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## Redescription of *Homaloptera ripleyi* (Fowler, 1940) from Sumatra, Indonesia (Teleostei: Balitoridae)\*

Wiederbeschreibung von *Homaloptera ripleyi* (Fowler, 1940)  
von Sumatra, Indonesien (Teleostei: Balitoridae)

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**Summary:** *Homaloptera ripleyi*, a member of the family Balitoridae, is only known by the holotype, originally described by H.W. Fowler in 1940 from northern Sumatra as *Homalopterula*. The inadequately studied species is redescribed on the base of freshly collected material. The species differs from all other *Homaloptera* species by combination of the following characters: eight to ten saddle-like blotches on dorsal side of body not reaching the lateral line; ventral side completely scaleless; obliquely truncate caudal fin and protruding curved shape of jaws, especially lower jaw with a pad of chondroid tissue; 72-78 scales on lateral line. *H. ripleyi* is endemic to Sumatra and only known from the northern provinces.

**Key words:** *Homalopterula*, *Homaloptera*, Homalopterinae, Sundaland, chondroid tissue

**Zusammenfassung:** *Homaloptera ripleyi*, ein Mitglied der Familie Balitoridae, war bisher nur durch den Holotypus bekannt, der von H.W. Fowler im Jahre 1940 erstmalig aus dem nördlichen Sumatra als *Homalopterula* beschrieben wurde. Diese unzureichend erforschte Art wird anhand von neuem Material ergänzend beschrieben. Die Art unterscheidet sich von allen anderen bekannten Arten der Gattung *Homaloptera* durch folgende Merkmalskombination: acht bis zehn sattelförmige Flecken auf dem Rücken, die die Seitenlinie nicht erreichen; die Körperunterseite ist vollständig schuppenlos; die Schwanzflosse ist schief abgeschnitten; gerundete, hervortretende Kiefer, besonders der Unterkiefer mit einem Polster von chondroidem Gewebe; 71-78 Seitenlinienschuppen. *H. ripleyi* ist endemisch für Sumatra und nur aus den nördlichen Provinzen bekannt.

**Schlüsselwörter:** *Homalopterula*, *Homaloptera*, Homalopterinae, Sundaland, chondroides Gewebe

### 1. Introduction

The members of the freshwater fish genus *Homaloptera* are distributed throughout Sundaland (peninsular Malaysia and the southern tip of Thailand south of the isthmus of Kra, Sumatra, Borneo and Java), Indochina (Laos, Cambodia and Vietnam) and in the western Ghats of the Indian subcontinent. Most species of the genus *Homaloptera* live in fast flowing waters, adapted by a depressed body, a flat belly and the pectoral and ventral fins inserted and expanded laterally.

According to TAN & NG (2005) and TAN (2009) the genus is most probably polyphyletic. The south Indian species of *Homaloptera* s.l. form a group of its own that may not belong to the genus *Homaloptera*. The genus *Homaloptera* van Hasselt, 1823 is defined within the family Balitoridae by the combination of the following characters: 8 to 10 ventral fin rays, at least 2 up to 8 simple rays anteriorly in the pectoral fin, the ventral fins not united posteriorly. Four rostral barbels and one at each mouth angle. Mouth subterminal with an absent or very poorly developed oral groove or fold.

\*Dedicated to Prof. Dr. F. KIRSCHBAUM on occasion of his 65<sup>th</sup> birthday and retirement.

Eight species of *Homaloptera* are known from Sumatra, Indonesia (KOTTELAT et al. 1993, DOI 1997). *Homaloptera ripleyi* is only known from a single specimen (FOWLER 1940) and has not been recorded and studied since then. Several species of *Homaloptera* were collected in 2003 by D. DETTMERS and the author in the northern part of Sumatra. One of these was identified as *H. ripleyi*. The present study aims to give a detailed description of this poorly documented species, because the data of the fresh deposited material enables a more precise definition of the species, removing some uncertainties (e.g. in measurements and anatomical data) of the first description.

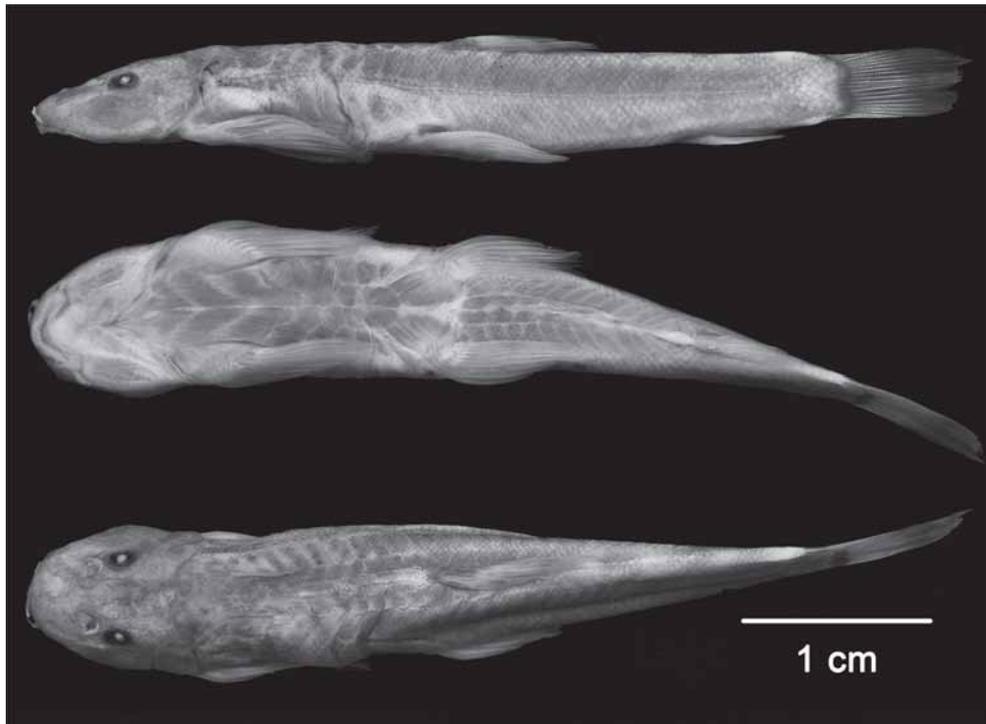
## 2. Material and methods

The holotype of *Homaloptera ripleyi* is deposited in the Natural History Museum in Philadelphia

(Academy of Natural Sciences). Due to the poor condition of the holotype – already mentioned by HORA (1950) – it was studied by photographs (fig. 1) and radiographs (fig. 2) and compared with Fowler's original description and drawing.

