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R.K.



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A New Species of Rainbowfish (Melanotaeniidae), from western New Guinea (West Papua Province, Indonesia)

Gerald R. Allen¹ & Renny K. Hadiaty²

Abstract

A new species of rainbowfish, *Melanotaenia mairasi*, is described on the basis of 22 specimens, 12.1–54.2 mm SL, collected in November 2010 at Lake Furnusu in the Bird's Neck region of Kaimana Regency, West Papua Province, Indonesia. It is closely allied to *M. ogilbyi* from central-southern New Guinea (southeastern Papua Province, Indonesia). The two species share similar meristic and morphological features as well as general colour patterns. They differ most notably in the number of gill rakers on the lower limb of the first gill arch, 15–17 for *M. mairasi* and 10 or 11 for *M. ogilbyi*. The count for *M. mairasi* is the highest among the “*maccullochi*” group of species.

Introduction

The *maccullochi* group of rainbowfish species, including *Melanotaenia caerulea* Allen 1996, *M. maccullochi* Ogilby 1915, *M. ogilbyi* Weber 1910, *M. papuae* Allen 1981, *M. sexlineata* Munro 1964, and *M. sylvatica* Allen 1997, was described and discussed by Allen 1981, 1996, 1997. The members of this complex possess a relatively small size (usually less than about 60 mm SL), a colour pattern that includes reddish stripes between scale rows on the upper body and often a blackish stripe along the middle of the side. All except *M. maccullochi*, which inhabits both northern Australia and south-central New Guinea, occur in southern New Guinea. The combined distribution of the various species ranges along nearly the entire length of New Guinea. The habitat generally consists of creeks and small rivers in forested lowlands and adjacent low-lying foothills.

The present paper describes a new species, the seventh known member of the *maccullochi* group. It was collected in November 2010 during an expedition led by the Indonesian Institute of Sciences to the Arguni Bay region of the Bird's Neck (Figure 1), the narrow isthmus of New Guinea situated between the Bird's Head Peninsula in the far west and the main body of the island. The latest discovery is notable among the *maccullochi* group for two reasons. It is the first lake-dwelling member and its occurrence in the Bird's Neck region represents a significant range extension (about 350 km westward) in southern New Guinea for this species complex.

The Bird's Neck area is among the most rugged on the island of New Guinea, containing extensive karst limestone, which forms a formidable barrier and makes inland forays extremely difficult. Consequently, most of the region remains unexplored, with the exception of a few lakes and coastal streams. Previous expeditions by the first author resulted in a number of new discoveries, including endemic rainbowfishes from the Triton Lakes and nearby Lake Mbutu (Allen 1998, and Allen & Renyaan 1998).

The present expedition, which was sponsored by Conservation International in order to assist the Kaimana government in an inventory of their coastal and marine resources, focused predominantly on the Arguni Bay region. Previously, Allen *et al* (2008) described *Melanotaenia ammeri* from a small creek flowing into Arguni Bay, near Gusimawa Village. The present paper describes a second species from the region. It was found at a single location, Lake Furnusu, which lies about 45 km south of Arguni Bay. The lake, which is accessible via a foot track from the coast of Bitsyara Bay, was reached using a small aircraft equipped with floats. During the course of the week-long expedition we collected rainbowfishes from two other main drainage areas of Arguni Bay including the Karora Estuary, an extensive Nipa palm embayment in the north and the Sewiki Basin in the south. Only a single species, *M. ammeri*, was found although considerable variation exists with regards to colouration and overall body shape.

