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Three New Species of Rainbowfishes (Melanotaeniidae) from Irian Jaya, Indonesia

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Keywords

Melanotaenia, new species, Melanotaeniidae, freshwater, New Guinea, Irian Jaya, Wapoga River, Raja Ampat Islands.

Abstract

Three new melanotaeniid fishes are described from Irian Jaya. *Melanotaenia batanta* sp. n. is described from 12 specimens, 39.1-87.4 mm SL, collected at Batanta Island. It is most closely related to *M. fredericki*, but has a higher modal number of dorsal fin rays and fewer cheek scales. The remaining two species were collected in the Wapoga River system of northern Irian Jaya. *Melanotaenia rubripinnis* sp. n. is described from 51 specimens, 25.0-102.3 mm SL. It is most closely allied to *M. vanheurni*, but differs in colour, and generally has fewer soft dorsal rays and fewer cheek scales. *Glossolepis leggetti*, sp. n. is described from 79 specimens, 35.4-92.9 mm SL. It is most closely related to *G. multisquamatus*, but usually has a higher number of soft dorsal rays, fewer predorsal scales and a more slender body shape in adult males.

Zusammenfassung

Nachstehend die Beschreibung von drei neuen Regenbogenfische aus Irian Jaya. *Melanotaenia batanta* sp. n. auf der Basis von 12 Exemplaren, 39.1 - 87.4 mm SL. Die Verbreitung dieser eng mit *M. fredericki* verwandten Art beschränkt sich auf den Ostteil der Batanta Insel. Die neue Art besitzt jedoch eine größere Anzahl von Rückenflossenstrahlen und hat weniger Schuppen an der Wange. Die beiden anderen Arten wurden im Wapoga Fluß im nördlichen Irian Jaya gefangen. Die Beschreibung von *Melanotaenia rubripinnis* sp. n. beruht auf 51 Exemplaren, 25.0 - 102.3 mm SL. Diese Art ist eng verwandt mit *M. vanheurni*, unterscheidet sich jedoch in der Farbe und hat für gewöhnlich weniger weiche Rückenflossenstrahlen und Wangenschuppen. Die Beschreibung von *Glossolepis leggetti* sp. n. basiert auf 79 Exemplaren, 35.4. - 92.9 mm SL. Dieser Fisch ist engverwandt mit den *G. multisquamatus*, besitzt jedoch für gewöhnlich mehr weiche Rückenflossenstrahlen, jedoch weniger Schuppen am Rücken. Der Körper der Männchen ist schlanker.

Résumé

Trois nouvelles espèces de Melanotaeniidae sont décrites de l'Irian Jaya. *Melanotaenia batanta* sp. n. est décrit à partir de 12 spécimens, d'une L. S. de 39,1 à 87,4 mm, collectés sur l'île de Batanta. Cette espèce est très proche de *M. fredericki* mais a un nombre modal supérieur de rayons de la nageoire dorsale et un nombre inférieur d'écaillles jugales. Les deux autres espèces ont été collectées dans le bassin versant de la rivière Wapoga au nord de l'Irian Jaya. *Melanotaenia rubripinnis* sp. n. est décrit de 51 spécimens, d'une L. S. de 25,0 à 102,3 mm. Il est très proche de *M. vanheurni* mais sa coloration est différente et il a, en général, un nombre inférieur de rayons mous de la nageoire dorsale et un nombre inférieur d'écaillles jugales. *Glossolepis leggetti* sp. n. est décrit à partir de 79 spécimens, d'une L. S. de 35,4 à 92,9 mm. Il est très proche de *G. multisquamatus* mais a habituellement un nombre supérieur de rayons mous de la nageoire dorsale, un nombre inférieur d'écaillles prédorsales et les mâles adultes ont une morphologie plus élancée.

Sommario

Dall'Irian Jaya provengono tre nuovi pesci melanotaeniidi. I *Melanotaenia batanta* sp. n. raggruppano 12 esemplari, lunghi da 39,1 mm. a 87,4, raccolti sull'Isola di Batanta. C'è una forte correlazione tra questa specie e i *M. fredericki*, ma la prima presenta un maggior numero di raggi della pinna dorsale e meno squame sulle guance. Le altre due specie sono state raccolte nel fiume Wapoga nel nord dell'Irian Jaya. I *Melanotaenia rubripinnis* sp. n. si compongono di 51 esemplari, lunghi da 25,0 a 102,3 mm. Sono i più vicini alleati dei *M. vanheurni*, ma sono diversi nella colorazione e generalmente hanno meno raggi dorsali e squame sulle guance. I *Glossolepis leggetti* sp. n. racchiudono 79 esemplari, lunghi tra i 35,4 e i 92,9 mm. Sono strettamente collegati ai *G. multisquamatus*, ma di norma hanno un maggior numero di raggi dorsali, meno squame predorsali e i maschi adulti presentano un corpo di forma più sottile.

Introduction

Rainbowfishes are common inhabitants of fresh waters of New Guinea and Australia. They are small

(usually under 12 cm SL), brightly coloured fishes, believed to have evolved in relatively recent times from marine atherinoids (Allen, 1980a). They are considered to have a sister-group relationship with the Pseudomugilidae (Saeed, *et al.* 1989). A total of 68 species are currently known including 13 Australian species and 55 from New Guinea of which three (*Iriatherina werneri*, *Melanotaenia maccullochi*, and *M. splendida*) are shared by both regions. Most of the species were illustrated by Allen, 1995. The majority of recent discoveries have occurred in previously unsurveyed areas of New Guinea, particularly the Indonesian province of Irian Jaya. Thirty-one species have been described from there by the first author and colleagues since 1980 (Allen, 1980b and c, 1981a, b and c, 1982a and b, 1983, 1985, 1987, 1990, 1996 a and b, and 1997; Allen and Cross, 1980; Allen and Renyaan, 1996; Price, 1997), including a new genus and species from the Etna Bay area of Irian Jaya, (Allen, 1998).

The present paper describes three new melanotaeniids collected by the authors on recent (April-May 1998) expeditions to Irian Jaya. Two of the species were taken during a 3-week faunal survey of the Wapoga River drainage (see Fig. 1 for location) conducted by Conservation International. Collecting activities were facilitated by the Freeport Indonesia Company, which operates a major copper and gold mine in the province. The survey team utilised a geological exploration camp at Siewa, which was conveniently located near a variety of lowland and mountainous aquatic habitats. Freeport also provided helicopters, which greatly expanded our collecting range.

The remaining new species was collected during a 10-day visit to the Raja Ampat Islands (see Fig. 1). This group, situated off the western extremity of Irian Jaya contains hundreds of small islands and several major ones including Waigeo, Batanta, Salawati, and Misool. The freshwater fish fauna consists of about 35-40 species, mostly forms that are widely distributed in

coastal streams of northern New Guinea, but there is an interesting endemic element including at least four rainbowfishes (Melanotaeniidae). The authors are currently preparing a paper dealing with the entire fauna of the Raja Ampats.

