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# Two new fish species of the genus *Puntius* Hamilton (Cyprinidae) from Manipur, India, with notes on *P. ticto* (Hamilton) and *P. stoliczkanus* (Day)

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## Abstract

*Puntius ater* and *P. khugae*, two new species of fishes, each having a black longitudinal stripe on the side, are described from the Chindwin basin in Manipur, India. *Puntius ater*, which inhabits sluggish streams is distinct in having the dorsal fin edge black, the lateral line incomplete with 5–11 pored scales, 25–29 scales in the lateral row; transverse scales ½4/1/4½; preanal scales 20; and a black blotch extending over the 19th and 20th scales of the lateral-line row at the level above the posterior end of the anal fin base. *Puntius khugae*, inhabiting comparatively faster, clear-water streams is distinct in having the dorsal fin edge plain, the lateral line incomplete with 8–11 pored scales, 28–30 scales in the lateral row; transverse scales ½5/1/4½; preanal scales 19; and a black blotch on the 21st scale of the lateral-line row at the level above one scale behind the origin of the last anal fin ray. Morphological traits observed in *P. ticto* and *P. stoliczkanus* are given, and the status of these species is discussed.

**Key words:** Cypriniformes, Cyprinidae, *Puntius*, new species, Manipur

## Introduction

The genus *Puntius* Hamilton is diagnosed by the following combination of characters: absence or presence of maxillary only or rostral and maxillary barbels; dorsal fin with last simple ray serrate or entire, branched rays usually 8; anal fin with last simple ray entire, branched rays usually 5; lateral line complete or incomplete, lateral-line scales 17–36 in row; cephalic cutaneous papillae minute or absent; pharyngeal teeth in 3 rows, usually 2,3,5/5,3,2; colour pattern extremely variable (Roberts, 1989). According to Kottelat (1999), *Puntius* is a catchall 'genus' in which a large number of unrelated small barbs have been placed.

Manipur, with its varying forms of water bodies harbours many species of *Puntius*. Hamilton (1822) described *Cyprinus ticto* (now *Puntius*) from the Gangetic basin. While describing *Barbus stoliczkanus* (now *Puntius*) from the Chindwin basin, Pegu and Moulmein, Day (1878) wrote that the species supersedes the distribution of *P. ticto* in the east. Hora *et al* (1937), Talwar and Jhingran (1991) and Jayaram (1991) considered *P. stoliczkanus* to be a junior synonym of *P. ticto*. Hora (1921), without giving any collection data, reported *P. ticto* to be very common in the Imphal valley. Menon (1953) recorded the species from fields near Kanglatombi and from the banks of Imphal River (Chindwin basin). Menon (1954) recorded the species from Manipur without discussing its distribution by basin.

In order to clarify the identity and distribution of *Puntius ticto* and *P. stoliczkanus*, several collections have been made from the Barak and Chindwin drainages for a detailed study. The present work reveals that two species are distinct. *Puntius ticto* is restricted to the Barak basin while *P. stoliczkanus* is restricted to the

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Chindwin basin. *Puntius ticto*, as reported by Vishwanath & Juliana (2004) from the Imphal River is *P. ater*, described here as a new species. Another species from the Khuga River is also described here as *P. khugae*.

## Material and methods

Measurements were made with a dial caliper to the nearest 0.1 mm. Counts and measurements were made on the left side of specimens wherever possible using a PC-based binocular stereozoom microscope (Olympus SZ40) with transmitted light. Counts and measurements followed Kottelat (2001). Clearing and staining of specimens for osteology followed Hollister (1934). Identification of bones is based on Nelson (1969). Neural spines are numbered sequentially from the spines of the first vertebra posterior of the Weberian complex. Predorsal neural spines are counted from behind the Weberian apparatus to the dorsal fin. The fused $PU_1+U_1$ is considered to be a single element and vertebrae incorporated in the Weberian apparatus as four elements. Subunits of the head are presented as proportions of head length (HL). Head length and measurements of body parts are given as proportions of standard length (SL).

Ten specimens each of the two new species were dissected to examine the gut for calculating relative gut length [gut length/total length]. The specimens examined for the present study are deposited in the Manipur University Museum of Fishes (MUMF).

### *Puntius ater*, new species

(Fig. 1)

*Puntius ticto* Vishwanath and Juliana, 2004 (reported from Chindwin basin of Manipur valley).

**Holotype.** MUMF 6101, 50.0 mm SL; India: Manipur State: Iril R. at Bamonkampu; I. Linthoingambi, 25 March 2004.

**Paratypes.** (all from Chindwin basin of Manipur) MUMF 3030, 1, 47.5 mm SL; Imphal valley, Juliana L, 19 August 1998. MUMF 6102-06, 5, 53.0–58.0 mm SL; same data as holotype. MUMF 6107-11, 5, 52.0–57.0 mm SL; Imphal R. at Mayang Imphal, I. Linthoingambi, 10 April 2004. MUMF 6208-15, 8, 51.0–55.0 mm SL; Imphal R. at Mayang Imphal, Juliana L., 2 September 2004. Uncat. 20, 33.0–51.0 mm SL; Loktak Lake, at Moirang, same data as MUMF 6107-11, 8 August 2005.