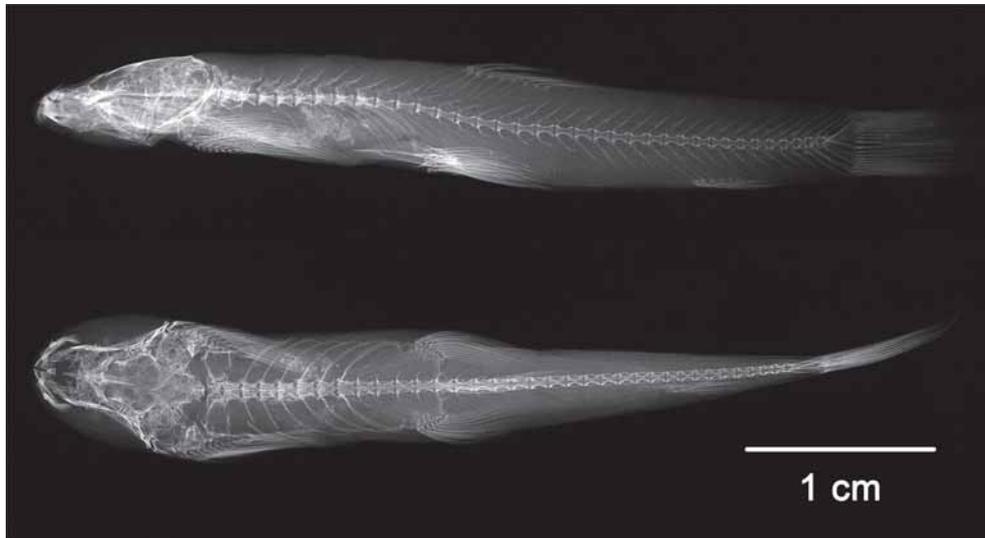
All measurements were taken from the left side with a digital caliper. Morphometric data are based on the principle measurements shown in figs. 3 and 4. Morphometric measurements follow TAN (2006) and KOTTELAT (1990) with two modifications: length of snout and length of caudal peduncle are measured as shown in figs. 3 and 4. Terms of description for caudal fin forms follow FISCHER & WHITEHEAD (1974) and MENON (1987) for homalopterid fishes.

The following morphometric parameters are used (abbreviations in brackets): total length (TL), standard length (SL), preventral or prepelvic length (PVL), preanal length (PAL),

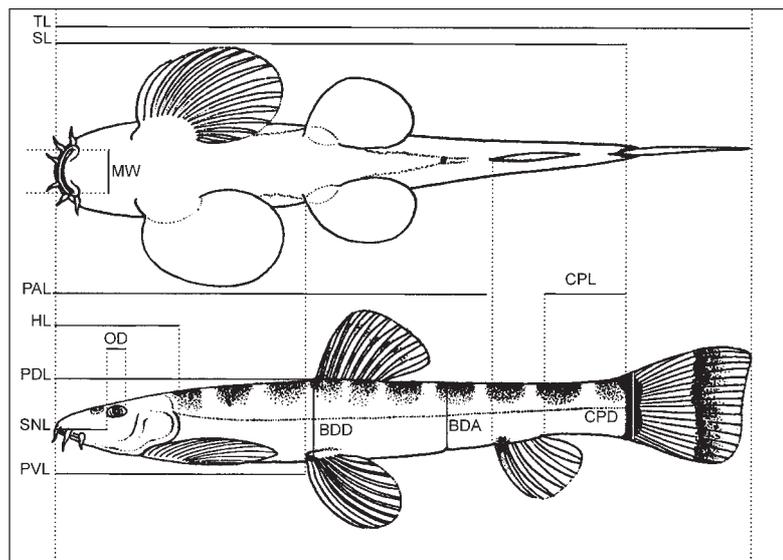


**Fig. 1:** Holotype of *Homaloptera ripleyi* in lateral (above), ventral (middle) and dorsal (below) view. Photo: KYLE LUCKENBILL.

**Abb. 1:** Holotypus von *Homaloptera ripleyi* in lateraler (oben), ventraler (Mitte) und dorsaler Sicht (unten). Foto: KYLE LUCKENBILL.

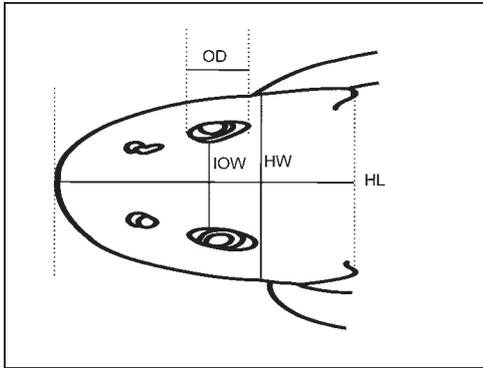


**Fig. 2:** Radiographs of the holotype *Homaloptera ripleyi*, lateral (above) and ventral (below).  
**Abb. 2:** Röntgenaufnahmen des Holotypus von *Homaloptera ripleyi*, lateral (oben) und ventral (unten).



**Fig. 3:** Morphometric measurements based on the drawing of *Homaloptera ripleyi* in FOWLER (1940). BDA = body depth at anus, BDD = body depth at dorsal fin origin, CPD = caudal peduncle depth, CPL = caudal peduncle length, HL = head length, MW = mouth width, OD = orbital diameter, PAL = preanal length, PDL = predorsal length, PVL = preventral length (prepelvic length), SL = standard length, SNL = snout length, TL = total length.

