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Glyptothorax mibangi, a new species of catfish (Teleostei: Sisoridae) from the Tisa River, Arunachal Pradesh, northeast India

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Abstract

Glyptothorax mibangi, a new sisorid catfish, is described from the Tisa River of Arunachal Pradesh, India. The new species can be distinguished from its congeners in the Ganga–Brahmaputra and Barak–Surma–Meghna basins by the following combination of characters: an obtuse leaf-shaped thoracic adhesive apparatus with a spindle-shaped median depression, skin ridges present over the entire apparatus including the depressed region; ventral surface of pectoral spine and first pelvic-fin ray non-plaited; slender body with depth of 10.4–13.5% SL; caudal peduncle shallow with depth 6.8–8.3% SL; snout long with length 52.9–58.6% HL; and 2+7 gill rakers on the first branchial arch.

Key words: New sisorid, Brahmaputra basin

Introduction

Glyptothorax Blyth 1860, is the most species-diverse and widely-distributed genus of sisorid catfishes (Ng & Kullander 2013). Fishes in this genus are treated as a monophyletic group (Jiang *et al*. 2011) and easily distinguished from other sisorids in having a thoracic adhesive apparatus with grooves parallel or oblique to the longitudinal axis of the body (Thomson & Page 2006). The genus is osteologically diagnosed in having a detached distal portion of the premaxilla and long and thin lateral arms of the vomer that extend under the entire length of the articular process of the lateral ethmoid (de Pinna 1996).

Twenty-one species of *Glyptothorax* have been described from the Ganga–Brahmaputra and Barak–Surma–Meghna basins (Ng 2005; Anganthoibi & Vishwanath 2013; Tamang and Chaudhry 2011; Menon 1955; Ng and Lalramliana 2012a, 2012b, 2013). Of these, the Ganga-Brahmaputra basin has 14 valid species, viz. *Glyptothorax alaknandi*, *G. brevipinnis, G. botius, G. telchitta, G. cavia*, *G. conirostris*, *G. garhwali*, *G. gracilis*, *G. pectinopterus*, *G. stolickae, G. indicus*, *G. radiolus, G. dikrongensis* and *G. pantherinus,* while the Barak–Surma–Meghna basin has four valid species: *G. manipurensis*, *G. striatus*, *G. maceriatus* and *G. scrobiculus* (Eschmeyer 2014).

During a recent ichthyological survey of the tributaries of the Brahmaputra River draining the eastern part of Arunachal Pradesh, specimens from the Tisa River included an undescribed species of *Glyptothorax*, which is herein described as a new species, *Glyptothorax mibangi.*

Material and methods

Measurements were made on the left side of specimens with dial calipers to the nearest 0.1 mm, following Ng and Dodson (1999). The thoracic adhesive apparatus was measured following Vishwanath and Linthoingambi (2007). Measurements of head length (HL) and body parts are expressed as proportions of standard length (SL) and the

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subunits of the head as proportions of head length. Fin rays were counted under a Nikon SMZ800 stereo-zoom microscope. Gill raker and vertebral counts, and institutional abbreviations follow Rameshori and Vishwanath (2012a). Numbers in parentheses after a count indicate the frequency of that count. The type specimens are deposited at the Rajiv Gandhi University Museum of Fishes (RGUMF), Doimukh, Arunachal Pradesh.