**Diagnosis.** A species of *Puntius* with the following combination of characters: dorsal fin edge black, its spine weak, serrated posteriorly with 13–17 serrae, spine length 16.8–23.3% SL; predorsal scales 10 or 11; lateral line incomplete with 5–11 pored scales, 25–29 scales in lateral-line row; transverse scales ½4/1/4½; a black longitudinal stripe covering the upper half of the 1st scale row and lower half of the 2nd scale row above lateral-line row of scales; a black spot extending over 19th and 20th scales of lateral-line row at the level above the posterior end of the anal fin base; intestine long and coiled, its relative gut length 2.0–2.5 TL. Other differentiating characters from nearest congeners are in Table 1.

**Description.** Table 2 presents morphometric data, and Table 3 presents frequency distributions of meristic characters. Body elongated. Head large. Eyes large. Barbels absent. Lips thin, no lateral fold on snout.

Dorsal fin origin opposite that of pelvic fin, inserted midway between tip of snout and base of caudal fin; 3 simple and 8 branched rays; third simple ray spinous, weak, and serrated posteriorly with 13–17 serrae.

Pectoral fin with 1 simple posteriorly serrated ray and 12 branched rays, almost reaching pelvic fin origin. Pelvic fin with 1 simple and 8 branched rays. Anal fin with 3 simple and 5 branched rays. Caudal fin with 10+9 principal rays and 9+8 branched rays.

Scales large, 25–29 in lateral-line row; lateral line incomplete with 5–11 pored scales; ½4 scales between dorsal fin origin and lateral line row, 4½ scales between lateral line and pelvic fin origin. Predorsal scales 10–11. Preanal scales 20.

Predorsal bones 5 and predorsal neural spines 5. First pterygiophore inserted between 9th and 10th vertebrae. Number of total vertebrae 4+28–29. The infraorbital 3+4 is much broader and has greatly elevated margins compared to other bones of the infraorbital series. Intestine long and coiled (Fig. 2a), its relative length 2.0–2.5 TL.

**FIGURE 1.** *Puntius ater* **n. sp.** (holotype, MUMF 6101, 50.0 mm SL).

**TABLE 1.** Comparison of morphometric characters of four species of *Puntius.*

| | *P. ater* | *P. khugae* | *P. ticto* | *P. stoliczkanus* |
|---|---|---|---|---|
| Lateral line | incomplete | incomplete | incomplete | complete |
| No. predorsal bones | 5 | 5 | 4 | 4 |
| No. predorsal neural spines | 5 | 5 | 4 | 4 |
| Total vertebrae | 4+28–29 | 4+28–29 | 4+26 | 4+25–26 |
| Band on body | present | present | absent | absent |
| No. blotches and spots on side | 1 blotch | 1 blotch | 2 spots | 2 blotches |
| Dorsal-fin edge | black | plain | plain | plain |
| No. dorsal-fin bands | 0 | 0 | 2 | 2 |
| Insertion of first dorsal pterygiophore | 9th & 10th vertebrae | 9th & 10th vertebrae | 8th & 9th vertebrae | 8th & 9thvertebrae |
| Lips & lateral folds | thin & absent | thin & absent | thick & well developed | thick & well developed |
| Scales betn. dorsal-fin origin & Lat. line row | ½4 | ½5 | ½5 | ½5 |
| Scales betn. Lat. line row & pelvic-fin origin | 4½ | 4½ | 5½ | 5½ |
| No. lateral-line scales | 25–29 | 28–30 | 22–26 | 21–24 |
| No. lateral-line pores | 5–11 | 8–11 | 6–11 | 19–23 |

**Colouration.** In formalin, specimens have a black longitudinal stripe covering the upper half of the 1st scale row and lower half of the 2nd scale row above lateral-line row of scales, and a black spot on the 19th and 20th scales of lateral-line row, at the level above the posterior end of the anal fin base. Dorsal fin reddish, edged black. Pectoral, pelvic and anal fins reddish.

