

Revision of Catfishes of the Genus *Eutropiichthys*, with the Description of Two New Species (Siluriformes: Schilbiidae)

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Schilbid catfishes of the genus *Eutropiichthys* are reviewed. *Eutropiichthys murius* occurs in Bangladesh, northern India, and southern Nepal. *Eutropiichthys vacha*, considered by previous authors to be distributed from Pakistan across India, Nepal, Bangladesh, and Myanmar to Thailand, was found to include four species, with *E. vacha* limited to the rivers of eastern Pakistan, northern India, Nepal, Bhutan, and Bangladesh. *Eutropiichthys burmannicus*, originally proposed as a variety of *E. vacha* but not subsequently recognized as valid, was found to be a distinct species inhabiting drainages from the Irrawaddy River of Myanmar to the lower Salween River of Myanmar and Thailand. Two additional species of *Eutropiichthys* are named in this paper: *Eutropiichthys britzi* is described from the Irrawaddy and Sittang Rivers of Myanmar; and *E. salweenensis* is described from the portion of the Salween River in Thailand. A lectotype is designated for *Eutropiichthys burmannicus*. *Hypophthalmus goongwaree*, which has been considered to be a member of *Eutropiichthys*, was found to lack the characteristics of that genus. Similarly, *Pseudeutropius murius batarensis* was found not to pertain to *Eutropiichthys*. A key to the species of *Eutropiichthys* is provided.

CATFISHES of the genus *Eutropiichthys* are moderate-sized fishes of the family Schilbiidae distributed from the Indus River basin of Pakistan across northern India, southern Nepal and Bhutan, through Bangladesh and Myanmar to the far western portions of Thailand. The earliest described species of *Eutropiichthys* (*E. murius* and *E. vacha*) were proposed by Hamilton (1822) from localities in India, with Day (1877) subsequently describing a new “variety” (*E. burmannicus*) from Burma (=Myanmar). Considerable confusion exists concerning the recognizable species in the genus. Although most subsequent authors recognized *E. murius* as a distinct species, albeit placed in various genera, *E. burmannicus* was considered to be a synonym of *E. vacha*, which was, in turn, thought to have a distribution that encompassed the entire east-west range of *Eutropiichthys*. The species-level uncertainty in the genus was derived, in part, from the relatively limited samples of what were considered to be *Eutropiichthys vacha* that were available in museums until recent years, with this particularly the case for samples from Myanmar and Thailand.

Recent collecting efforts have produced good series of *Eutropiichthys* from the eastern portions of its range. Analysis of this material and older samples revealed that *E. vacha* of recent authors actually included four species, *E. vacha*, *E. burmannicus*, and two undescribed species, to which we give the names *E. britzi* and *E. salweenensis* herein. *Hypophthalmus goongwaree*, a species described from peninsular India, and *Pseudeutropius murius batarensis*, from Nepal, have

been placed in *Eutropiichthys* by some authors (Talwar and Jhingran, 1991; Jayaram, 2006), but both were found by us to lack characteristics of that genus.

MATERIALS AND METHODS

Unpaired fin-ray counts were taken primarily from radiographs. Such data were supplemented by counts from non-radiographed specimens in some instances. The two posteriormost dorsal- and anal-fin rays articulating on the last pterygiophore of each fin were counted as separate rays. Caudal-fin ray counts included all principal-fin rays (i.e., branched rays and the first unbranched ray of the dorsal and ventral lobes). Paired fin rays were counted under a stereomicroscope and included all elements. Vertebral counts were obtained from radiographs and are presented in terms of total vertebrae, with the terminal centrum counted as a single element and the Weberian complex counted as five centra. Numbers in parentheses following a particular meristic count are the number of individuals with that count. Meristic values followed by an asterisk are those of the holotype.

Measurements were taken point-to-point with the limits of most distances self-evident from the descriptors. The following measurements are delimited as follows: head length was measured as a straight line distance from the tip of the snout to the posteriormost point of the fleshy operculum; dorsal-fin spine length was measured from the tip of the bony spine to the junction point between the first spine (spinelet) and the

second spine; and anal-fin base length was measured from the anal-fin origin to the insertion of the last anal-fin ray. It is impossible to accurately determine the anterior and posterior limits of the eye in many specimens of *Eutropiichthys* as a consequence of the connective tissue overlying the anterior and posterior portions of the eye. Delimiting those landmarks was particularly problematic for larger specimens or individuals of all sizes that have long been in preservative. As a consequence we do not provide proportions for subunits of the head that are dependent on determining the anterior and posterior limits of the eye. Institutional abbreviations follow Leviton et al. (1985) and are listed at <http://www.asih.org/codons.pdf>. Standard length is abbreviated as SL.

Eutropiichthys Bleeker, 1862

Eutropiichthys Bleeker, 1862:398. Type species: *Pimelodus vacha* Hamilton, 1822. Type by original designation. Gender: Masculine.

Diagnosis.—*Eutropiichthys* is distinguished from other genera of the Schilbidae by the presence of an elongate mouth that extends posteriorly at least to the vertical through the anterior margin of the orbit, an elongate accessory premaxillary tooth patch, the palatal teeth arranged in a broadly parabolic patch that is continuous across the midline and consists of a central more-or-less transverse vomerine tooth plate and the elongate lateral accessory tooth plates that extend posteriorly past the limit of the accessory premaxillary tooth plates.

Remarks.—Hora (1937a) suggested that the form of the swimbladder in *Eutropiichthys* was diagnostic for the genus. The unusual form of the swimbladder in the species of *Eutropiichthys* (Hora, 1937a:fig. 3) differs from the form of that organ present in some other Asian members of the Schilbidae (*Clupisoma garua* [Nair, 1938:fig. 4] and *Pseudeutropius* [Hora, 1941:fig. 2]). The form of the swimbladder in the species of *Eutropiichthys*, however, is similar to the form of the organ in the schilbid *Ailia coila* (Nair, 1938:fig. 3; Hora, 1941:fig. 5) and as such does not serve to delimit *Eutropiichthys*, albeit perhaps being indicative of a close phylogenetic relationship of those two nominal genera—a question that requires further study.

Although a phylogenetic analysis of the species of *Eutropiichthys* is beyond the scope of this study and indeed it has not yet been established whether the genus is a monophyletic group, it is noteworthy that several characters are corre-

lated in some assemblages within the genus. Three species in *Eutropiichthys* (*E. britzi*, *E. murius*, and *E. salweenensis*) share a somewhat to distinctly rounded margin of the snout in lateral view that contrasts with the pointed snout of their congeners (*E. burmannicus* and *E. vacha*). These groupings also differ in the shape of the snout margin from dorsal view and in the relative size of the dentition (snout trilobed at all sizes and teeth small in *E. britzi*, *E. murius*, and *E. salweenensis* versus snout acutely pointed in adults and teeth large in *E. burmannicus* and *E. vacha*).

Eutropiichthys britzi, new species

Figures 1B, 2, 3; Table 1

Holotype.—USNM 344657, 164 mm SL, Myanmar, Kachin State, Irrawaddy River at Myitkyina, obtained at Myitkyina Market, approximately 25°26'N, 97°26'E, 21–22 April 1996, C. J. Ferraris, Jr.

Paratypes.—9 specimens, 91–185 mm SL. All collected in Myanmar: USNM 387544, 2, 120–125 mm SL, Sagaing District, Chindwin River at Sarpho Kyi, 22°32.35'N, 94°47.29'E, 26 March 2003, R. Britz and local fishermen. NRM 31202, 1, 185 mm SL, Kachin State, Irrawaddy River, Myitkyina, 10 March 1934, R. Malaise. NRM 40694, 1, 167 mm SL, Kachin State, Myitkyina Market, 24 March–3 April 1998, S. O. Kullander and R. Britz. SU 39867, 2, 183–185 mm SL, Rangoon Division, Irrawaddy Delta, market at Rangoon, A. Herre. BMNH 1891.11.30.167–169, 3, 91–145 mm SL, Myanmar, Sittang River and adjacent streams from Toungoo to about 150 mi further south, E. W. Oates.

Non-type material.—All collected in Myanmar: CAS 206920, 2, 47–48 mm SL, Mandalay Division, Irrawaddy River basin, Nyaung-U fish market near Bagan, approx. 21°19'N, 95°29'E. USNM 44741, 1, 139 mm SL, Mandalay Division, no specific locality. NRM 31197, 2, 138–140 mm SL, Sagaing Division, Irrawaddy River drainage, Shweli River, probably where emptying into Irrawaddy River at Inywa, approx. 24°N, 96°E. FMNH 40919, 1, 208 mm SL, Myanmar, Sagaing Division, Chindwin River, Monywa, 22°06.7'N, 95°08'E. SU 39868, 7, 186–229 mm SL, Sagaing Division, Irrawaddy River basin, market at Monywa, on Chindwin River.

