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Odontamblyopus rebecca, a new species of amblyopine goby from Vietnam with a key to known species of the genus (Gobiidae: Amblyopinae)

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Abstract

A new species of amblyopine goby, *Odontamblyopus rebecca*, is described on the basis of 37 specimens from Vietnam. It differs from other species of *Odontamblyopus* by the following combination of characters: caudal vertebrae typically 20; dorsal fin with 44-48 total elements; anal fin with 37-42 total elements; and pectoral-fin ray count 40-51. This species is figured and compared with other known species of *Odontamblyopus*.

Key words: *Odontamblyopus*, Amblyopinae, Gobiidae, new species

Introduction

Gobies of the genus *Odontamblyopus* (Gobiidae: Amblyopinae) are given the vernacular name of eel gobies or worm gobies, which refers to their long and slender bodies. *Odontamblyopus* inhabits mud bottom habitats from the West Coast of India eastward to Japan. In their review of *Odontamblyopus*, Murdy and Shibukawa (2001) indicated that the genus comprised four species; they provided a key to species as well as a descriptive account of each. Recently, 37 specimens of an *Odontamblyopus* not fitting the key or descriptive accounts in Murdy and Shibukawa (2001) were collected from a fish market on the east side of Haiphong City, Vietnam. The objective of this paper is to describe this species as new and compare it with congeners.

Methods for counts and measurements follow Murdy and Shibukawa (2001). The methods of Birdsong et al. (1988) were used in describing the relationship between the spinous dorsal-fin pterygiophores and the underlying vertebrae. Institutional abbreviations are as listed in Leviton et al. (1985). Standard length (SL) is used throughout.

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***Odontamblyopus rebecca* sp. nov.**
(Fig.1; Tables 1-2)

Holotype: ROM 72279, 141.0 mm SL, male.

Paratypes: AMS I.41549-001, 2: 110.8-125.6 mm SL; MNHN 2002-3010, 1:78.5, MNHN 2002-3011, 1:89.0, MNHN 2002-3012, 1: 92.0 mm SL; ROM 72625, 2:96.1-136.8 mm SL; ROM 72626, 26:75.1-132.6 mm SL; USNM 369736, 3:113.1-137.8 mm SL.

All material was collected on 29 February 2000 by Richard Winterbottom from a fish market located on the east side of Haiphong City, Vietnam (20º52' N, 106º41' E).

Diagnosis. *Odontamblyopus rebecca* can be diagnosed from congeners by the following combination of characters: total dorsal-fin elements 44-48 (mean 45.8), anal-fin elements 37-42 (mean 38.5), pectoral fin with 40-51 rays (mean 45.8), and caudal vertebrae 20-21 (mean 20.1). A brownish streak courses from the dorsal surface of the head along dorsum to the caudal fin; chin blackish; caudal fin blackish.

FIGURE 1. *Odontamblyopus rebecca*, sp. nov., ROM 72279, holotype, 141.0 mm SL, Haiphong City, Vietnam (image by Sandra J. Raredon).

TABLE 1. Selected meristic character values of *Odontamblyopus rebecca* sp. nov. Condition in holotype is underscored.

Meristic character	*n*	*mean*	*frequencies*
Dorsal-fin rays (total elements)	37	45.8	44(1), 45(12), <u>46</u>(17), 47(6), 48(1)
Anal-fin rays (total elements)	37	38.5	37(5), <u>38</u>(14), 39(16), 41(1), 42(1)
Caudal vertebrae	37	20.1	<u>20</u>(35), 21(2)
Anal-fin pterygiophores anterior to first hemal spine	37	2.0	1(2), <u>2</u>(32), 3(3)
Upper-jaw teeth (outer row)	24	14.3	7(1), 9(3), 10(2), 12(1), 13(3), 14(1), 15(2), 16(3), 17(2), 18(2), <u>19</u>(3), 20(1)
Lower-jaw teeth (outer row)	24	8.2	6(2), 7(6), 8(6), <u>9</u>(5), 10(5)
Pectoral-fin rays	48	45.8	40(1), 41(3), 42(2), 43(4), 44(2), <u>45</u>(5), 46(11), 47(7), 48(6), 49(4), 50(2), 51(1)

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Description. Counts of holotype given first, followed by those of paratypes in parentheses. D VI (VI), 40 (38-42), first non-spinous dorsal-fin ray segmented and branched; spinous dorsal-fin pterygiophore formula 3-12210 (holotype and all paratypes); dorsal fin connected by membrane to the caudal fin. Anal-fin rays 38 (37-42), first element of anal fin segmented but not branched. Anal fin connected by membrane to caudal fin. Pectoral-fin rays 45/45 (40-51), all pectoral-fin rays segmented, occasionally one or more ventral-most rays branched, all others unbranched; for distal half of fin, membranous connection lacking so that rays are free and silk-like. Pelvic-fin rays I, 5; frenum present; interradial membrane uniting fins present throughout length of innermost rays. Caudal fin with 17 (17) segmented rays including 8+7 (8+7) branched rays and a dorsal and ventral simple ray.