Materials and Methods

Collection stations - Collections were made with seine nets and powdered rotenone at the localities listed below.

Station 1 -Tiawiwa River, about 1 km from Siewa Base Camp (3°02.665'S, 136°22.336'E); about 130 km upstream from river mouth at elevation of approximately 70 m; gravel, rock, and sand bottom; water slightly turbid to clear with minimal flow in overflow channel, but moderate flow in main river channel; collections made with seine in both narrow (2-3 m wide) overflow channel and main river (to 10-15 m wide); average depth about 0.5 m with pools to 1.5 m deep; water temperature 30.4°C, pH 7.2; G. Allen, S. Renyaan, and B. Burnett on 3 April 1998.

Station 2 - Tributary of Tiawiwa River, about 0.4 km from Siewa Base Camp (3°02.141'S, 136°22.656'E); about 132 km upstream from river mouth at elevation of approximately 75 m; gravel, rock, and sand bottom with log snags and leaf debris; water clear, but darkly stained with slight to moderate flow through nearly-closed-canopy rainforest; average width of stream about 3-4 m, depth ranging from 0.2-1.2 m; collection made with seine; water temperature 26.4°C, pH 6.2; G. Allen, and S. Renyaan on 4 April 1998.

Station 3 - Braid of Tiawiwa River, about 0.7 km from Siewa Base Camp near far end of air strip (3°02.792'S, 136°22.852'E); about 132 km upstream from river mouth at elevation of approximately 75 m; mainly gravel, cobble, bedrock, and sand bottom; collection made with 1.5 kg of rotenone at confluence of rainforest creek (clear, but dark stained, temperature 26.5°C, pH 6.0) and cobbled braid of Tiawiwa River (clear, temperature

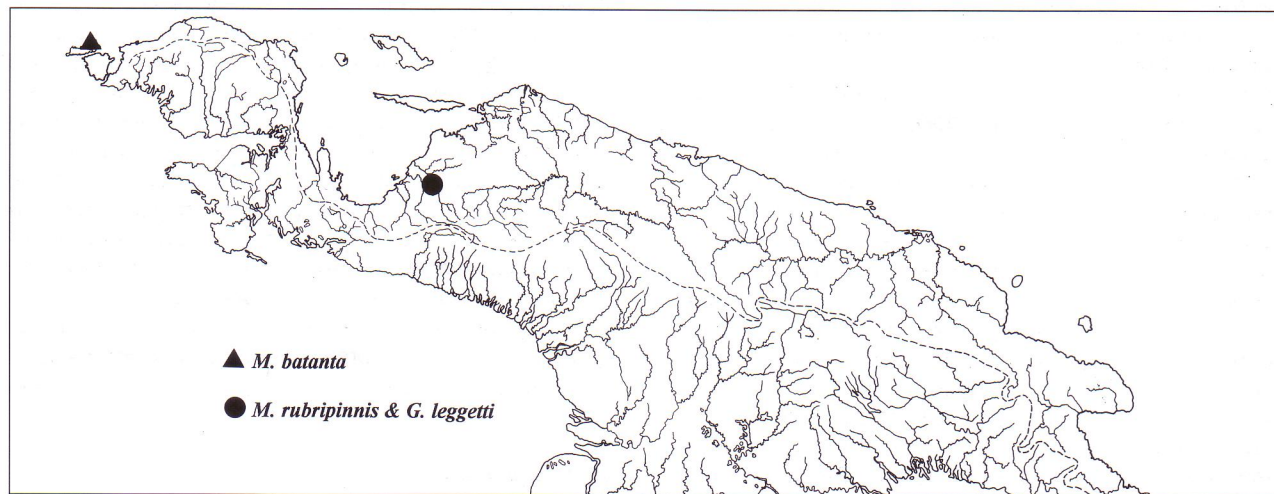


Fig. 1. Map of Irian Jaya showing collection localities.

30.7°C, pH 7.8); resulting mix flows into large rocky pool (approximately 40 m long and up to 3 m deep) with temperature 27.5°C and pH 6.6; very effective rotenone collection with specimens taken up to 0.5 km downstream; open sun-exposed habitat except where shaded by trees along edge of stream; G. Allen, and S. Renyaan on 4 April 1998.

Station 4 - Tributary of Tiawiwa River, about 0.4 km from Siewa Base Camp (3°02.141'S, 136°22.656'E); same site as Station 2, except larger section (about 200 m) of stream sampled; G. Allen, S. Renyaan and B. Burnett on 5 April 1998.

Station 5 - Small tributary of Logari River, about 3-4 km from LS-21 geological exploration camp (3°00.55'S, 136°33.13'E); about 205 km upstream from river mouth at elevation of approximately 375 m; mainly rock, cobble, and boulder bottom; water clear and slow to moderately fast flowing through nearly-closed-canopy rainforest; average width of stream about 2 m, depth ranging from 0.2-1.0 m; collection made with 0.5 kg of rotenone over 100 m section; water temperature 24.5°C, pH 6.9; G. Allen on 6 April 1998.

Station 6 - Small tributary of Logari River, about 1.5-2 km from LS-21 geological exploration camp (3°00.45'S, 136°33.23'E); about 203 km upstream from river mouth at elevation of approximately 335 m; mainly rock, boulder, gravel, and sand bottom; water clear and slow- to moderately fast-flowing through nearly-closed-canopy rainforest; average width of stream about 3-4m, depth ranging from 0.2-1.0 m; collection made with 1.0 kg of rotenone over 150 m section; water temperature 25.0°C, pH 7.5; G. Allen on 6 April 1998.

Station 7 - Logari River next to LS-21 geological exploration camp (3°00.35'S, 136°33.34'E); about 200 km upstream from river mouth at elevation of approximately 290 m; mainly rock, cobble, boulder, gravel, and sand bottom; water clear and mainly fast-flowing through open-canopy rainforest; average width of stream about 15-20 m, depth ranging 4-5 m; collection made at night with use of dipnets and flashlight at edge of main channel; water temperature 24.0°C, pH 7.8; G. Allen on 7 April 1998.

Station 8 - Side tributary at confluence of Tiawiwa River at abandoned logging camp, about 2.0 km from Siewa Base Camp (3°02.141'S, 136°22.656'E); about 135 km upstream from river mouth at elevation of approximately 80 m; gravel, rock, and soft sand bottom; water relatively turbid and green-coloured with slow flow; open gravel bar on one side of stream and patch of rainforest on other side; collection made with 1.0 kg of rotenone over section approximately 100 m long and 15 m wide, depth to 3-4 m; water temperature 28.0°C, pH 7.2; G. Allen, and S. Renyaan on 10 April 1998.