**TABLE 2.** Morphometric data of *Puntius ater* and *P. khugae*.

| | *P. ater* | | | *P. khugae* | | |
|---|---|---|---|---|---|---|
| | $\bar{x}$ | Range | S.D. | $\bar{x}$ | Range | S.D. |
| Standard length (mm) | | 33.0–58.0 | | | 44.0–46.0 | |
| In % SL | | | | | | |
| Head length | 28.1 | 27.4–29.2 | 0.7 | 29.4 | 28.6–31.0 | 1.3 |
| Body depth | 32.4 | 29.1–37.0 | 1.8 | 33.3 | 32.0–34.5 | 0.9 |
| Body width at dorsal-fin origin | 16.1 | 15.1–17.1 | 0.6 | 15.6 | 15.4–16.0 | 0.3 |
| Body width at anal-fin origin | 12.1 | 10.6–12.9 | 0.9 | 12.9 | 12.3–13.2 | 0.5 |
| Length of caudal peduncle | 19.2 | 17.7–19.8 | 0.8 | 20.9 | 19.0–22.2 | 1.7 |
| Depth of caudal peduncle | 15.5 | 14.6–16.5 | 0.7 | 14.1 | 14.0–14.3 | 0.1 |
| Length of dorsal-fin base | 17.9 | 18.3–19.0 | 0.8 | 18.3 | 15.6–20.4 | 2.4 |
| Length of pectoral fin | 23.0 | 22.5–23.6 | 0.4 | 24.0 | 23.0–25.0 | 1.0 |
| Length of pelvic fin | 21.6 | 19.8–22.6 | 1.0 | 21.8 | 21.0–23.0 | 1.0 |
| Length of anal fin | 12.6 | 12.1–13.6 | 0.9 | 12.6 | 12.1–13.6 | 0.8 |
| Anal-fin depth | 17.8 | 16.8–19.0 | 0.9 | 17.4 | 16.5–18.2 | 0.8 |
| Dorsal-fin spine length | 19.3 | 16.8–23.3 | 1.5 | 17.6 | 16.0–20.9 | 1.3 |
| In % HL | | | | | | |
| Head depth at eye | 53.7 | 51.0–59.4 | 2.4 | 60.3 | 56.4–64.3 | 2.7 |
| Snout length | 29.2 | 28.1–32.2 | 1.5 | 28.4 | 26.1–30.1 | 2.0 |
| Eye diameter | 29.7 | 25.3–33.0 | 1.8 | 29.7 | 27.8–31.5 | 1.2 |
| Interorbital width | 36.4 | 34.0–42.3 | 1.9 | 36.5 | 33.0–39.0 | 1.8 |
| Head width at eye | 43.6 | 40.0–51.2 | 2.6 | 48.4 | 47.0–51.0 | 1.1 |
| Maximum head width | 51.1 | 48.7–55.7 | 2.2 | 54.3 | 53.0–55.5 | 0.8 |
| Gape width | 20.5 | 17.1–24.8 | 1.8 | 25.1 | 24.0–27.0 | 0.9 |
| Internarial width | 26.7 | 25.0–28.4 | 1.0 | 26.1 | 24.3–28.6 | 2.2 |
| Dorsal-fin spine length | 60.7 | 54.7–65.3 | 2.7 | 60.5 | 57.0–66.8 | 2.7 |

**Etymology.** Named after the black longitudinal stripe on the body, derived from 'ater' (Latin), black.
**Distribution.** India: Manipur: Iril and Imphal rivers, ponds and lakes in Imphal valley (Fig. 3).

