

# A new species of *Pectenocypris* (Teleostei: Cyprinidae) from peat swamps in Sumatra

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## Abstract

A new cyprinid species, *Pectenocypris rubra*, is described from peat swamps from central Sumatra (Indonesia). This species is only known from peat lakes upstream of the river Serkap, a tributary of the Kampar River. *Pectenocypris rubra* differs from the other four species of this genus in the following combination of characters: a distinct mid-lateral stripe, an oval black spot at the base of the caudal fin, scales in lateral midline 33, 7–8 pored lateral line scales, 202 gill-rakers on first gill arch, small dark grey symphyseal knob on lower jaw, and a long and narrow caudal peduncle.

## Key words

Endemic, Indonesia, peat swamp, *Pectenocypris rubra* **sp. nov.**, Sumatra.

## Introduction

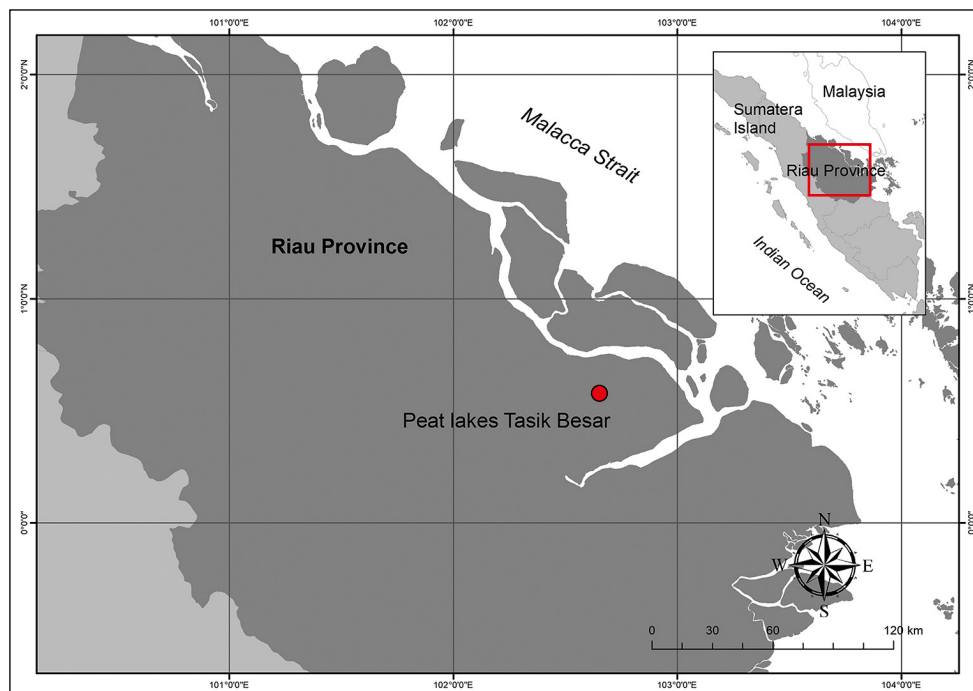
Four species of the small cyprinid genus *Pectenocypris* endemic to Indonesia, are known: *Pectenocypris balaeana*, from western Borneo (Province Kalimantan Barat), *P. korthausae* from southern Borneo (Province Kalimantan Tengah) and Sumatra, *P. micromysticetus* from Sumatra (Province Jambi) and *P. nigra* from Sumatra (Province Riau) (ROBERTS, 1989; DOI, 1997; TAN & KOTTELAT, 2009; WIBOWO *et al.*, 2016). The species of *Pectenocypris* are filter feeders characterized by possessing numerous and elongated gill-rakers, a slender body and a small size (< 45 mm SL) (KOTTELAT, 1982; ROBERTS, 1989; RAINBOTH, 1991).

During a survey in 2013, small, bright red, cyprinid specimens were sampled in peat waters of the Serkap River system in central Sumatra which we describe here as a new species of *Pectenocypris*.

