

# New species of stinging catfish *Heteropneustes nani* (Siluriformes: Heteropneustidae) from Noakhali, Bangladesh

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## Abstract

The Meghna deltaic region in Noakhali, Bangladesh is endowed with favourable diverse freshwater ecosystems for varieties of fishes. Here a new species, *Heteropneustes nani* sp. nov. is described after detailed morphological examination and careful comparisons with other congeners. The new species *H. nani* differs from other congeners in having shortest standard length, greater head length than body depth, terminal mouth with equal jaws, separated pectoral spine from rays and bears antrorse serrae along entire inner and outer edges, and united anal and caudal fin.

## Key words

Stinging catfish, *Heteropneustes*, new species, Heteropneustidae, Bangladesh.

## Introduction

*Heteropneustes* spp., the stinging catfishes of family Heteropneustidae, are distributed in freshwater habitats of Bangladesh, India, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand and Vietnam (BERRA, 2007). The species can be distinguished by their elongated and compressed bodies, small mouth with fleshy lips, short dorsal fin, pectoral fin with serrated spine and ribbon-like longer anal fin. Four nominal species of *Heteropneustes* are described (FERRERIS, 2007) namely *Heteropneustes fossilis* BLOCH (1794) from Tamil Nadu of India, *H. microps* GÜNTHER (1864) from Dambuwa of Sri Lanka, *H. kemratensis* FOWLER (1937) from the Chao Praya River of Thailand, and *H. longipectoralis* DEVI & RAGHUNATHAN (1999) from Western Ghats of India. PETHIYAGODA & BAHIR (1998) suggested *H. microps* as synonymous to *H. fossilis*, because the occurrence of fused conjoined anal and

caudal fins, which is a distinct character of *H. microps*, may arise in wild populations (~2%) of *Heteropneustes* due to an injury. This observation proved to be redundant by ARUNACHALAM *et al.* (1999), who described the occurrence and morphology of *H. microps* from Western Ghats, India. However, *H. fossilis* (Synonyms: *Silurus fossilis* BLOCH, 1794; *Silurus singio* HAMILTON-BUCHANAN, 1822; *Saccobranthus singio* CUVIER & VALENCIENNES, 1831; *Saccobranthus fossilis* MÜLLER & HENLE, 1837; GÜNTHER, 1864; DAY, 1878) and *H. microps* (Synonyms: *Saccobranthus microps* GÜNTHER, 1864; DAY, 1878) are the two widely recognized species, the former is better known (BERRA, 2007; NELSON, 2006).

The stinging catfishes are often inhabited in ponds, ditches, canals, flooded rice fields, swamps, marshes, waterlogged areas and rivers of Bangladesh. The air-

breathing apparatus enables the fish to survive in low water depth, even in turbid and oxygen deficit conditions. The fishes are commercially important due to high market price and nutritional value, i.e. low fat content, and source of high amount of iron and calcium. However, to date, only *H. fossilis* is reported from Bangladesh (BHUIYAN, 1964; SHAFI & QUDDUS, 1982; RAHMAN, 1989; SIDDIQUI *et al.*, 2007; GALIB *et al.*, 2009; SAMAD *et al.*, 2010; HOSSAIN 2011) with an observation of high level of genetic variability within and between the populations (NASREN *et al.*, 2009). In this study, during a fish biodiversity survey in 2011–2012, we observed that one species of *Heteropneustes* occurred in the freshwater ecosystems of Noakhali clearly different from its congeners and herein describe it as a new species, *H. nani*.

## Materials and methods

During a fish biodiversity survey in 19 stations of greater Noakhali district (i.e. Feni, Laxmipur and Noakhali; Fig. 1) during January 2011 to December 2012, the authors observed a phenotypically different stinging catfish among catches of local fishers (Fig. 2). About 100 live adult specimens of this species were collected and brought to the Fisheries Laboratory of the Institute of Marine Sciences and Fisheries of the University of Chittagong for taxonomic identification. Moreover, data on fish habitats, abundance and socio-economics were collected through field visit and interview of fishers, traders and local residents. High resolution digital photographs were taken to analyze colour and morphological characteristics of the specimens. Previously published descriptions of species and morphometric data of different specimen of *Heteropneustes* spp. those deposited in different museum were used to make comparison with the newly described species. Measurements were made point to point for each sample with digital calipers and the data were recorded to 0.1 mm. Counts and measurements were made on the left side of the specimens. Subunits of head are presented as proportions of the head length (HL). HL and measurements of the body parts are given as proportions of standard length (SL). Measurements follow the keys of HUBBS & LAGLER (2004) and include: TL (total length); SL; HL; HW (head width); ED (eye diameter); SNL (snout length); BD (body depth); AFL (anal fin length); DFL (dorsal fin length); PFL (pectoral fin length); PSL (pectoral spine length); CFL (caudal fin length); BL1 (first barbel length); BL2 (second barbel length); BL3 (third barbel length) and BL4 (fourth barbel length). The examined specimens are preserved at the Museum of the Institute of Marine Sciences and Fisheries (MMSF), University of Chittagong, Bangladesh.