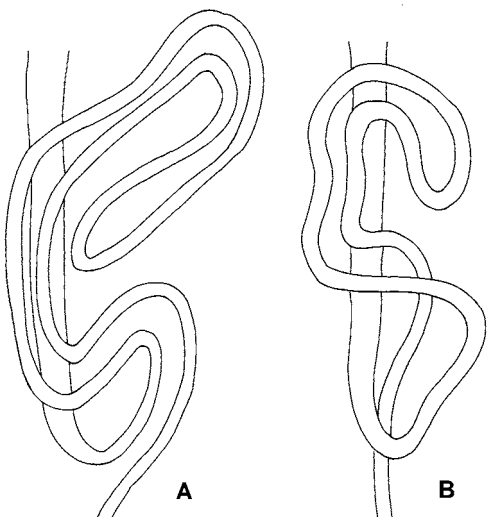


**FIGURE 2.** a. Gut of *Puntius ater* **n. sp.** b. Gut of *P. khugae* **n. sp.**

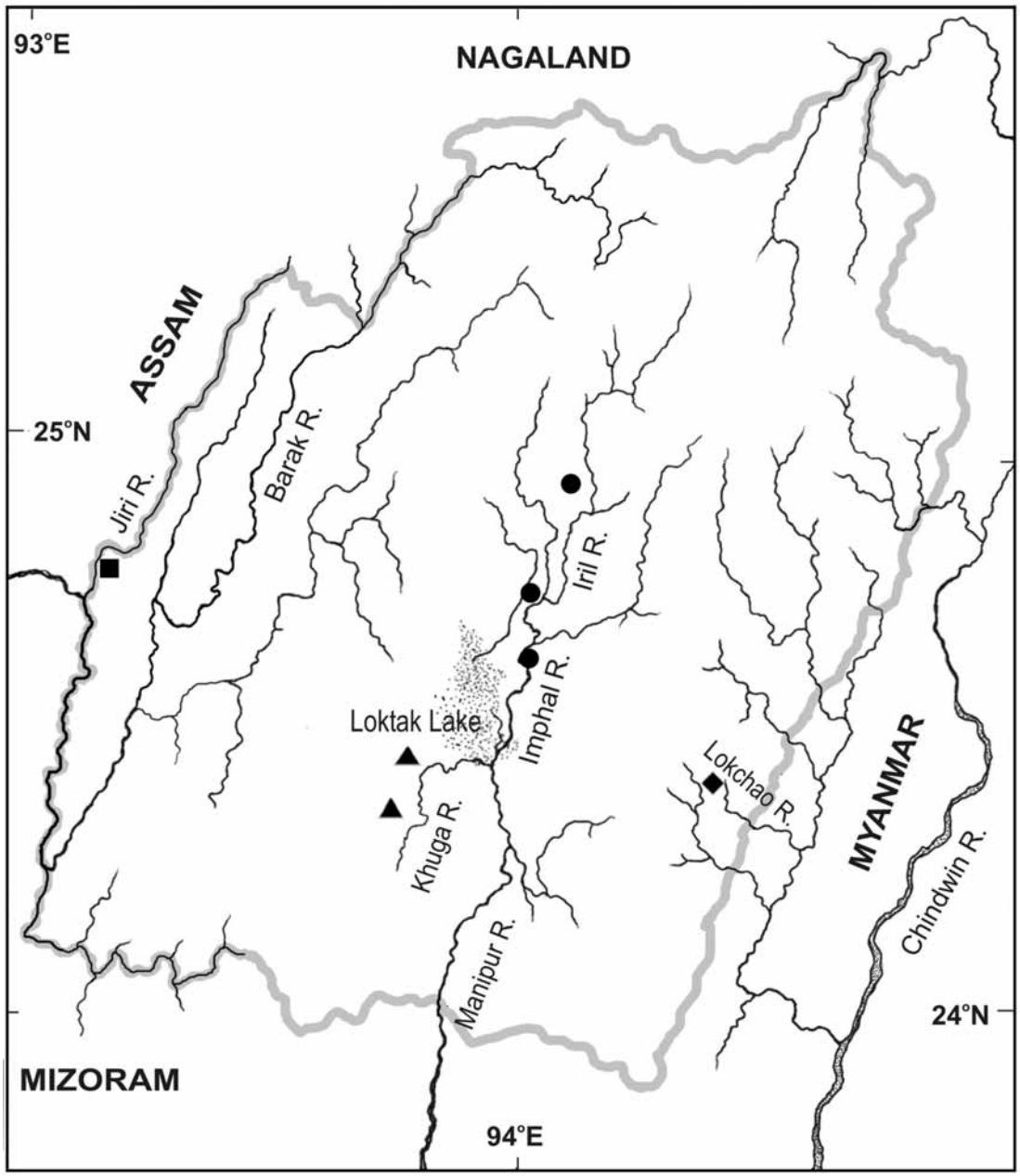


**FIGURE 3.** Map of Manipur showing distributions of *Puntius ater* (●) *P. khugae* (▲), *P. ticto* (■) and *P. stoliczkanus* (◆).

***Puntius khugae*, new species**
(Fig. 4)

**Holotype.** MUMF 6112, 45.5 mm SL; India: Manipur: Khuga R. (Chindwin Basin) at Churachandpur district; K. Shanta Devi, 25 March 2002.

**Paratypes.** MUMF 6113, 3; 44.0–46.0 mm SL; same data as holotype. MUMF 6216, 16; 45.0–47.0 mm SL; same locality data as holotype, I. Dhanabir, 25 Oct. 2004.

**Diagnosis.** A species of *Puntius* with the following combination of characters: dorsal fin edge plain, its spine serrated posteriorly with 10–12 serrae, spine length 16.0–20.9% SL; predorsal scales 11–12; lateral line incomplete with 8–11 pored scales; 28–30 scales in lateral-line row; transverse scales ½5/1/4½; black blotch on caudal peduncle at level of one scale behind posterior end of anal origin; intestine coiled, its relative length 0.9–1.2 TL. Other differentiating characters from nearest congeners are in Table 1.

**Description**. Table 2 presents morphometric data, and Table 3 presents frequency distributions of meristic characters. Body small and slender. Head large. Eyes large. Barbels absent. Lips thin.

Dorsal fin origin opposite that of pelvic fin, inserted midway between tip of snout and base of caudal fin; 3 simple and 8 branched rays; third simple ray spiny and serrated posteriorly with 10–12 serrae. Pectoral fin with 1 simple, posteriorly serrated ray and 12 branched rays. Pelvic fin with 1 simple and 8 branched rays. Caudal fin with 10+9 principal rays, 9+8 branched.

Scales large. Lateral line incomplete, 28–30 scales in the row with 8–11 pored. ½5 scales between dorsal fin origin and lateral-line row, 4½ between lateral line and pelvic fin base. Predorsal scales 10–12. Preanal scales 19.

Predorsal bones 5; predorsal neural spines 5; first pterygiophore inserted between 9$^{th}$ and 10$^{th}$ vertebrae; total vertebrae 4+28–29. The infraorbital 3+4 is broad and has greatly elevated margins compared to other bones of infraorbital series. Intestine coiled (Fig. 2b), its relative length 0.9–1.2 TL.

**Colouration**. In formalin, specimens have a blue-black longitudinal stripe occupying the upper half of the 1st scale row and lower half of the 2nd scale row above the lateral-line scale row. A black spot is present on the 21st scale of the lateral-line row; dorsal fin with a red band, edge plain. Pectoral, pelvic and anal fins reddish.