Scales cycloid, embedded, non-imbricated, and difficult to discern without magnification; present on body and head, largest posteriorly. Head scales most abundant on dorsum with some scales on cheeks and a few on operculum. Two lateral rows of teeth in each jaw, more than two rows anteriorly; outer-row teeth much larger and more pointed than those of inner rows; lower-jaw teeth longer than upper-jaw teeth; 19 (7-20) fang-like teeth in outer row of upper jaw, typically interlocking with those of lower jaw; numerous conical teeth on inner rows of upper jaw; 9 (6-10) fang-like teeth in outer row of lower jaw; numerous conical teeth in inner rows of lower jaw. Two (occasionally only one) stout caninoid teeth internal to symphysis of lower jaw. No palatine or vomerine teeth present.

Precaudal vertebrae 10 (10), caudal vertebrae 20 (20-21).

Coloration. Head and body tannish brown. Chin with diffuse blackish blotch. Dorsal surface of head dusky brown as is dorsal-fin base almost to the caudal peduncle. From midpoint of caudal fin posteriad, blackish. Other fins translucent.

Distribution. Known only from a single locality, a fish market located on the east side of Haiphong City, Vietnam. The collector of these specimens, Dr. Richard Winterbottom, assumes the specimens were obtained along the Gulf of Tonkin coast, which is near the market, or in a nearby estuarine environment. Nguyên (1991) reported an unidentified species of *Odontamblyopus* from coastal provinces in northern Vietnam and stated that the species possessed: VI, 39-42 dorsal-fin rays; 37-41 anal-fin rays; 43-50 pectoral-fin rays; 10+19 (18-20) vertebrae. With the exception of the caudal vertebral count, we believe that Nguyên's description is a match with the subject specimens. (As we do not know Nguyên's methodology for counting vertebrae, we cannot be sure that our counting methods are the same.) Unfortunately, attempts to contact Mr. Nguyên were unsuccessful so his specimens were not available to us.

Etymology. This species is named for Rebecca Rootes, the life partner and spouse of the first author.

Comparisons with congeners. The following data and information pertaining to *Odontamblyopus*, excepting the new species described herein, were taken from Murdy and Shibukawa (2001) unless otherwise cited. With respect to *O. rebecca*, *O. roseus* differs in

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having a chocolate-brown distal margin on the median fins (vs. translucent in *O. rebecca*); more caudal vertebrae (22 in *O. roseus* vs. typically 20 in *O. rebecca*) and in having a longer pelvic fin (pelvic-fin length/SL 0.124-0.151, mean = 0.141, in *O.* roseus vs. 0.074-0.126, mean = 0.107, in *O. rebecca*). In comparison to *O. rubicundus, O. rebecca* has more caudal vertebrae (20-21 in *O. rebecca* vs. 17 in *O. rubicundus*); a longer pectoral fin with respect to head length (pectoral-fin length/head length 0.673-1.050, mean = 0.852, in *O. rebecca* vs. 0.628-0.965, mean = 0.719, in *O. rubicundus*); and fewer anal-fin pterygiophores anterior to the first hemal spine (typically 2 in *O. rebecca* vs. 3 in *O. rubicundus*). Whereas there is considerable overlap in most meristic values between *O. rebecca* and *O. lacepedii*, a significant difference exists in the number of pectoral-fin rays (40-51, mean = 45.8, in *O. rebecca* vs. 24-33, mean = 27.9, in *O. lacepedii*). Several morphometric measures also serve to distinguish *O. rebecca* from *O. lacepedii*: SL/TL (range 0.761-0.829, mean = 0.788, in *O. rebecca* vs 0.808-0.850, mean = 0.825, in *O. lacepedii)*; pelvic-fin length/head length (range 0.508-0.842, mean = 0.703, in *O.* rebecca vs. 0.665-1.08, mean = 0.810, in *O. lacepedii)*; and pectoral-fin length/SL (range 0.093-0.154, mean = 0.130, in *O. rebecca* vs. 0.082-0.132, mean = 0.101, in *O. lacepedii*).

TABLE 2. Ranges and means of selected morphometric measurements of *Odontamblyopus rebecca* sp. nov.