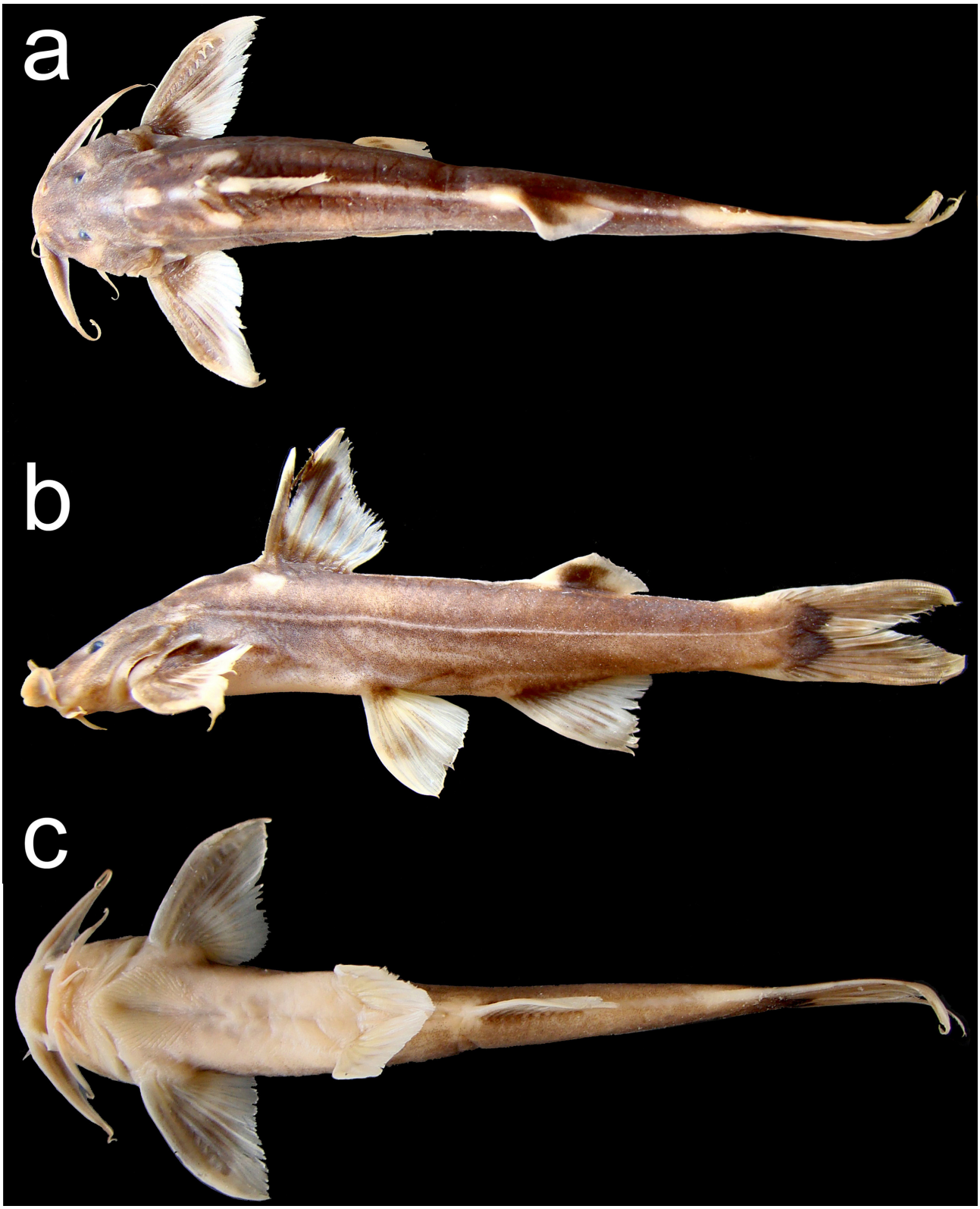

FIGURE 1. *Glyptothorax mibangi*, holotype, RGUMF 243, 79.0 mm SL; a) dorsal, b) lateral and c) ventral views. India: Arunachal Pradesh: Tisa River near Longding.

Glyptothorax mibangi, new species (Fig. 1)

Type material. Holotype: RGUMF 243, 79.0 mm SL; India: Arunachal Pradesh State, Tisa River near Longding, Brahmaputra River basin, 26°52'N, 95°21'E, D.N. Das & party, 18 October 2008.

Paratypes: RGUMF 244–245 (2), 75.9–83.5 mm SL; same data as holotype; RGUMF 245, 83.5 mm SL, partially dissected for vertebral count.

Diagnosis. *Glyptothorax mibangi* can be distinguished from its congeners in the Ganga–Brahmaputra and Barak–Surma–Meghna basins by the following combination of characters: an obtuse, leaf-shaped thoracic adhesive apparatus with a spindle-shaped median depression, skin ridges present over entire apparatus, including the depressed region; ventral surface of pectoral spine and first pelvic-fin ray non-plaited; body slender with a depth of 10.4–13.5% SL; caudal peduncle shallow with a depth 6.8–8.3% SL; snout long with 52.9–58.6% HL; and 2+7 gill rakers on the first branchial arch.