Station 9 - Tributary of Wapoga River about 4 km downstream from Wapoga Staging Base Camp (2°42.378'S, 136°05.401'E); about 6 km upstream from river mouth at elevation of approximately 10 m; mud, sand, and limestone rock bottom; water clear with slow

to relatively fast flow through second-growth vegetation; collection made with dipnets and small rubber-band propelled spear; stream width average 2-3m and average depth 0.5 m with pools to 1.5 m deep; water temperature 26.5°C, pH 8.4; S. Ansek on 14 April 1998.

Station 10 -Warmon Stream on northeastern end of Pulau Batanta (0°49.948'S, 130°43.123'E); pool at base of 10-m high waterfall and 50 m section below, about 0.5 km upstream from river mouth at elevation of approximately 10 m; limestone rocky bottom with boulders and gravel; water clear with general rapid flow except slow on edges of pool; collections made with seine; average stream width 4-5 m and 30 cm deep except to 3 m depth at base of falls; water temperature 26.0°C, pH 8.6; G. Allen and S. Renyaan on 27 April 1998.

The methods of counting and measuring are as follows: **dorsal and anal rays** - the last ray of the anal and second dorsal fins is divided at the base and counted as a single ray; **lateral scales** - number of scales in horizontal row from upper corner of gill cover to caudal-fin base, excluding the small scales posterior to the hypural junction; **transverse scales** - number of scales in vertical row between anal fin origin and base of first dorsal fin; **predorsal scales** - number of scales along midline of nape in front of first dorsal fin; **cheek scales** - total number of scales covering the suborbital and preoperculum; **standard length (SL)** - measured from the tip of the upper lip 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** is the least depth and **caudal peduncle length** is measured between two vertical lines, one passing through the base of the last anal ray and the other through the caudal-fin base.

Counts and measurements that appear in parentheses in the new species descriptions refer to the range for paratypes. Type specimens or comparative material are deposited at the American Museum of Natural History, New York (AMNH), Museum Zoologicum Bogoriense, Bogor, Indonesia (MZB), National Museum, Washington, D.C. (USNM), the Western Australian Museum, Perth (WAM), and Universiteit van Amsterdam (ZMA).

Comparative material: *Glossolepis multisquamatus* - AMNH 15031, 19 specimens, 63.0-115.0 mm SL, Idenburg River, Irian Jaya; WAM P.30694, 27 specimens, 48.0-67.0 mm SL, tributary of Mamberamo River, Irian Jaya. *Melanotaenia fredericki* - WAM P.29981-001, 33 specimens, 18.0-90.0 mm SL, Sorong, Irian Jaya; WAM P.31469-001, 15 specimens, 33.0-94.0 mm SL, Salawati Island, Irian Jaya. *Melanotaenia irianjaya* - WAM P.29960-001, 53 mm SL, near Bintuni, Irian Jaya. *Melanotaenia vanheurni* - WAM P.31032-003, 7 specimens, 28.0-84.0 mm SL; ZMA 103-050, 54 specimens, 39.0-75.0 mm SL; ZMA 103-137, 131.6 mm SL, Idenburg River, Irian Jaya; ZMA 103-166, 4 specimens, 60.8-89.2 mm SL, Idenburg River, Irian Jaya; ZMA 103-138, 13 specimens, 80.0-127.5 mm SL, Idenburg River, Irian Jaya.

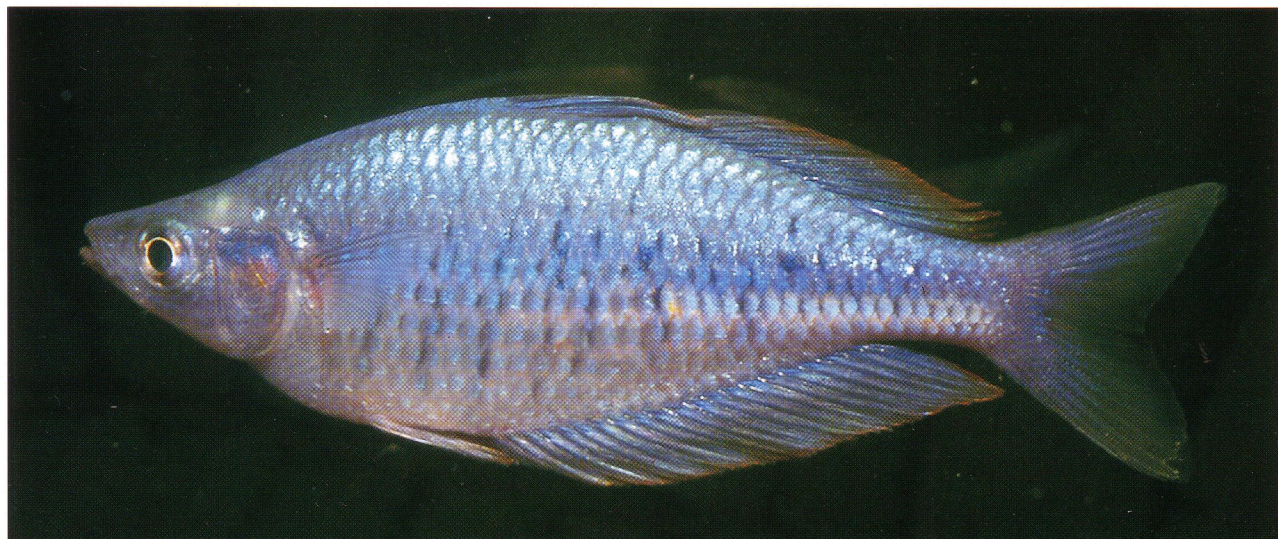


Fig. 2. *Glossolepis leggetti*, male holotype, 73.0 mm SL, Siewa, Irian Jaya, photographed in an aquarium.

Descriptions

Glossolepis leggetti, sp. n.

Leggett's Rainbowfish (Figs. 2 & 3)

Holotype: MZB 9365, 73.0 mm SL, Tiawiwa River, Station 1.

Paratypes: MZB 9366 specimens, 35.4-65.5, Tiawiwa River, Station 1; USNM 349658, 10 specimens, 59.3-

87.2 mm SL, Tiawiwa River, Station 3; WAM P.31455-002, 24 specimens, 43.7-78.5 mm SL, Tiawiwa River, Station 8; WAM P.31459-004, 92.9 mm SL, tributary of Wapoga River, Station 9.

General description

Counts and proportions that appear in parentheses refer to the range for paratypes (based on 20 specimens, 51.1-92.9 mm SL) if different from the holotype.

Table I. Summary of dorsal and anal fin-ray counts for *Glossolepis leggetti*, *Melanotaenia batanta*, *M. rubripinnis* and related species.