**Abb. 3:** Morphometrische Maße auf der Basis der Zeichnung von *Homaloptera ripleyi* in FOWLER (1940). BDA = Körperhöhe beim After, BDD = Körperhöhe an der Basis der Rückenflosse, CPD = Höhe des Schwanzstiels CPL = Länge des Schwanzstiels, HL = Länge des Kopfes, MW = Maulbreite, OD = Augendurchmesser, PAL = Länge vor der Afterflossenbasis, PDL = Länge vor der Rückenflossenbasis, PVL = Länge vor der Bauchflossenbasis, SL = Standardlänge, SNL = Länge der Schnauze, TL = Totallänge (Gesamtlänge).



**Fig. 4:** Morphometric measurements of the head. HL = head length, HW = head width, IOW = interorbital width, OD = orbital diameter.

**Abb. 4:** Morphometrische Maße des Kopfes. HL = Kopflänge, HW = Kopfbreite, IOW = Interorbitalbreite, OD = Augendurchmesser.

predorsal length (PDL), head length (HL), snout length (SNL), caudal peduncle length (CPL), orbital diameter (OD), body depth at dorsal fin origin (BDD), body depth at anus (BDA), caudal peduncle depth (CPD), interorbital width (IOW), head width (HW) and mouth width (MW). As far as possible parameters were re-measured on the photographs of the holotype and compared with the measurements used by FOWLER 1940: (body) depth, head (length), head width, snout (length), eye (diameter), mouth width, interorbital (width) and least depth of caudal peduncle. All distance measurements are given in millimeters (mm). Relative morphometric data are calculated for BDD in SL, HL in SL, SNL in HL, OD in HL, OD in SNL, OD in IOW, IOW in HL and MW in HL, as used by FOWLER (1940) in the original description.

Meristic data taken were counts of scales, fin rays and vertebrae. Scales in lateral line (SLL) counts all pored scales, i.e. all perforated scales between pectoral girdle and base of caudal fin, terminated by the end of the last scale. In case of a complete lateral line this is the same as the midlateral row of scales (after KOTTELAT & FREYHOF 2007) or the lateral row (after KOTTELAT et al. 1993). Fin ray counts for pectoral, ventral (pelvic), dorsal and anal fins are given in roman numerals for simple (unbranched) rays and arabic numerals for branched rays.

Vertebrae counts were taken from radiographs of the holotype, another deposited specimen (MTD F 31804) and one cleared and

stained specimen (deposited in author's collection). Counts exclude the Weberian apparatus, but include the urostyle. Clearing and staining was done with a simplified method with 2 % caustic potassium solution (KOH), Alizarin Red S, a dehydrating series of alcohol and preservation in glycerol (BHUDHOYE et al. 2001, ZANGER 1994).

Water parameters (pH, hardness, nitrate, nitrite) were taken with a water testing laboratory set (JBL company), conductivity with a conductivity meter (Hannah) and temperature with a digital thermometer. Photographs were taken with a digital SLR camera (Minolta Dynax 5D), 50 mm and 90 mm macro lenses (Minolta, Tamron) and a low magnifying (20 ×) microscope (Euromex). Geographical positions were taken by GPS positioning (Garmin GPS 12).

Abbreviations: A = anal fin; asl = above sea level; ANSP = Academy of Natural Sciences, Natural History Museum in Philadelphia, U.S.A.; C = caudal fin; MTD-F = Senckenberg Naturhistorische Sammlungen, Museum für Tierkunde, Fischsammlung, Dresden, Germany; n = random sample number, sd = standard deviation; P = pectoral fin; s.l. = sensu lato; sp. = species (singular); spp. = species (plural); s. str. = sensu stricto; V = ventral (pelvic) fin.

### 3. Results

#### *Homaloptera ripleyi* (Fowler, 1940)

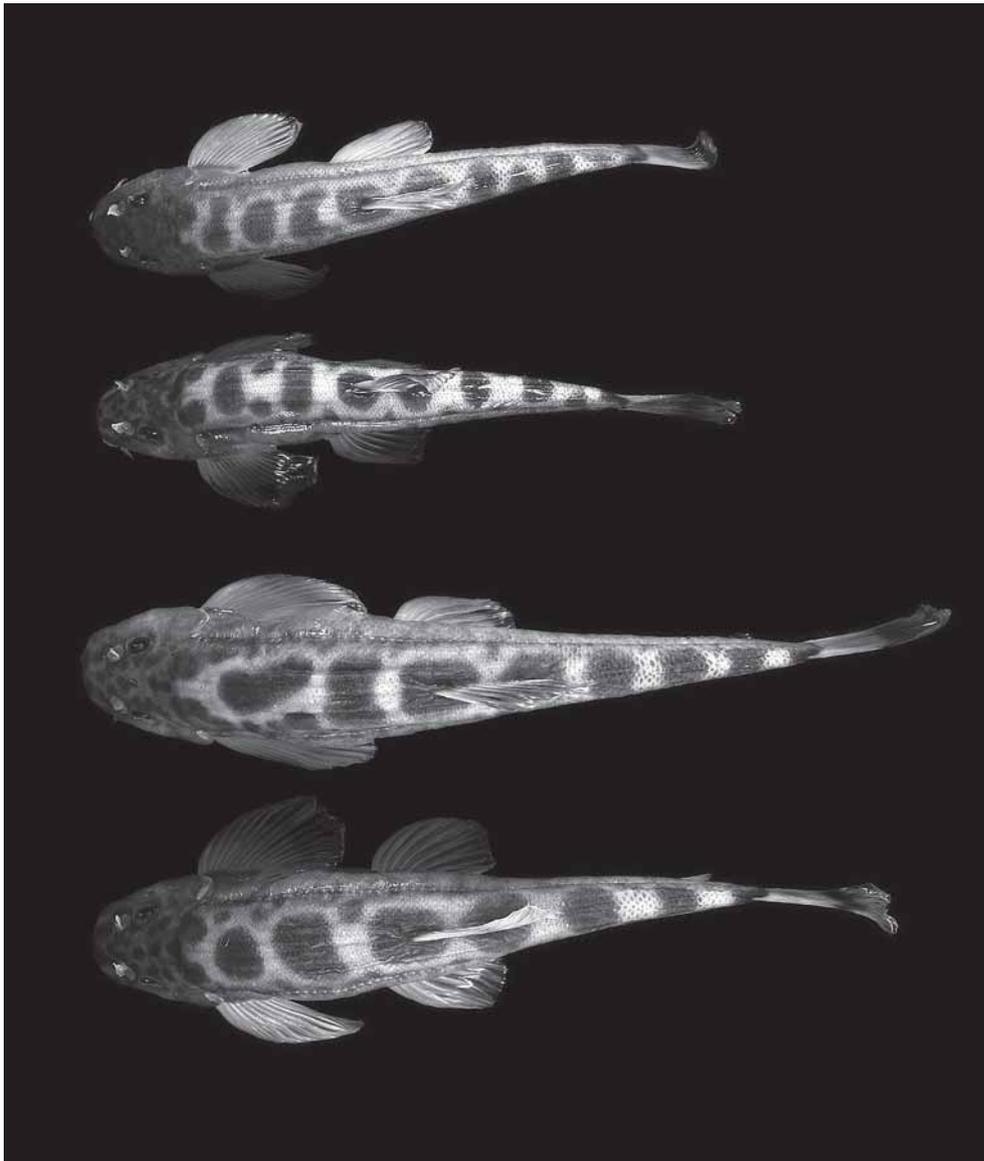
**Holotype:** ANSP 68713, 51 mm TL, Indonesia, Sumatra, Province Aceh (Atjeh), river Goepang