TABLE 1. Morphometric data of holotype and paratypes of *Glyptothorax mibangi* (n=3) and *G. gracilis* (n=7). * including the data of ZSI/NRSV-988.

	G. mibangi Holotype RGUMF 243	*G. mibangi* Paratype RGUMF 244	*G. mibangi* Paratype RGUMF 245	*G. gracilis* ZSI/NRS V-988	*G. gracilis* range*
Total length (TL) in mm	97.7	95.0	102.9	145.9	102.5–145.9
Standard Length (SL) in mm	79.0	75.9	83.5	113.5	84.1–113.5
% SL					
Predorsal length	35.5	34.9	33.6	32.9	32.3–34.3
Preanal length	59.8	64.9	63.7	62.8	59.3–66.0
Prepelvic length	43.2	45.0	45.2	45.6	42.9–47.3
Prepectoral length	19.1	19.3	19.5	18.9	18.0–20.9
Dorsal-fin-base length	10.3	11.3	12.3	13.6	11.5–13.6
Dorsal-spine length	15.3	15.1	-	15.7	14.0–17.8
Anal-fin-base length	13.4	13.7	15.6	13.6	13.3–14.1
Pelvic-fin length	17.4	17.1	15.8	19.2	18.0–19.3
Pectoral-fin length	23.4	22.5	22.5	23.6	18.4–24.5
Pectoral-spine length	15.3	15.1	-	18.4	16.1–18.5
Caudal-fin length (lower lobe)	26.2	25.8	26.3	26.6	24.3–27.1
Adipose-fin-base length	13.4	12.2	11.7	13.4	9.6–14.3
Dorsal-to-adipose distance	20.8	21.4	24.0	24.6	21.0–24.6
Post-adipose distance	21.8	20.2	20.5	21.0	18.5–22.3
Caudal-peduncle length	22.4	20.5	20.8	22.6	20.7–23.7
Caudal-peduncle depth	8.3	6.8	8.3	8.6	7.7–8.4
Body depth at anus	13.5	10.4	12.2	19.3	1 4.0–19.3
Head length	22.6	22.6	21.4	22.9	22.0–24.2
Head width	17.8	16.3	17.3	19.2	14.1–19.2
Head depth	13.4	12.2	12.8	15.6	11.5–15.6
Adhesive apparatus length	15.1	13.7	13.4	13.3	13.3–16.8
Adhesive apparatus width	11.2	10.4	9.4	10.8	10.4–12.0
% HL					
Snout length	55.3	52.9	58.6	51.7	47.2–51.9
Interorbital distance	26.8	26.7	28.4	26.4	21.6–28.1
Eye diameter	11.1	8.7	10.6	9.9	8.7–10.1
Nasal barbel length	30.7	30.8	30.7	32.1	31.5–38.4
Maxillary barbel length	112.2	101.7	110.0	104.0	104.0–120.2
Inner mandibular barbel length	27.9	26.7	29.0	34.8	23.8–34.8
Outer mandibular barbel length	52.5	48.8	53.0	55.1	44.6–63.4

Description. Morphometric data are given in Table 1. Body elongate, compressed laterally towards posterior region; dorsal profile rising evenly from tip of snout to dorsal-fin origin, then sloping gently ventrad from dorsal-

fin origin to end of caudal-peduncle. Ventral profile flat to anal-fin origin, then gradually sloping dorsad from anal-fin origin to end of caudal peduncle. Anus and urogenital openings at posterior half of adpressed pelvic fin. Skin granular, granules more prominent on dorsal surface of neurocranium. Lateral line complete, midlateral in position. Head depressed, longer than broad, triangular in lateral view. Snout slightly pointed in lateral aspect. Mouth inferior, lips broad, upper jaw longer than lower jaw, upper lip continuing into maxillary barbel. Oral teeth small, villiform, in irregular rows, borne on all tooth-bearing surfaces. Palate edentate. Premaxillary tooth-band exposed partially with mouth closed, teeth arranged in single, broad, semilunate band. Dentary teeth in two crescentic patches separated at midline by narrow gap. Anterior and posterior nares separated only by base of nasal barbel. Eye ovoid. Gill opening wide, extending from beneath post-temporal to isthmus. Occipital process not reaching anterior tip of nuchal plate of dorsal fin. First branchial arch with 2+7 (1) gill rakers. Thoracic adhesive apparatus well-developed, obtuse, leaf-shaped, with a median spindle-shaped depression; skin ridges present over entire apparatus, including depressed region. Vertebrae 17+18 = 35 (1).