**Etymology.** Named after the Khuga River, the type locality for the species.

**Distribution.** India: Manipur: Khuga River (Fig. 3).

**FIGURE 4.** *Puntius khugae* **n. sp.** (holotype, MUMF 6112, 45.5 mm SL).

***Puntius ticto* (Hamilton)**

(Fig. 5)

*Cyprinus ticto* Hamilton, 1822: 314, fig.87, Pl. 8.

**Material examined**. (All from Brahmaputra basins) MUMF 6115, 1, 38.0 mm SL; India: Manipur: Jiri R. at Jiribam Subdivision; W. Vishwanath, 8 March 2000. MUMF 6116–20, 5, 40.0–46.0 mm SL; India: Assam: Wetlands of Hajo, North Kamrup District, A. Boishya, 20 April 2004. Uncat., 9, 35.0–44.0 mm SL; India: Assam: Brahmaputra R. at Guwahati; W. Vishwanath, 3 August, 2000. Uncat., 3, 40.0–41.3 mm SL; India: Nagaland: Dikhu R. at Moalenden; Bendangkokpa Jamir, 10 September 2005. Uncat., 21, 34.5–45.8 mm SL; India: Assam: Brahmaputra R. at Guwahati, W. Vishwanath, K. Nebeshwar and I. Linthoingambi, 21 July 2005.

**TABLE 3.** Meristic counts of *Puntius ater*, *P. khugae*, *P. ticto* and *P. stoliczkanus* .

| Species | No. of dorsal-fin spine serrae | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | N |
| *P. ater* | | | | 7 | 3 | 3 | | 3 | 16 |
| *P. khugae* | 9 | 6 | 7 | | | | | | 22 |
| *P. ticto* | | | | | | 2 | 8 | 6 | 16 |
| *P. stoliczkanus* | | | 2 | 7 | 5 | | 2 | | 16 |

| | No. of predorsal scales | | | | | |
|---|---|---|---|---|---|---|
| | 8 | 9 | 10 | 11 | 12 | N |
| *P. ater* | | | 7 | 5 | | 12 |
| *P. khugae* | | | | 12 | 6 | 18 |
| *P. ticto* | | 10 | 6 | | | 17 |
| *P. stoliczkanus* | 2 | 6 | 8 | | | 16 |

| | No. of lateral-line pores | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12-18 | 19 | 20 | 21 | 22 | 23 | N |
| *P. ater* | 2 | 7 | 14 | 10 | 4 | 1 | 3 | | | | | | | 41 |
| *P. khugae* | | | | 2 | 7 | 4 | 6 | | | | | | | 19 |
| *P. ticto* | | 6 | 8 | 8 | 8 | 5 | 4 | | | | | | | 39 |
| *P. stoliczkanus* | | | | | | | | | 1 | 2 | 9 | 14 | 11 | 37 |

| | No. of lateral-line scales | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | N |
| *P. ater* | | | | | 9 | 13 | 12 | 5 | 2 | | 41 |
| *P. khugae* | | | | | | | | 5 | 9 | 5 | 19 |
| *P. ticto* | | 1 | 13 | 9 | 12 | 4 | | | | | 39 |
| *P. stoliczkanus* | 3 | 6 | 10 | 18 | | | | | | | 37 |

**Diagnosis.** Body deep, its depth 36.8–45.0% SL; last simple ray of dorsal fin long, spiny and serrated posteriorly with 15–17 serrae, spine length 20.6–28.0% SL, 78.3–88.6% HL; lateral line incomplete with 22–26 scales in the row, 6–11 pored; preanal scales 16; two spots along lateral line scale row, one on the 4$^{th}$ scale and second on 17$^{th}$–20$^{th}$ scales; two complete black bands on dorsal fin.

**Description**. Table 3 presents frequency distributions of meristic characters, and Table 4 presents morphometric data. Body short, compressed and deep. Barbels absent. Lips thick, lateral fold on snout well developed.

Dorsal fin origin a little behind that of pelvic fin, inserted midway between tip of snout and base of caudal fin; 3 simple and 8 branched rays; third simple ray long, spiny and finely serrated posteriorly with 15–17 serrae. Pectoral fin with 1 posteriorly serrated simple ray and 12 branched rays, almost reaching the pelvic fin origin. Pelvic fin with 8–9 rays, the 1st and last two undivided. Anal fin with 3 simple and 5 branched rays. Caudal fin with 10+9 principal rays, 9+8 branched.

Scales large. Lateral line incomplete, 22–26 in the row with 6–11 pored. ½5 scales between dorsal fin origin and lateral-line row, 5½ between lateral line and pelvic fin origin. Predorsal scales 9–10. Preanal scales 16.

Predorsal bones 4, predorsal neural spines 4. First pterygiophore inserted between 8th and 9th vertebrae. Total vertebrae 4+26.

**Colouration**. A black spot on the 4th scale and one on 17th –20th scales of lateral line row. Two black bands on dorsal fin, the first at middle length on the membranes between the branched rays and the second on the branched rays at about ¾ length of the fin from its base.