Diagnosis.—*Eutropiichthys britzi* can be distinguished from its congeners by the combination of the number of rakers on the first gill arch (15 to 19 in *E. britzi* versus 22 to 28 in *E. burmannicus*), the number of branched pectoral-fin rays (15 to 17, modally 16, in *E. britzi* versus 14 to 15, modally

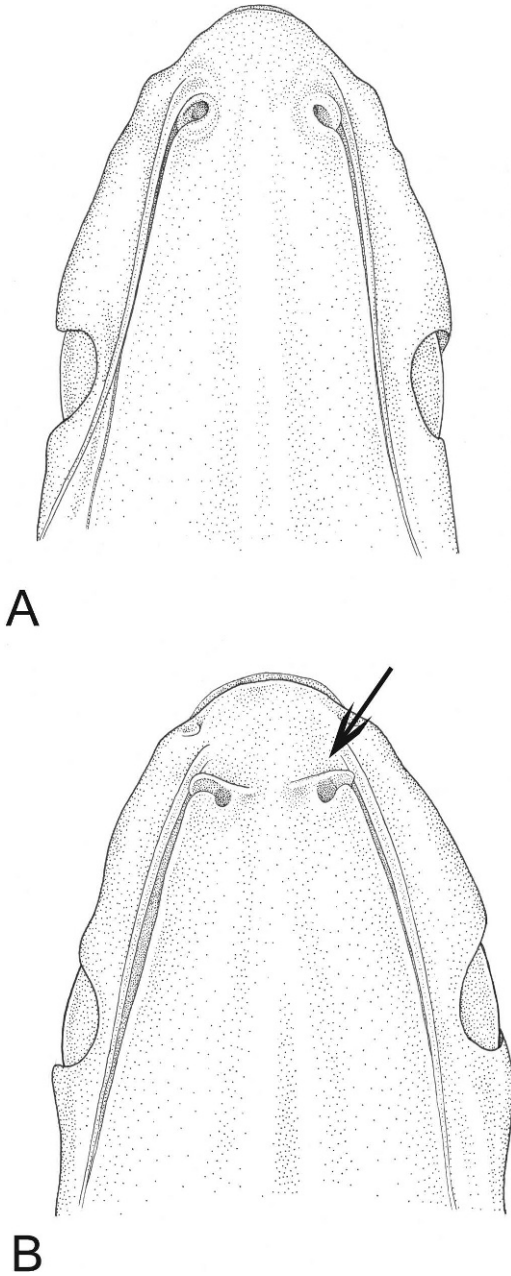


Fig. 1. Dorsal view of head of *Eutropiichthys burmannicus*, USNM 387555, 131 mm SL (A) and *E. britzi*, NRM 31197, 140 mm SL (B), showing different forms of narial flap. Arrow indicates highly developed narial flap in *E. britzi*.

14, in *E. vacha*, and 11 or 12 in *E. murius*), the extent of the accessory premaxillary tooth patch (extending posteriorly nearly to the terminus of the gape in *E. britzi* versus falling distinctly short of the terminus of the gape in *E. murius*), the number of branched anal-fin rays (46 to 54 in *E.*

britzi versus 32 to 37 in *E. murius*), the posterior limit of the gape (located under orbit in *E. britzi* versus extending only to the vertical through the anterior margin of the eye in *E. murius*), the extent of the fleshy flap along the anterior margin of the posterior naris (extending medial of the medial margin of the naris by a distance equal to, or greater than, the transverse dimension of the posterior naris in *E. britzi* [Fig. 1B] versus barely extending medial of the medial margin of the naris for a distance distinctly less than the transverse length of the posterior naris in *E. burmannicus* [Fig. 1A], *E. salweenensis*, and *E. vacha*), the length of the pectoral-fin spine (16.8–18.0% SL in *E. britzi* versus 18.7–21.3% SL in *E. salweenensis*), the form of the lateral margin of the pectoral spine (roughened in *E. britzi* versus smooth in *E. murius* and *E. salweenensis*), and the shape of the snout in lateral view (somewhat rounded in *E. britzi* versus distinctly pointed in *E. vacha* and *E. burmannicus*) and dorsal view (slightly trilobed in *E. britzi* versus angular in *E. vacha* and *E. burmannicus*).

Description.—Morphometrics of *Eutropiichthys britzi* in Table 1. Body elongate, compressed. Body depth greatest at dorsal-fin origin. Dorsal profile of body nearly straight from rear of head to dorsal-fin origin and gently convex between posterior terminus of dorsal-fin base and caudal-fin origin. Ventral profile of body convex to anal-fin origin, then straight along base of anal fin. Vent located slightly anterior of anal-fin origin. Lateral line complete, midlateral, and extends onto basal fleshy portion of dorsal lobe of caudal fin, with short secondary branches extending obliquely above and below entire length of main portion of system. Total vertebrae 52(1), 53(10)*, or 54(3).

Head compressed along entire length, with lateral margins of head posterior of orbit running nearly in parallel. Head pointed overall anteriorly from lateral view, albeit with snout rounded. Opercular opening broad, extending from horizontal through anterior limit of lateral line anteriorly to vertical through middle of pupil. Opercular membrane not connected to isthmus. Posteroventral margin of operculum with posteriorly directed, fleshy lobe; posterior portion of lobe rounded.

Anteriormost portion of snout somewhat rounded in lateral view. Snout margin slightly trilobed from dorsal view, but with lobes poorly defined (Fig. 1B). Anterior naris round, anteriorly directed, and located on anterior margin of snout (Fig. 1B). Posterior naris transversely elongate or sometimes rounded; when elongate having straight anterior and convex posterior

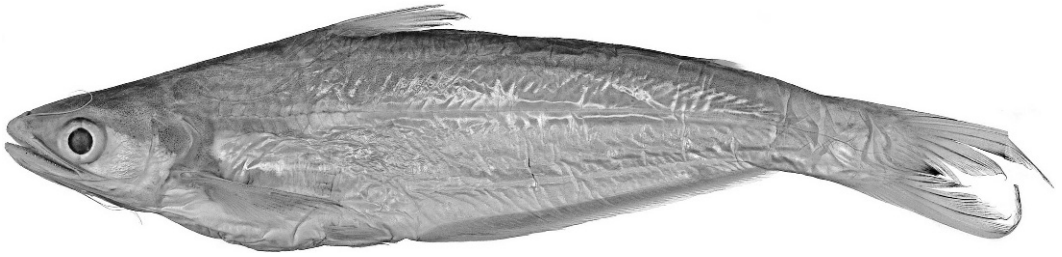


Fig. 2. *Eutropichthys britzi*, holotype, USNM 344657, 164 mm SL, Myanmar, Kachin State, Irrawaddy River at Myitkyina.

margins. Posterior naris located slightly postero-dorsal and medial to anterior naris. Width of posterior naris somewhat less than one-half of internarial distance. Anterior margin of naris with transversely aligned flap of skin that extends medially beyond medial margin of naris by distance equal to or slightly greater than narial opening (Fig. 1B).

Eye lateral, visible from both dorsal and ventral views; eye positioned slightly below horizontal through middle of vertical extent of head; middle of pupil situated distinctly below horizontal through anterior naris. Anterior and posterior portions of eye covered laterally by connective tissue (adipose eyelid), but with ovoid, vertically elongate opening positioned lateral to pupil.

Mouth terminal, with opening large and posteroventrally angled. Posterior terminus of gape located at vertical through middle of pupil. Lower jaw in smaller individuals slightly shorter than upper jaw; jaws of equal length in larger

specimens. Premaxillary tooth plate crescentic. Teeth on tooth plate slender, conical, and depressible, with approximately seven irregular rows at symphysis, reduced to three or four irregular rows laterally. Teeth on posteromedial portion of tooth plate larger than remaining teeth on that plate. Outermost teeth of upper jaw exposed laterally when mouth closed. Accessory premaxillary tooth plate extends from postero-lateral margin of premaxillary tooth plate nearly to posterior angle of gape. Teeth on accessory plate arranged in four or five irregular rows, with teeth largest medially and progressively decreasing in size laterally. Lateral teeth on accessory patch comparable in size to smallest teeth on premaxilla. Palatal tooth patch in form of parabolic arch extending posteriorly from midline to level of posterior terminus of accessory tooth patch. Anterior and lateral margins of palatal tooth patch closely applied to, and barely distinct from, both posterior margin of premaxillary tooth patch and medial margins of accessory tooth patch in larger specimens, but with separation of palatal patch from premaxillary and accessory tooth patches more obvious in smaller individuals. Teeth of palatal tooth patch slender and conical with teeth of median portion of patch largest and remaining teeth becoming progressively smaller posterolaterally. Largest teeth on palate comparable in size to largest teeth on premaxilla. Dentary tooth plate parabolic with slender, conical teeth covering dorsal surface and extending onto lateral surface of dentary. Teeth on lateral surface of dentary visible in closed mouth. Teeth along medial portion of anterior one-half of dentary largest with remaining teeth becoming progressively smaller. Largest teeth on dentary approximately equal to largest teeth on premaxilla. Dentary with seven or eight irregular rows of teeth along entire length of tooth patch.

Gill rakers on outer face of first arch 15(1), 16(6), 17(4), 18(7)*, or 19(1). Rakers on upper limb 4(11) or 5(8)* and on lower limb 11(1), 12(9), 13(5)*, or 14(4).

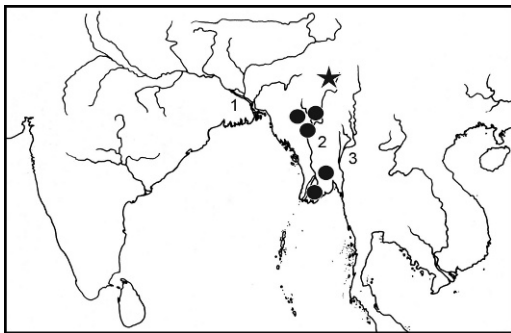


Fig. 3. Distribution of *Eutropichthys britzi* examined in this study. Star indicates type locality and dots indicate locations of other examined specimens. Symbols may represent more than one sampling locality or lot of specimens. Major river basins that are within the distribution of the genus are identified by number as follows: 1) Ganges-Brahmaputra River system; 2) Irrawaddy River; 3) Salween River.

TABLE 1. MORPHOMETRIC DATA FOR SPECIES OF *Eutropiichthys*. Standard length expressed in mm; all remaining values are presented as percent of standard length.