Barbels in four pairs; nasal barbel arising from internarial septum, just reaching anterior margin of eye when adpressed; maxillary barbel supported by large flap of skin, extending slightly beyond end of pectoral-fin base; outer mandibular barbel longer than inner, reaching base of first pectoral-fin ray, inner mandibular barbel short, slightly less than horizontal length of eye.

Dorsal fin with I,6 (3) rays, inserted nearer to snout tip than to caudal-fin origin, its distal margin concave. Dorsal spine long, straight and rigid, with anterior margin smooth and posterior margin weakly serrated bearing 4 (1) or 6 (2) serrae. Pectoral fin with I,10 (2), or I,11 (1) rays, extending past dorsal-fin base, almost reaching pelvic fin origin when adpressed. Pectoral spine broad, its anterior margin smooth, posteriorly serrated, with 11 (2) serrae. Ventral surfaces of spine and adjacent branched ray of pectoral fin non-plaited. Pelvic fin with i,5 rays (3), first ray originating at vertical behind dorsal-fin base, tip of adpressed fin not reaching anal-fin origin. Ventral surfaces of simple ray and adjacent branched ray of pelvic fin non-plaited. Anal-fin with ii,10 (1) or ii,11 (2) rays, its origin located slightly anterior to vertical through adipose-fin origin, anterior fin margin straight, posterior margin slightly concave. Adipose-fin base length shorter than dorsal-fin base, its anterior margin straight, inclined at an angle of about 33° from mid-dorsal line, posterior margin angular. Caudal fin with i,7,8,i (3) principal rays, fin deeply forked, lower lobe slightly longer than upper.