- ANSP** Academy of Natural Sciences of Drexel University, Philadelphia, USA  
**BMHN** The Natural History Museum, London (formerly the British Museum Natural History)  
**UMMZ** University of Michigan Museum of Zoology, USA  
**ZMB** Museum für Naturkunde, Germany;  
**ZSI/SRS** Zoological Survey of India, Southern Regional Station, Chennai.

## *Heteropneustes nani* sp. nov.

Figs. 1–5, Table 1–2

**Holotype.** MMSF 2013C1, 103.25 mm SL male, collected from the freshwater swamp of Begumgonj (22°55' N, 90°58' E), Noakhali, Bangladesh; collected by M. SHAHADAT HOSSAIN, December 07, 2012.

**Paratypes.** MMSF 2013C2, 109.33 mm SL, MMSF 2013C3, 89.77 mm SL, MMSF 2013C4, 95.72 mm SL, MMSF 2013C5, 99.07 mm SL, MMSF 2013C6, 84.61 mm SL, MMSF 2013C7, 103.24 mm SL, MMSF 2013C8, 109.32 mm SL, MMSF 2013C9, 89.76 mm SL, MMSF 2013C10, 95.71 mm SL, MMSF 2013C11, 99.06 mm SL collected from same locality as the holotype; collected by M. SHAHADAT HOSSAIN, December 08, 2012.

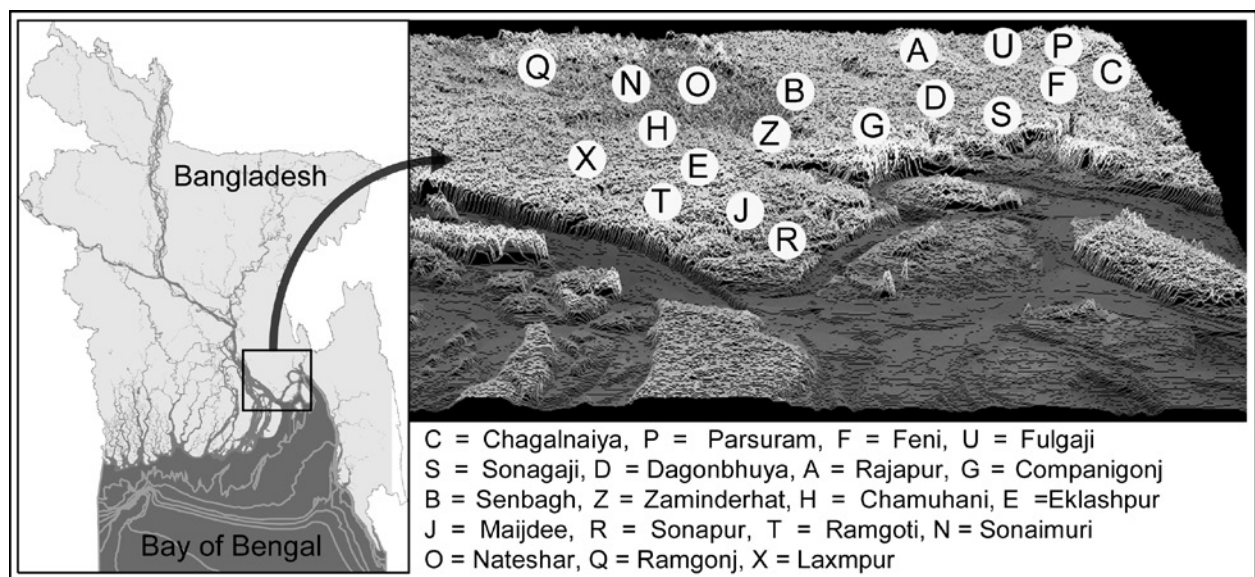
**Comparative material.** *Heteropneustes fossilis*: MMSF 2013D1-11 (11), 212.50–234.21 mm SL; Rasulpur, Begumgonj, Noakhali, Bangladesh by M. SHAHADAT HOSSAIN, December 08, 2012. ZMB 3074 (lectotype), 188.0 mm SL, Tranquebar, India, 18<sup>th</sup> century. ZMB 33115 (paralectotype), 181.5 mm SL, Tranquebar, India, 18<sup>th</sup> century. UMMZ 187862 (3), 133–184 mm SL; pond at Hajiganj, Chandpur, Bangladesh by Z ANWAR, 24 May 1968. UMMZ 208589, 173 mm SL; Chandpur downtown fish market; Meghna drainage, Comilla, Bangladesh by W Rainboth and G Kibria, 16 January 1978. UMMZ 208598 (4), 121–200 mm SL; Dakatia River oxbow at Bistakali, Meghna drainage, Comilla, Bangladesh by W. RAINBOTH & G. KIBRIA, 12 January 1978. UMMZ 208610 (2), 90–208 mm SL; Kunti Choumohani, PS Kaska, roadside ditch of Brahmanbaria, Bangladesh by W.J. RAINBOTH & A. RAHMAN, 18 February 1978. UMMZ 209799 (3), 79–81 mm SL; Town of Marawila, Sri Lanka by N. PERERA for C. GANS, 30 August 1979. UMMZ 233698 (3), 120–150 mm SL; Pak Hai flood fishery, Thailand, 10 January 1965. UMMZ 244766 (2), 154–168 mm SL; market at Barobisha, Sankosh of Brahmaputra drainage, West Bengal, India by H.H.Ng, 14 April 2004. *Heteropneustes microps*: BMNH 1859.5.31.9–11 (syntypes), 129.0 mm, 111.5 mm, 80.5 mm SL; Sri Lanka (the then Ceylon), 31 May 1859, purchased from Mr CUMING. *Heteropneustes kemratensis*: ANSP 67880 (holotype), 186.0 mm SL; from the Mekong at Kemarat in Eastern Thailand (the then Siam), by R.M. DE SCHAUENSEE and crew in 1939. *Heteropneustes longipectoralis*: ZSI/SRS F(Fish) 4935 (holotype), 150 mm SL; Thirumurthi Dam, Anamalai Hills, Western Ghats, Tamil Nadu, India, by M.B. RAGHUNATHAN, 11 February 1996. F 5044 (3 paratype), 146–154 mm SL; Thirumurthi Dam, Anamalai Hills, Western Ghats, Tamil Nadu, India, by M.B. RAGHUNATHAN, 11 February 1996.