	<i>E. britzi</i> (holotype)	<i>E. britzi</i> (n = 10)	<i>E. burmannicus</i> (n = 10)	<i>E. murius</i> (n = 10)	<i>E. salweenensis</i> (holotype)	<i>E. salweenensis</i> (n = 6)	<i>E. vacha</i> (n = 10)
Standard length (mm)	163	92–183	107–133	78–120	124	83–132	90–215
Body depth at anal-fin origin	25.2	23.3–27.1	23.4–26.3	19.4–24.6	22.8	22.7–25.3	19.7–24.5
Body width at pectoral-fin insertion	12.4	11.1–13.8	11.0–12.8	12.5–15.5	12.0	11.9–13.1	11.4–12.7
Caudal-peduncle depth	9.8	9.2–11.0	8.1–10.0	8.5–11.6	9.4	9.2–10.2	8.8–10.4
Snout to dorsal-fin origin	38.3	36.3–38.7	34.3–39.2	31.5–34.2	35.9	33.9–35.9	35.9–39.1
Snout to anal-fin origin	49.7	47.8–51.4	46.4–51.3	51.4–56.2	48.4	47.0–49.2	46.6–51.8
Length of anal-fin base	42.0	38.3–45.2	40.0–43.9	33.3–38.2	42.2	42.2–44.6	37.1–40.5
Snout to pelvic-fin insertion	38.3	36.9–40.2	35.4–38.8	37.7–42.7	37.7	37.1–38.8	38.4–41.1
Length of first dorsal-fin ray	14.2	13.7–15.2	12.8–14.4	15.7–18.0	15.5	15.5–17.4	12.8–16.1
Length of first pelvic-fin ray	7.4	6.8–9.7	7.3–9.0	8.3–9.2	9.3	9.3–9.9	6.8–9.2
Length of pectoral-fin spine	17.2	16.8–18.0	15.9–18.3	17.1–21.3	19.7	18.7–21.3	16.1–18.8
Length of first pectoral-fin ray	17.7	17.7–19.0	16.4–18.5	16.2–19.1	19.6	19.1–20.6	16.6–18.4
Length of dorsal principal caudal-fin ray	25.8	25.7–27.5	24.4–26.2	23.1–26.9	29.0	27.7–29.5	22.1–25.6
Head length	22.7	21.5–23.5	20.8–24.3	21.0–23.5	22.9	22.8–23.9	23.1–25.8
Interorbital width	6.7	5.4–7.7	5.6–7.0	5.9–8.4	5.7	5.7–7.9	5.8–7.9

Barbels in four pairs. All barbels rest in shallow groove in skin, at least basally. Nasal barbel thread-like and extending posteriorly from lateral margin of posterior naris to beyond vertical through posterior limit of opercle in smaller specimens, but only to vertical through vertical limb of preopercle in larger individuals. Maxillary barbel extends from posterior of anterior naris to middle of pectoral fin in smaller specimens, but only to base of pectoral spine in larger specimens. Mental barbels in two pairs; barbel bases originate in transverse row at level of posterior naris. Inner and outer mental barbels extend in smaller specimens to beyond pectoral-fin base, but become shorter ontogenetically and in larger individuals reach only to posterior limit of posteroventral lobe of operculum.

Dorsal-fin origin located at anterior one-third of SL. Dorsal-fin base short, about equal to length of snout. Dorsal fin similar in size to pectoral fin; segmented rays preceded by spinelet and sharply pointed, slender spine. Spine in smaller specimens nearly smooth along both anterior and posterior margins. Larger specimens with very fine serrations located along basal one-half of anterior margin of spine and with fine retrorse serrations along most, or all, of distal portion of posterior margin. Fin margin straight with rays becoming progressively shorter posteriorly; length of last ray about one-half that of first ray. Dorsal-fin rays II,6(1) or II,7(16)*. Adipose fin small, located above posterior one-third of anal-fin base.

Caudal fin deeply forked, lobes pointed and symmetrical. Outer principal rays about 2.5 times

length of middle rays in smaller specimens, about three times in larger individuals. Principal caudal-fin rays i,7,8,i(16)*.

Anal-fin origin located just anterior to vertical through middle of SL. Anal-fin base long. Anal-fin margin slightly concave anteriorly, nearly straight posteriorly; posterior ray shortest. Last ray without membranous connection to caudal peduncle. Anal-fin rays iv,46(2), iii,47(1), v,47(1), v,48(6), iii,49(1), v,49(1), iv,50(2)*, v,50(2), iii,51(1), v,52(1), or v,54(1).

Pelvic fin small, its length only slightly more than one-half that of pectoral fin. Pelvic-fin insertion located slightly anterior, to slightly posterior, of vertical through dorsal-fin origin. Adpressed fin extending ventral of anus, with tip of fin reaching approximately to urogenital pore. Pelvic-fin rays i,5(19)*.

Pectoral fin triangular, first branched ray longest. Tip of adpressed fin in smaller specimens extends posteriorly to vertical through terminus of dorsal-fin base, but only to vertical through dorsal-fin origin in larger individuals. Pectoral-fin spine slender, but more robust than that of dorsal fin, with fine roughened ridge anteriorly and with retrorse serrations on distal two-thirds of posterior margin. Pectoral-fin rays I,15(3), I,16(9)*, or I,17(5).

Coloration in alcohol.—Body variably brown dorsally, silvery on lateral and ventral surfaces. Head dark dorsally, silvery from snout to postorbital region and across ventral portion of operculum. Ventral surface of head pale. Dorsal fin unpigmented other than for dusky pigmentation on

distal one-half of fin in smaller individuals; dark pigmentation reduced to diffuse, marginal, dark band on anterior rays of larger specimens. Adipose fin unpigmented. Caudal fin unpigmented other than for diffuse dark pigmentation along distal portions of all rays and with dark pigmentation also more concentrated along interradiation membranes. Anal and pelvic fins unpigmented. Pectoral fin with diffuse dusky pigmentation on distal portion of anterior rays and with remainder of fin unpigmented. Maxillary and outer mental barbels dusky on dorsal surfaces. Nasal barbel and medial mental barbel unpigmented.

Distribution.—Irrawaddy and Sittang River systems of Myanmar (Fig. 3).

Remarks.—Previous authors (Hora, 1937a; Smith, 1945; Jayaram, 2006) considered the populations of *Eutropiichthys* that occurred in Myanmar (at that time known as Burma) and western Thailand to represent a single species, *E. vacha*, whose range extended west to the Indus River in eastern Pakistan. Nonetheless, it is noteworthy that Prashad and Mukerji (1929) reported that there were several “forms” of *E. vacha* present in Indawgyi Lake and the streams of the Myitkyina District of Burma. Our results indicate that there are three species of *Eutropiichthys* in Myanmar and Thailand, none of which are conspecific with *E. vacha*. Pairs of *Eutropiichthys* species inhabit at least the Chindwin, Irrawaddy, Salween, and Sittang River basins, and some of those species occur sympatrically. Although similar in many features, these three forms can be distinguished in the form of the snout from both lateral and dorsal view, along with other features (see Key to the species of *Eutropiichthys* and differential characters in Diagnoses). The form exhibiting a distinctly pointed snout in adults that is present in Myanmar is equated herein with *E. burmannicus* (see Remarks under that species). Inasmuch as there are no available names for the two blunt-snouted species of *Eutropiichthys* from the Irrawaddy River and Salween River basins, we name those species herein as *E. britzi* and *E. salweenensis*, respectively. It is impossible to determine which of the many previous citations of *E. vacha* from locations in Myanmar and Thailand refer to *E. britzi*, *E. burmannicus*, or *E. salweenensis* or some combination of those species, but it is likely that the “pointed-snouted” form of *E. vacha* reported by that Prashad and Mukerji (1929) is *E. burmannicus*, which is the only species of *Eutropiichthys* in Myanmar with that attribute.

Vinciguerra (1890:199) reported on specimens collected by Fea in Burma (=Myanmar). In his

discussion of *Eutropiichthys vacha*, Vinciguerra noted that material he assigned to that species which originated in Burma failed to agree with the description of the form that Day (1877) identified as *E. burmannicus*. We examined one specimen of *Eutropiichthys* collected by Fea in Burma (USNM 44741), and we agree with Vinciguerra (1890) that it does not fit with the form described by Day (1877) as *E. burmannicus*, but rather is an individual of *E. britzi*.

The holotype of *Eutropiichthys britzi* was obtained at the fish market at Myitkyina, Myanmar. According to U Tun Shwe, Kachin State Fisheries Officer (pers. comm. to CJF, April 1996), all fishes at the market came from government-allocated fishery concessions on the Irrawaddy River, in the immediate vicinity of Myitkyina.

Etymology.—The species name, *britzi*, is in honor of Ralf Britz of the Natural History Museum, London, who collected some of the specimens that served as the basis of the description of this species, in recognition of his many contributions to our knowledge of diverse groups of fishes and to the fishes of Myanmar.

Eutropiichthys burmannicus Day, 1877

Figures 1A, 4, 5; Table 1

Eutropiichthys Burmannicus Day, 1877:490 [type-locality: Burma; originally as “Variety *Eutropiichthys Burmannicus*” in the account of *E. vacha*].—Hora, 1937a:436 [as synonym of *E. vacha*].—Whitehead and Talwar, 1976:157 [syn-type depository].

Material examined.—27 specimens, 82–349 mm SL. USNM 372441, 1, 106 mm SL, Myanmar, Yangon Division, Hliang River, Insein township, 16°53'41"N, 96°05'28"E. NRM 31199, 1, 128 mm SL, Myanmar, Yangon Division, Yangon River drainage, Yangon. NRM 17900, 1, 214 mm SL and NRM 17901, 1, 129 mm SL, Myanmar, Mandalay Division, Mandalay. USNM 387556, 3, 122–133 mm SL, Myanmar, Mandalay Division, Mandalay market. AMNH 13835, 1, 196 mm SL, Myanmar, Sittang River. USNM 305748, 2, 90–92 mm SL, Myanmar, Irrawaddy River, Bagan morning market, approx. 21°09'58"N, 95°27'59"E. CAS 88816, 1, 115 mm SL, Myanmar, Bago Division, Sittang River at Taungoo or Taungoo Market, 18°55'N, 96°25'E. NRM 19064, 1, 213 mm SL, Myanmar, Bago Division, Bago, 17°20'N, 96°29'E. SU 69881, 3, 220–234 mm SL and FMNH 117259, 1, 240 mm SL, Myanmar, Sagaing Division, Chindwin River, Monywa, 22°07'N, 95°08'E. USNM 387555, 3, 117–132 mm SL, Myanmar, Sagaing Division,



Fig. 4. *Eutropiichthys burmannicus*, USNM 372441, 106 mm SL, Myanmar, Yangon Division, Hliang River, Insein township.