No. Soft Dorsal Rays

	8	9	10	11	12	13	14	15	16
<i>G. leggetti</i>		1	5	14	8	1			
<i>G. multisquamatus</i>	1	11	13						
<i>M. batanta</i>						1	6	4	1
<i>M. fredericki</i>					6	16	5		
<i>M. irianjaya</i>					1	14	30	9	2

No. Soft Dorsal Rays

	14	15	16	17	18	19	20	21	22	23
<i>M. rubripinnis</i>		1	6	8	10	2	2			
<i>M. vanheurni</i>					4	15	20	4	1	1

No. Soft Anal Rays

	19	20	21	22	23	24	25	26	27	28	29	30
<i>G. leggetti</i>	2	11	10	4	3							
<i>M. batanta</i>						1	2	5	2	2		
<i>M. fredericki</i>							1	2	11	11	1	1
<i>M. irianjaya</i>			1	4	16	20	8	1				
<i>M. rubripinnis</i>				2	2	3	10	9	3	1		
<i>M. vanheurni</i>			1	1	7	13	12	7	2	1	1	

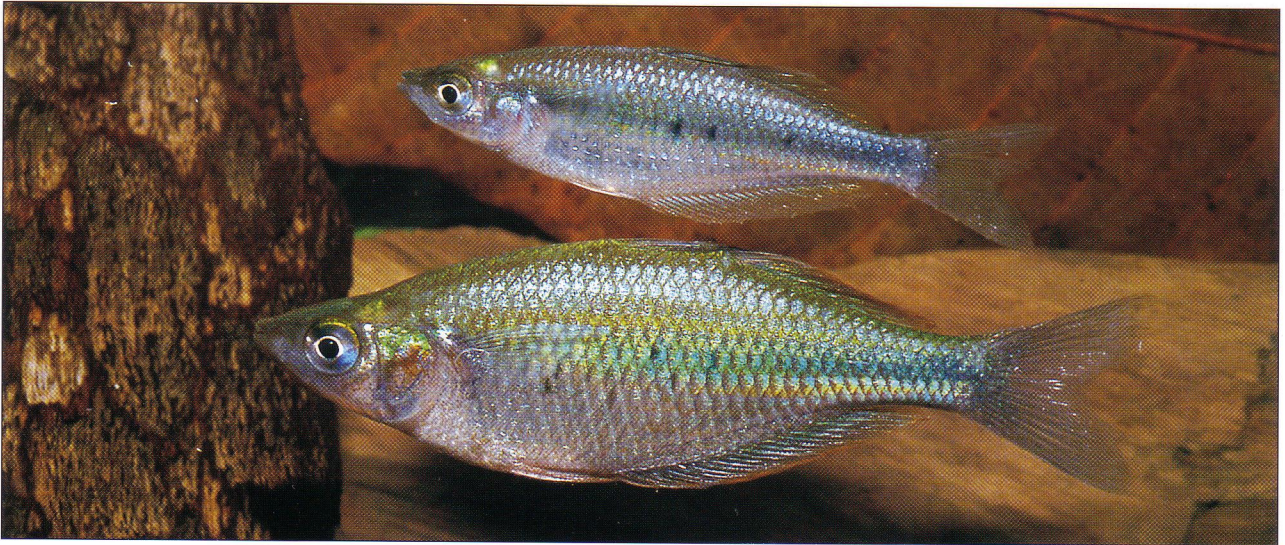


Fig. 3. *Glossolepis leggetti*, male (lower) and female paratypes, approximately 70.0 and 50.0 mm SL, Siewa, Irian Jaya, photographed in an aquarium.

Dorsal rays VII-I,12 (IV to VI,9 to 13); anal rays I,20 (I,19-23); pectoral rays 13 (13 to 15); pelvic rays I,5; branched caudal rays 15; lateral scales 37 (33 to 37); transverse scales 12 (12, rarely 13); predorsal scales 21 (18 to 23); cheek scales 20 (18-26); gill rakers on first arch 2 + 18 = 20 (2 or 3 + 17 to 19).

Body depth 2.7 (2.6-3.5), head length 3.7 (3.4-3.8), both in SL. Greatest width of body 2.9 (2.1-2.9) in greatest body depth. Snout length 3.6 (3.5-4.0), eye diameter 3.2 (2.6-3.4), interorbital width 3.3 (3.0-3.3),

depth of caudal peduncle 2.5 (2.4-3.0), length of caudal peduncle 1.6 (1.5-1.9), all in head length.

Jaws about equal, oblique, premaxilla with an abrupt bend between the anterior horizontal portion and lateral part; mouth relatively small, maxilla ends at level well in front of anterior border of eye; lips thin; teeth conical with slightly curved tips, extending onto outer surface of lips; teeth of upper and lower jaws in 5-8 irregular rows anteriorly, reduced to a single row posteriorly, where those of upper jaw are exposed when mouth is closed;

Table II. Proportional measurements of selected type specimens of *Glossolepis leggetti* expressed as percentages of the standard length.

	Hototype MZB 9365	Paratype WEAM P.31459 -004 male	Paratype WAM P.31455 -002 male	Paratype WAM P.31455 -002 female	Paratype WAM P.31455 -002 male	Paratype MZB 9366 female
Standard length (mm)	73.0	92.9	78.4	78.2	55.3	54.6
Body depth	37.0	36.1	35.3	28.6	33.5	30.6
Body width	12.9	13.8	12.8	12.1	12.5	14.3
Head length	27.4	26.7	26.8	26.5	27.7	29.3
Snout length	7.5	7.5	7.0	7.7	6.9	7.3
Eye diameter	8.6	8.0	8.3	8.2	10.5	10.1
Bony interorbital width	8.4	8.8	9.1	8.3	8.7	9.5
Depth of caudal peduncle	11.0	11.3	9.9	9.0	9.6	10.3
Length of caudal peduncle	17.4	14.0	16.5	17.6	15.7	16.1
Predorsal distance	48.1	48.0	49.4	50.1	47.4	50.9
Preanal distance	47.3	50.4	48.7	49.1	49.2	50.9
Prepelvic distance	35.9	36.8	36.2	33.9	36.2	39.0
2nd dorsal fin base	24.1	23.9	23.6	20.2	20.8	21.2
Anal fin base	42.3	40.5	40.6	35.5	40.7	36.4
Pectoral fin length	19.2	23.3	19.6	18.5	19.9	20.3
Pelvic fin length	16.4	14.7	15.1	13.8	15.0	15.9
Longest ray 1st dorsal fin	20.8	17.9	17.2	12.8	18.1	15.2
Longest ray 2nd dorsal fin	16.4	16.4	15.3	10.5	10.8	15.4
Longest anal ray	16.2	15.4	12.1	12.8	12.7	14.3
Caudal fin length	23.0	21.5	21.0	21.9	25.3	26.7