## Material and methods

Specimens were sampled in peat lakes of the Serkap River system, Sumatra (Fig. 1). The aim of the survey was sampling of fishes for genetic analysis (DNA barcoding). Therefore, all sampled specimens were frozen immediately after sampling. Space for frozen specimens was limited, so only a few specimens of each species were taken. However, the new species described herewith was abundant in the lakes forming large shoals (WIBOWO pers. observation).

Counts and measurements follow KOTTELAT (2001). In the range of meristic and morphometric characters we follow TAN & KOTTELAT (2009). Additionally we provide the following measurements: head width (distance from left to right dorsal origin of the opercular opening), postorbital length (posteriormost edge of eye to posteriormost point of opercle), prepectoral length (tip of snout to dorsal



**Fig. 1.** Sampling site of *Pectenocypris rubra*, Province Riau (dark grey) in Sumatra.

origin of pectoral fin), predorsal length (tip of snout to origin of dorsal fin), prepelvic length (tip of snout to dorsal origin of pelvic fin), preanal length (tip of snout to origin of anal fin), dorso-hypural distance (origin of dorsal fin to origin of hypural plate) and pectoral-pelvic length (dorsal origin of pectoral fin to lateral origin of pelvic fin). All counts and measurements were taken twice and the data are presented as means. Measurements were taken to the nearest 0.01 mm with the aid of an electronic caliper and rounded to the nearest 0.1 mm. The pharyngeal jaw was investigated by MicroCT imaging. For details of MicroCT imaging see AHNELT *et al.* (2015).

The transparency of water was measured with a Secchi disc, pH with a digital pH meter, and dissolved oxygen with a dissolved oxygen meter.

The type specimens are deposited in the Museum Zoologicum Bogoriense, Bogor, Indonesia and the Natural History Museum in Vienna, Vienna, Austria.

#### Abbreviations of collections

- CAS** California Academy of Sciences  
**MHNG** Muséum d'histoire naturelle, Ville de Genève, Switzerland  
**MZB** Museum Zoologicum Bogoriense, Bogor, Indonesia  
**NMW** Natural History Museum in Vienna, Vienna, Austria.

#### Comparative material

*Pectenocypris balaena* Roberts, 1989; CAS 49307, five paratypes; 23.2–28.5 mm SL; Indonesia, Borneo, Kalimantan Barat, Kapuas River Basin, Danau Piam near Ketungau, 39 km NE of Sintang (0°23'30"N; 111°37'30"E); collected by Tyson R. Roberts and S. Woerjoatmodjo, 5–6 June 1976.

*Pectenocypris korthausae* Kottelat, 1982; MHNG 2073.073–075, three paratypes; 20.31–21.1 mm SL; Indonesia, Borneo, Kalimantan Tengah, approximately 50 to 100 km North of Sampit; collected by Mrs. Korthaus, March 1979. CAS 50488, one paratype; 20.7 mm SL; same data as MHNG 2073.073–075. CAS 94171, three specimens; 31.8–36.6 mm SL; Indonesia, Borneo, Kalimantan Tengah, Sungai Seruyan basin, Danau Sembuluh at Bangkal (–2.701715°; 112.388515°; source: FishNet Collaborative Georeferencing Project); collected by Tyson R. Roberts, 12–13 June 1992.

*Pectenocypris nigra* Wibowo, Ahnelt & Kertamihardja, 2016; MZB 22149 (holotype), MZB 22150 and NMW 98607 (7 paratypes); 30.2–34.2 mm SL, Indonesia, Central Sumatra, Riau province, Serkap river system, river and peat lakes 'TelukKapal' (00°25'42"N; 102°38'45"E) approximately 90 km east of Pelalawan; collected by Arif Wibowo and colleagues, May 2013.

#### *Pectenocypris rubra*, spec. nov.

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Figs. 2–3

**Holotype:** MZB 22148, 31.1 mm SL; Indonesia, Sumatra, Riau, Serkap river system, peat lakes 'Tasik Besar' (00°34'42"N; 102°39'17"E); May 2013; collected by A. Wibowo and colleagues.