**Diagnosis.** Major differences between *H. nani* and the other congeners, *H. fossilis*, *H. microps*, *H. kemratensis* and *H. longipectoralis* are shown in Tab. 1. Adult *H. nani* differs in having the smallest size with 98.08 mm SL (Vs.

**Tab. 1.** Differences among *H. nani*, *H. fossilis*, *H. microps*, *H. kemratensis* and *H. longipectoralis*.

| Features                 | <i>H. nani</i> †                                                                                       | <i>H. fossilis</i> †                                                                   | <i>H. microps</i> []                           | <i>H. kemratensis</i> *                                                                    | <i>H. longipectoralis</i> ◇                     |
|--------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------|
| Standard length (SL, mm) | 98.08                                                                                                  | 223.96                                                                                 | 152.40                                         | 210.00                                                                                     | 150.00                                          |
| Head length (% SL)       | 18.01 ± 1.01                                                                                           | 13.65 ± 0.64                                                                           | —                                              | —                                                                                          | 17.60                                           |
| Body depth (% SL)        | 17.59 ± 1.52.39                                                                                        | 14.46 ± 0.79                                                                           | 8.00                                           | 6.50                                                                                       | 7.60                                            |
| Head width (% HL)        | 82.45 ± 1.80                                                                                           | 99.45 ± 0.20                                                                           | 93.35                                          | 85.36                                                                                      | 81.96                                           |
| Eye diameter (% HL)      | 9.26 ± 0.98                                                                                            | 11.71 ± 0.47                                                                           | 6.10                                           | 6.50                                                                                       | 5.97                                            |
| Dorsal fin rays          | 6–7                                                                                                    | 6–7                                                                                    | I–II/5                                         | I/5                                                                                        | 7                                               |
| Pectoral fin rays        | I/6–7                                                                                                  | I/7                                                                                    | I/5–6                                          | I/8                                                                                        | I/8–9                                           |
| Pectoral spine           | Completely separated from rays and bears 9–10 antrorse serrae along inner edge and 13–15 in outer edge | Attached to rays by membrane with 3–4 antrorse serrae along inner edge at anterior tip | Separated from rays, serrated along inner edge | Separated from rays with 10–11 antrorse serrae along outer edge and 12–13 along inner edge | Very faintly serrated anteriorly and internally |
| Ventral fin rays         | 6–7                                                                                                    | 6                                                                                      | I/6                                            | I/5                                                                                        | 6                                               |
| Anal fin rays            | 66–69                                                                                                  | 60–79                                                                                  | 72–74 (A+C)                                    | 75–84                                                                                      | 66–73                                           |
| Caudal fin rays          | 10–12                                                                                                  | 19                                                                                     | —                                              | —                                                                                          | 18                                              |
| Anal-caudal fins         | United                                                                                                 | Separated by a distinct notch                                                          | Anal fin confluent with caudal without notch   | Separated                                                                                  | Anal fin not confluent with caudal fin          |

† Present study; [] ARUNACHALAM et al. 1999; \* FOWLER 1937; ◇ DEVI and RAGHUNATHAN 1999