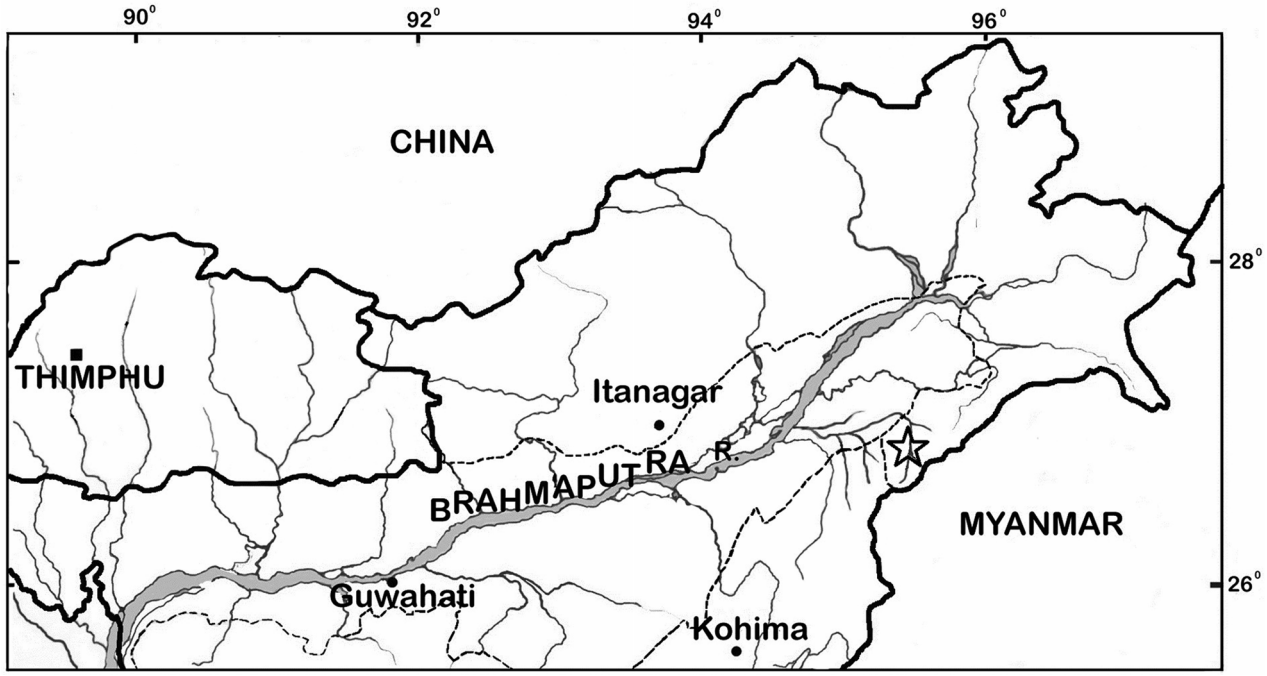

FIGURE 2. Type locality of *Glyptothorax mibangi* (star).

Coloration. In 70% ethanol: dorsal and lateral surfaces of head and body uniformly brown, ventrally pale brown. Thin, yellowish mid-dorsal stripe. Skin over occipital spine, anterior tip of nuchal plate and third nuchal

plate pale yellow. A narrow, pale-yellow line superimposed on lateral line. Base and distal third quarter of dorsal and pectoral fins with dark-brown bands. Adipose fin with large dark-brown blotch. Caudal-fin dark-brown at base. Pelvic and anal fins with faint brown band midway between base and distal tip of the fins, against amber background.

Distribution. Known only from the Tisa River, Brahmaputra basin (Fig. 2).The type locality is a fast flowing hill stream with a substrate of boulders, cobble, pebbles and sand. Cobbles dominate the substrate composition of the stream (Fig. 3).

FIGURE 3. Type locality of *Glyptothorax mibangi* (Tisa River). Photograph courtesy of P.J. Saikia.

Etymology. The species is named after Tamo Mibang, Vice-Chancellor of Rajiv Gandhi University, Doimukh, whose patronage has continually been extended to freshwater-fish research and conservation in the Eastern Himalyan region of India.

Discussion

Species of *Glyptothorax* are usually restricted to a particular river basin, their ranges rarely extending to multiple basins (Ng & Rachmatika, 2005). In view of this, we restricted our comparisons of the new species to congeners in the Ganga–Brahmaputra and Barak–Surma–Meghna basins and to congeners with similar coloration in the neighboring Koladyne and Chindwin basins.

Glyptothorax mibangi differs from *G. indicus* and *G. dikrongensis* in having a longer caudal peduncle (20.5–22.4 vs. 18.7–20.4% SL) and snout (52.9–58.6 vs. 48.0–49.9% HL), a shorter head (21.4–22.6 vs. 27.3–28.5% SL), more slender body (body depth at anus: 10.4–13.5 vs. 15.3–17.6% SL), more widely spaced eyes (interorbital distance: 26.7–28.4 vs. 16.6–23.1% HL), and the gular region lacking (vs. having) unculiferous ridges.

The new species differs from *G. cavia* in having a shorter head (21.4–22.6 vs. 26.1–29.2% SL), shorter preanal

length (59.8–65.0 vs. 68.2–70.5% SL) and prepectoral length (19.1–19.5 vs. 22.0–25.4% SL), longer post-adipose distance (20.2–21.8 vs. 16.4–17.8% SL) and caudal peduncle (20.5–22.4 vs. 17.2–18.6% SL); and more widely-spaced eyes (interorbital distance: 26.7–28.4 vs. 22.1–25.4% HL) and depressed head (head depth 12.2–13.4 vs. 14.0–15.8% SL). It further differs from *G. cavia* in having more gill rakers on the first branchial arch (2+7=9 vs. 1+5=6), and a thoracic adhesive apparatus with a median spindle-shaped depression possessing longitudinal ridges (vs. thoracic adhesive apparatus with an ovoid depression devoid of ridges); from *G. botius* and *G. telchitta* by its posteriorly serrated (vs. smooth) dorsal-fin spine and deeper caudal peduncle (6.8–8.3 vs. 3.1–5.9% SL); and from *G. garhwali* by its shorter adipose-fin base (11.7–13.4 vs. 16.4% SL), longer caudal peduncle (20.5–22.4 vs. 18.5% SL) and narrower head (head width 16.3–17.8 vs. 18.0–19.9% SL).