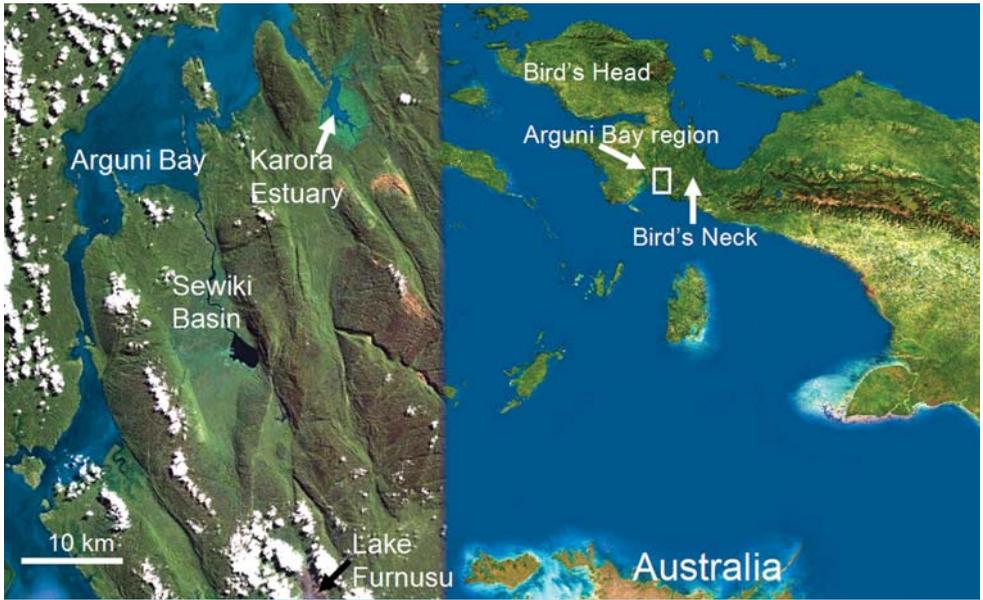


Figure 1. Map of Papua & West Papua provinces, Indonesia in Western New Guinea and the Arguni Bay region.

Materials & Methods

Counts and measurements that appear in parentheses refer to the range for paratypes if different from the holotype. Type specimens are deposited at Museum Zoologicum Bogoriense, Cibinong, Indonesia (MZB) and the Western Australian Museum, Perth (WAM).

The methods of counting and measuring are as follows:

dorsal and anal rays

The last ray of the second dorsal fin and of the anal fin is divided at the base and counted as a single ray.

lateral scales

The number of scales in horizontal row from upper edge of pectoral-fin base to caudal-fin base, excluding the small scales posterior to the hypural junction.

transverse scales

The number of scales in vertical row between anal fin origin and base of first dorsal fin.

predorsal scales

The number of scales along midline of nape in front of first dorsal fin.

cheek scales

The total number of scales covering suborbital and preoperculum.

standard length (SL)

Measured from the tip of the upper lip of the mouth to the caudal-fin base.

head length (HL)

Measured from the tip of the upper lip to the upper rear edge of the gill opening.

caudal peduncle depth

Measured at the least depth.

caudal peduncle length

Measured between two vertical lines, one passing through the base of the last anal ray and the other through the caudal-fin base.

Melanotaenia mairasi, new species

Lake Furnusu Rainbowfish

(Figure 2 & 3)

Holotype

MZB 19657, female, 54.2 mm SL, southeastern corner of Lake Furnusu, 3°33.988'S, 133°51.933'E, about 15 km northeast of Kaimana, West Papua Province, Indonesia, 2–3 m, hook and line, G. Allen, 3 November 2010.

Paratypes

MZB 19772, 11 specimens, 12.1–24.5 mm SL, southwestern corner of Lake Furnusu, 3°33.980'S, 133°51.953'E, West Papua Province, Indonesia, 0–2 m, rotenone, G. Allen & M. Ammer, 3 November 2010
WAM P. 33337-001, 10 specimens, 14.4–27.3 mm SL, collected with MZB paratypes.

Comparative material examined

Melanotaenia ogilbyi

(Timika region, Papua Province, Indonesia)
WAM P.27807, 60 specimens, 22.0–41.0 mm SL;
WAM P.31051-002, 24 specimens,
22.0–43.0 mm SL;
WAM P.31057, 25 specimens, 25.0–52.1 mm SL;
WAM P.31298-009, 21 specimens,
15.0–54.0 mm SL.

Melanotaenia sexlineata

(Kiunga region, Papua New Guinea)
WAM P.27807, 60 specimens, 22.0–41.0 mm SL.

Diagnosis

A species belonging to the *maccullochi* group of rainbowfishes distinguished by the following combination of characters:

dorsal rays IV–VI, 11 to 13 (usually 11); anal fin rays I–II, 16–19 (usually I, 18–19); pectoral rays 12–14 (usually 13–14); lateral scales 32–34 (usually 34); gill rakers on lower limb of first gill arch 15–17; colour in life brownish dorsally and white ventrally with mid-lateral blackish stripe from eye to caudal-fin base, narrow red stripe between each scale row of body, and orange scale margins.