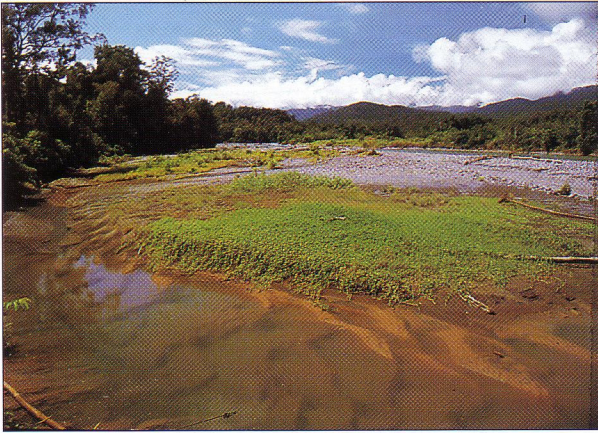


Fig. 4. Tributary of Tiawiwa River, near Siewa, Irian Jaya (Station 8). Habitat of *Glossolepis leggetti* and *Melanotaenia rubripinnis*.

about 64 teeth in outer row of upper jaw; several rows of small, conical teeth on vomer and palatines.

Scales relatively large, arranged in regular horizontal rows; most of body scales with pronounced crenulate margins; predorsal scales extending to posterior half of interorbital; preopercle with 3 scale rows from posterior angle to edge of eye.

First dorsal fin originates about even with level of anal fin origin or slightly anterior to this point; longest spine (second to fourth) of first dorsal fin 1.7 (1.5-2.1) in head length, its depressed tip reaching spine or first soft ray of second dorsal fin in females and third or fourth soft ray in mature males. Longest rays (middle ones in female, posterior rays in male) of second dorsal fin 1.7 (1.6-2.5) in head length, the depressed posterior rays extending about 1/2 length of caudal peduncle or less in female and 2/3rds length of caudal peduncle or more in mature male. Longest (usually middle rays in both male and female, but sometimes posteriormost rays in male) anal rays 1.7 (1.6-2.2) in head length. Pelvic fin tips when depressed reaching first or second soft anal ray; length of pelvic fins 1.7 (1.7-1.9), of pectoral fins 1.4 (1.1-1.4), of caudal fin 1.2 (1.1-1.3), all in head length. Caudal fin moderately forked.

Colour in life: male holotype (Fig. 2) iridescent green on back, dull orange to whitish on breast and lower side; a diffuse blue stripe on middle of side, its coloration most intense posteriorly and bordered immediately below by narrower stripe of light metallic blue; sides with scattered dark blue flecks or narrow bars; fins generally translucent, although dorsal and anal may be bluish, particularly in adult male. Females (Fig. 3, upper fish) are basically the same colour, but less ornate with a narrower mid-lateral stripe and with the dark flecks and narrow bars on the side considerably reduced.

Colour in alcohol: brownish on upper half, whitish to pale grey on lower half; a diffuse mid-lateral stripe sometimes present, its width occupying 1-2 scale rows;



Fig. 5. *Glossolepis multisquamatus*, male, approximately 55 mm SL, Ramu River system, Papua New Guinea, photographed in an aquarium.

usually with scattered dark bars, spots, or blotches on side of body; fins translucent, often with dusky basal portion, especially on dorsals, anal, and caudal.

Sexual dimorphism: Males generally possess a deeper body and have elongated posterior rays on the dorsal and anal fins. A comparison of the maximum depth in specimens exceeding 50 mm SL reveals an average depth (as percentage of SL) of 33.1 for males ($n = 25$) and 28.6 for females ($n = 23$). The smallest gravid female examined was 36.7 mm SL, indicating that sexual maturity is reached within the first year.

Distribution and Habitat

The species is currently known only from the Wapoga River system of northern Irian Jaya (Fig. 1). It was abundant in relatively clear, quiet pools of the Tiawiwa River, a major tributary of the Wapoga, in the vicinity of Siewa air strip (Fig. 4). This area represents a transition between foothills and alluvial flood plain. A single large adult was also collected near the mouth of the Wapoga River and therefore is probably common in a variety of lowland habitats. The species co-occurs in the Tiawiwa River with two other melanotaeniids, *Chilatherina alleni* and *Melanotaenia rubripinnis*, but unlike these species which are most abundant in shallow relatively rapid sections, it favours deeper pools, with minimal flow.

Comparisons

Glossolepis leggetti is most closely related to *G. multisquamatus* Weber and De Beaufort (Fig. 5) from the Ramu, Sepik, and Mamberamo river systems of northern New Guinea. The two species are similar in general appearance and coloration, although *G. multisquamatus* usually lacks scattered dark markings on the side of the body, which are typical of *G. leggetti*. Moreover, *G. leggetti* usually has a higher number of soft dorsal rays (Table 1) and fewer predorsal scales (range 18-23, average 20.5, $n = 29$ versus range 24-31, average 27.8, $n = 25$). In addition, males (in excess of 50 mm SL) of

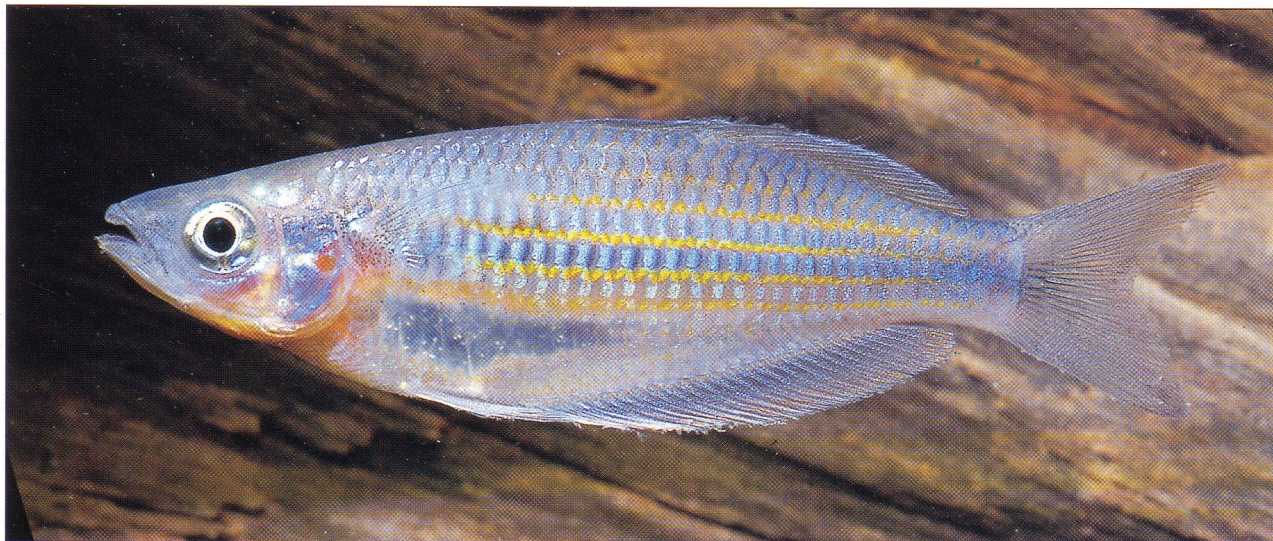


Fig. 6. *Melanotaenia batanta*, male paratype, 66.4 mm SL, Batanta Island, Irian Jaya, photographed in an aquarium.