at Meloewak, 500 m asl (1640 feet), collected by S. Dillon Ripley, field representative of the Academy of Natural Sciences Philadelphia during the George Vanderbilt Sumatra Expedition 1936–1939 on March 23, 1939.

Material examined: ANSP 188907, 1 specimen SL 39.3 mm, Indonesia, Sumatra, Province Sumatera Utara, small nameless

tributary to Sungai Bohorok, north of Bukit Lawang 03°33'01.4"N - 098° 07'01.0"E, 236 m asl, collected by D. DETTMERS and G. OTT February, 24, 2003.

ANSP 188908, 4 specimens, SL 43.1-58.5 mm, Indonesia, Sumatra, Province Sumatera Utara, Tanah Karo County, Kampung Bassam northeast of Berastagi, southeast of Gunung



**Fig. 5:** Dorsal view of the preserved specimens of *Homaloptera ripleyi* ANSP 188908.

**Abb. 5:** Rückenansicht der unter ANSP 188908 katalogisierten konservierten Exemplare von *Homaloptera ripleyi*.

Sibayak, 03°11'27.1"N – 098°32'47.7" E – 1391 m asl, collected by D. DETTMERS and G. OTT, March 10, 2003 (fig. 5).

MTD F 31804-31807, 4 specimens, SL 30.5–53.7 mm, Indonesia, Sumatra, Province Sumatera Utara, Tanah Karo County, Kampung Basam northeast of Berastagi, southeast of Gunung Sibayak, 03°11'27.1"N – 098°32'47.7" E 1391 m asl, collected by D. DETTMERS and G. OTT, March 10, 2003.

**Diagnosis:** *Homaloptera ripleyi* differs from the other members of the genus by combination of the following characters: eight to ten saddle-like blotches on dorsal side of body not reaching lateral line; ventral side completely scaleless; obliquely truncate caudal fin, upper lobe slightly longer than lower lobe; a prominent curved shape of jaws, especially lower jaw; origin of dorsal fin just anterior to pelvic-fin origin; 72–78 scales in lateral line.

**Description:** The redescription is based on nine preserved and deposited specimens (see above) and 14 living specimens, observed in aquarium (figs. 6 a, b, d) and in the field (fig. 6 c). Maximum measured size 58.5 mm SL.

The general body shape and appearance show figs. 5, 6 a-b and 7 a. The body is dorsoventrally depressed with flat ventral side. Pectoral fins do not reach bases of ventral fins. Origin of dorsal fin in posterior half of the body (PDL > PVL). Caudal fin obliquely truncate (fig. 8). The ventral surface without scales (fig. 6 d). Mouth inferior, with three short, fleshy pairs of barbels, two rostral, one maxillary. Pre-maxillary and dental bone covered with flexible whitish hyaline tissue (fig. 9).