Description

Dorsal fin rays IV–I, 11 (IV–VI, 11–13); anal fin rays II, 19 (I, 16–19); pectoral rays 13 (12–14); pelvic rays I, 5; branched caudal fin rays 15; lateral scales 34 (32–34); transverse scales 10 (10–11); predorsal scales 18 (14–18); cheek scales 14 (12–15); gill rakers on first arch 2+16 (2+15–17).

Body depth 3.1 (2.9–3.2) in SL, head length 3.7 (3.6–3.8) in SL; greatest width of body 2.7 (2.5–2.8) in greatest body depth; snout length 2.8 (2.7–3.0) in HL; eye diameter 3.3 (3.1–3.4) in HL; interorbital width 2.7 (2.7–2.8) in HL; depth of caudal peduncle 2.3 (2.3–2.5) in HL; length of caudal peduncle 1.5 (1.6–1.7) in HL.

Upper jaw oblique and projecting very slightly, premaxilla with an abrupt bend between the anterior horizontal portion and lateral part; maxilla ends below anterior edge of eye; lips thin; teeth conical with slightly curved tips, extending on to outer surface of lips; teeth of upper jaw in 4 or 5 irregular rows anteriorly, reduced to a single row posteriorly, where they are exposed when mouth is closed; teeth in lower jaw in about 6 irregular rows anteriorly, reduced to 1 or 2 rows posteriorly; narrow row containing several small, conical teeth on vomer; palatines edentate.

Scales of body cycloid, large, and arranged in regular horizontal rows; scale margins crenulate; predorsal scales extending forward to rear portion of interorbital space; preopercle with 2–3 scale rows between its posterior angle and eye.

Predorsal length 2.0 (2.0–2.1) in SL; preanal length 2.0 (1.9–2.0) in SL; prepelvic length 2.7 (2.6–2.7) in SL; length of second-dorsal fin base 4.4 (4.0–4.4) in SL; length of anal-fin base 2.6 (2.6–2.7) in SL.

First dorsal fin origin over anal fin origin; longest spines (usually second or third) of first dorsal fin 2.1 (2.0–2.2) in HL, its depressed tip barely reaching spine of second dorsal fin in female holotype; longest rays (anterior ones) of second dorsal fin 2.1 (1.9–2.2) in HL, the depressed posterior rays extending slightly less than one-half length of caudal peduncle in female holotype; longest (middle rays) anal rays 2.0 (1.7–2.0) in HL; pelvic fin tips when depressed reaching to anal-fin origin; length of pelvic fins 1.5 (1.3–1.7); length of pectoral fins 1.3 (1.2–1.4) in HL; length of caudal fin 1.1 (1.1–1.4) in HL; caudal fin moderately forked, caudal concavity of holotype 3.3 in head length.



Figure 2. Aquarium photograph of *Melanotaenia mairasi*, female holotype, 54.2 mm SL, Lake Furnusu, West Papua Province. R.H.



Figure 3. *Melanotaenia mairasi*, preserved female holotype, 54.2 mm SL, Lake Furnusu, West Papua Province. G.A.

Colour of female holotype in life (Fig. 2): brownish dorsally and white ventrally with mid-lateral blackish stripe from eye to caudal-fin base, narrow red stripes between each scale row of body, scale margins on side of body orange; second dorsal and caudal fins pale yellow; remaining fins translucent to whitish.

Colour in alcohol (Fig. 3): generally tan with mid-lateral blackish stripe from eye to middle of caudal-fin base; scales of upper half of body with brown narrow scale margins; fins translucent to faintly dusky brown.

Comparisons

The new species is closely related to *Melanotaenia ogilbyi* Weber, 1910 (Fig. 4), whose nearest known population lies approximately 350 km southeast in the Timika region of Papua Province. Both species have similar meristic and morphometric



Figure 4. *Melanotaenia ogilbyi*, approximately 60 mm SL, Timika region, Papua Province, Indonesia. G.A.