G. leggetti are generally more slender than those of *G. multisquamatus* (range: 28.1-37.5, average 33.1, n = 25 versus range 33.1-43.5, average 39.0, n = 15).

Etymology

The species is named *leggetti* in honour of Ray Leggett of Brisbane, Queensland in recognition of his contributions to the knowledge of freshwater fishes of the Australia-New Guinea region.

***Melanotaenia batanta* sp. n.**

Batanta Rainbowfish (Fig. 6)

Holotype: MZB 9367, male, 87.4 mm SL, Warmon Stream, Batanta Island, Station 10.

Paratypes: MZB 9368, 5 specimens, 40.8-72.0 mm SL, Warmon Stream, Batanta Island, Station 10; USNM 349659, 52.7 mm SL, Warmon Stream, Batanta Island, Station 10; WAM P.31461-001, 5 speci-

Table III. Proportional measurements of selected type specimens of *Melanotaenia batanta* expressed as percentages of the standard length.

	Hototype MZB 9367 female	Paratype WEAM 9368 male	Paratype WAM P.31461 -001 male	Paratype WAM P.31461 -001 male	Paratype WAM P.314615 -001 male	Paratype MZB 9368 male
Standard length (mm)	87.4	72.0	65.8	66.4	53.3	50.0
Body depth	32.4	32.4	30.9	32.1	32.5	30.8
Body width	14.2	13.5	13.2	13.6	12.8	13.6
Head length	26.4	25.4	26.4	26.1	27.4	26.8
Snout length	8.5	8.5	8.5	8.3	9.4	7.6
Eye diameter	7.8	7.8	8.4	8.3	8.8	9.6
Bony interorbital width	9.5	9.0	9.3	9.3	9.4	9.4
Depth of caudal peduncle	11.8	11.0	11.2	10.4	11.3	11.0
Length of caudal peduncle	13.7	13.9	12.2	12.2	13.5	14.0
Predorsal distance	51.5	50.8	50.8	50.2	51.8	51.6
Preanal distance	48.1	44.9	47.0	45.2	43.9	49.0
Prepelvic distance	37.4	35.6	35.9	36.6	37.5	36.8
2nd dorsal fin base	24.6	24.7	22.0	22.0	22.9	24.6
Anal fin base	46.9	45.8	45.4	45.6	46.0	43.2
Pectoral fin length	21.6	19.3	20.5	20.8	19.7	18.4
Pelvic fin length	18.0	16.4	16.1	19.1	18.4	17.6
Longest ray 1st dorsal fin	13.7	12.9	17.3	15.7	14.3	14.8
Longest ray 2nd dorsal fin	10.3	11.5	12.2	12.3	12.6	12.0
Longest anal ray	12.6	11.7	13.7	13.3	11.6	10.4
Caudal fin length	19.5	22.5	21.3	26.2	23.8	24.0



Fig. 7. Warmon Stream, northern Batanta Island, Irian Jaya. This waterfall forms a barrier to upstream movement for *Melanotaenia batanta*.

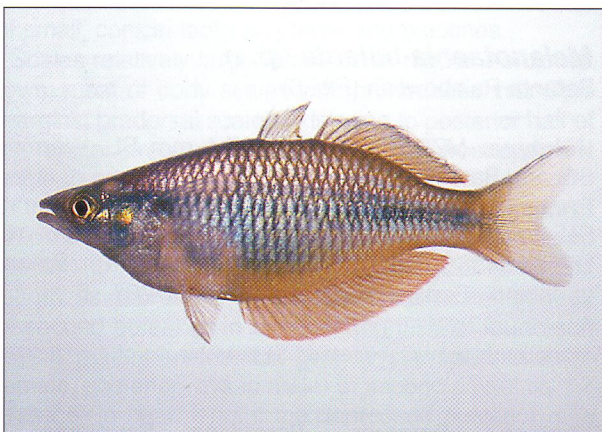


Fig. 8. *Melanotaenia irianjaya*, male, 67.0 mm SL, near Bintuni, Irian Jaya.

mens, 39.1-66.4 mm SL, Warmon Stream, Batanta Island, Station 10.

General description

Counts and proportions that appear in parentheses refer to the range for paratypes (based on 6 specimens, 50.0-72.0 mm SL) if different from the holotype.

Dorsal rays VI-I, 16 (V or VI, 13 to 16); anal rays I, 29 (I, 26-30); pectoral rays 14 (13 to 15); pelvic rays I, 5; branched caudal rays 15; lateral scales 37 (35 to 37); transverse scales 11; predorsal scales 16 (16 to 18); cheek scales 12 (11-13); gill rakers on first arch 3 + 15 = 18.

Body depth 3.1 (3.1-3.2), head length 3.8 (3.7-3.9), both in SL. Greatest width of body 2.3 (2.3-2.5) in greatest body depth. Snout length 3.1 (2.9-3.5), eye diameter 3.4 (2.8-3.3), interorbital width 2.8 (2.8-2.9), depth of caudal peduncle 2.2 (2.3-2.5), length of caudal peduncle 1.9 (1.8-2.2), all in head length.

Jaws about equal, oblique, premaxilla with an abrupt

bend between the anterior horizontal portion and lateral part; maxilla ends at level of front border of eye; lips thin; teeth conical with slightly curved tips, extending on to outer surface of lips; teeth of upper jaw in 5-6 irregular rows anteriorly, reduced to a single row posteriorly, where they are exposed when mouth is closed; about 70-78 teeth in outer row of upper jaw; teeth in lower jaw in about 6-8 irregular rows anteriorly, reduced to 1 or 2 rows posteriorly; narrow patch of small, conical teeth on vomer; palatines edentate or with a few feeble teeth.

Scales relatively large, arranged in regular horizontal rows; most of body scales with slight, but distinct crenulations along posterior margin; predorsal scales extending to posterior half of interorbital; preopercle with 3 scale rows from posterior angle to edge of eye.