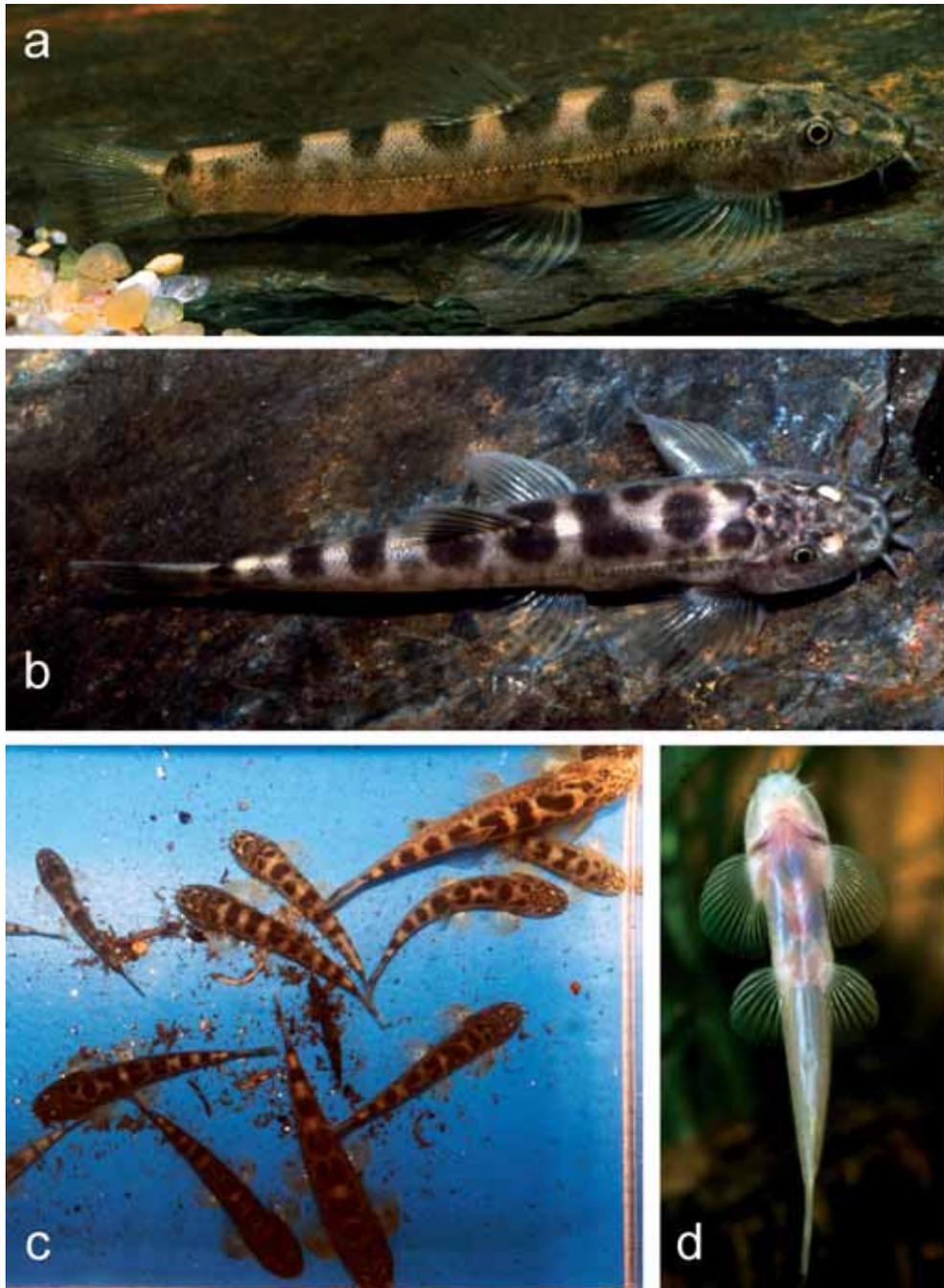
Table 1 presents statistics of morphometric parameters; table 2 presents relative morphometric parameters. Fin ray counts: P v, 10–12; V ii,7; D i, 7; A i,5. The lateral line is complete, SLL 72–78 with a modal of 75 (n=9). Vertebrae 34.

**Colouration:** For general appearance see figs. 5, 6 a-d and 7a. The colour in living specimens is brownish olive on the dorsal side with eight to ten more or less well defined dark to black saddle-like blotches with some reflections down on the sides, but the dorsal saddles not reaching the lateral line. Number of the saddle-like blotches varies from eight to ten with size (figs. 5, 6 c). Generally larger fishes show more

**Tab. 1:** Morphometric data of *Homaloptera ripleyi*. Abbr. = Abbreviations, min = minimum, max = maximum, sd = standard deviation, D = difference of the means to the holotype.

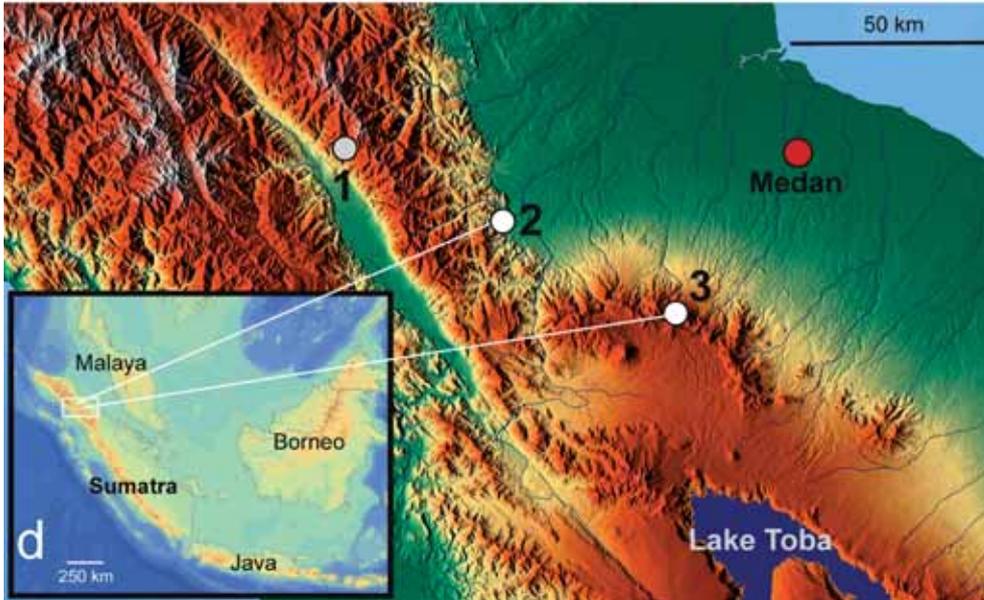
**Tab. 1:** Morphometrische Daten von *Homaloptera ripleyi*. Abbr. = Abkürzungen, min = Minimum, max = Maximum, sd = Standardabweichung, D = Differenz der Mittelwerte zum Holotypus.