**Paratype:** NMW 98606, 29.2 mm SL; same collection data as holotype.

**Diagnosis.** A *Pectenocypris* with a distinct black mid-lateral stripe from the posterior margin of the eye to the base of the caudal fin; a distinct black oval spot at origin of caudal fin; 33 scales in longitudinal series; lateral line incomplete, with 7–8 pored scales; 202 densely set gill rakers on the first gill arch, one row of pharyngeal teeth



**Fig. 2.** Holotype of *Pectenocypris rubra* (MZB 22148), right side, reversed; 31.1 mm SL. Scale bar = 5 mm.



**Fig. 3.** Holotype of *Pectenocypris rubra* (MZB 22148); head, lateral view; right side, reversed. Note origin of black mid-lateral stripe at posterior margin of orbit and small symphyseal knob of lower jaw. Scale bar = 0.5 mm.

and a tooth formula 3-3, all teeth slightly hooked with a single tip; a long, narrow caudal peduncle.

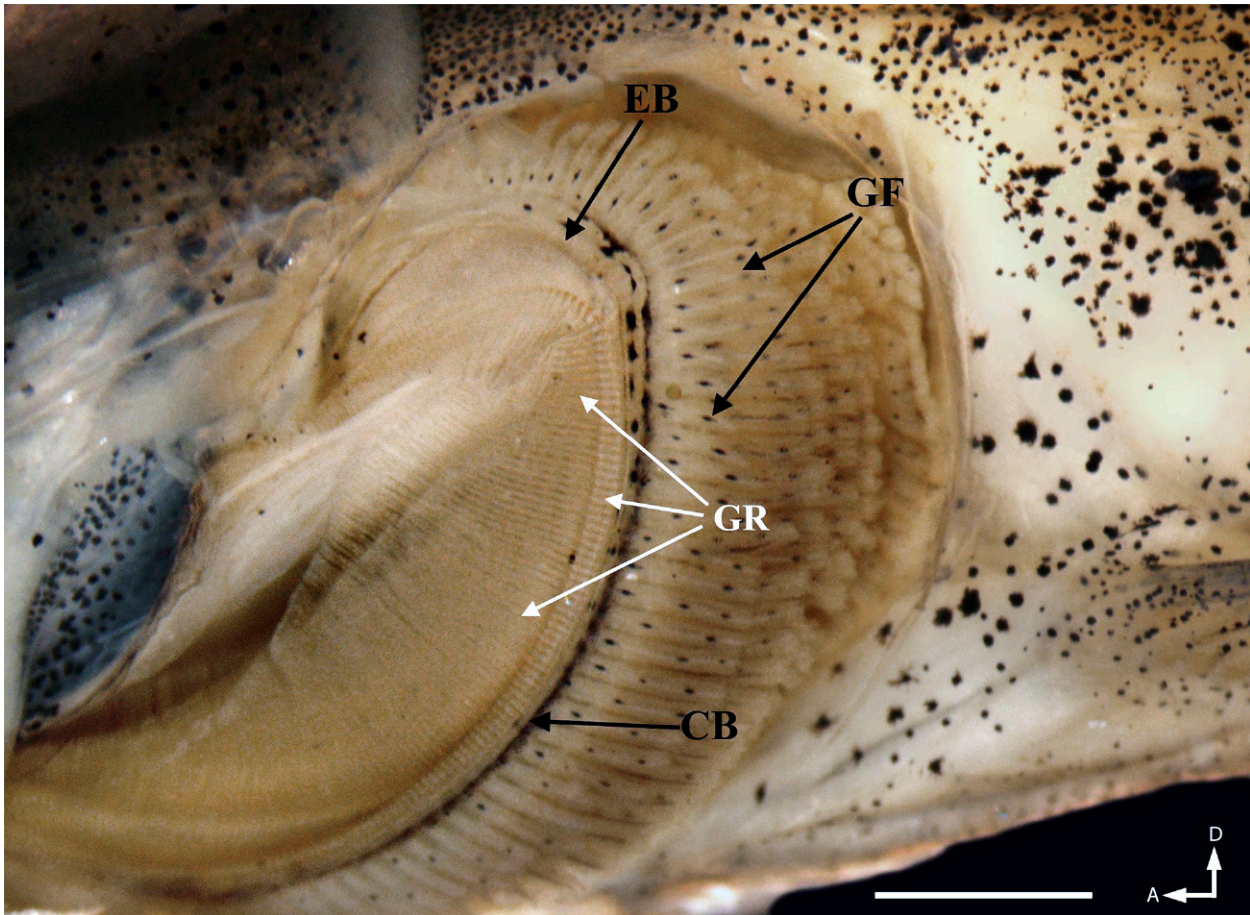
**Description.** For the overall appearance see Fig. 2. Body slender, compressed; dorsal outline arched, ventral outline straight. Mouth terminal. Lower jaw slightly projecting beyond upper jaw with an indistinct symphyseal knob (Fig. 3). Gill rakers densely set, thin and long (Fig. 4). Origin of dorsal fin slightly anterior to pelvic fin origin. Pectoral fin short, roundish and reaching about two third of distance to pelvic fin origin. Tip of first (longest) ray of slightly pointed pelvic fin, when depressed, reaches origin of anal fin. Caudal fin distinctly forked with pointed lobes. Caudal peduncle long and slender, about 50% as high as long.