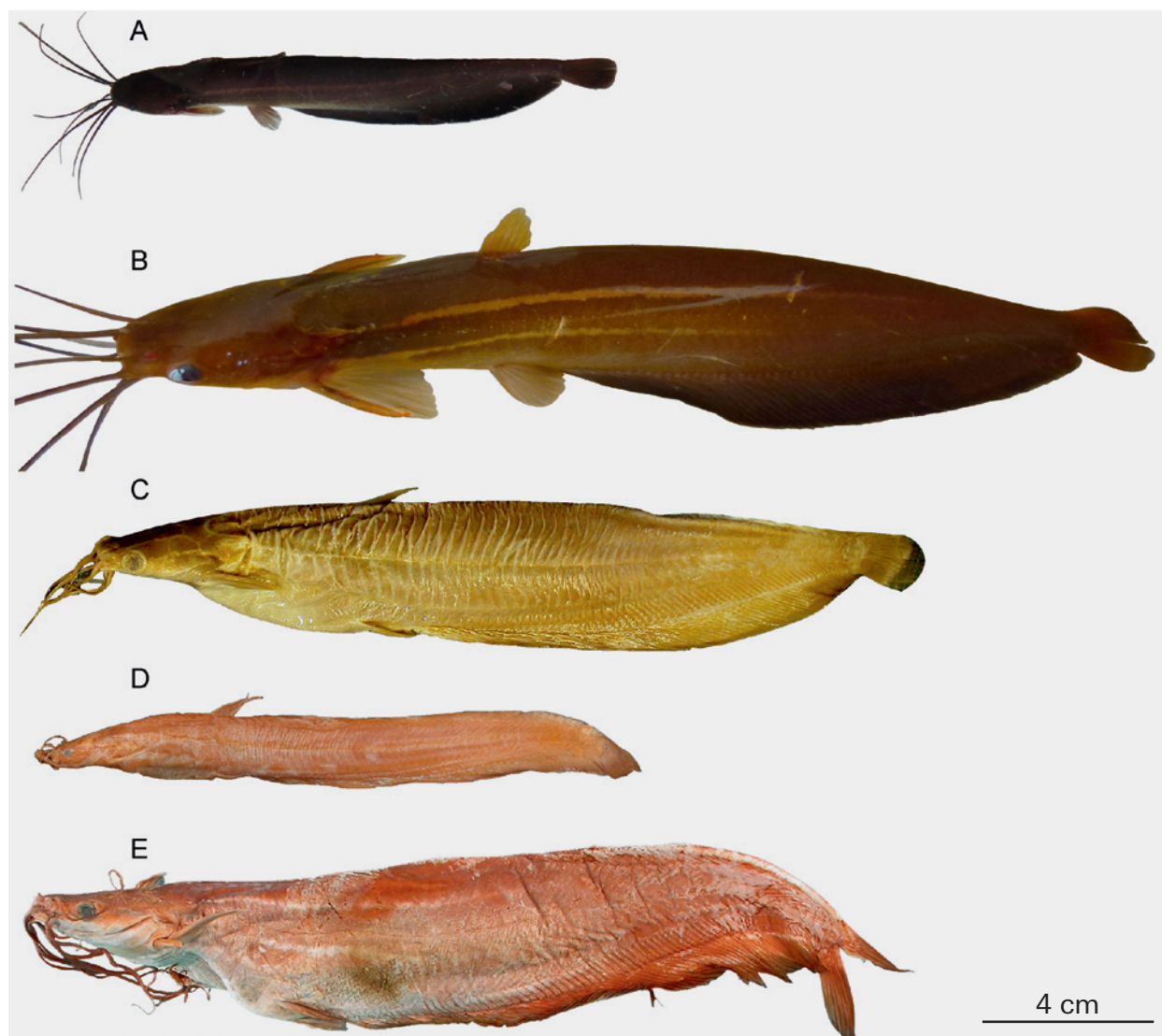
**Fig. 1.** Catfish specimen collection sites from the greater Noakhali region of Bangladesh.

223.96 mm SL in *H. fossilis*, 152.40 mm SL in *H. microps*, 210.00 mm SL in *H. kemratensis* and 150.00 mm in *H. longipectoralis*, in having a head length greater than the depth of body (vs. head length 91.66% of body depth having slopes toward the mouth in *H. fossilis*, head length equals body depth in *H. microps*, and this measurement is 88.70% in *H. kemratensis* and 74.73% in *H. longipectoralis*), and a small terminal mouth bearing nearly equal jaws and fleshy lips (vs. extended backward mouth in *H. fossilis*, terminal mouth with well developed lips in *H. microps*, lower barely extended mouth with equal jaws in *H. kemratensis*, and small terminal and transverse mouth in *H. longipectoralis*).