Morphometric parameter	Abbr.	min [mm]	max [mm]	min [%SL]	max [%SL]	mean (n=9)	sd	mean [%SL]	Holotype [% SL]	D
Total length	TL	30.5	58.5	117.2%	120.4%	45.1	8.6	118.0%	116.4%	1.6%
Standard length	SL	26.1	48.6	100.0%	100.0%	38.3	7.4	100.0%	100.0%	0.0%
Preventral (prepelvic) length	PVL	12.6	21.2	48.4%	43.6%	17.1	2.8	44.7%	46.4%	-1.7%
Preanal length	PAL	27.1	39.0	104.0%	80.2%	31.9	4.3	83.3%	80.7%	2.6%
Predorsal length	PDL	12.9	25.5	49.7%	52.4%	19.4	4.0	50.8%	50.7%	0.1%
Head length	HL	6.7	10.7	25.7%	22.0%	8.9	1.3	23.2%	21.1%	2.2%
Snout length	SNL	2.4	4.5	9.1%	9.2%	3.8	0.7	9.8%	9.6%	0.2%
Caudal peduncle length	CPL	4.0	6.7	15.2%	13.8%	5.1	1.0	13.3%	11.4%	1.9%
Orbital diameter	OD	1.0	1.6	4.0%	3.3%	1.3	0.2	3.5%	3.2%	0.3%
Body depth at dorsal fin origin	BDD	4.1	8.5	15.6%	17.6%	6.2	1.6	16.2%	15.0%	1.2%
Body depth at anus	BDA	3.3	6.1	12.8%	12.5%	4.7	0.9	12.3%	11.8%	0.5%
Caudal peduncle depth	CPD	2.7	4.8	10.4%	9.9%	3.9	0.7	10.2%	8.6%	
Interorbital width	IOW	1.9	4.3	7.1%	8.8%	2.9	0.7	7.7%	8.9%	-1.2%
Head width	HW	4.5	9.2	17.4%	19.0%	7.3	1.3	19.2%	20.0%	-0.8%
Mouth width	MW	2.5	4.2	9.6%	8.7%	3.2	0.7	8.4%	9.7%	-1.3%



**Figs. 6 a-d:** Live specimens of *Homaloptera ripleyi* in an aquarium (except c). **a** Lateral view, **b** dorsal view, **c** Dorsal view in a container at collection site, **d** ventral view.

**Abb. 6 a-d:** Lebende Exemplare von *Homaloptera ripleyi* im Aquarium (außer c). **a** Seitenansicht, **b** Rückenansicht, **c** Rückenansicht in einem Behälter am Fundort, **d** Körperunterseite.



**Tab. 2:** Relative morphometric data of *Homaloptera ripleyi*. min = minimum, max = maximum, sd = standard deviation.

**Tab. 2:** Relative morphometrische Daten von *Homaloptera ripleyi*. min = Minimum, max = Maximum, sd = Standardabweichung.

Relative parameters	min [mm]	max [mm]	mean (n=9)	sd	Fowler 1940	Holotype
BDD in SL	5.3	7.2	6.3	0.7	7.75	6.7
HL in SL	3.8	4.7	4.3	0.3	4.60	4.7
SNL in HL	2.2	2.8	2.4	0.2	1.89	2.2
OD in HL	6.0	7.5	6.7	0.5	6.00	6.6
OD in SNL	2.3	3.5	2.8	0.3	3.25	3.0
OD in IOW	1.8	2.7	2.2	0.3	2.00	2.8
MW in HL	2.5	3.1	2.8	0.2	2.75	2.2
IOW in HL	2.4	3.6	3.1	0.4	3.00	2.4
CPD in HL	2.1	2.5	2.3	0.1	2.13	2.5

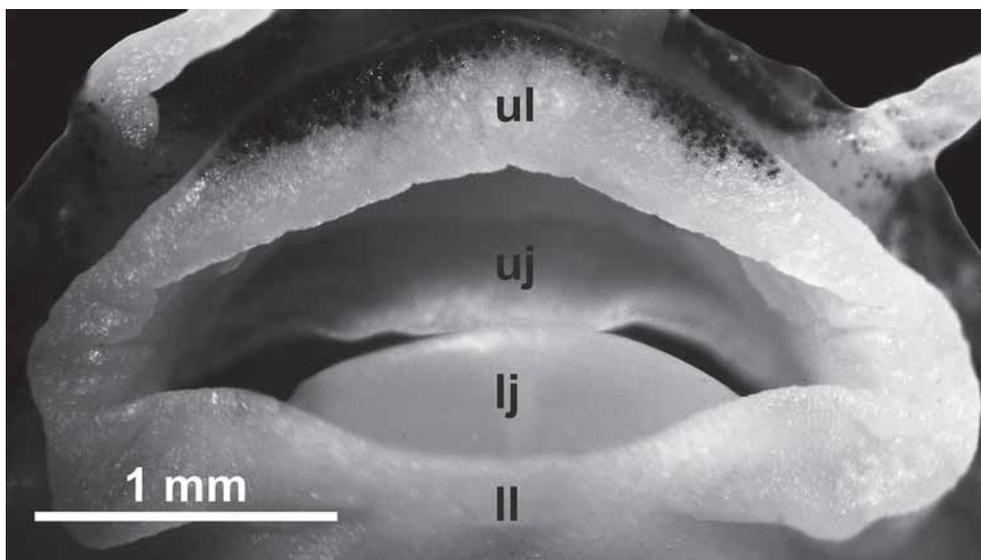


**Fig. 8:** Obliquely truncate caudal fin of *Homaloptera ripleyi*.

**Abb. 8:** Schief gestutzte Schwanzflosse von *Homaloptera ripleyi*.

**Figs. 7 a-d:** **a** Freshly preserved specimen of *Homaloptera ripleyi* showing general appearance, **b** lotic habitat (locality 2 in d), small nameless tributary to Sungai Bohorok, north of Bukit Lawang 03°33'01,4"N – 098° 07'01,0"E, **c** swampy spring habitat (locality 3 in d) near Kampung Bassam 03°11'27,1"N – 098°32'47,7" E, **d** map of northern Sumatra: 1 = locus typicus, 2 = Bukit Lawang (Bohorok), 3 = Kampung Bassam.