**Distribution.** India: Ganges (Hamilton, 1822). India: Assam: Brahmaputra River (Sen, 1985). It is here reported from Jiri R., Manipur state (Fig. 3) and Dikhu R., Nagaland state, India.

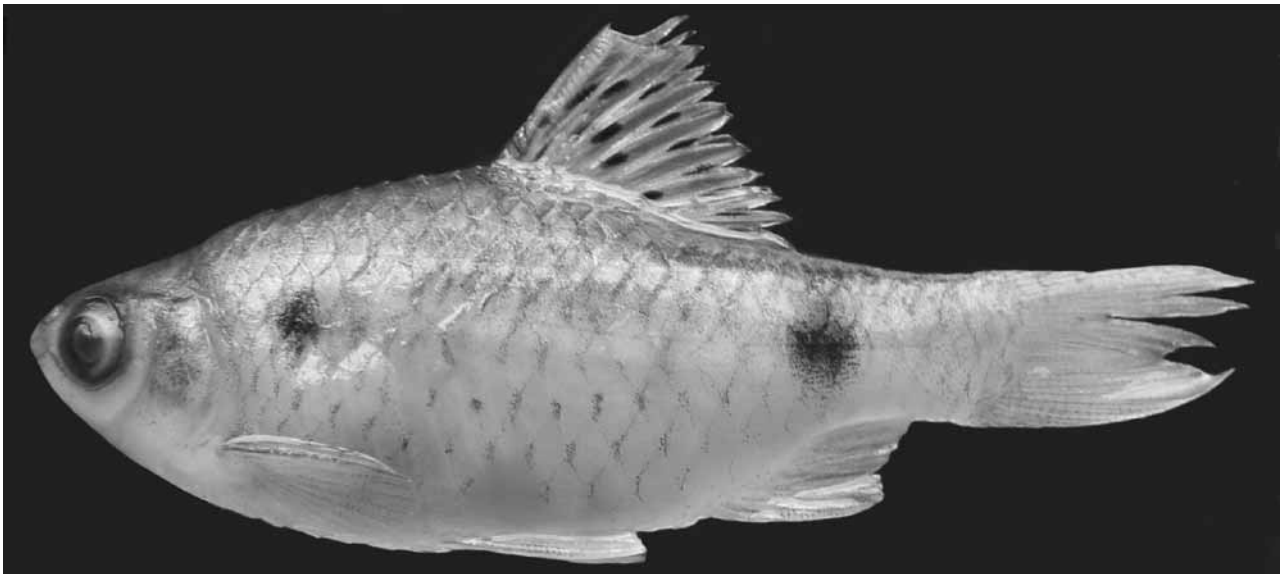

**FIGURE 5.** *Puntius ticto* (MUMF 6115, 38.0 mm SL).

***Puntius stoliczkanus* (Day)**
(Fig. 6)

*Barbus stoliczkanus* Day, 1871: 328, fig. 8, Pl. 144.

**Material examined**. MUMF 6120, 10, 46.6–50.5 mm SL; India: Manipur: Lokchao R at Moreh, (Indo-Myanmar border 94°18'11" E, 24°14'56"N, 212m asl); W. Vishwanath, 2 April 2004. MUMF 7250, 15, 47.5–53.9 mm SL; same data as MUMF 6120; L. Sakuntala, 5 July 1999. MUMF 9500-8, 9, 41.2–53.0 mm SL; same data as MUMF 6120; A. Darshan and S. Sanjabihari, 14 July 2005. MUMF 10001, 3, 41.0–45.5 mm SL; India: Manipur: Maklang R. at Ukhrul district; Kingson, 15 July 2005.

**Diagnosis.** Maximum head width 55.5–66.0% of head length; last simple dorsal ray short, spiny and finely serrated posteriorly with 12–16 serrae, spine length 16.0–20.0% SL and 58.0–65.4% HL; lateral line complete with 21–24 scales in row and 19–23 pored scales, if incomplete, reaches at least to the caudal peduncle; preanal scales18; presence of an oblong black mark above pectoral fin and one black blotch on 17th–19th scales of the lateral-line row; two black bands on dorsal fin, incomplete one at middle length on the membrane between 3rd –5th branched rays and another one on the branched rays at margin.

**Description**. Table 3 presents frequency distributions of meristic characters, and Table 4 presents morphometric data. Body short, compressed and deep. Barbels absent. Lips thick, lateral fold on snout well developed.

Dorsal fin origin opposite that of pelvic fin, inserted midway between tip of snout and base of caudal fin; 3 simple and 8 branched rays; third simple ray short, spiny and serrated posteriorly with 12–16 serrae. Pectoral fin with 1 simple posteriorly serrated ray and 12 branched rays; almost reaching the pelvic fin origin. Pel-

vic fin with 1 simple and 8 branched rays. Anal fin with 3 simple and 5 branched rays. Caudal fin with 10+9 principal rays, 9+8 branched.