Glyptothorax mibangi differs from *G. gracilis* in having a longer snout (52.9–58.6 vs. 47.2–51.9% HL), shorter pelvic fin (15.8–17.4 vs. 18.0–19.3% SL) and pectoral spine (15.1–15.3 vs. 16.1–18.5% SL), more slender body (10.4–13.5 vs. 14.0–19.3% SL), fewer gill rakers (2+7=9 vs. 2+8=10 [n=2]) on the first branchial arch, 11 (vs. 12–15) serrations on the pectoral spine and 4–6 (vs. 8–9) serrations on the dorsal spine. *Glyptothorax mibangi* further differs from *G. gracilis* by its leaf-shaped thoracic adhesive apparatus (Fig. 4a) which tappers gradually towards both the posterior and anterior ends of the apparatus (vs. tappers only towards the anterior tip but becomes broad and blunt posteriorly) and also by its spindle-shaped median depression (vs. depressed broadly in the central region of the apparatus without forming any distinct shape (Fig. 4b).

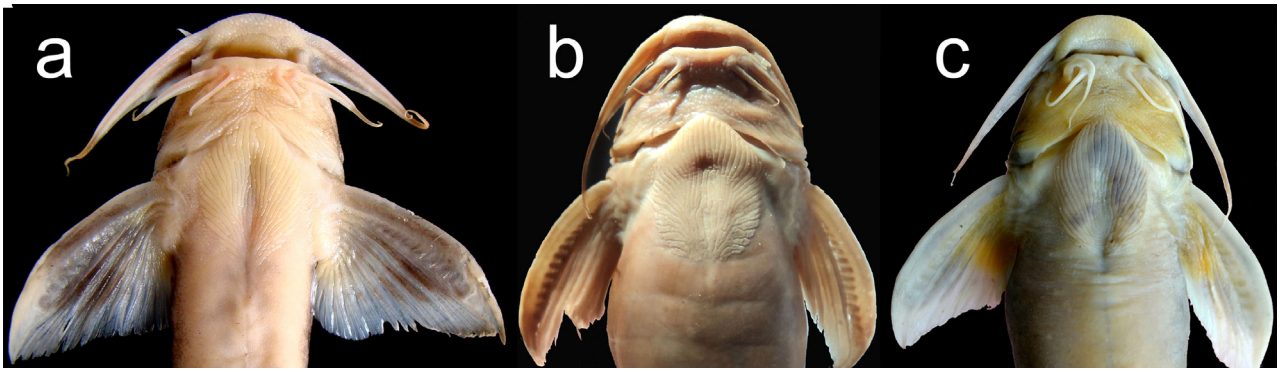

FIGURE 4. Thoracic adhesive apparatus of: a) *Glyptothorax mibangi* , holotype, RGUMF 243, 79.0 mm SL; b) *G. gracilis*, ZSI/NRS V-988, 113.5 mm SL; and **c)** *G. pantherinus,* RGUMF 247, 97.2 mm SL.

Glyptothorax mibangi differs from *G. stolickae* in having a more pectoral-fin branched rays (10–11 vs. 9) and serrations (11 vs. 9) on the posterior edge of the pectoral spine; from *G. scrobiculus* by its posteriorly serrated (vs. smooth) dorsal spine and pectoral spine lacking (vs. having) a furrow along the posterior margin of the entire length of the ventral surface of the spine; from *G. alaknandi* by its obtuse leaf-shaped (vs. chevron-shaped) thoracic adhesive apparatus; from *G. manipurensis* by its longer snout (52.9–58.6 vs. 45.6–49.0% HL) and the absence (vs. presence) of a black spot at the dorsal and adipose-fin bases; from *G. maceriatus* by its shorter head (21.4–22.6 vs. 23.7–25.3% SL), shorter dorsal-fin base (10.3–12.3 vs. 13.1–14.8% SL), and posteriorly serrated (vs. smooth) dorsal spine.