Measurements of the holotype (31.1 mm SL) and the paratype (29.2 mm SL) as percent of standard length (values of the holotype followed by values of paratype and mean in parentheses): head length 27.2, 29.7 (28.5), head width at gill opening 11.5, 13.1 (12.3), head depth at nape 15.9, 17.1 (16.5), predorsal length 52.7, 55.9

(54.3), prepelvic distance 52.4, 53.0 (52.7), preanal distance 69.7, 70.4 (70.1), prepectoral distance 28.6, 28.8 (28.7), pectoral-pelvic distance 25.1, 25.1 (25.1), pectoral fin length 19.0, 19.0 (19.0), body depth at dorsal fin origin 17.6, 18.6 (18.1), caudal peduncle depth 9.6, 9.8 (9.7), caudal peduncle length 19.9, 19.7 (19.8), snout length 7.7, 7.9 (7.8), eye diameter 8.4, 8.7 (8.6), postorbital length 12.6, 14.1 (13.4), interorbital width 9.5, 10.1 (9.8), dorso-hypural distance 47.7, 49.8 (48.8). As percentage of head length: snout length 26.4, 26.8 (26.6), eye diameter 28.8, 29.4 (29.1), interorbital width 32.6, 34.3 (33.5), postorbital length 43.2, 44.1 (43.7). As percentage of eye diameter: interorbital width 113.1, 116.4 (114.8). As percentage of caudal peduncle length: caudal peduncle depth 48.5, 49.8 (49.2).

Counts of the holotype and the paratype (values of the holotype are indicated by \*): dorsal fin with 2 simple and 6.5 or 7\* branched rays; anal fin with 3 simple and 5.5 branched rays; pectoral fin with 1 simple and 12\* or 13 branched rays; pelvic fins with 1 simple and 7 or 8\* branched rays; caudal fin deeply forked with 18 or 19\*





**Fig. 4.** Paratype of *Pectenocypris rubra* (NMW 98606); head, lateral view; first left gill arch; A, anterior; EB, epibranchial; CB, ceratobranchial; D, dorsal; GF, gill filaments; GR, gill rakers. Scale bar = 1 mm.