**TABLE 4.** Morphometric data of *Puntius ticto* and *P. stoliczkanus.*

| | P. ticto | | | P. stoliczkanus | | |
|---|---|---|---|---|---|---|
| | $\bar{x}$ | Range | S.D. | $\bar{x}$ | Range | S.D. |
| Standard length (mm) | | 34.5–46.0 | | 41.0–53.9 | | |
| In % SL | | | | | | |
| Head length | 28.3 | 26.7–30.3 | 1.4 | 27.1 | 25.0–29.0 | 1.7 |
| Body depth | 40.8 | 36.8–45.0 | 2.0 | 41.7 | 38.0–45.0 | 2.1 |
| Body width at dorsal-fin origin | 17.1 | 16.5–18.4 | 0.8 | 17.4 | 13.3–21.0 | 3.6 |
| Body width at anal-fin origin | 13.3 | 12.9–13.7 | 0.3 | 12.6 | 11.6–14.0 | 0.9 |
| Length of caudal peduncle | 19.0 | 17.7–19.7 | 0.9 | 18.8 | 18.0–20.0 | 0.8 |
| Depth of caudal peduncle | 15.3 | 14.2–17.1 | 1.2 | 16.1 | 15.2–17.0 | 0.7 |
| Len Length of dorsal-fin base | 19.8 | 18.6–21.0 | 1.0 | 18.7 | 17.0–20.0 | 1.2 |
| Dorsal-fin depth | 27.3 | 25.3–28.9 | 1.5 | 27.0 | 26.0–28.0 | 1.1 |
| Length of pectoral fin | 21.1 | 19.7–23.7 | 1.8 | 23.1 | 22.5–24.1 | 0.6 |
| Length of pelvic fin | 22.0 | 19.9–25.0 | 2.1 | 23.2 | 22.3–24.5 | 0.9 |
| Length of anal fin | 12.0 | 11.2–13.1 | 0.9 | 12.7 | 12.2–13.4 | 0.5 |
| Anal-fin depth | 17.8 | 16.3–21.0 | 2.1 | 19.1 | 18.0–20.1 | 0.8 |
| Dorsal-fin spine length | 24.8 | 20.6–28.0 | 1.7 | 18.1 | 16.0–20.0 | 1.3 |
| In % HL | | | | | | |
| Head depth at eye | 57.8 | 54.0–68.2 | 3.0 | 62.7 | 57.0–66.9 | 2.6 |
| Snout length | 27.1 | 24.8–29.6 | 1.9 | 29.7 | 27.6–31.0 | 1.4 |
| Eye diameter | 33.0 | 29.6–39.1 | 2.2 | 32.6 | 29.6–36.5 | 1.9 |
| Interorbital width | 37.7 | 36.0–44.5 | 1.9 | 42.1 | 39.3–45.3 | 1.6 |
| Head width at eye | 44.3 | 39.1–48.0 | 1.9 | 51.9 | 46.9–55.9 | 1.8 |
| Maximum head width | 48.7 | 44.7–56.5 | 2.5 | 58.3 | 55.5–66.0 | 2.2 |
| Gape width | 21.1 | 18.1–26.0 | 1.6 | 23.3 | 20.5–25.9 | 1.4 |
| Internarial width | 25.5 | 22.9–28.3 | 2.7 | 25.0 | 22.2–28.0 | 3.2 |
| Dorsal-spine length | 82.7 | 78.3–88.6 | 2.9 | 61.6 | 58.0–65.4 | 2.3 |

Scales large. Lateral line complete, 21–24 in the row with 19–23 pored scales; ½5 scales between dorsal fin origin and lateral-line row, 5½ between lateral line and pelvic fin base. If incomplete, the lateral line at least reaches the caudal peduncle. Predorsal scales 8–10. Preanal scales 18.

Predorsal bone 4 and predorsal neural spine 4. First pterygiophore inserted between 8$^{th}$ and 9$^{th}$ vertebrae. Total vertebrae count 4+25–26.

**Colouration**. An oblong black mark above pectoral fin on the 3$^{rd}$ scale of the lateral line and one black blotch on 17$^{th}$–19$^{th}$ scales of the lateral-line row. Two black bands on the dorsal fin, the first at middle length and on the membrane between 3$^{rd}$ –5$^{th}$ branched rays only, the second on the branched rays at the margin of the fin.

**Distribution.** Myanmar: Chindwin Basin (Day, 1871). India: Chindwin basin in Manipur (Vishwanath and Juliana, 2004) (Fig. 3). Myanmar, Thailand, Laos (Kottelat, 2001).