Glyptothorax mibangi differs from *G. pectinopterus, G. striatus, G. brevipinnis, G. radiolus, G. conirostris* and *G. pantherinus* in having a smooth (vs. plicate) ventral surface of the pectoral-fin spine and first pelvic-fin ray. The new species is further distinguished from *G. pectinopterus* in having a shorter adipose-fin base (11.7–13.4 vs. 14.7–17.6% SL) and more slender caudal peduncle (its depth 6.8–8.3 vs. 8.9–9.2% SL), from *G. striatus* in having a shorter and narrower head (head length 21.4–22.6 vs. 23.8–27.6% SL; head width 16.3–17.8 vs. 19.4–20.9% SL), more anteriorly positioned anal fin (preanal length 59.8–64.9 vs. 65.0–71.2% SL), shorter dorsal-to-adipose distance (20.8–24.0 vs. 24.9–27.9% SL) and longer nasal barbel (30.7–30.8 vs. 13.8–29.4% HL); from *G. brevipinnis* by its longer snout (52.9–58.6 vs. 44.6–48.4% HL), shorter adipose-fin base (11.7–13.4 vs. 13.4–15.9% SL), and more slender caudal peduncle (6.8–8.3 vs. 8.0–9.7% SL); from *G. radiolus* by its posteriorly serrated (vs. smooth) dorsal spine, narrower head (16.3–17.8 vs. 18.8–19.1% SL), shorter dorsal-to-adipose distance (20.8–24.0 vs. 26.6–26.8% SL) and a longer pectoral-fin spine (14.7–14.9 vs. 11.6–13.9% SL); and from *G. conirostris* in having more branched pectoral-fin rays (10–11 vs. 9) and serrations (11 vs. 9) on the posterior margin of the pectoral spine .

Both the new species and *G. pantherinus* have a similar leaf-shaped thoracic adhesive apparatus and gill-raker count (2+7=9) on the first branchial arch. However, *G. pantherinus* has less-well-formed dermal pleats on the ventral surface of the pectoral-fin spine and the first pelvic-fin ray in comparison to those of *G. striatus* and *G. radiolus;* the pleats appearing irregular and faint along the marginal and distal portions of the first element of the fin. Furthermore, the new species can be readily distinguished from *G. pantherinus* in having a greater predorsal length (33.6–35.5 vs. 31.3–33.3% SL), shorter caudal peduncle (20.5–22.4 vs. 23.3–25.7% SL), a more slender body (10.4–13.5 vs. 15.2–16.4% SL), more depressed head (head depth 12.2–13.4 vs. 15.3–16.3% SL), longer snout (52.9–58.6 vs. 51.3–51% HL), spindle-shaped median depression (vs. irregularly depressed, lacking a distinct shape) in the thoracic adhesive apparatus (Fig. 4c) and no dark blotches (vs. body mottled with dark-brown irregularly-set ovoid blotches).

Species of *Glyptothorax* from adjacent drainages bearing a similar coloration with *G. mibangi* are *G. jayarami*, *G. ater*, *G. churamanii* and *G. verrucosus* from the Kaladan (Koladyne) basin; and *G. ventrolineatus*, and *G. trilineatus* from the Chindwin-Irrawaddy drainage. The new species differs from all of these species by the presence (vs. absence) of ridges on the depressed region of the thoracic adhesive apparatus and by having, except in *G. verrucosus, G. ventrolineatus* and *G. trilineatus,* non-plaited (vs. plaited) ventral surfaces of the pectoral spine and first simple pelvic-fin ray. *Glyptothorax mibangi* further differs from *G. verrucosus* in having a slender body (body depth at anus10.4–13.5 vs. 14.0–16.9% SL) and shorter head (21.4–22.6 vs. 23.9–27.4% SL); from *G. ventrolineatus* and *G. trilineatus* by its narrower head (16.3–17.8 vs. 18.8–21.0% HL), more slender caudal peduncle (length 20.5–22.4 vs. 18.4–19.9% SL, depth 6.8–8.3 vs. 8.9–9.9% SL), longer adipose-fin base (11.7–13.4 vs. 9.9–11.2% SL); and from *G. ventrolineatus* by its closely set eyes (26.7–28.4 vs. 30.9–33.5% HL), more branched anal-fin rays (ii,10–11 vs. iii,9), and in lacking (vs. having) a pale stripe running along the mid-ventral region of the body.