**Abb. 7 a-d:** **a** Frisch konserviertes Exemplar von *Homaloptera ripleyi*, **b** Fließgewässerhabitat (Fundort 2 in d), kleiner namenloser Zufluss zum Sungai Bohorok, Bukit Lawang 03°33'01,4"N – 098° 07'01,0"E, **c** sumpfiges Quellwasserhabitat (Fundort 3 in d) beim Dorf Bassam 03°11'27,1"N – 098°32'47,7" E, **d** Karte von Nord-Sumatra: 1 = locus typicus, 2 = Bukit Lawang(Bohorok), 3 = Kampung Bassam.



**Fig. 9:** Mouth of *Homaloptera ripleyi* with chondroid tissue pads on lower and upper jaw bones before maceration. ul = upper lip, uj = upper jaw, lj = lower jaw, ll = lower lip.

**Abb. 9:** Maul von *Homaloptera ripleyi* mit Polstern von Chondroid-Gewebe auf Unter- und Oberkieferknochen vor Mazeration. ul = Oberlippe, uj = Oberkiefer, lj = Unterkiefer = lower jaw, ll = Unterlippe.

saddles than smaller specimens. On the dorsal side of head some irregular brownish blotches, in the neck area two almost black blotches, well defined in large specimens, less developed in smaller ones. Ventral side of body from snout to origin of caudal peduncle white. Caudal fin with small dark band on base and one broader vertical band in posterior third. Branched fin rays of dorsal fin darkened before splitting. Anal, ventral and pectoral fins almost clear, towards bases with brown-yellow hue.

**Distribution:** *Homaloptera ripleyi* is currently only known from northern Sumatra, Indonesia. The three known localities are shown in fig. 7 d. All locations are situated in the zoogeographic unit of North Toba (East) of Sumatra as defined by MacKinnon in Whitten et al. (2000).

**Habitat:** Fowler (1940) listed the holotype as collected in River Goempang (locality 1). The habitat of the first specimen collected in 2003 was a small nameless tributary to Sungai Bohorok north of Bukit Lawang (locality 2) about 0.5 to 1.2 m broad with shallow, slowly running water with a depth between 10 and 30

cm in February; in other seasons the maximum water depth probably does not exceed one meter (according to the vegetation along the bank of the rivulet). The bottom substrate consisted of a mix of bedrock, boulders, rocks and gravel. The water was clear. Water and air temperature 26 °C at 10.00 pm. Electric conductivity of water 20 µS/cm, pH 6.8; total hardness, nitrate and nitrite nearly zero. No water plants seen. Other fish species observed: *Rasbora spilotaenia* (MTD F 30839-30840) and *Puntius binotatus* s.l. (MTD F 30854-30857); *Homaloptera gymnogaster* and other *Homaloptera* spp. were observed in the Bohorok system.

Locality 3 in Tanah Karo County, Kampung (Bahasa Indonesia for “village”) Basam was a small brook with one meter width and not more than 10 cm depth in a shady bamboo and bush forested swampy area. It contained a thick layer of leaves. It was a crenal water extending not more than 400 m before flowing into Sungai Basam (Indonesian language) or Lau Bassam (Karo dialect). The water temperature at 1:30 p.m. was 20 °C, air temperature 31 °C. Electric conductivity of the water was 20 µS/cm, pH 6.4;

hardness and nitrite nearly zero, nitrate about 15 mg/litre, obviously due to a washing and bathing place nearby. The local Karo people call this area "Siberu Lau", in Indonesian "air mata", meaning "mother of water" = spring (BANGKARU 2001). *Homaloptera ripleyi* was rather common at this place, about 25 specimens were caught with a scoop net (30 × 20 cm) within an hour.

#### 4. Discussion

FOWLER (1940) described *Homaloptera ripleyi* in the monotypic genus *Homalopterula* Fowler, 1940, which was included in *Homaloptera* van Hasselt, 1823 by ROBERTS (1989). KOTTELAT (1998) discusses the members of *Homaloptera* as a likely polyphyletic lineage with several groups. In accordance with KOTTELAT (1998) *Homaloptera ripleyi* belongs to a group of *Homaloptera* from Sumatra, including *H. gymnogaster*, *heterolepis*, *ripleyi* and *vanderbilti*, characterized by a more cylindrical rather than compressed body, a relatively wide mouth, shorter paired fins than other *Homaloptera* and a truncate or only slightly emarginate caudal fin. *H. ripleyi* differs from all other members of this group by a longer lateral line (72-78 versus 60-73 scales in *H. gymnogaster*, 63-70 in *H. heterolepis* and 55-57 in *H. vanderbilti*). *Homaloptera ripleyi* further differs from *H. gymnogaster* in having a completely naked ventral surface (versus belly naked only in front of ventral fins in *H. gymnogaster*). It further differs from *H. heterolepis* by a broad vertical stripe in posterior half of caudal fin (versus three small vertical stripes in *H. heterolepis*) and from *H. vanderbilti* by having 8 to 10 broad dorsal saddlespots (versus 14 to 17 small saddlespots in *H. vanderbilti*). The long lateral line differentiates *H. ripleyi* from all other Sumatran *Homaloptera* (72-78 scales in *H. ripleyi* versus 36-40 in *H. nebulosa*, 63-65 in *H. ocellata*, 43-47 in *H. wassinki* and 41-45 in *H. zollingeri*). It further differs from *H. nebulosa* by pectoral fin not reaching ventral fin (versus reaching it in *H. nebulosa*), from *H. ocellata* by unkeeled scales (versus keeled in *H. ocellata*), from *H. wassinki* by oblique truncate

(versus deeply emarginate in *H. wassinki*) and from *H. zollingeri* by origin of dorsal fin posterior to ventral fin (versus anterior in *H. zollingeri*).

*H. ripleyi* can easily be distinguished from all other named species of *Homaloptera* s.l. by having 8 to 10 irregular saddle-like dark blotches on dorsal side of body, not reaching the lateral line.

The morphometric parameters shown in table 1 from the nine preserved and examined specimens match all fifteen parameters of the holotype based on data in % SL and do not differ more than -1.7% to +2.6%. The range of the relative morphometric parameters (calculated parameter data in SL, HL, SNL and IOW) from table 2 match with the data of the first description, except BDD in SL; this may be due to the fact that it is not clear where body depth was measured by FOWLER (1940). FOWLER's counts D III,7,1 and A II,5,1 express that he has found half rays or short spines. According to the radiographs the holotype has D I,7 and A I,5 like all nine specimens examined.