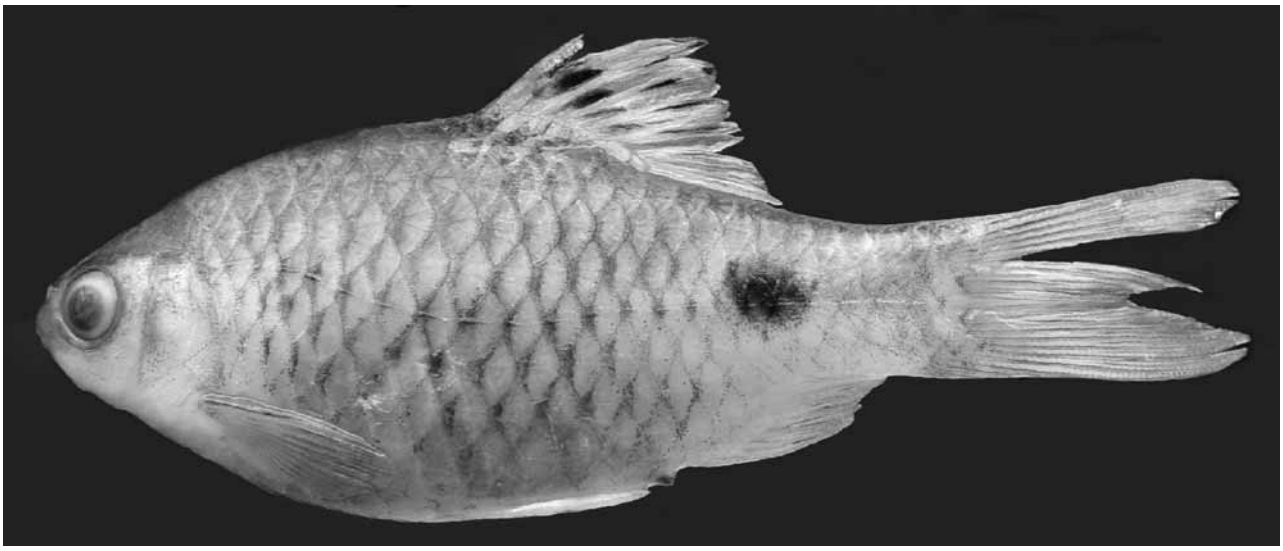

**FIGURE 6.** *Puntius stoliczkanus* (MUMF 6120, 50.5 mm SL).

## Discussion

*Puntius ater* and *P. khugae* are unique among species of *Puntius* in Manipur in having one black longitudinal stripe on the side of the body. The former species is distinguished from the latter in having a black edge on the dorsal fin, 13–17 serrae (modally 13) on the dorsal fin spine, 10–11 (modally 10) predorsal scales, modally 26 or 27 (range = 25–29) lateral-line scales, and a longer gut (2.0–2.5 times total length). *Puntius khugae* has no black edge on the dorsal fin, 10–12 serrae (modally 10) on the dorsal fin spine, 9–10 (modally 9) predorsal scales, modally 29 (range = 28–30) lateral-line scales, and a shorter gut (0.9–1.2 times total length) (Tables 1 & 3). Taki *et al* (1978) classified species of *Puntius* having broad and elevated infraorbital 3+4 in the *Puntius conchonius*-group. The two new species have similar structures and thus may be included in the group.

*Puntius ater* inhabits sluggish streams of the Imphal River and its tributaries, while *P. khugae* inhabits the Khuga, a comparatively faster clear-water stream. The latter species has a shorter gut (Fig. 2a & b) and probably is a sympatric species adapted to a different environment with a different food habit.

Hamilton (1822) described *P. ticto* from Gangetic basin. He observed the pelvic fin of the species to have one undivided ray in front and two behind. Similar observations were also made in the present study.

Hora *et al*. (1937) observed variations in *P. ticto* and treated *P. punctatus* of Peninsular India and *P. stoliczkanus* of the Irrawady as its junior synonyms. Silas (1952), however, regarded *P. punctatus* and *P. stoliczkanus* as subspecies of *P. ticto*. Jayaram (1991) did not give subspecies status to *P. punctatus* and *P. stolizckanus* as the fishes showed great variation in morphology. He also considered *P. ticto* to be widely distributed and not restricted to any definite geographical region.

Day (1871) described *P. stoliczkanus* from the Chindwin basin, Pegu and Moulmein. He reported the species to have a less compressed body and weaker serrations in the dorsal spine compared to *P. ticto*. Hora (1936) distinguished *P. stoliczkanus* from *P. ticto* in having weaker serrations on the dorsal spine, and also in differences in the positions of lateral spots and the numbers of predorsal scales. Jayaram (1981) considered *P. stoliczkanus* to be a subspecies of *P. ticto*. Kottelat (2001) reported on the occurrence of *P. stoliczkanus* in the Irrawady, Salween, Mekong and Chao Phraya basins.

Early workers had access to very few, poorly preserved specimens. Thus, species were poorly described. Variations in ontogenic development were not considered, and several species from different geographically isolated habitats were put together as highly variable species. Various workers (Kottelat, 1996; Kottelat &

Lim, 1993, 1995; Ng & Dodson, 1999; Ng & Kottelat, 2000; Chakrabarty & Ng, 2005; Ng, 2005) reexamined such 'highly variable' widely distributed species and concluded that they were in fact aggregates of distinct, often not even closely related species. *Puntius ticto* and *P. stoliczkanus* were also examined and found to be distinct (Table 1).

None of the fish collections from the Chindwin basins of the state contained *P. ticto*. The species reported as *P. ticto* by previous workers from the valley were probably misidentifications of *P. stoliczkanus* or *P. ater*. It may be concluded that *P. ticto* is a Brahmaputra form, and *P. stoliczkanus* is a Chindwin form.

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