Chindwin River at Sapho Kyi, 22°32'N, 94°47'E. BMNH 1891.11.30.162–166, 5, 137–340 mm SL, Myanmar, no specific locality. CAS 56638, 1, 130 mm SL, Myanmar, Kachin State, creek near Lake Indawgyi. AMNH 17806, 1, 157 mm SL, Myanmar, Sagaing Division, Irrawaddy drainage, market at Monywa, on Chindwin River. NRM 31196, 2, 82–95 mm SL, Myanmar, Mon State, Moulmein. CAS 76262, 1, 123 mm SL, Thailand, Salween River.

Diagnosis.—*Eutropiichthys burmannicus* differs from its congeners in the combination of the number of rakers on the first gill arch (22 to 28 in *E. burmannicus* versus 15 to 19 in *E. britzi*, 15 to 20 in *E. vacha*, 15 to 18 in *E. murius*, and 18 to 20 in *E. salweenensis*), the number of branched pectoral-fin rays (15 to 17, rarely 15, in *E. burmannicus* versus 11 or 12 in *E. murius*, and 14 or 15 in *E. vacha*), the length of the accessory

premaxillary tooth patch (extending posteriorly nearly to the terminus of the gape in *E. burmannicus* versus falling distinctly short of the posterior terminus of the gape in *E. murius*), the extent of the fleshy flap along the anterior margin of the posterior naris (barely extending medial of the medial margin of the naris for a distance distinctly less than the transverse length of the posterior naris in *E. burmannicus* [Fig. 1A] versus extending medial of the medial margin of the naris by a distance equal to, or greater than, the transverse dimension of the posterior naris in *E. britzi* [Fig. 1B] and *E. murius*), the number of branched anal-fin rays (46 to 54 in *E. burmannicus* versus 32 to 37 in *E. murius*), in the position of the posterior limit of the upper jaw (at, or beyond, the vertical through the middle of eye in *E. burmannicus* versus at the vertical through the anterior margin of the eye in *E. murius*), and the form of the snout of adults in lateral view (distinctly pointed in *E. burmannicus* versus moderately to broadly rounded in *E. britzi*, *E. murius*, and *E. salweenensis*) and dorsal view (acutely angular in *E. burmannicus* versus slightly trilobed in *E. britzi*, *E. murius*, and *E. salweenensis*).

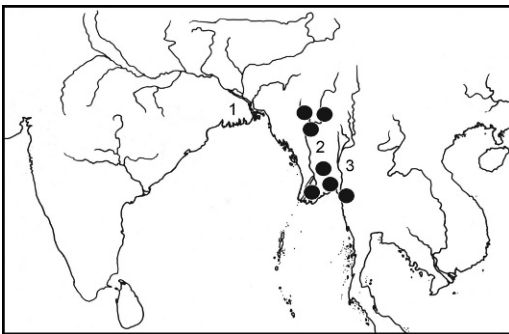


Fig. 5. Distribution of specimens of *Eutropiichthys burmannicus* examined in this study. Dots may indicate more than one sampling locality or lot of specimens. Major river basins that are within the distribution of the genus are identified by number as follows: 1) Ganges–Brahmaputra River system; 2) Irrawaddy River; 3) Salween River.

Description.—Morphometrics of *Eutropiichthys burmannicus* presented in Table 1. Body elongate, compressed. Body depth greatest at dorsal-fin origin. Dorsal profile of body nearly straight from rear of head to dorsal-fin origin and gently convex between posterior terminus of dorsal-fin base and caudal-fin origin. Ventral profile of body convex to anal-fin origin, then straight along base of anal fin. Vent located slightly anterior of anal-fin origin. Lateral line complete, midlateral, and extends onto basal fleshy portion of dorsal lobe of caudal fin, with short secondary branches extending obliquely above and below entire length of main portion of system. Total vertebrae 52(2), 53(8), 54(5), 55(1), or 56(1).

Head compressed along entire length, with lateral margins of head posterior of orbit running nearly in parallel. Head acutely pointed overall anteriorly from lateral view. Opercular opening broad, extending from horizontal through anterior limit of lateral line to vertical through middle of pupil. Opercular membranes not connected to isthmus. Posteroventral margin of operculum with posteriorly directed, fleshy lobe; posterior portion of lobe rounded.

Anteriormost portion of snout pointed in lateral view. Snout margin somewhat rounded in smaller individuals from dorsal view but acutely angular from dorsal view in larger individuals. Anterior naris longitudinally horizontally ovoid, anteriorly directed, and located on anterolateral margin of snout. Posterior naris ranging from ovoid to nearly round. Anterior margin of naris with convex flap of skin. Posterior naris located slightly posterodorsal and medial to anterior naris. Maximum width of posterior naris approximately equal to one-quarter of internarial distance.

Eye positioned laterally, visible from both dorsal and ventral views; eye positioned slightly below horizontal through middle of vertical extent of head; middle of pupil situated distinctly below horizontal through anterior naris. Anterior and posterior portions of eye covered laterally by connective tissue (adipose eyelid), but with ovoid, vertically elongated opening lateral to pupil.

Mouth terminal with opening large and posteroventrally angled; posterior terminus of gape located posterior of vertical through middle of pupil and approximately at vertical through posterior margin of opening in adipose eyelid. Jaws of equal length in specimens of all sizes. Premaxillary tooth plate crescentic. Teeth on tooth plate slender, conical, and depressible, with approximately seven irregular rows at symphysis that progressively reduce to three or four irregular rows laterally. Teeth on postero-medial portion of tooth plate larger than remaining teeth on that plate. Outermost teeth of upper jaw exposed laterally when mouth closed. Accessory premaxillary tooth plate extends from posterolateral margin of premaxillary tooth plate nearly to rear of gape. Teeth on accessory plate arranged in four or five irregular rows, with teeth largest medially and progressively decreasing in size laterally. Lateral teeth on accessory plate comparable in size to smallest teeth on premaxilla. Palatal tooth patch in form of parabolic arch extending posteriorly from midline to slightly past posterior terminus of accessory tooth patch. Anterior and lateral margins of palatal tooth patch closely applied to, and barely distinct from, posterior margin of

premaxillary tooth patch and medial margins of accessory tooth patch in larger specimens, but with separation between premaxillary and palatal tooth patches more obvious in smaller individuals. Teeth of palatal tooth patch slender and conical, with teeth of median portion of patch largest and remaining teeth becoming progressively smaller posterolaterally. Largest teeth on palate comparable in size to largest teeth on premaxilla. Dentary tooth plate parabolic with slender, conical teeth covering oral surface and extending onto lateral surface of dentary. Teeth on lateral surface of dentary visible in closed mouth. Teeth along medial portion of anterior one-half of dentary largest with remaining teeth becoming progressively smaller. Largest teeth on dentary approximately equal in size to largest teeth on premaxilla. Dentary with seven or eight irregular rows of teeth along entire length of tooth patch.

Total gill rakers on outer face of first arch 22(7), 23(6), 24(10), 25(2), 27(1), or 28(1). Upper limb rakers 5(4), 6(17), 7(3) or 8(3) and lower limb rakers 15(1), 16(4), 17(10), 18(9), 19(2), or 20(1).

Barbels in four pairs. All barbels rest in shallow groove in skin, at least basally. Nasal barbel thread-like and extending posteriorly from lateral margin of posterior naris to slightly beyond vertical through posterior limit of opercle in smaller specimens, but only to vertical lying between posterior margin of eye and vertical limb of preopercle in larger individuals. Maxillary barbel extends from posterior of anterior naris to base of pectoral fin in smaller specimens, but only to vertical limb of preopercle in larger individuals. Mental barbels in two pairs; barbel bases originate in nearly transverse row at vertical through posterior naris. Inner and outer mental barbels extending posteriorly to base of pectoral fin in smaller specimens, but only to vertical limb of preopercle in larger individuals.

Dorsal-fin origin located posterior of vertical situated at anterior one-third of SL. Dorsal-fin base short and slightly shorter than length of snout. Dorsal fin similar in size to pectoral fin; segmented rays preceded by spinelet and sharply pointed, slender spine. Anterior surface of spine irregular basally and smooth distally. Posterior margin of spine with very fine, retrorse serrations along distal one-half. Margin of dorsal fin straight with rays becoming progressively shorter posteriorly; length of last fin ray about one-third that of first ray. Dorsal-fin rays II,7(27). Adipose fin small, located above posterior one-third of anal-fin base.

Caudal fin deeply forked, lobes pointed and symmetrical; outer principal rays about three

times length of middle rays. Principal caudal-fin rays i,7,8,i(27).

Anal-fin origin located just anterior to vertical through middle of SL. Anal-fin base long. Anal-fin margin slightly concave anteriorly, nearly straight posteriorly; posterior ray shortest. Last fin ray without membranous connection to caudal peduncle. Anal-fin rays v,45(1), v,47(2), v,48(2), v,49(3), iv,50(1), v,50(5), iv,51(1), v,51(1), iv,52(3), v,52(1), v,54(1), or v,55(1).

Pelvic fin small, its length only slightly more than one-third that of pectoral fin. Pelvic-fin insertion at, to slightly posterior of, vertical through dorsal-fin origin. Adpressed fin extending ventral to anus with tip of fin reaching approximately to urogenital pore. Pelvic-fin rays i,5(27).

Pectoral fin triangular, first branched ray longest. Tip of adpressed fin extends posteriorly to slightly beyond base of pelvic fin. Pectoral-fin spine slender, but more robust than that of dorsal fin, with fine roughened ridge anteriorly and with retrorse serrations on distal two-thirds of posterior margin. Pectoral-fin rays I,15(1), I,16(13), or I,17(9).

