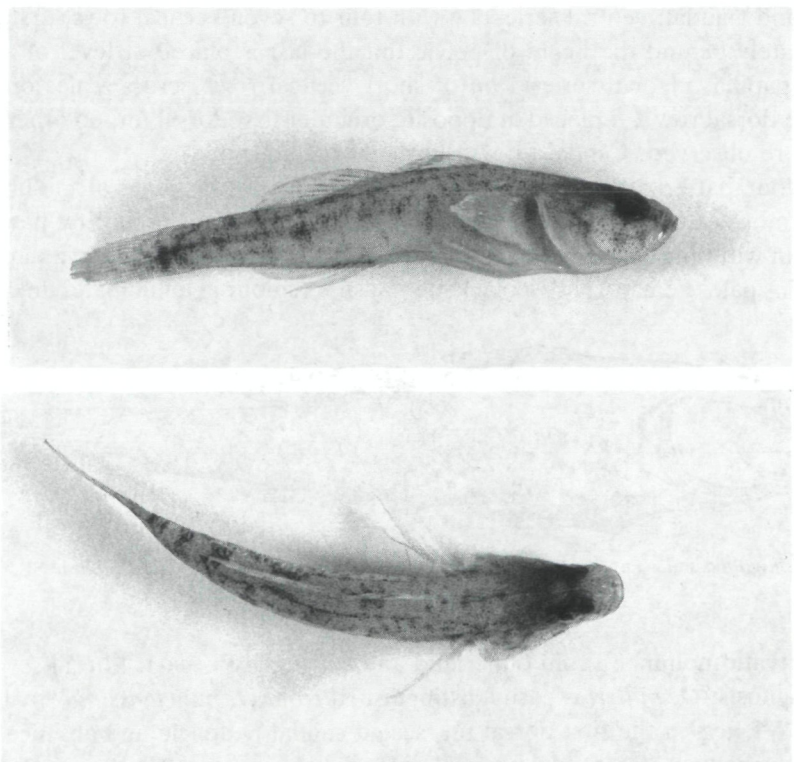

Fig. 1: A: lateral, B: dorsal view showing the holotype of *Orsinigobius milleri* n. sp.

Lateral line system (Fig. 3): (a) Cephalic canals absent. (b) Sensory papillae: (1) Median series in three rows (median *r*, lateral *s* and anterior s^3). Lateral series with ascending row *c* and c^2. (2) Suborbital: infraorbital row *a* extending forwards from the row *tra* to below anterior edge of pupil. Longitudinal row *b* extends short before vertical from posterior border of orbit. 6 transverse rows (*c* 1–6). *cp* below level of row *b*, *cp* before or below row *tra*. Longitudinal row *d* continuous. Anterior and posterior part only indicated by an angle, never reaching *cp*. (3) Preopercular-mandibular: external row *e* and internal row *i* developed, both devided into prearticular and postarticular parts. Mental row *f*, developed. (4) Oculoscapular: anterior transverse series *tra*, continuous. Row *z* developed. The posterior transversal row *trp* divides the longitudinal row x^1; below the posterior section of x^1, mostly two papillae, below the anterior section 1–3, 1–3 papillae of the longitudinal oculoscapular row *u*. Last extend from below the first both papillae of the anterior section of row x^1, backward. Posterior longitudinal row x^2, developed below one papilla of row *y*. Axillary rows *1a*, *as*–as^3, developed. (5) Opercular: transverse row *ot*, superior longitudinal row *os*, and inferior longitudinal row *oi*, present. (6) Anterior dorsal (occipital): anterior dorsal row *n*, developed, also longitudinal row *g* and *h*. Rows *m* and *o*, not present. (7) Interorbital: interorbital row *p* extends backwards from posterior end of row *s* along the orbit, but does not reach the horizontal through the inferior end of row *n*. (8) Trunk and Caudal: ventral series 1 *v* with four to seven vertical rows, first placed immediately behind the begin of pelvic fin, the last is placed at level of anus or genital papilla; median series 1 *tm* of short vertical rows across scales of lateral midline; dorsal row 1 *d* placed at opposite origin of first dorsal fin, no other dorsal rows were observed. Caudal fin with three horizontal rows.

Colour pattern: Body pale fawn above, white below. Lateral midline with several more or less distinct dark blotches. Head with dark preorbital bars. First dorsal fin with three dark bands, the middle one ending posteriorly in a dark spot. Other fins pale. Females with a black mental spot (colour in adult males unknown).

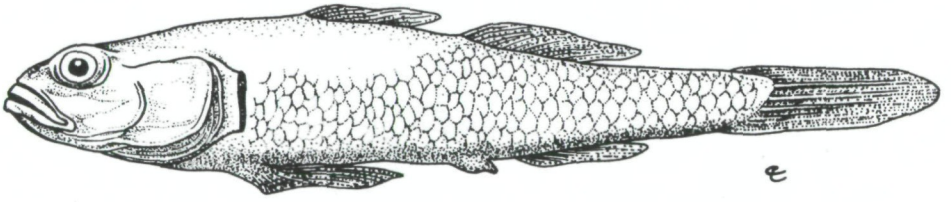

Fig. 2: *Orsinigobius milleri* n. sp., paratype, NMW 86066: 1, lateral view, female, 25.1 mm SL; drawing by Dr. ERICH PUCHER (pectoral fin removed).