Moreover, *H. nani* differs in having body colour blackish with two indistinct lateral bands on flank, but the ventral surface lighter (vs. yellow or dark purplish-

brown above and ventral side lighter; *H. fossilis* bears two longitudinal yellowish stripes on each side: one is above the lateral line and another is below the lateral line). In case of *H. kemratensis*, the colour is light gray under the head and, the belly shows two narrow and pale gray longitudinal bands parallel to either side of the body, i.e. one above and one below the lateral line, fading out behind. On the contrary, *H. longipectoralis* characterize uniformly dark brown body without yellowish lateral bands. *H. nani* also differs from other *Heteropneustes* species by having pectoral spines which are completely separated from rays with 9–10 antrorse serrae along inner edge and 13–15 in outer edge (Vs. attached to rays by membrane with 3–4 antrorse serrae along inner edge at anterior tip in *H. fossilis*, separated from rays and serrated along inner edge in *H. microps*,





**Fig. 2.** *Heteropneustes* congeners (A) *H. nani* Holotype: MMSF 2013C1, (B) *H. fossilis*, MMSF 2013D1 (C) *H. fossilis*, ZMB 3074, (D) *H. microps*, BMNH 1859.5.31.9-11, (E) *H. kemratensis*, ANSP 67880.

separated from rays with 10–11 antrorse serrae along outer edge and 12–13 along inner edge in *H. kemratensis* and very faintly serrated anteriorly and internally in *H. longipectoralis*). Moreover *H. nani* can be easily distinguished by other congeners by having a united anal-caudal fin (vs. separated by a distinct notch in *H. fossilis*, anal fin confluent with caudal without notch in *H. microps*, separated in *H. kemratensis* and anal fin not confluent with caudal fin in *H. longipectoralis*). Regression lines of bivariate analysis (ANCOVA) against SL shown in Fig. 3 indicate that new species *H. nani* significantly differs from its widely distributed congener *H. fossilis* in terms of the pectoral spine length, pectoral fin length, head length, head width, snout length and body depth ( $P=0.013$ ,  $P=0.003$ ,  $P=0.023$ ,  $P=0.024$ ,  $P=0.021$  and  $P=0.025$  respectively).

**Description.** The morphometric data for adult *H. nani* is shown in Tab. 2. Body of *H. nani* is short and sub-cylindrical up to the pelvic fin base, compressed behind

(Fig. 2). Head is depressed, head length (16.64–19.74 % with a mean 18.01 % of SL) is less than body depth (14.42–21.79 % with a mean 17.59 % of SL) and snout length ranges between 23.12–27.83 % of HL with a mean 25.13% of HL. Small terminal mouth, length of jaws is almost equal to fleshy lips, teeth in villiform bands on jaws. Eye small, eye diameter ranges between 8.47–11.12 % of HL with a mean 9.26 % of HL and about one-third of snout length. Barbel 4 pairs, 1 pair from the corners of the mouth, 2 pairs from the chin and extend to about the end of the pectoral fins, the shorter 1 pair at the hinder nostrils. The first, second, third and fourth barbels length ranges between 20.59–27.77, 27.20–42.24, 30.21–39.23 and 22.42–34.48 % of SL respectively with a mean 23.41 %, 31.10 %, 32.98 % and 26.13 % of SL respectively. Dorsal fin ranges between 11.82–14.87 % of SL with a mean 12.89 % of SL and inserted above the ventral fin. First ray is simple and others are branched. Dorsal fin margin is convex and its tip exceeds anal fin base. Pectoral fin ranges