The counts for SLL by FOWLER (1940) are "scales 70 + 3 in lateral line". Some American authors end counting at the end of the hypural plate. European ichthyologists usually count all perforated scales (see HOLCIK et al. 1989). KOTTELAT et al. (1993) mention "lateral line scales 43" for *H. ripleyi*, which is obviously an error, confusing the SLL with Fowler's counts of predorsal scales.

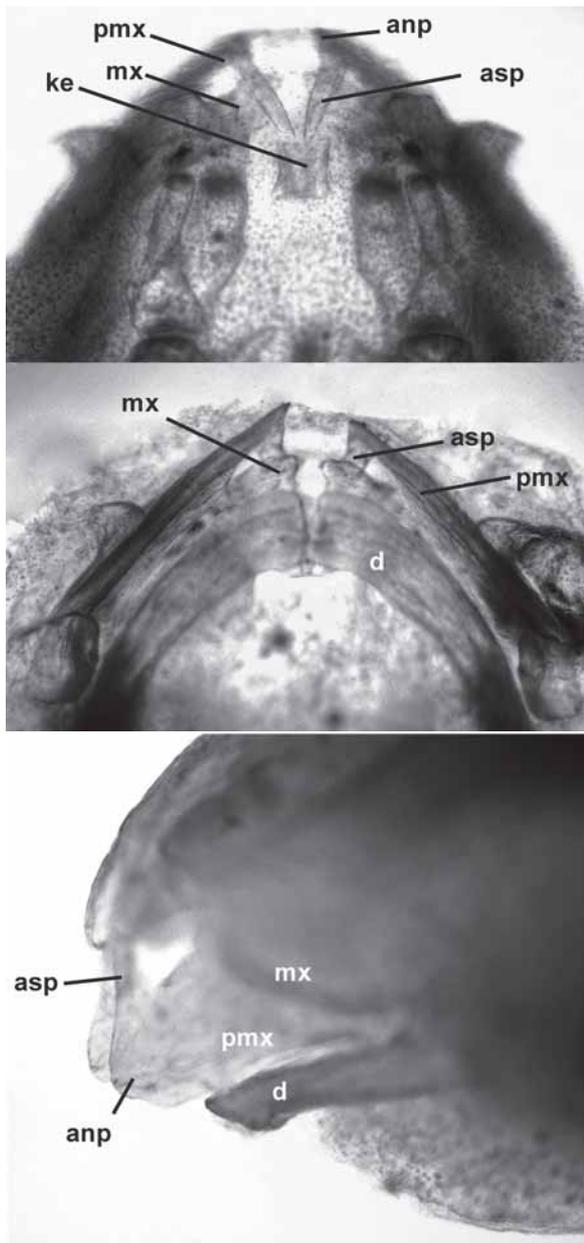
FOWLER (1940) established his new genus *Homalopterula* with *H. ripleyi* as type species "chiefly by the peculiar shape of its jaws". This character is shown in a small line drawing in FOWLER's original description and here shown as photograph (fig. 9). In a cleared and stained specimen the tissue on the jaw bones macerated away. One assumption is, that the outer shape of the jaws is formed by a chondroid tissue. In living or fresh preserved specimens the "jaws" show a considerable elasticity and pearly bluish color. BENJAMIN (1988, 1989) has shown that in the balitorid fish *Pseudogastromyzon cheni* such tissues provide the jaws of bottom-dwelling,

algae eaters with flexible support. The histology of this tissue especially on the maxillary bones of *H. ripleyi* needs further investigation.

Figures 10 and 11 illustrate the bones of the jaws (premaxillary, maxillary and dentary) in a cleared specimen. The premaxillary has an anterior process as shown by SAWADA (1982) for example at *Homaloptera smithi* and other

cobitoid fishes. RAMASWAMI (1952: 500) called this structure of the premaxillary “rostral process” (e.g. as shown by him in *Homaloptera amphisquamata*).

The colour pattern of *H. ripleyi* superficially resembles *H. yuwonoi* Kottelat, 1998 from the Kapuas basin, Borneo, with six to seven dark dorsal bars. ARMBRUSTER & PAGE (1996) suppose



**Fig. 10:** Jaws of a cleared and stained specimen of *Homaloptera ripleyi*. Above: dorsal view, below: ventral view. mx = maxillary, pmx = premaxillary, d = dentary, anp = anterior process of premaxillary, asp = ascending process of premaxillary, ke = kinethmoid.

**Abb. 10:** Kiefer eines aufgethellten Exemplars von *Homaloptera ripleyi*. Oben: dorsale Ansicht, unten: ventrale Ansicht. mx = Maxillare, pmx = Prämaxillare, d = Dentale, anp = vorderer Fortsatz des Prämaxillare, asp = aufsteigender Fortsatz des Prämaxillare, ke = Kinethmoid.

**Fig. 11:** Jaws of a cleared and stained specimen of *Homaloptera ripleyi* (lateral view from the left): mx = maxillary, pmx = premaxillary, d = dentary, anp = anterior process of premaxillary, asp = ascending process of premaxillary.

**Abb. 11:** Kiefer eines aufgethellten Exemplars von *Homaloptera ripleyi* (laterale Ansicht von links). mx = Maxillare, pmx = Prämaxillare, d = Dentale, anp = vorderer Fortsatz des Prämaxillare, asp = aufsteigender Fortsatz des Prämaxillare.

a selective advantage of such saddle patterns through disruptive colouration, because fish with such saddle pattern are living on a ground of gravel mainly in lotic waters and can mimic shadows or gaps between stones in combination with light reflections. *Homaloptera ripleyi* seems not be restricted to flowing rivulets with rocks, stones and gravel, but is also found in bush forest shaded small waters with substrate mainly composed of leaves and leaf litter.

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