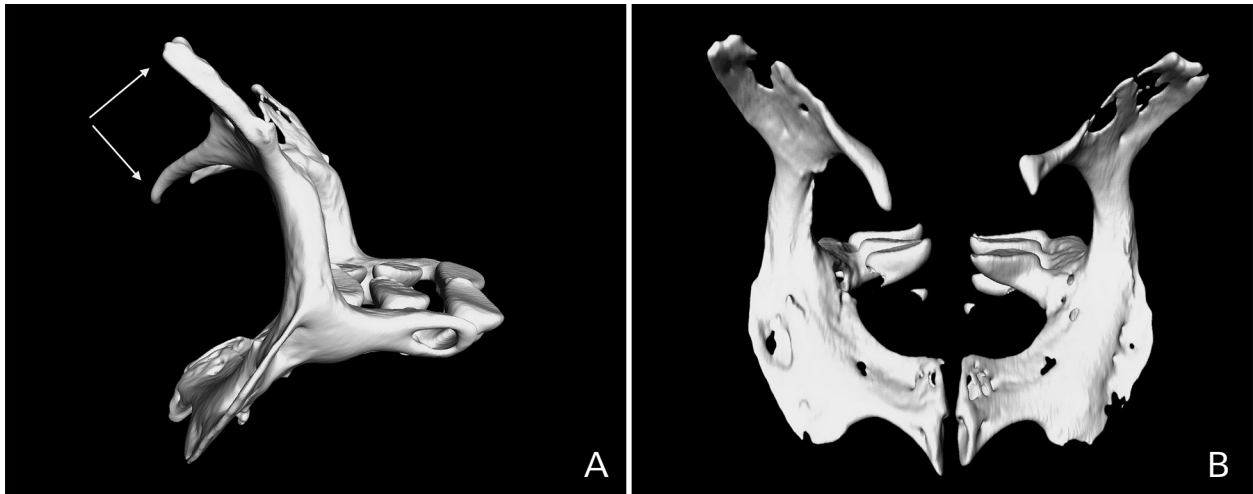
principle rays, 16–17\* of them branched (from dorsal to ventral: 1/9+8/1). Scales in lateral series (left/right) 32+1/32+1; lateral line incomplete, pored scales left/right 7/8\*, 8/8; predorsal scales 11; scales in transverse series from origin of dorsal fin rearwards and downwards/from origin of anal fin forward and upward (left/right) 8/6.5\*, 7.5/6.5); scales in circumpeduncular series 11. Gill rakers (paratype, n=1): 50 on upper, 152 on lower arm of first gill arch. Vertebra 32 (n=1): 17 precaudal and 15 caudal including pleurostyle.

Lower pharyngeal jaw (LPJ) C-shaped with posterior and anterior arm of about same length with two distinct processes: one slender and anterior-medial pointing process at widened bifurcated dorsal end of dorsal limb and, where anterior and posterior arm of LPJ meet, a posterior extending tooth-bearing process (Fig. 5). This tooth-bearing process broadly attached to LPJ, narrowing posteriorly. Three teeth attached perpendicular on medial side of tooth-bearing process arranged in a single row (tooth formula 3-3). In resting position of LPJ left and right tooth row distinctly separated from each other. Teeth gradually increase in size from anterior to posterior. Tooth crowns distinctly longer than tooth shafts. Shaft and crown form a straight line and are not inclined. Crowns carry cusp with an oval and wide grinding surface, a slightly elevated rim and a small hooked tip on its

end. Grinding surface of each tooth faces dorsally. Anterior arm of LPJ, ventral to tooth-bearing area, is laterally plate-like and extended.

**Coloration in life.** Head and dorsal side of trunk and tail dark red. Ventral side of abdomen light red. All fins red with a hyaline margin. Cornea of eye red. Distinct black stripe extends mid-lateral from posterior margin of orbit continuously to base of caudal fin ending in an oval black spot on base of the caudal fin.