Coloration in alcohol.—Body variably brown dorsally, silvery on lateral and ventral surfaces. Head dark dorsally, but lighter from snout to post-orbital region and across ventral portion of operculum. Ventral surface of head pale. Dorsal fin unpigmented other than for dusky pigmentation of variable form on distal one-third to one-half of anterior rays; pigmentation sometimes faint. Adipose fin unpigmented. Caudal fin unpigmented other than for diffuse dark pigmentation along distal portions of all rays and with dark pigmentation also more concentrated along interradiar membranes. Anal and pelvic fins unpigmented. Pectoral fin with diffuse dusky pigmentation on medial portions of anterior rays and with remainder of fin unpigmented. Barbels unpigmented.

Distribution.—Rivers of Myanmar from the Irrawaddy River to the Salween River and the Salween basin of western Thailand (Fig. 5).

Remarks.—Day (1877:490) noted that the examined samples of the genus *Eutropiichthys* which originated in the rivers of Burma (now Myanmar) differed from material of *E. vacha* collected in India. Day consequently identified the form from Burma as a new variety of *E. vacha* that he named *Eutropiichthys burmannicus* and provided the following diagnosis: “. . . A. 4/55, and its nasal barbels almost reach to the dorsal fin: the maxillary to the middle of the pectoral spine,

whilst all the others are longer than the head. The pectoral spine is serrated externally [*sic*, internally] and reaches the anal fin.” Day neither indicated how many of the specimens that he examined originated in Burma, nor the size(s) of the specimen(s). Although the BMNH received various collections brought from India and adjoining regions by Day, no specimens of *Eutropiichthys* from the Day collection that originated in Burma have been found in the holdings of that museum.

Hora (1937a:438) reported on a single specimen of *Eutropiichthys* that originated in Burma, which had been purchased from Day and deposited in the Indian Museum (now the Zoological Survey of India). Whitehead and Talwar (1976:157) reported finding three lots in the ZSI collections that may represent part, or all, of the type series of *E. burmannicus*. The specimen identified as “Dup. Cat. no. 39” in the Hora (1937a) paper presumably corresponds with one of the specimens reported in Whitehead and Talwar (1976) as B38-9 and must be considered a syntype of *E. burmannicus*. Hora (1937a) compared that specimen with the diagnosis of *E. burmannicus* provided by Day (1877) and found that the specimen agreed in the barbel and anal-fin characters mentioned in Day’s account, but that, in general, the specimen “does not quite show the characters of *E. burmannicus*” (Hora, 1937a:438). Hora was not explicit as to the apparent differences he observed, but he did illustrate the head of this specimen (Hora, 1937a:fig. 1b) and compared the specimen with other material of *Eutropiichthys* originating from the vicinity of Mandalay, Burma, that were not part of the Day collection. His illustration depicts a specimen with a clearly pointed snout from lateral view—a condition which was confirmed by his comments that the specimens from Mandalay differed from the Day specimen in question in having a snout that was “somewhat blunt” (Hora, 1937a:438), thereby implying that the Day specimen had the comparatively pointed snout. From this statement, we conclude that the specimen identified as “Dup. Cat. no. 39” is an example of the species of *Eutropiichthys* with an acutely pointed snout that is present in Myanmar. Because three species of *Eutropiichthys* occur in Myanmar, with two species often co-occurring, and given that Day apparently did not distinguish a blunt-snouted form of the genus from the pointy-snouted *E. burmannicus*, it is possible that other syntypes of that species, if still extant, may include a second of the species of the genus that are present in many of the major drainage basins of Myanmar. In order to stabilize the nomenclature of *E. burmannicus*, we

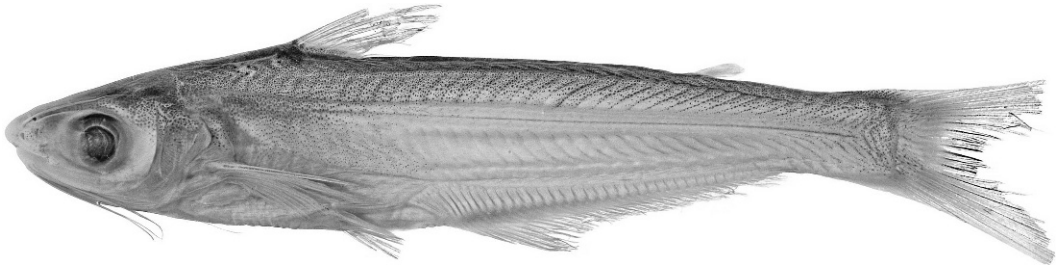


Fig. 6. *Eutropiichthys murius*, KU 29184, 120 mm SL, Nepal, Jhapa, Kankai River at Raj–Marg highway.

hereby select as the lectotype of *E. burmannicus* the specimen mentioned by, and illustrated in, Hora (1937a:438, fig. 1b) as “Dup. Cat. No. 39” and more recently cited by Whitehead and Talwar (1976:157) as B38-9.

The majority of the material of *Eutropiichthys burmannicus* examined during this study have 20 to 25 rakers on the first gill arch. The three specimens from the Salween River, which are the easternmost records for the species, have, however, 25, 27, or 28 rakers. In light of the overlap in the gill-raker counts of some specimens from across the remainder of the species range and the limited sample available from the Salween River system, we tentatively identify those individuals as *E. burmannicus*. Nonetheless, it is noteworthy that the ichthyofauna of the Salween River system includes a number of endemic species (see Kottelat, 1989) including *E. salweenensis*, which is described as new in this paper. The question of the distinctiveness of the population that is recognized herein as *E. burmannicus* in the Salween River should be revisited once additional population samples of the species from that river basin become available.

Prashad and Mukerji (1929) reported the presence of *Eutropiichthys vacha* from “upper Burma” and noted the variation in the form of the snout that they encountered in their samples. Our results indicate that the distribution of *E. vacha* does not extend into Myanmar, and it is likely that the “pointed-snouted” form of *E. vacha* reported on by Prashad and Mukerji is *E. burmannicus*, which is the only member of the genus with that attribute known to occur in Myanmar.

Eutropiichthys vacha has been reported from the Salween River by various authors (Hora, 1937a; Smith, 1945; Kottelat, 1989), an area far outside the range of that species under the results of this study. Because both *E. burmannicus* and *E. salweenensis* are found in the lower portions of the Salween River, it is impossible to determine which of these species served as the basis for these reports.

Eutropiichthys murius (Hamilton, 1822)

Figures 6, 7; Table 1

Pimelodus murius Hamilton, 1822:195, 378 (type-locality: Mahananda River [Bengal]; no type specimens preserved; previously unpublished Hamilton illustration printed in Hora, 1929:pl. 22, fig. 2).

Pachypterus melanurus Swainson, 1839:306 [type-locality: Mahananda River (Bengal); unneeded new name for *Pimelodus murius* Hamilton, 1822].

Material examined.—17 specimens, 65–120 mm SL. USNM 316716, 2, 100–103 mm SL, India, Uttar Pradesh, Ganges River, Kanpur, 26°28'N, 88°30'E. UF 35190, 2, 111–112 mm SL, India, Uttar Pradesh. BMNH 1889.2.1.2782, 2, 65–77 mm SL, India, Assam. BMNH 1889.2.1.2783–22786, 4, 65–120 mm SL, India, Orissa. KU 29184, 7, 78–120 mm SL, Nepal, Jhapa, Kankai River at Raj–Marg highway, 26°39'30"N, 87°52'12"E.

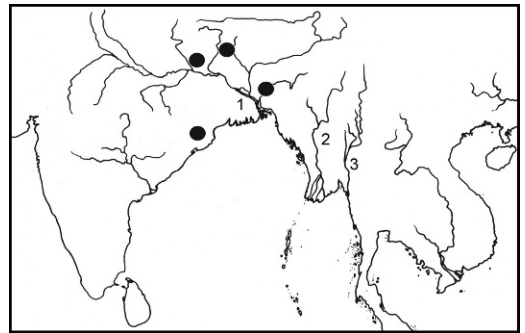


Fig. 7. Distribution of specimens of *Eutropiichthys murius* examined during this study; dots may indicate more than one sampling locality. For comments on reported distribution of species, see Distribution in species' account. Major river basins that are within the distribution of the genus are identified by number as follows: 1) Ganges–Brahmaputra River system; 2) Irrawaddy River; 3) Salween River.

Diagnosis.—*Eutropiichthys murius* can be distinguished from its congeners by the combination of the number of branched pectoral-fin rays (11 or 12 in *E. murius* versus 15 to 17 in *E. britzi* and 14 or 15 in *E. vacha*), the number of branched anal-fin rays (32 to 37 in *E. murius* versus 46 to 54 in *E. britzi*, 45 to 55 in *E. burmannicus*, 48 to 50 in *E. salweenensis*, and 44 to 48 in *E. vacha*), the number of rakers on the first gill arch (15 to 18 in *E. murius* versus 22 to 28 in *E. burmannicus* and 18 to 20 in *E. salweenensis*), the extent of the accessory premaxillary tooth patch (falling distinctly short of the terminus of the gape in *E. murius* versus extending posteriorly nearly to the terminus of the gape in *E. britzi* and *E. burmannicus*), the extent of the fleshy flap along the anterior margin of the posterior naris (extending medial of the medial margin of the naris by a distance equal to, or greater than, the transverse dimension of the posterior naris in *E. murius* [similar to the condition in *E. britzi*, Fig. 1B] versus barely extending medial of the medial margin of the naris for a distance distinctly less than the transverse length of the posterior naris in *E. burmannicus* [Fig. 1A], *E. salweenensis*, and *E. vacha*), the posterior limit of the upper jaw (located at the vertical through the anterior limit of the eye in *E. murius* versus located under the orbit in *E. britzi*, *E. burmannicus*, *E. salweenensis*, and *E. vacha*), and the form of the snout in lateral view (rounded in *E. murius* versus distinctly pointed in *E. burmannicus* and *E. vacha*) and dorsal view (slightly trilobed in *E. murius* versus angular in adults of *E. burmannicus* and *E. vacha*).