**Tab. 2.** Summary of qualitative diagnostic characters of *H. nani* and the congener *H. fossilis*.

| Features                      | <i>H. nani</i> (n = 11) |             |                  | <i>H. fossilis</i> (n = 11) |             |                  |
|-------------------------------|-------------------------|-------------|------------------|-----------------------------|-------------|------------------|
|                               | Length (mm)             | %SL         |                  | Length (mm)                 | %SL         |                  |
|                               |                         | Range       | Mean $\pm$ SD    |                             | Range       | Mean $\pm$ SD    |
| Head length                   | 17.64                   | 16.64–19.74 | 18.01 $\pm$ 1.01 | 30.56                       | 12.77–14.56 | 13.65 $\pm$ 0.65 |
| Body depth                    | 17.12                   | 14.42–21.79 | 17.59 $\pm$ 2.39 | 32.33                       | 13.10–15.50 | 14.46 $\pm$ 0.79 |
| Anal fin length               | 63.76                   | 58.83–69.90 | 65.09 $\pm$ 3.69 | 136.33                      | 59.47–63.11 | 60.89 $\pm$ 1.27 |
| Dorsal fin length             | 12.58                   | 11.82–14.87 | 12.89 $\pm$ 1.07 | 21.39                       | 9.09–10.12  | 9.54 $\pm$ 0.46  |
| Pectoral fin length           | 11.25                   | 10.43–12.58 | 11.53 $\pm$ 0.83 | 22.96                       | 10.07–10.55 | 10.25 $\pm$ 0.16 |
| Pectoral spine length         | 8.39                    | 7.35–9.27   | 8.55 $\pm$ 0.67  | 18.77                       | 7.78–9.03   | 8.37 $\pm$ 0.48  |
| Caudal fin length             | 18.73                   | 17.51–22.60 | 19.19 $\pm$ 1.87 | 21.97                       | 8.33–10.72  | 9.82 $\pm$ 0.98  |
| Ventral fin length            | 7.21                    | 5.86–8.95   | 7.43 $\pm$ 1.20  | 17.76                       | 7.69–8.40   | 7.93 $\pm$ 0.24  |
| 1 <sup>st</sup> barbel length | 22.80                   | 20.59–27.77 | 23.41 $\pm$ 2.79 | 38.91                       | 8.71–21.96  | 17.32 $\pm$ 4.77 |
| 2 <sup>nd</sup> barbel length | 30.26                   | 27.20–42.24 | 31.10 $\pm$ 4.97 | 63.57                       | 22.25–31.98 | 28.44 $\pm$ 3.33 |
| 3 <sup>rd</sup> barbel length | 32.19                   | 30.21–39.23 | 32.98 $\pm$ 3.04 | 52.97                       | 19.30–27.71 | 23.68 $\pm$ 2.73 |
| 4 <sup>th</sup> barbel length | 25.41                   | 22.42–34.48 | 26.13 $\pm$ 3.73 | 46.01                       | 18.32–22.69 | 20.57 $\pm$ 1.89 |
|                               | Length (mm)             | %HL         |                  | Length (mm)                 | %HL         |                  |
| Snout length                  | 4.42                    | 23.12–27.83 | 25.13 $\pm$ 1.53 | 9.87                        | 29.04–36.47 | 32.39 $\pm$ 2.84 |
| Head width                    | 14.52                   | 79.80–84.80 | 82.45 $\pm$ 1.80 | 30.39                       | 98.94–99.95 | 99.45 $\pm$ 0.20 |
| Eye diameter                  | 1.63                    | 8.47–11.12  | 9.26 $\pm$ 0.98  | 3.57                        | 10.82–12.25 | 11.71 $\pm$ 0.47 |

between 10.43–12.58 % of SL with a mean 11.53 % of SL with a strong curved spine pointed at the tip that is separated from the interconnected rays with 9–10 antrorse serrae along inner edge and 13–15 in outer edge (Fig. 4). Pectoral spine is curved and length ranges between 7.35–9.27 % of SL with a mean 8.55 % of SL. Pectoral fin margin is oblique, outer rays longer than inner. Ribbon-like anal fin ranges between 58.83–69.90 % of SL with a mean 65.09 % of SL and extends up to the caudal fin. Caudal fin is rounded and ranges between 17.51–22.60 % of SL with a mean 19.19 % of SL. Anal and caudal fins are united. Ventral fin ranges between 5.86–8.95 % of SL with a mean 7.43 % of SL with 6–7 branched rays and reaches near to the origin of the anal fin. Ventral fin margin is convex. Vent is present in between ventral and anal fin base. The faint lateral line passes straight along the middle of the side.

**Measurements (mm).** Holotype (male), MMSF 2013A1: TL 122.50; SL 103.25; HL 19.86; HW 15.85; ED 1.76; SNL 4.60; BD 17.25; AFL 68.21; DFL 12.21; PFL 11.40; PSL 9.18; CFL 19.25; BL1 22.04; BL2 28.09; BL3 32.16 and BL4 24.11. Paratype (male): TL 116.24; SL 97.56; HL 17.41; HW 14.39; ED 1.61; SNL 4.40; BD 17.11; AFL 63.31; DFL 12.62; PFL 11.23; PSL 8.31; CFL 18.68; BL1 22.87; BL2 30.48; BL3 32.19 and BL4 25.54.