Morphometric measurement	*n*	*mean*	*range*
Standard length/TL	23	0.788	0.761-0.829
Head length/SL	24	0.152	0.130-0.179
Pelvic-fin length (PEL)/SL	24	0.107	0.074-0.126
Pelvic-fin length/HL	24	0.703	0.508-0.842
Pectoral-fin length/SL	35	0.130	0.093-0.154
Pectoral-fin length/HL	35	0.852	0.673-1.050
Pectoral-fin length/PEL	35	1.247	0.977-1.530
Head width/SL	24	0.083	0.062-0.110
Snout length/SL	21	0.040	0.027-0.055
Jaw length/SL	24	0.064	0.052-0.082
Interorbital width/SL	21	0.030	0.024-0.037
Nape width/SL	24	0.058	0.048-0.076
Body depth/SL	24	0.084	0.065-0.107
Predorsal length/SL	24	0.209	0.184-0.236
Prepelvic length/SL	24	0.169	0.143-0.196
Preanal length/SL	24	0.380	0.343-0.422
Distance between P2 & A origins/SL	24	0.223	0.188-0.254

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Within the genus *Odontamblyopus*, only *O. tenuis* and *O. rebecca* have pectoral-fin ray counts greater than 39; the average pectoral-fin ray count for *O. tenuis* is 59.5 (range = 46-65) whereas for *O. rebecca* it is 45.8 (range = 40-51). (No other species of *Odontamblyopus* has more than 33 pectoral-fin rays.) We hypothesize that the shared possession of high numbers of pectoral-fin rays connotes a greater degree of relatedness between these two species than with species that do not possess this feature.

In contrast with *O. rebecca*, *O. tenuis* has barbels on the underside of the chin (*O. rebecca* has none). *O. tenuis* typically has fewer elements in both the dorsal and anal fins than does *O. rebecca* (range of dorsal-fin elements 40-42, mean = 40.4, in *O. tenuis* vs. range of 44-48, mean = 45.8, in *O. rebecca*; range of anal-fin elements 32-35, mean = 33.2, in *O. tenuis* vs. range of 37-42, mean = 38.5, in *O. rebecca*). *O. tenuis* and *O. rebecca* differ in vertebral numbers; *O. tenuis* has 17 caudal vertebrae whereas *O. rebecca* typically has 20. Epineurals are present from 1st precaudal vertebra to the 5th caudal vertebra in *O. tenuis*, and 1st precaudal vertebra to the 4th, 5th, 6th, or 7th caudal vertebra in *O. rebecca*.

The following morphometric measures also show differences between the two species: head length/SL (range of 0.078-0.130, mean = 0.114, in *O. tenuis* vs. 0.130-0.179, mean = 0.152, in *O. rebecca*); head width/SL (0.040-0.059, mean = 0.054, in *O. tenuis* vs. 0.062-0.110, mean = 0.083, in *O. rebecca*); and pectoral-fin length/SL (0.084-0.119, mean = 0.102, in *O. tenuis* vs. 0.093-0.154, mean = 0.130, in *O. rebecca*).

Key to the species of *Odontamblyopus*
(modified from Murdy and Shibukawa, 2001)

1a. Pectoral-fin rays 40 or more 2
1b. Pectoral-fin rays 33 or fewer 3
2a. Chin with numerous small barbels; pectoral-fin rays 46-65; total dorsal-fin elements 40-42; anal-fin elements 32-35; 17 caudal vertebrae. (Pakistan, Myanmar) .... *O. tenuis*
2b. Chin lacking barbels; pectoral-fin rays 40-51; total dorsal-fin elements 44-48; anal-fin elements 37-42; 20-21 caudal vertebrae. (Vietnam) ..... *O. rebecca* sp. nov.
3a. In preservative, distal margins of dorsal and anal fins tinged chocolate-brown; dorsal surface of skull bony lacking portions of adductor mandibulae muscle; epineurals present from 1st precaudal vertebra to 10th caudal vertebra. (west coast of India) .... *O. roseus*
3b. In preservative, distal margins of dorsal and anal fins the same color as rest of fin but not chocolate-brown; dorsal surface of skull covered by adductor mandibulae muscle; epineurals present from 1st precaudal vertebra to 3rd, 4th, or 5th caudal vertebra..... 4
4a. Caudal fin very long, standard length typically less than 80% of total length; total dorsal-fin elements 40-47; anal-fin elements 33-40; caudal vertebrae 17; 3 anal-fin pterygiophores preceding first hemal spine. (east coast of India, Bangladesh, Myanmar) .... *O. rubicundus*

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4b. Caudal fin long, standard length more than 80% of total length; total dorsal-fin elements 44-54; anal-fin elements 36-45; caudal vertebrae 20-24; 2 (rarely 3) anal-fin pterygiophores preceding first hemal spine. (China, Hong Kong, Taiwan, Korea, Japan) .....*O. lacepedii*

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