Comparative material and sources

Glyptothorax cavia: RGUMF 123 (2), 100–170 mm SL; India: Arunachal Pradesh, Noa Dehing at Namdapha. RGUMF 0227 (3), 82.9–88.5 mm SL; India: Arunachal Pradesh, East Siang district, Singen River, Brahmaputra Drainage. RGUMF, unregistered (1), 138.0 mm SL; India: Arunachal Pradesh, Dikrong River at Doimukh.

G. striatus: RGUMF 127, 197.0–73.3 mm SL (2); India: Arunachal Pradesh, Lohit District, Tunaigat.

G. indicus: RGUMF 126, 95.4–117.7 mm SL (7); India: Arunachal Pradesh, West Siang district, Yomgo River at Aalo, Brahmaputra basin.

G. dikrongensis: MUMF, unregistered, 75.9 mm SL; India: Arunachal Pradesh, Dikrong River at Doimukh, Brahmaputra basin.

G. manipurensis: MUMF 4029–4032 (4), 69.0–104.0 mm SL; India: Manipur, Barak river, Vanchengphai, Tamenglong District. MUMF unregistered (3), 137.7–151.1 mm SL; India: Manipur, Barak River at Tamenglong.

G. pantherinus: MUMF 10047, holotype, 131.2 mm SL; India: Arunachal Pradesh, Noa Dehing River at Deban-Namdapha, Brahmaputra basin, Changlang district. RGUMF 0247 (1), 97.2 mm SL; India: Arunachal Pradesh, Noa Dehing River at Deban-Namdapha, Brahmaputra basin, Changlang district. RGUMF 0248 (1), 99.3 mm SL; India: Arunachal Pradesh, Dipu Nalla at Dibang valley, Brahmaputra drainage.

G. telchitta: RGUMF 186(3), 54–68 mm SL; India: Arunachal Pradesh, Singen River, Brahmaputra basin.

G. botius: RGUMF 246 (1), 79.1 mm SL; India: Bihar, Patna, Ganga River at Gaighat.

G. jayarami: MUMF 14012, holotype, 104.5 mm SL; India: Mizoram state, Kaladan River at Kolchaw, Lawntlai District.

G. ater: MUMF 10044, holotype, 126.5 mm SL; India: Mizoram State, Koladyne (Kaladan) River at Kolchaw, Lawntlai District.

G. churamanii: MUMF 14023, holotype, 85.5 mm SL; MUMF 14024 and 4026, paratypes, 62.5 and 83.9 mm SL; India: Mizoram state, Koladyne (Kaladan) River at Kolchaw, Lawntlai District.

G. verrucosus: MUMF 14001, 53.6 mm SL; India: Mizoram State, Koladyne River at Kolchaw, Lawntlai District. Additional data from Rameshori and Vishwanath (2012b).

G. ventrolineatus: MUMF L0221, holotype, 85.8 mm SL; India: Manipur, Ukhrul district, Iril River at Phungther. MUMF 4300/4 (4), paratypes, 67.2–83.2 mm SL; India: Manipur, Lokchao River at Moreh, Chandel District.

G. trilineatus: ZSI F10380/1, 78.3 mm SL; Myanmar: Tenasserim.

G. brevipinnis: Data from Ng & Lalramliana (2012a, 2013).

G. garhwali: Data from Ng (2005); Anganthoibi & Vishwanath (2013).

G. maceriatus: Data from Ng & Lalramliana (2012a).

G. gracilis: ZSI/NRS V-988 (1), 113.5 mm SL; ZSI/NRS V-989 (2), 101.6–106.9 mm SL; and
ZSI/NRS V-990 (4), 84.1–113.9 mm SL; India: Uttarakhand, Yamuna River below Dakpathar barrage, Dehradun district.

G. scrobiculus: Data from Ng & Lalramliana (2012b).

G. pectinopterus and *G. radiolus*: Data from Ng & Lalramliana (2013).

G. alaknandi: Data from Anganthoibi &Vishwanath (2013).

G. stolickae and *G. conirostris*: Data from Steindachner (1867).

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