**Coloration in ethanol.** Body dusky fawn (Fig. 2). Distinct black stripe extends mid-lateral from posterior margin of orbit continuously to base of caudal fin ending in an oval black spot on base of caudal fin. Stripe starts at orbit and runs obliquely postero-dorsal over entire opercle and its soft margin. On the trunk black mid-lateral stripe originates underneath soft margin of opercle and extends from there, slightly bent dorsally, to base of caudal fin. Stripe is of uniform width until it reaches level of anal fin, then gets gradually narrower on caudal peduncle. Black spot on base of caudal fin increases in width posteriorly extending onto fin rays. Upper lip is not or only slightly pigmented. Symphyseal knob on lower jaw dark grey. Dorsal sides of head and trunk uniformly dark grey with a blackish line along midline of



**Fig. 5.** MicroCT images of the lower pharyngeal jaws of *Pectenocypris rubra* (holotype, MZB 22148). A, lateral view; arrows point to the forked dorsal process of the pharyngeal jaw; anterior to the left. B, anterior view; anterior tooth on the right pharyngeal jaw in attachment process with only the tooth crown mineralized; ventral to the tooth rows the mineralized tips of two replacement teeth.



**Fig. 6.** Peat lakes Tasik Besar (Sumatra) (00°34'42"N, 102°39'17"E). Type locality of *Pectenocypris rubra*. A = View to the North, B = View to the West.

back extending from nape rearwards to origin of dorsal fin and from last dorsal fin ray to origin of caudal fin. Abdomen and tail ventral to mid-lateral stripe pale fawn. A similar pale fawn but narrow line extends from head to black spot immediately dorsal to mid-lateral stripe. This stripe is uniformly wide and does not increase in height immediately anterior to origin of black spot. Pale fawn areas enclosing the mid-lateral stripe emphasize its black color. No thin black axial streak accompanies black mid-lateral stripe. Posterior margins of scales on dorsal sides of body somewhat more densely covered by dark grey melanophores, leaving an indistinct reticulate pattern. Blackish streak extends on ventral midline of caudal peduncle from base of last anal fin ray to origin of caudal fin. All fins transparent with very small black melanophores following course of all fin rays from their base close to their tips. Gill filaments whitish, covered by two to three small black spots each consisting of a single melanophore. These spots are arranged in a row more or less regularly distributed along the entire length of gill filaments giving the gills a spotted pattern, an-

tero-ventrally getting indistinct. Upper arm and dorsal most portion of ventral arm of first gill arch covered by few black spots of about two to three times of the spots on gill filaments. No such blackish spots occur on gill rakers. Gill rakers are distinctly longer than gill filaments.

**Habitat and ecology.** *Pectenocypris rubra* was sampled in a small series of peat lakes in a region upstream of the river Serkap, a tributary of the Kampar River, locally known as ‘Tasik Besar’ (Figs. 1, 6). The water is dark brown with a transparency of 50–100 cm. The pH-value varies between 3.19–4.32 and the dissolved oxygen between 1.3–5.9 ppm. This species was not found elsewhere during the survey and possibly occurs only in these few peat lakes. *Pectenocypris rubra* occurs in this lake in large numbers and was observed in groups of hundreds of specimens (A. WIBOWO pers. observation). This small fish shows a diurnal behavior. During daytime it retreats to deeper areas of the peat lakes and returns to the surface at sunset (Fig. 7B).





**Fig. 7.** A, *Pectenocypris balaena*, paratype, CAS 49307. B, *Pectenocypris korthausae*, CAS 94171. C, *Pectenocypris korthausae*, paratype, CAS 50488. D, *Pectenocypris nigra*, holotype. MZB 22149. Scale bars = 10 mm.

**Etymology.** From the Latin word ‘rubra’ (red). The name refers to the red life coloration of the species.

**Distribution.** Known only from the peat lakes ‘Tasik Besar’ in the Riau Province of Sumatra (Fig. 1)

### Comparisons

To date five species of the danionine genus *Pectenocypris* are known: *P. balaena* (Fig. 7A) *P. korthausae* (Fig. 7B, C), *P. micromysticetus*, *P. nigra* (Fig. 7D) and *P. rubra* (Fig. 2). All species are small fishes (< 45 mm SL) with a similar body shape, slender and compressed (KOTTELAT, 1982; ROBERTS, 1989; TAN & KOTTELAT, 2009; this study). The live coloration of *P. balaena* and *P. korthausae* is not known. The three other species differ distinctly in this