Derivatio nominis: From our friend and colleague PETER J. MILLER.

Diagnosis: *O. milleri* is easily distinguished from *O. punctatissimus* by having modally VI rays in the first dorsal fin, scaled caudal peduncle and absence of pit line row *m*, against VII, caudal peduncle naked and presence of row *m*, in the other species.

Remarks: The habitat of *O. milleri* are transparent, nearly standing, but temperate (18–19° C on bottom, 21–23° C on surface in type locality, Aug. 1986), sometimes a little brackish waters, with abundant vegetation and sandy or muddy bottoms. Youngs were collected near the surface either in free waters or just below the carpet of algae that in several areas covered the water surface. *O. milleri* was collected together with cyprinids and cyprinodontids, some of them forming reproductive communities in type locality. It is quite interesting to note that all freshwater gobies known in W-Greece (4 species), but also *O. punctatissimus,* have free swimming juveniles and prefer similar habitats (GANDOLFI & al. 1986; MILLER

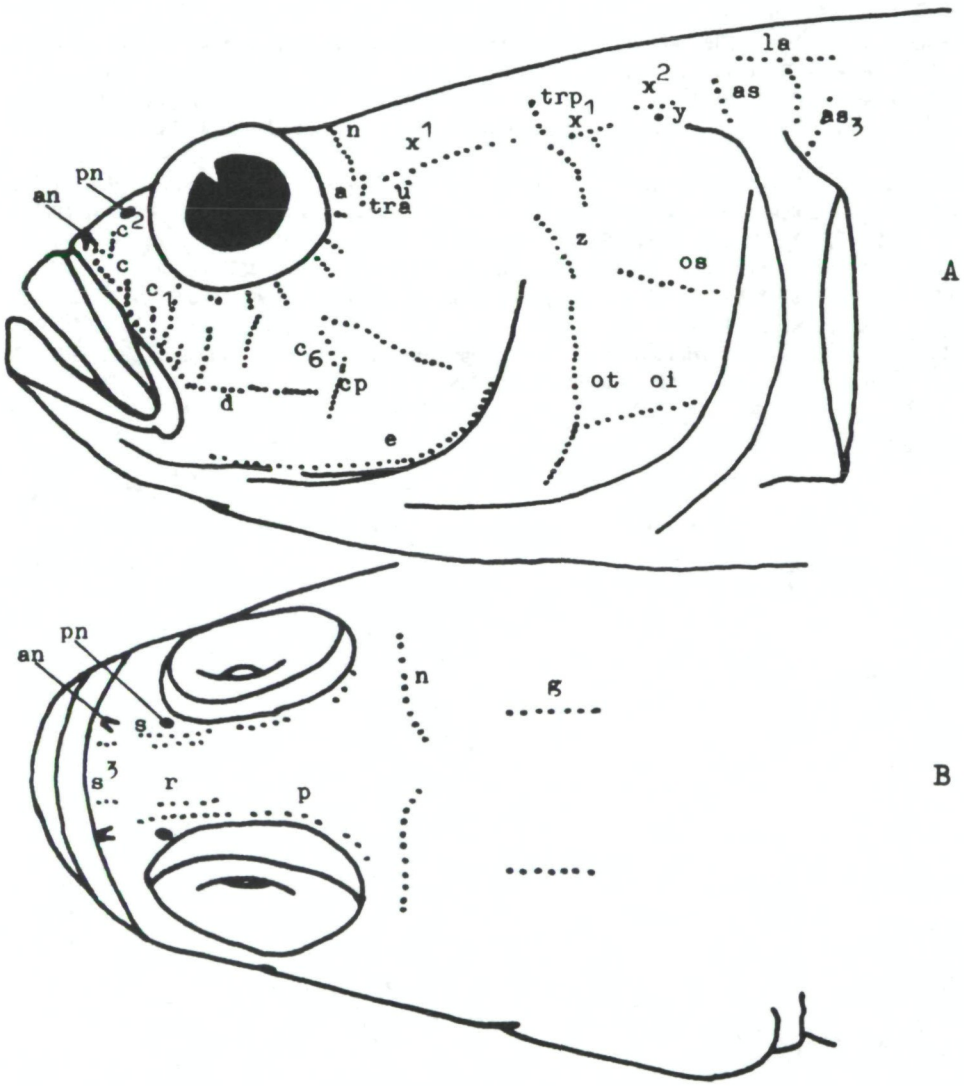

Fig. 3: A: lateral, B: dorsal view of head showing the sensory papillae of the cephalic lateral-line system found in holotype of *Orsinigobius milleri* n. sp.
an = anterior nostril, pn = posterior nostril. Other abbreviations in text. (Head length 7.2 mm).

1972; BIANCO pers. observ.). For these features, they may be regarded as an homogeneous bio-ecological group, possibly derived from a common ancestor evolved in lacustrine habitat (free swimming juveniles are quite unsuccessful in torrential water), namely the nearly freshwater Paratethys, and penetrated in E Mediterranean during the last Messinian phase (about 4.5 million years ago) when the Paratethys, after the salinity crisis, flooded the Mediterranean (HSÜ 1977).

We wish to thank PETER J. MILLER (Bristol University) for drawing our attention to the new species.

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