First dorsal fin originates behind level of anal fin origin by distance equal to eye diameter or slightly less; longest spine (second or third) of first dorsal fin 1.5 (1.5-2.0) in head length, its depressed tip usually reaching base of first to fourth soft ray of second dorsal fin. Longest rays (anteriormost) of second dorsal fin 2.6 (2.1-2.2) in head length, the depressed posterior rays extending about 1/2 to 2/3 length of caudal peduncle. Longest (anteriormost) anal rays 2.1 (1.9-2.6) in head length. Pelvic fin tips when depressed reaching base of first to third soft anal ray; length of pelvic fins 1.5 (1.4-1.6), of pectoral fins 1.2 (1.2-1.5), of caudal fin 1.4 (1.0-1.2), all in head length. Caudal fin moderately forked.

Colour in life: neon blue on upper half except for brown scale edges; lower half whitish to pale orange with triangular grey area on lower side, above pelvic fins; a narrow orange stripe between each horizontal scale row on upper two-thirds of side; a diffuse dark blotch consisting of concentration of melanophores immediately behind eye on uppermost part of operculum; fins mainly translucent except dorsal, anal, and caudal frequently with bluish tint.

Colour in alcohol: mainly pale tan to whitish except nape and top of head grey in larger specimens; scales of back with prominent grey edges forming reticulated



Fig. 9. *Melanotaenia fredericki*, female, 81.8 mm SL, Salawati Island, Irian Jaya, photographed in an aquarium.

effect; most specimens with diffuse dark stripe, 1-2 scales wide, mid-laterally on caudal peduncle; intensity of peduncular stripe highly variable, blackish in some specimens, but barely detectable in others; a diffuse blackish blotch on uppermost part of operculum; dorsal, caudal, and base of anal fin dusky grey; pectoral and pelvic fins translucent.

Sexual dimorphism: Most of the adult type specimens are males, but judging from the female holotype (largest type specimen) there appears to be little difference between male and female, an unusual feature for melanotaeniids. The smallest female with developing eggs is 41.4 mm SL, indicating that sexual maturity is reached in the first year.

Distribution and Habitat

Melanotaenia batanta is currently known only from the island of Batanta in the Raja Ampat Group lying immediately west of the Birdshead (Vogelkop) Peninsula (Fig. 1). Batanta is a large, narrow (approximately 55 x 10 to 15 km) island characterized by numerous deep bays and irregular-shaped islets along its northern shore. The terrain consists mainly of steep limestone hills and mountains (highest peak 1183 m) covered by undisturbed rainforest. There are at least six small rivers on the northern side, which invariably drain into a narrow, but well-developed mangrove zone. The southern portion of the island is generally steeper than the north and lacks large streams. There is little mangrove on this side and the rainforest essentially extends to the edge of the sea.

All specimens were collected from one site, Warmon Creek, on the northern side of the island. The rainbowfish was restricted to a very small portion of this stream, essentially a 400 m stretch bounded by brackish mangrove habitat downstream and a 10 m high waterfall upstream (Fig. 7). Collections above the falls yielded

mainly sicydiine gobies (noted for their climbing ability) and no melanotaeniids. The stream was clear and moderately fast-flowing through primary rainforest.

Comparisons

Melanotaenia batanta is allied to *M. fredericki* (Fowler) and *M. irianjaya* Allen. The trio is restricted to the Birdshead (Vogelkop) Peninsula at the western extremity of New Guinea. *M. irianjaya* occurs in southern drainages flowing into Bintuni Bay whereas *M. fredericki* occupies the westernmost portion of the peninsula and nearby Salawati Island. The three species have a similar body shape and unlike most *Melanotaenia* there is a lack of pronounced sexual dimorphism. Males, in particular, lack the pronounced elongation of the posterior dorsal and anal fin rays, but rather the anterior or middle rays tend to be longest. Moreover, the three species have poorly developed palatine teeth or lack them entirely. *M. irianjaya* is easily distinguished by the narrow dark margins on the upper and lower edges of the caudal fin lobes (Fig. 8). It also usually has fewer anal fin rays than *M. batanta* (Table 1). The new species is most closely related to *M. fredericki* (Fig. 9), but there is a modal difference in number of dorsal fin rays (Table 1) and it possesses fewer cheek scales (11-13 versus 17-20).

Etymology

The species is named *batanta*, with reference to the type locality.

Melanotaenia rubripinnis sp. n.

Red-finned Rainbowfish (Figs. 10 & 11)

Holotype: MZB 9369, male, 93.8 mm SL, tributary of Tiawiwa River, Station 2.

Paratypes: MZB 9370, 13 specimens, 53.0-102.3 mm



Fig. 10. *Melanotaenia rubripinnis*, male holotype, 93.8 mm SL, Siewa, Irian Jaya, photographed in an aquarium.

Table IV. Proportional measurements of selected type specimens of *Melanotaenia rubripinnis* expressed as percentages of the standard length.

	Hototype MZB 9369	Paratype MZB 9370	Paratype MZB 9370	Paratype WAM P.31450 -002	Paratype MZB 9370	Paratype MZB 9370
	male	male	male	female	female	female
Standard length (mm)	93.8	102.3	72.8	65.2	59.2	54.8
Body depth	34.0	33.3	31.2	35.3	29.1	28.8
Body width	14.2	13.7	14.0	15.3	13.5	12.8
Head length	27.3	28.0	28.7	29.1	27.0	26.8
Snout length	9.6	10.6	9.2	9.2	8.6	8.8
Eye diameter	7.5	7.0	8.2	8.4	8.4	9.1
Bony interorbital width	9.1	9.3	9.6	11.0	9.8	9.3
Depth of caudal peduncle	12.3	12.7	11.5	12.0	10.6	10.0
Length of caudal peduncle	13.9	15.2	14.6	15.3	14.4	15.0
Predorsal distance	46.9	45.7	47.4	47.5	46.8	46.5
Preanal distance	46.6	48.1	49.9	49.5	51.4	50.2
Prepelvic distance	36.6	38.4	37.6	37.9	37.5	37.2
2nd dorsal fin base	32.6	30.0	29.5	33.1	28.2	28.3
Anal fin base	46.4	47.1	41.6	39.9	40.2	40.7
Pectoral fin length	15.9	16.7	19.1	17.9	18.2	17.0
Pelvic fin length	15.9	14.0	14.0	13.3	13.2	13.5
Longest ray 1st dorsal fin	12.8	10.9	14.7	11.2	10.5	10.8
Longest ray 2nd dorsal fin	14.4	12.4	14.1	12.4	9.6	10.0
Longest anal ray	11.7	10.5	11.8	12.6	10.5	10.9
Caudal fin length	16.5	14.5	18.4	20.7	20.3	18.2

SL, tributary of Tiawiwa River, Station 2; MZB 9371, 2 specimens, 57.8-85.4 mm SL, Tiawiwa River, Station 3; USNM 349660, 3 specimens, 54.8-62.8 mm SL, tributary of Tiawiwa River, Station 8; WAM P.31448-001, 7 specimens, 77.0-99.5 mm SL, tributary of Tiawiwa River, Station 4; WAM P.31450-002, 24 specimens, 25.0-68.0 mm SL, tributary of Logari River, Station; WAM, 76.5 mm SL, tributary of Logari River, Station 6.