Description.—Morphometrics of *Eutropiichthys murius* presented in Table 1. Body elongate, compressed. Body depth greatest at dorsal-fin origin. Dorsal profile of body nearly straight from rear of head to dorsal-fin origin and gently convex between posterior terminus of dorsal-fin base and caudal-fin origin. Ventral profile of body convex to anal-fin origin, then straight along base of anal fin. Vent located slightly anterior of anal-fin origin. Lateral line complete, midlateral, and terminates at posterior limit of hypural plate, with short secondary branches extending obliquely above and below entire length of main portion of system. Total vertebrae 43(7), 44(8), or 45(2).

Head compressed along entire length, with lateral margins of head posterior of orbit diverging slightly posteriorly. Head acutely pointed overall anteriorly from lateral view, but with anteriormost portion of head broadly rounded. Opercular opening broad, extending posteriorly from horizontal through anterior limit of vertical

through middle of pupil. Opercular membranes not connected to isthmus. Posteroventral margin of operculum with posteriorly directed, fleshy lobe; posterior portion of lobe rounded.

Anteriormost portion of snout rounded in lateral view. Snout margin somewhat trilobed from dorsal view. Anterior naris rounded, anteriorly directed, and located on anterolateral margin of snout. Posterior naris transversely ovoid. Anterior margin of nares with convex flap of skin; flap extends medially for distance less than width of opening of naris. Posterior naris located slightly posterodorsal and medial to anterior naris. Maximum width of posterior naris approximately equal to one-third to one-half of internarial distance.

Eye positioned laterally, visible from both dorsal and ventral views; middle of eye positioned slightly below horizontal through middle of vertical extent of head and slightly ventral of horizontal through anterior naris. Anterior and posterior portions of eye covered laterally by connective tissue (adipose eyelid), but with ovoid, vertically elongated opening lateral to pupil.

Mouth slightly subterminal with opening moderate and posteroventrally angled; posterior terminus of gape located approximately at vertical through anterior margin of eye. Lower jaw distinctly shorter than upper jaw, with nearly all of premaxillary teeth visible from ventral view when mouth closed. Premaxillary tooth plate slightly arched. Teeth on tooth plate short, conical, and depressible, with approximately eight to ten irregular rows at symphysis that progressively reduce to four or five irregular rows laterally. Teeth of approximately same size across tooth plate. Accessory premaxillary tooth plate extends from posterolateral margin of premaxillary tooth plate for short distance towards rear of gape; longitudinal extent of tooth plate no more than twice width of plate. Teeth on accessory plate arranged in four or five irregular rows with teeth of similar size across tooth plate and comparable in size to teeth on premaxilla. Palatal tooth patch in form of parabolic arch extending posteriorly from midline beyond posterior terminus of accessory tooth patch nearly to terminus of gape. Anterior and lateral margins of palatal tooth patch distinctly separated from posterior margin of premaxillary tooth patch and medial margins of accessory tooth plate. Teeth of palatal tooth patch short, conical, and of similar size across tooth plate and comparable in size to teeth on premaxilla. Dentary tooth plate parabolic with short, conical teeth covering dorsal surface and extending onto lateral surface of dentary. Teeth on lateral surface of dentary

visible in closed mouth. Teeth along medial portion of anterior one-half of dentary largest with remaining teeth becoming progressively smaller. Largest teeth on dentary slightly larger than teeth on premaxilla. Dentary with seven or eight irregular rows of teeth along entire length of tooth patch.

Total gill rakers on outer face of first arch 15(4), 16(6), 17(5), or 18(2). Upper limb rakers 4(3), 5(11), 6(2) or 7(1) and lower limb rakers 10(3), 11(8), 12(5), or 13 (1).

Barbels in four pairs. All barbels rest in shallow groove in skin, at least basally. Nasal barbel thread-like and extending posteriorly from lateral margin of posterior naris approximately to vertical limb of preopercle. Maxillary barbel extends from posterior of anterior naris to slightly past base of pectoral fin. Mental barbels in two pairs; barbel bases originate in nearly transverse row at vertical through posterior naris. Inner and outer mental barbels extending posteriorly to tip of fleshy lobe along posterior margin of operculum.

Dorsal-fin origin located anterior of vertical situated at anterior one-third of SL. Dorsal-fin base short and slightly shorter than length of snout. Dorsal fin similar in size to pectoral fin; segmented rays preceded by spinelet and sharply pointed, slender spine. Anterior surface of spine irregular basally and smooth distally. Distal one-fourth of posterior margin of spine with very fine retrorse serrations. Margin of dorsal fin straight, with rays becoming progressively shorter posteriorly; length of last ray about one-third that of first ray. Dorsal-fin rays II,7(17). Adipose fin small, located above posterior one-third of anal-fin base.

Caudal fin deeply forked, lobes pointed and symmetrical; outer principal rays slightly more than two times length of middle rays. Principal caudal-fin rays i,7,8,i(17).

Anal-fin origin located approximately at vertical through middle of SL. Anal-fin base long. Anal-fin margin slightly concave anteriorly, nearly straight posteriorly; posterior ray shortest. Last ray without membranous connection to caudal peduncle. Anal-fin rays iv,32(2), iv,33(3), v,33(1), iv,34(4), iv,35(4), iv,36(1), v,36(1), or v,37(1).

Pelvic fin small, its length approximately one-half that of pectoral fin. Pelvic-fin insertion at vertical through middle of dorsal-fin base. Adpressed fin falling short of anus. Pelvic-fin rays i,5(17).

Pectoral fin triangular, first branched ray longest. Tip of adpressed fin extends posteriorly to beyond base of pelvic fin. Pectoral-fin spine slender, but more robust than that of dorsal fin; smooth anteriorly and with retrorse serrations

along distal two-thirds of posterior margin. Pectoral-fin rays I,11(14) or I,12(3).

Coloration in alcohol.—Ground coloration of body variably brown, darker dorsally. Dorsolateral portion of body with scattered dark chromatophores; concentration of chromatophores anterior of dorsal-fin origin appearing as triangular patch in dorsal view. Ventrolateral region of body with dark pigmentation only anteriorly. Head darker dorsally with few, scattered, dark chromatophores on dorsal portion of operculum; remainder of head without dark chromatophores. Ventral surface of head and abdomen pale. Dorsal fin with few, scattered, dark chromatophores on distal portion of anterior rays, with remainder of fin unpigmented. Adipose fin unpigmented. Caudal fin unpigmented other than for diffuse dark pigmentation distally. Anal and pelvic fins unpigmented. Pectoral fin with scattered dark chromatophores along anterior rays and remainder of fin unpigmented. Maxillary barbel dusky basally, with dark pigmentation somewhat more concentrated dorsally in that region; pigmentation limited to dorsal margin of remainder of barbel. Nasal barbel unpigmented. Mental barbels with dark pigmentation limited to dorsal margin.

Distribution.—Examined material originated at various localities in northern India and southern Nepal (Fig. 7). Jayaram (2006) reported that this species has been found throughout much of northern and northeastern India. Outside of India, the species has been reliably reported from Bangladesh (Rahman, 1989). Reports of the species from the Indian state of Orissa, as well as Pakistan (Jayaram, 2006) are apparently erroneous (Menon, 1999).

Remarks.—Shrestha (1981:212) reported on two specimens of a schilbid catfish from the Trisuli River basin, Bagmati Zone, Nepal, which she considered to be similar to *Eutropiichthys murius* (then *Pseudeutropius murius*). Based on several differences between her specimens and the description of *E. murius* in Day (1889), Shrestha concluded that the Nepalese population represented a distinct subspecies, which she named *Pseudeutropius murius batarensis*. Our examination of a small collection of *Eutropiichthys* specimens from southern Nepal (KU 29184) revealed no obvious differences between populations of *E. murius* from Nepal and various parts of India, and we have no hesitation in including Nepal in the range of the species. We did, however, find that the description of *Pseudeutropius murius batarensis* in Shrestha (1981:213) differed from

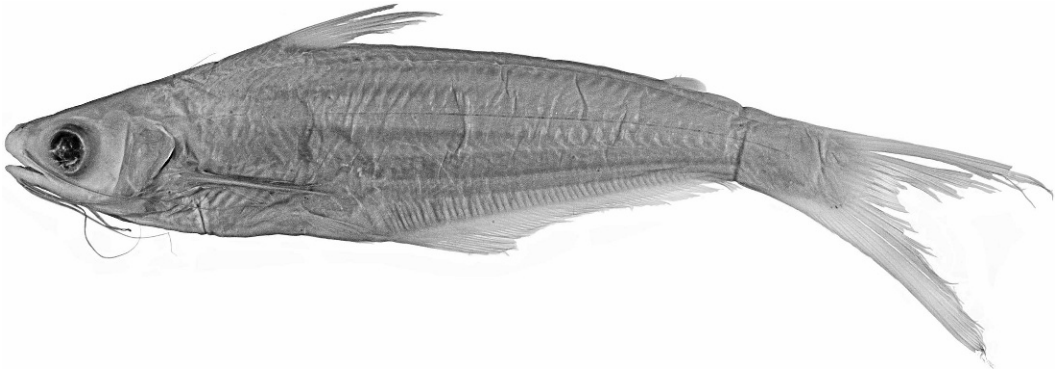


Fig. 8. *Eutropiichthys salweenensis*, holotype, CAS 76261, 124 mm SL, Thailand, Salween River, 20 km upriver from Mae Sam Lap.

the features in the examined specimens of *E. murius* and suspect that the two specimens upon which *P. murius batarensis* are based do not actually represent a species of *Eutropiichthys*. The characters listed in the description of *P. murius batarensis* closely resemble those of the schilbid genus *Clupisoma*, and we suspect that the two specimens actually represent a population of either *C. montana* (Hora, 1937b) or a closely related species. In the absence of direct examination of the type specimens of *P. murius batarensis*, however, we are unable to confirm this supposition.

***Eutropiichthys salweenensis*, new species**

Figures 8, 9; Table 1

Holotype.—CAS 76261, 124 mm SL, Thailand, Salween River, 20 km upriver from Mae Sam Lap, 21 April 1989, T. Roberts.