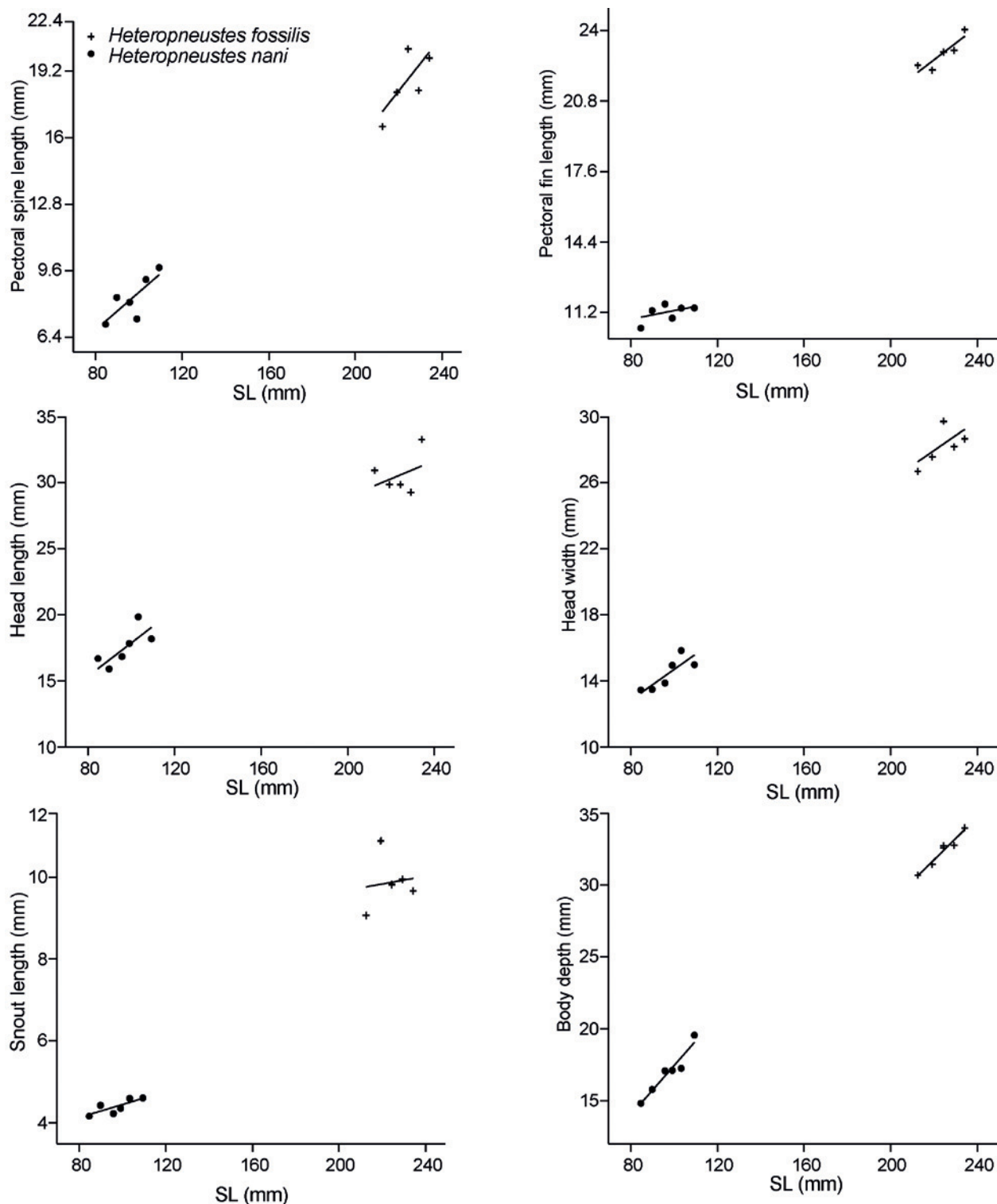
**Colouration.** Body is blackish dorsally and lighter coloured ventrally in live. One indistinct lateral band on flank. Dorsal and pectoral fin light orange, ventral fin with gray edging. Numerous fine grey spots on the abdomen.

**Etymology.** We take great pleasure in naming the new species as a patronym for the eminent fisheries and

aquaculture scientist Professor Dr Nani Gopal Das, in recognition of his continuous contribution to our research.

**Distribution.** *H. nani* was collected from the freshwater ecosystem of Noakhali (Fig. 5) and is widely distributed in ponds, ditches, canals, flooded rice fields, swamps, marshes, waterlogged areas and rivers.

**Biology and ecology.** The air-breathing apparatus enables the fish to survive in low water depth, even in turbid and oxygen deficit conditions. During the winter season they can live in semi-liquid mud and even when the mud dries up they take their bodies to the bottom of fissures and crevices formed by the cracking mud. During the study period, the physicochemical parameters were recorded as: water temperature 18–28 °C, pH 6.5–7.5, dissolved oxygen 4.5–5.0 mg/l, and water transparency 45–60 cm for a water body of 1.0–1.8 m deep. The stinging catfish can be transported to distant markets and remain alive for several days in a little water. The consumer desired the fish due to its good table quality and nutritional value. In particular, the flesh of the fish is rich in iron and low fat, and a valuable source of protein for growing children, pregnant women and recovering patients. *H. nani* is represented by 10–15% of the total *Heteropneustis* catch in the study area. Higher catches recorded from hook, trap and fixed net during November–February (dry winter) and lower catch in April–August (wet monsoon). Incidentally, this type of fish is able to deliver a stinging protein (known as poison) emanated from the venom glands around the pectoral spine (SATORA *et al.*, 2005). In humans, catfish venoms, which are reported to be neurotoxic and hemo-



**Fig. 3.** Bivariate analysis of pectoral spine length, pectoral fin length, head length, head width, snout length and body depth against SL for *H. nani* and *H. fossilis*.

lytic (i.e. destruction of red blood cells), can produce local numbness, inflammation and severe painful physical conditions of the limb under attack (WRIGHT, 2009). Warm water bath, application of luke warm turmeric paste, ejection of blood, and traditional herbal medicine are commonly used for healing. Local fishers remain extremely cautious to avoid its sting.