trait: the life coloration is grayish brown without a mid-lateral stripe in *P. micromysticetus* (TAN & KOTTELAT, 2009) but blackish with black mid-lateral stripe in *P. nigra* (WIBOWO *et al.*, 2016) and red with black mid-lateral stripe in *P. rubra*. Important characters to discern all five *Pectenocypris* species when preserved are the length and the form of the mid-lateral stripe, the size and shape of the dark spot on the base of the caudal fin and the pigmentation of the scales. Only three of the five species develop a distinct mid-lateral stripe: *P. balaena*, *P. nigra* and *P. rubra*. Note that an indistinct mid-lateral stripe may occur in some specimens of *P. korthausae* (KOTTELAT, 1982) but was not observed in the investigated specimens, including paratypes (Fig. 7B, C). Nevertheless, *P. balaena* differs distinctly from the two other species in the absence of a black spot on the base of the caudal fin (vs. present), absence of a light contrasting band dorsal

to the mid-lateral stripe (vs. present in *P. nigra* and *P. rubra*), and by scales with a pale fawn margin (vs. blackish to grey margin) (ROBERTS, 1989; TAN & KOTTELAT, 2009; this study).

KOTTELAT (1982) observed an indistinct mid-lateral stripe in some specimens of *P. korthausae*. Because this species has, like *P. nigra* and *P. rubra*, a black spot at the base of the caudal fin and scales with a dark grey margin, we briefly note characters separating this species from *P. nigra* and *P. rubra*: an indistinct or absent mid-lateral stripe (vs. distinct, black mid-lateral stripe in *P. nigra* and *P. rubra*), a triangular spot at base of the caudal fin (vs. oval spot), 14 circumpeduncular scales (vs. 11–12 in *P. nigra* and 11 in *P. rubra*), 95–135 of gill rakers (vs. 160 in *P. nigra* and 202 in *P. rubra*) and 36 vertebra (vs. 32 in *P. nigra* and *P. rubra* (KOTTELAT, 1982; TAN & KOTTELAT, 2009; WIBOWO *et al.*, 2016, this study).

The new species *P. rubra* (Fig. 2) differs from its putative closest relative *P. nigra* (Fig. 7D) in life coloration (red vs. blackish in *P. nigra*), black mid-axial streak absent (vs. present), number of scales in lateral series 32 (vs. 27–28), number of circumpeduncular scales 14 (vs. 11–12), number of gill rakers on the lower arm of the first gill arch 150 (vs. 110), size and coloration of the symphyseal knob on the lower jaw small, dark grey (vs. large, distinctly rounded and whitish) and in body proportions like caudal peduncle length 19.7–19.9 (vs. 17.7–18.6%), caudal peduncle depth 9.6–9.8% (vs. 10.1–11%), preanal distance 69.7–70.4 % (vs. 72.2–75.7%) and the postorbital length 12.6–14.1 % (vs. 10.9–11.8%).

**Remarks.** A highly specialized branchial apparatus with extremely elongated and densely set gill rakers, a triangular LPJ and a bifurcated dorsal end of the posterior arm of the LPJ (Fig. 5) make the genus *Pectenocypris* not only unique among the Danioninae but also among the Cypriniformes (KOTTELAT, 1982; ROBERTS, 1989; WIBOWO *et al.*, 2016, this study). Gill raker number is size-related in *Pectenocypris* (ROBERTS, 1989; TAN & KOTTELAT, 2009). It is noteworthy that *P. rubra*, although smaller in size (paratype = 29.2 mm SL), has distinctly more gill-rakers (~ 200) than the larger (paratype = 33.8 mm SL) *P. nigra* (~ 160).