Paratypes.—5 specimens, 83–132 mm SL. CAS 224135, 4, 83–132 mm SL, and USNM 385879, 1, 87 mm SL, collected with holotype.

Diagnosis.—*Eutropiichthys salweenensis* differs from its congeners in the combination of the number of rakers on the first gill arch (18 to 20 in *E. salweenensis* versus 15 to 18 in *E. murius* and 22 to 28 in *E. burmannicus*), the number of branched anal-fin rays (48 to 50 in *E. salweenensis* versus 32 to 37 in *E. murius* and 44 to 48 in *E. vacha*), the length of the accessory premaxillary tooth patch (extending posteriorly nearly to the terminus of the gape in *E. salweenensis* versus falling distinctly short of the terminus of the gape in *E. murius*), the location of the posterior limit of the upper jaw (under the orbit in *E. salweenensis* versus approximately at vertical through anterior margin of eye in *E. murius*), the extent of the fleshy

flap along the anterior margin of the posterior naris (barely extending medial of the medial margin of the naris for a distance distinctly less than the transverse length of the posterior naris in *E. salweenensis* similar to that in *E. burmannicus* [Fig. 1A] versus extending medial of the medial margin of the naris by a distance equal to, or greater than, the transverse dimension of the posterior naris in *E. britzi* [Fig. 1B] and *E. murius*), the length of the pectoral-fin spine (18.7–21.3% SL in *E. salweenensis* versus 16.8–18.0% SL in *E. britzi*), the form of the lateral margin of the pectoral spine (smooth in *E. salweenensis* versus roughened in *E. britzi*, *E. burmannicus*, and *E. vacha*), and the form of the snout in lateral view (rounded in *E. salweenensis* versus pointed in *E. burmannicus* and *E. vacha*)

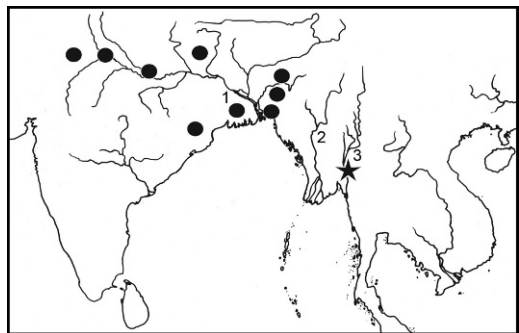


Fig. 9. Distribution of specimens of *Eutropiichthys salweenensis* (star) and *E. vacha* (dots) examined in this study; symbols may indicate more than one sampling locality or lot of specimens. For comments on reported distribution of *E. vacha*, see Distribution in species' account. Major river basins that are within the distribution of the genus are identified by number as follows: 1) Ganges-Brahmaputra River system; 2) Irrawaddy River; 3) Salween River.

and dorsal view (slightly trilobed in *E. salweenensis* versus angular in *E. burmannicus* and *E. vacha*).

Description.—Morphometrics of *Eutropiichthys salweenensis* presented in Table 1. Body elongate, compressed. Body depth greatest at dorsal-fin origin. Dorsal profile of body nearly straight from rear of head to dorsal-fin origin and gently convex between posterior terminus of dorsal-fin base and caudal-fin origin. Ventral profile of body convex to anal-fin origin, then straight along base of anal fin. Vent located slightly anterior of anal-fin origin. Lateral line complete, midlateral, and extending onto basal fleshy portion of dorsal lobe of caudal fin, with short secondary branches extending obliquely above and below entire length of main portion of system. Total vertebrae 52(1), 53(4)*, or 54(1).

Head compressed along entire length, with lateral margins of head posterior of orbit running nearly in parallel. Head pointed overall anteriorly from lateral view, albeit with snout rounded. Opercular opening broad, extending from horizontal through anterior limit of lateral line to vertical through middle of pupil. Opercular membranes not connected to isthmus. Posteroventral margin of operculum with posteriorly directed, fleshy lobe; posterior portion of lobe rounded.

Anteriormost portion of snout somewhat rounded in lateral view. Snout margin slightly trilobed from dorsal view (similar to that of *E. britzi*, Fig. 1B), but with lobes poorly defined. Anterior naris round, anteriorly directed, and located on anterior margin of snout. Posterior naris rounded. Posterior naris located slightly posterodorsal and medial to anterior naris. Width of posterior naris approximately equal to one-half of internarial distance. Anterior margin of naris with convex flap of skin extending medial of medial margin of naris for distance less than transverse extent of opening of naris.

Eye positioned laterally, visible from both dorsal and ventral views; middle of eye positioned slightly below horizontal through middle of vertical extent of head and distinctly below horizontal through anterior naris. Anterior and posterior portions of eye covered laterally by connective tissue (adipose eyelid), but with ovoid, vertically elongate opening positioned lateral to pupil.

Mouth terminal, with opening large and posteroventrally angled. Posterior terminus of gape at vertical through middle of pupil. Lower jaw slightly shorter than upper jaw. Premaxillary tooth plate crescentic. Teeth on tooth plate slender, conical, and depressible, with approximately seven irregular rows at symphysis that

progressively reduce to three or four irregular rows laterally. Teeth on posteromedial portion of tooth plate larger than remaining teeth on that plate. Outermost teeth of upper jaw exposed laterally when mouth closed. Accessory premaxillary tooth plate extends from posterolateral margin of premaxillary tooth plate nearly to rear of gape. Teeth on accessory plate arranged in four or five irregular rows, with teeth largest medially and progressively decreasing in size laterally. Lateral teeth on accessory patch comparable in size to smallest teeth on premaxilla. Palatal tooth patch in form of parabolic arch extending posteriorly from midline to slightly past posterior terminus of accessory tooth patch. Anterior and lateral margins of palatal tooth patch closely applied to, but slightly separated from, posterior margin of premaxillary tooth patch and medial margins of accessory tooth patch. Teeth of palatal tooth patch slender and conical, with teeth of medial portion of patch largest and remaining teeth becoming progressively smaller posterolaterally. Largest teeth on palate comparable in size to largest teeth on premaxilla. Dentary tooth plate parabolic with slender, conical teeth covering dorsal surface and extending onto lateral surface of dentary. Teeth on lateral surface of dentary visible in closed mouth. Teeth along medial portion of anterior one-half of dentary largest with remaining teeth becoming progressively smaller. Largest teeth on dentary approximately equal in size to largest teeth on premaxilla. Dentary with seven or eight irregular rows of teeth along entire length of tooth patch.

Total gill rakers on outer face of first arch 18(1), 19(2), or 20(3)*. Upper limb rakers 4(1) or 5(5)* and lower limb rakers 14(3) or 15(3)*.

Barbels in four pairs. All barbels rest in shallow groove in skin, at least basally. Nasal barbel thread-like and extending posteriorly from lateral margin of posterior naris to beyond vertical through posterior limit of opercle. Maxillary barbel extends from posterior of anterior naris to slightly past middle of pectoral fin. Mental barbels in two pairs; barbel bases originate in transverse row at level of posterior naris. Inner and outer mental barbels extend posteriorly to transverse through pectoral-fin base.

Dorsal-fin origin located at anterior one-third of SL. Dorsal-fin base short, about equal to length of snout. Dorsal fin slightly smaller than pectoral fin; segmented rays preceded by spinelet and sharply pointed, slender spine. Spine smooth anteriorly and with very fine serrations along distal one-half of posterior margin, with irregular surface but without distinct serrations along basal portion of that margin. Fin margin

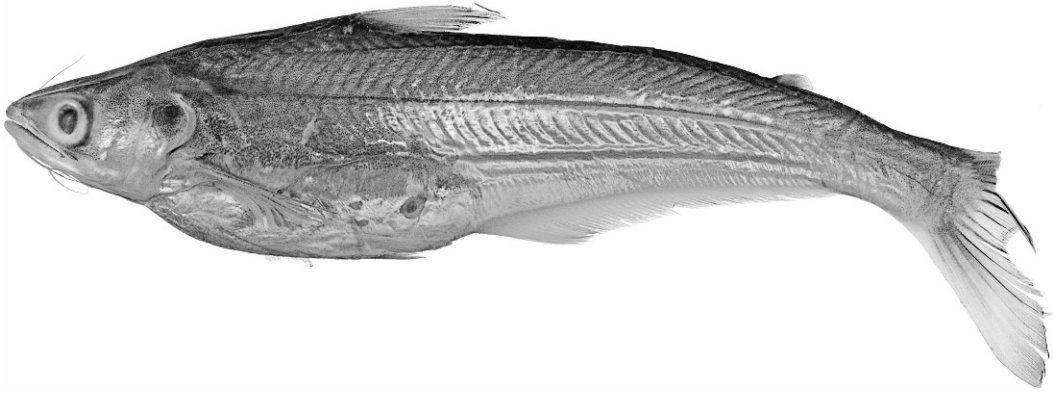


Fig. 10. *Eutropiichthys vacha*, NRM 40579, 220 mm SL, India, Assam, Brahmaputra River drainage, Dibrugarh Market.

straight with rays becoming progressively shorter posteriorly; length of last ray about one-half that of first ray. Dorsal-fin rays II,7(6)*. Adipose fin small, located above posterior one-third of anal-fin base.

Caudal fin deeply forked, lobes pointed and nearly symmetrical. Outer principal rays about three times length of middle rays. Principal caudal-fin rays i,7,8,i(6)*.

Anal-fin origin located markedly anterior to vertical through middle of SL. Anal-fin base long. Anal-fin margin slightly concave anteriorly, nearly straight posteriorly; posterior ray shortest. Last fin ray without membranous connection to caudal peduncle. Anal-fin rays v,48(1), v,49(1)*, or v,50(4).

Pelvic fin small, its length only slightly more than one-half that of pectoral fin. Pelvic-fin insertion located slightly posterior of vertical through dorsal-fin origin. Adpressed fin extending ventral of anus with tip of fin reaching slightly past urogenital pore but falling short of anal-fin origin. Pelvic-fin rays i,5(6)*.