General description

Counts and proportions that appear in parentheses refer to the range for paratypes (based on 20 specimens, 56.0-102.3 mm SL) if different from holotype.

Dorsal rays IV-1, 17 (IV to VI, 14 to 19); anal rays I, 25 (I, 22-28); pectoral rays 15 (13 to 15); pelvic rays 1, 5; branched caudal rays 15 (usually 15, occasionally 16); lateral scales 36 (35 to 37); transverse scales 11; predorsal scales 15 (14 to 17); cheek scales 23 (17-26); gill rakers on first arch 3 + 13 = 16 (2 or 3 + 13 or 14).

Body depth 2.9 (2.7-3.5), head length 3.7 (3.4-3.8), both in SL. Greatest width of body 2.40 (2.2-2.4) in greatest body depth. Snout length 2.8 (2.6-3.2), eye diameter 3.7 (2.9-4.0), interorbital width 3.0 (2.6-3.1), depth of caudal peduncle 2.2 (2.2-2.7), length of caudal peduncle 2.0 (1.8-2.1), all in head length.

Jaws about equal, oblique, premaxilla with an abrupt bend between the anterior horizontal portion and lateral part; maxilla ends at about level of front border of eye; lips thin; teeth conical with slightly curved tips, extending onto outer surface of lips; teeth of upper jaw

in 5-7 irregular rows anteriorly, reduced to 2-3 rows posteriorly, where they are exposed when mouth is closed; about 70-80 teeth in outer row of upper jaw; teeth in lower jaw in about 6-8 irregular rows anteriorly, reduced to 1 or 2 rows posteriorly; several rows of small, conical teeth on vomer and palatines.

Scales relatively large, arranged in regular horizontal rows; most of body scales with slight, but distinct crenulations along posterior margin; predorsal scales extending to posterior half of interorbital; preopercle with 4 (3 or 4) scale rows from posterior angle to edge of eye.

First dorsal fin originates behind level of anal fin origin (by distance equal to pupil width or less); longest spine (usually second or third) of first dorsal fin 1.7 (1.8-2.6) in head length, its depressed tip reaching spine or first ray of second dorsal fin in females and base of second or third soft ray in mature males. Longest rays (posteriormost rays in males and about third to fifth rays in females) of second dorsal fin 1.9 (2.0-2.8) in head length, the depressed posterior rays extending about 1/2 to 2/3 length of caudal peduncle in females and to base of caudal fin in mature males. Longest (posteriormost rays in males and anterior rays in females) anal rays 2.3 (2.3-2.7) in head length. Pelvic fin tips when depressed reaching spine or base of first soft anal-fin ray in females and base of third to fourth soft ray in males; length of pelvic fins 1.7 (1.8-2.2), of pectoral fins 1.7 (1.5-1.8), of caudal fin 1.7 (1.3-1.9), all in head length. Caudal fin moderately forked.

Colour in life: holotype (Fig. 10) red on back, mainly white on lower half of body except for blue smudge above anterior part of anal fin; black stripe from rear edge of eye to pectoral fin base, continuing as blue-black mid-lateral stripe to base of caudal fin; mid-lateral stripe more or less uniform in width (embracing 1-1/2 horizontal scale rows), bordered by narrow blue stripe above and broader yellow stripe below; dorsal, anal, caudal fins red-orange; pectoral and pelvic fins translucent. Paratypes are variably coloured. Many are similar to the holotype, particularly those from dense lowland rainforest habitat (Stations 2 and 4). However, the most common variety (Fig. 11) from more open habitats is brown above and white below with a black mid-lateral stripe that is narrowly bordered above and below by a light blue stripe. Occasional specimens from mountain streams are uniformly bluish except for a white breast region and black stripe between the eye and pectoral-fin base.

Colour in alcohol: brown on back, usually with lighter scale centres and whitish or tan on lower half of side, sometimes with pepper-like melanophores forming dark smudge on lower side above anterior part of anal fin base; prominent black mid-lateral stripe of more or less uniform width; fins mainly translucent, although dorsal, anal, and caudal variably dusky.

Sexual dimorphism: males have a more intense colour pattern, especially specimens from dense lowland rainforest streams (Stations 2 and 4). As in the majority of *Melanotaenia*, males are distinguished from females by the longer first dorsal fin and profile of the second dorsal and anal fins typified by elongation of the posteriormost rays. The difference between male and female body depth is far less in this species than in most other melanotaeniids: that of males over 50 mm SL averaged 32.6 percent of SL ($n = 13$) compared to 30.8 percent for similar-sized females ($n = 15$). The smallest female with eggs measured 47 mm SL, indicating that sexual maturity probably occurs in the first year.

Distribution and Habitat

Melanotaenia rubripinnis is currently known only from the Wapoga River system of northern Irian Jaya (Fig. 1). It was relatively common in a variety of habitats including tannin-stained creeks in lowland rainforest, larger streams in more open situations (Fig. 4), and mountain tributaries (Fig. 12) to an elevation of about 400 m above sea level. Of the four melanotaeniids occurring it appears to be as adaptable as *Chilatherina alleni* as far as occupying a variety of habitats and penetrating into the lower mountains is concerned. The two species generally co-occur in the same streams and are also sometimes found with *Glossolepis leggetti* in lowlands immediately adjacent to foothills. It is found in quiet shaded pools, as well as sunlit sections of larger streams and relatively fast-flowing mountain streams.



Fig. 11. *Melanotaenia rubripinnis*, male paratype, 54.8 mm SL, Siewa, Irian Jaya, photographed in an aquarium.



Fig. 12. Mountain tributary of Logari River, part of Wapoga River system of northern Irian Jaya. Habitat of *Melanotaenia rubripinnis*.

Comparisons

Melanotaenia rubripinnis belongs to the *affinis* species-group of northern New Guinea (includes *M. affinis*, *M. japonensis*, *M. maylandi* and *M. vanheurni*) and is most closely related to *M. vanheurni* Weber and De Beaufort from the Mamberamo River system of Irian Jaya. However, it differs in colour (see Fig. 13) and modal number of soft dorsal rays (usually less than 18 in *M. rubripinnis* and more than 18 in *M. vanheurni*, see Table 1). In addition, *M. rubripinnis* has fewer cheek scales (range 17-26, average 19.9, $n = 28$ versus range 19-36, average 29.2, $n = 43$).

Etymology

The species is named *rubripinnis* (Latin: with red fins), with reference to the characteristic fin coloration.

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