Very conspicuous are the widened bifurcated dorsal end of the LPJ, the tooth-bearing area positioned perpendicular to the LPJ, and the horizontally oriented teeth. These characters are possibly synapomorphic for the genus *Pectenocypris* but the shape of the LPJ is not known from *P. balaena* and *P. micromysticetus*. Nevertheless, the triangular shape of the LPJ deserves some discussion. Instead of extending along the axis of the LPJ, as is typical for Cyprinidae (e.g., AHNELT *et al.*, 2015), the tooth-bearing area (distance from the anterior most tooth to the posterior most tooth) of *Pectenocypris* extends perpendicular to it and caudally. This allows a unique positioning of the three pharyngeal teeth and enables a plane orientation of the teeth with the surface of their crowns facing dorsal against the chewing pad on the base of the skull (Fig 5).

## Key to species of *Pectenocypris*

- 1 Black mid-lateral stripe absent or indistinct; lower jaw not or only indistinctly projecting beyond upper jaw ..... 2  
 Black mid-lateral stripe distinct; lower jaw distinctly projecting beyond upper jaw ..... 3
- 2 Black mid-lateral stripe absent; black spot at base of caudal fin elongated; 165–240 gill-rakers; Jambi, Sumatra ..... *Pectenocypris micromysticetus*  
 Black mid-lateral stripe absent or indistinct; black spot at base of caudal fin rounded to triangular; 95–135 gill-rakers; Kalimantan Tengah, Borneo ..... *Pectenocypris korthausae*
- 3 Black spot at base of caudal fin absent; dark grey scales with pale fawn margin; no symphyseal knob on lower jaw; Kapuas, Borneo ... *Pectenocypris balaena*  
 Black spot at base of caudal fin present; pale fawn scales with dark grey to blackish margin; lower jaw with symphyseal knob ..... 4
- 4 Black mid-lateral stripe straight, not narrowing on caudal peduncle; mid-axial streak present; caudal peduncle short, high; lower jaw with large, whitish symphyseal knob; 29 scales in lateral series; 160 gill-rakers, Riau, Sumatra ..... *Pectenocypris nigra*  
 Black mid-lateral stripe arched, narrowing on caudal peduncle; mid axial streak absent; caudal peduncle long, narrow; symphyseal knob on lower jaw small, greyish; 32 scales in lateral series; 202 gill-rakers, Riau, Sumatra ..... *Pectenocypris rubra*

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## References

- AHNELT, H., HERDINA, A. N. & METSCHER, B.W. (2015). Unusual pharyngeal dentition in the African Chedrin fishes (Teleostei: Cyprinidae): Significance for phylogeny and character evolution. *Zoologischer Anzeiger*, **255**, 85–102.
- DOI, A. (1997). A review of taxonomic studies of cypriniform fishes in South-east Asia. *Japanese Journal of Ichthyology*, **44**, 1–33 [in Japanese].
- KOTTELAT, M. (2001). *Fishes of Laos*. Colombo, WHT Publications.
- KOTTELAT, M. (1987). A small collection of fresh-water fishes from Kalimantan, Borneo, with descriptions of one new genus and

- three new species of Cyprinidae. *Revue Suisse Zoologique*, **89**, 419–437.
- RAINBOTH, R. J. (1991). Cyprinids of South East Asia in: WINFIELD, I. J. & NELSON, J. S. (eds): *Cyprinid Fishes: Systematics, Biology and Exploitation*. Chapman and Hall, London.
- ROBERTS, T. R. (1989). The freshwater fishes of western Borneo (Kalimatan Barat, Indonesia). *Memoires of the California Academy of Sciences, Scientific Series*, **14**, 1–210.
- TAN, H. H. & KOTTELAT, M. (2009). The fishes of Batang Hari drainage, Sumatra, with description of six new species. *Ichthyological Explorations of Freshwaters*, **20**, 13–69.
- WIBOWO, A., AHNELT, H. & KERTAMIHARDJA, E. S. (2016). *Pectenocypris nigra*, a new danionine species (Teleostei: Cyprinidae: Danioninae) from Sumatra (Indonesia). *Acta Biologica Turcica*, **29**, 137–142.

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