## Discussion

BLOCH (1794); DAY (1878) and SHAFI & QUDDUS (1982) described *H. fossilis* by having 223.96 mm SL, head length 91.66 % of body depth, extended backward





**Fig. 4.** Pectoral spine pointed at the tip and distinctively separated from the rays with antrorse serrae along entire outer and inner edges of *Heteropneustes nani*.



**Fig. 5.** Habitat of *H. nani* at Noakhali, Bangladesh.

mouth, attached pectoral spine to rays by membrane with 3–4 antrorse serrae along inner edge at anterior tip and separated anal-caudal fin by a distinct notch. GÜNTHER (1864) and ARUNACHALAM *et al.* (1999) described *H. microps* by having 152.40 mm SL, head length equals body depth, terminal mouth with well developed lips, separated pectoral spines from rays, serrated along inner edge and anal fin confluent with caudal without notch. DEVI & RAGHUNATHAN (1999) described *H. longipectoralis* by measuring 150.00 mm SL, head length 74.73% of the body depth, lower barely extended mouth with

equal jaws, very faintly serrated anteriorly and internally pectoral spine and anal fin not confluent with caudal fin. FOWLER (1937) described *H. kemratensis* by having 210.00 mm SL, head length 88.70 % of the body depth, transverse mouth, separated pectoral spines from rays with 10–11 antrorse serrae along outer edge and 12–13 along inner edge with separated anal-caudal fin.

Thus new species *H. nani* differs from other congeners in having shortest standard length, greater head length than body depth, terminal mouth with equal jaws and fleshy lips, distinctively separated pectoral spine from

rays and bears antrorse serrae along entire inner and outer edges, and united anal and caudal fin. Significantly different regression lines of bivariate analysis (ANCOVA) for the pectoral spine length, pectoral fin length, head length, head width, snout length and body depth against SL of *H. nani* and *H. fossilis* (Fig. 3) also indicate that newly described species is different from its widely distributed geographical congeners. Moreover, *H. nani* is also readily distinguishable from its congeners by the fin formula of D 6–7, P I/6–7, V 6–7, A 66–69, C 10–12. In case of *H. fossilis*, it is D 6–7, P I/7, V 6, A 60–79, C 19 (DAY 1878); D I–II/5, P I/5–6, V I/6, A+C 72–74 for *H. microps* (ARUNACHALAM *et al.*, 1999); D I/5, P I/8, V I/5, A 75–84 for *H. kemratensis* (FOWLER, 1937) and D 7, P I/8–9, V 6, A 66–73, C 18 for *H. longipectoralis* (DEVI & RAGHUNATHAN, 1999).

In summary, the biodiversity of aquatic ecosystems of Noakhali, Bangladesh have been very poorly investigated and several areas remain untouched, indicating that our understanding of the fish fauna of these areas is far from being complete. Therefore, a unified and comprehensive effort is needed to identify the species diversity therein as well as disseminate the results in the form of fully illustrated taxonomic key and identification guide for ease classification of freshwater fishes.

## Key to species of *Heteropneustes*

Body yellow or dark purplish-brown in above and lighter in ventral side, extended backward mouth, pectoral spine attached to rays by membrane with 3–4 antrorse serrae along inner edge at anterior tip, and separated anal-caudal fin by a distinct notch [Tamil Nadu, India]

..... *H. fossilis*

Body depth equals to head length, terminal mouth with well developed lips, pectoral spine separated from rays and serrated along inner edge, and anal fin confluent with caudal without notch [Dambuwu, Sri Lanka]

..... *H. microps*

Body dark brown without yellowish lateral, terminal and transverse mouth, pectoral spine faintly serrated anteriorly and internally, and anal fin not confluent with caudal fin [Western Ghats, India] .....

*H. longipectoralis*

Body light gray under the head and, the belly shows two narrow and pale gray longitudinal bands parallel to either side of the body, lower barely extended mouth with equal jaws, pectoral spine separated from rays with 10–11 antrorse serrae along outer edge and 12–13 along inner edge, separated anal-caudal fin. [Chao Praya River, Thailand] .....

*H. kemratensis*

Smallest body size than other congeners, two indistinct lateral bands on flank, numerous fine grey spots on the

abdomen, head length greater than body depth, small terminal mouth bearing nearly equal jaws and fleshy lips, pectoral spines completely separated from rays with 9–10 antrorse serrae along inner edge and 13–15 in outer edge, united anal-caudal fin. [Noakhali, Bangladesh]

..... *H. nani*

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