... *A new Melanotaenia*

features and similar colour patterns characterized by red stripes between the scale rows and a blackish mid-lateral stripe. However, there is a notable difference in the number of gill rakers on the lower limb of the first gill arch, 15–17 for *M. mairasi* and 10 or 11 for *M. ogilbyi*. The count for *M. mairasi* is the highest among the “*maccullochi*” species group. The present comparison of these species is somewhat restricted due to the lack of mature male specimens of *M. mairasi* and there remains a good possibility that additional differences may be evident when more specimens are available. The species is also similar in appearance to *M. sylvatica* from the Lakekamu drainage of Papua New Guinea, but the latter has fewer gill rakers on the lower limb of the first gill arch (12 or 13), and usually fewer soft anal rays (16 or 17 compared with 18 or 19 in *M. mairasi*). There is also a modal difference in the number of pectoral rays with 12 or 13 (about 50% with each count) rays in *M. sylvatica* compared to 13 or 14 rays (about 63% with 14) in *M. mairasi*.

Zoogeography and habitat

The new species is currently known only from the type locality, Lake Furnusu (Figure 5), which lies approximately 15 km northeast of Kaimana, West Papua Province. The lake is situated at an elevation of 15 m and is only about 1.5 km from the sea, but the two are separated from it by a steep ridge that rises to an altitude of about 500–550 m. The lake occupies a scenic basin that is approximately 5 km long and 1 to 2 km wide. It is completely surrounded by steep ridges without any connection to the nearby sea. Drainage appears to be subterranean, which is typical for other lakes in this region (e.g. Triton Lakes, lying 40 km to the southwest) that consists of rugged limestone karst. The current Google Earth satellite image of the lake basin reveals it to be mainly dry or swampy, but the water level at the time of our collection was extremely high and most of the basin was filled with a large continuous lake and swampy margins. Judging from snorkel observations and scattered trees that protruded from the lake we estimate the shoreline was approximately 3 to 4 m above normal levels. Apart from the holotype, which was collected with a small baited hook, specimens were collected adjacent to a rocky shore among aquatic vegetation and submerged *Pandanus* roots. Except for the holotype, only juveniles were collected, but adult fish were seen among dense vegetation at depths below 2 to 3 m. Four other species provisionally identified as *Neosilurus brevidorsalis* (Plotosidae), *Craterocephalus fistularis* (Atherinidae), *Mogurnda* new species (Eleotridae), and *Oxyeleotris nullipora* (Eleotridae) were present in the lake.

Etymology The new species is named *mairasi* with reference to the tribal name of the traditional land owners of the type locality.

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Figure 5. Aerial photograph of Lake Furnusu, the type locality of *Melanotaenia mairasi*.

M.E.

Table 1. Proportional measurements of selected type specimens of *Melanotaenia mairasi* expressed as percentage of the standard length.

Holotype: MZB 19657 (**HT**)

Paratypes: WAM P. 33337 (**PT1**), WAM P. 33337 (**PT2**), MZB 19772 (**PT3**), MZB 19772 (**PT4**), MZB 19772 (**PT5**)

	HT	PT1	PT2	PT3	PT4	PT5
Standard length (mm)	54.2	27.3	25.4	24.5	21.4	20.6
Body depth	31.9	34.5	33.0	31.3	31.2	32.4
Body width	11.7	13.3	11.8	11.3	11.0	13.0
Head length	26.7	27.9	27.3	28.0	27.0	26.4
Snout length	9.4	9.4	9.0	9.4	9.5	9.6
Eye diameter	8.1	8.4	8.8	9.0	8.5	7.7
Bony interorbital width	9.7	9.9	9.6	10.2	10.0	9.8
Depth of caudal peduncle	11.7	11.3	11.4	11.5	11.2	11.5
Length of caudal peduncle	17.9	16.0	16.1	17.1	17.4	16.6
Predorsal distance	49.4	49.3	50.5	50.7	49.1	48.8
Preanal distance	50.6	51.7	49.7	52.6	49.9	50.1
Prepelvic distance	37.5	38.7	38.9	37.2	37.2	38.4
2nd dorsal fin base	22.8	25.1	22.8	22.8	23.4	23.1
Anal fin base	38.1	38.6	36.9	37.8	38.0	36.8
Pectoral fin length	19.8	20.2	20.6	19.4	19.3	21.5
Pelvic fin length	17.5	19.0	17.9	18.0	16.1	20.7
Longest ray 1st dorsal fin	12.7	13.0	13.9	12.7	12.1	13.1
Longest ray 2nd dorsal fin	12.9	12.6	14.1	14.4	12.9	13.3
Longest anal ray	13.1	14.3	14.7	14.0	13.4	15.2
Caudal fin length	24.8	25.1	21.6	23.6	19.1	24.1

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