Pectoral fin triangular, first branched ray longest. Tip of adpressed extends posteriorly to beyond vertical through terminus of dorsal-fin base. Pectoral-fin spine slender, but more robust than that of dorsal fin; smooth along anterior margin with retrorse serrations on distal two-thirds of posterior margin. Pectoral-fin rays I,15(5)* or I,16(1).

Coloration in alcohol.—Specimens largely depigmented, but some dark pigmentation remaining on dorsal surface of pectoral fin and distal one-half of anterior dorsal-fin rays.

Distribution.—Known only from one location along the Salween River in Thailand (Fig. 9), but presumably more broadly distributed

through that basin in both eastern Myanmar and western Thailand.

Remarks.—Hora (1937a:441), Smith (1945:357), and Kottelat (1989:14) reported *Eutropiichthys vacha* from the Salween River system with the record by Hora apparently based on a specimen sent to him by Smith. Our results indicate that *E. vacha* is limited to the region of southern Asia from eastern Pakistan through Bangladesh. Some, or all, of the reports of *E. vacha* from the Salween River may have been based on *E. salweenensis*, but may also have been based on specimens of *E. burmannicus*, which also occurs in the lower portion of that river basin.

Etymology.—The species name, *salweenensis*, is in reference to the Salween River, the type locality of the species.

Eutropiichthys vacha (Hamilton, 1822)

Figures 9, 10; Table 1

Pimelodus vacha Hamilton, 1822:196, 378, pl. 19, fig. 64 [type-locality: larger fresh water rivers of the Gangetic provinces; no type specimens preserved].

Pachypterus punctatus Swainson, 1839:306 [type-locality: larger fresh water rivers of the Gangetic provinces; based on Hamilton, 1822. Unneeded new name for *Pimelodus vacha* Hamilton, 1822:196].

Material examined.—21 specimens, 80–275 mm SL. CAS, 2, 102–142 mm SL, Bangladesh, Chittagong, 22°22'N, 91°48'E. MCZ 74221, 1, 185 mm SL, "North India," Bengal. BMNH 1872.5.17.5, 1, 175 mm SL, "North East Bengal." CAS 61841, 2, 89–136 mm SL, India, Orissa, Mahanadi River basin, fish market at Sonepur,

20°50'N, 83°59'E. CAS 94224, 1, 217 mm SL, India, Orissa, Mahanadi River basin, Hirakud Reservoir or Sambalpur Market. BMNH 1867.2.14.63, 1, 122 mm SL, India, Cachar. MCZ 25944, 1, 114 mm SL; MCZ 4257, 1, 113 mm SL; BMNH 1889.2.1.2463, 1, 96 mm SL; BMNH 1889.2.1.2595, 1, 80 mm SL, India, Calcutta. SU 34840, 3, 128–152 mm SL, India, Hugli River. NRM 40579, 1, 220 mm SL, India, Assam, Brahmaputra River drainage, Dibrugarh Market, 27°29'N, 94°54'E. KU 12169, 2, 118–123 mm SL, India, Jamna River, near Delhi. BMNH 1989.9.26.29–30, 2, 150–275 mm SL, India, Delhi, Rajputana. BMNH 1934.10.17.89, 1, 120 mm SL, India, Ganges River, Allahabad, 24°27'N, 81°51'E. USNM 165030, 1, 162 mm SL, Pakistan, Punjab, Ravi River, Lahore. BMNH 1932.2.30.28, 1, 275 mm SL, Pakistan, Lahore, 31°33'N, 74°21'E. KU 29184, 1, 174 mm SL, Nepal, Saptari/Sunsari, Koshi, Koshi River at Koshi barrage, 26°31'N, 86°56'E.

Diagnosis.—*Eutropiichthys vacha* differs from its congeners in the number of rakers on the first gill arch (15 to 20 in *E. vacha* versus 22 to 28 in *E. burmannicus*), the number of branched pectoral-fin rays (14 or 15 in *E. vacha* versus 15 to 17, rarely 15, in *E. burmannicus* and 11 or 12 in *E. murius*), the length of the accessory premaxillary tooth patch (extending posteriorly nearly to the terminus of the gape in *E. vacha* versus falling distinctly short of the terminus of the gape in *E. murius*), the number of branched anal-fin rays (44 to 48 in *E. vacha* versus 32 to 37 in *E. murius* and 48 to 50 in *E. salweenensis*), the extent of the fleshy flap along the anterior margin of the posterior naris (barely extending medial of the medial margin of the naris for a distance distinctly less than the transverse length of the posterior naris in *E. vacha*, similar to the condition in *E. burmannicus* [Fig. 1A] versus extending medial of the medial margin of the naris by a distance equal to, or greater than, the transverse dimension of the posterior naris in *E. britzi* [Fig. 1B] and *E. murius*), in the position of the posterior limit of the upper jaw (at vertical through the middle of the eye in *E. vacha* versus at vertical through the anterior limit of the eye in *E. murius*), and the form of the snout in lateral view (pointed in *E. vacha* versus rounded in *E. britzi*, *E. murius*, and *E. salweenensis*) and dorsal view (acutely angular in *E. vacha* versus slightly trilobed in *E. britzi*, *E. murius*, and *E. salweenensis*).

Description.—Morphometrics of *Eutropiichthys vacha* presented in Table 1. Body elongate, compressed. Greatest body depth located at dorsal-fin origin. Dorsal profile of body nearly straight from

rear of head to dorsal-fin origin and gently convex between posterior terminus of dorsal-fin base and caudal-fin origin. Ventral profile of body convex to anal-fin origin, then straight along base of anal fin. Vent located slightly anterior of anal-fin origin. Lateral line complete, midlateral, and extends onto basal fleshy portion of dorsal lobe of caudal fin, with short secondary branches extending obliquely above and below entire length of main portion of system. Total vertebrae 49(3), 50(2), or 51(1).

Head compressed along entire length, with lateral margins of head posterior of orbit running nearly in parallel. Head acutely pointed overall anteriorly from lateral view. Opercular opening broad, extending from horizontal through anterior limit of lateral line anteriorly to vertical through middle of pupil. Opercular membrane not connected to isthmus. Posteroventral margin of operculum with posteriorly directed, fleshy lobe; posterior portion of lobe rounded.

Anteriormost portion of snout pointed in lateral view. Snout margin acutely angular from dorsal view. Anterior naris longitudinally horizontally ovoid, anteriorly directed, and located on anterolateral margin of snout. Posterior naris ranging from ovoid to nearly round. Anterior margin of nares with convex flap of skin. Posterior naris located slightly posterodorsal and medial to anterior naris. Maximum width of posterior naris approximately equal to one-third of internarial distance.

Eye positioned laterally, visible from both dorsal and ventral views. Eye positioned slightly below horizontal through middle of vertical extent of head; middle of pupil situated distinctly below horizontal through anterior naris. Anterior and posterior portions of eye covered laterally with connective tissue (adipose eyelid), but with ovoid, vertically elongate opening lateral to pupil.

Mouth terminal with opening large and posteroventrally angled; posterior terminus of gape located posterior of vertical through middle of pupil and approximately at vertical through posterior margin of opening in adipose eyelid. Jaws of equal length in specimens of all sizes. Premaxillary tooth patch crescentic. Teeth on tooth plate slender, conical, and depressible, with approximately seven irregular rows at symphysis that progressively reduce to three or four irregular rows laterally. Teeth on postero-medial portion of tooth plate larger than remaining teeth on that plate. Outermost teeth of upper jaw exposed laterally when mouth closed. Accessory premaxillary tooth plate extends from posterolateral margin of premaxillary

tooth plate nearly to rear of gape. Teeth on accessory tooth plate arranged in four or five irregular rows, with teeth largest medially and with size of teeth progressively decreasing laterally. Lateral teeth on accessory tooth plate comparable in size to smallest teeth on premaxilla. Palatal tooth patch in form of parabolic arch extending posteriorly from midline to slightly past posterior terminus of accessory tooth patch. Anterior and lateral margins of palatal tooth patch closely applied to, and barely distinct from, posterior margin of premaxillary tooth patch and medial margins of accessory tooth patch in larger specimens, but with separation between premaxillary and palatal tooth patches more obvious in smaller individuals. Teeth of palatal tooth patch slender and conical with teeth of median portion of patch largest and remaining teeth becoming progressively smaller posteriorly and laterally. Largest teeth of palatal tooth patch comparable in size to largest teeth on premaxilla. Dentary tooth patch parabolic with slender, conical teeth covering dorsal surface and extending onto lateral surface of dentary. Teeth on lateral surface of dentary visible in closed mouth. Teeth along medial portion of anterior one-half of dentary largest with remaining teeth on dentary becoming progressively smaller. Largest teeth on dentary approximately equal to largest teeth on premaxilla. Dentary with seven or eight irregular rows of teeth along entire length of tooth patch.

Total gill rakers on outer face of first arch 15(1), 16(1), 17(3), 18(2), 19(2), or 20(3). Gill rakers on upper limb 4(2), 5(7), or 6(3) and on lower limb 11(2), 12(2), 13(4), 14(3), or 15(1).

Barbels in four pairs. All barbels rest in shallow groove in skin, at least basally. Nasal barbel thread-like and extending posteriorly from lateral margin of posterior naris to slightly beyond vertical through posterior limit of preopercle in smaller specimens, but only slightly beyond vertical through posterior margin of eye in larger individuals. Maxillary barbel extends from posterior of anterior naris to posterior margin of operculum in smaller specimens, but only to vertical limb of preopercle in larger individuals. Mental barbels in two pairs; barbel bases originate in nearly transverse row at vertical through posterior naris. Inner and outer mental barbels extend to posterior margin of operculum in smaller specimens, but only to vertical limb of preopercle in larger specimens.

Dorsal-fin origin located posterior of vertical situated at anterior one-third of SL. Dorsal-fin base short and slightly shorter than length of snout. Dorsal fin similar in size to pectoral fin; segmented rays preceded by spinelet and sharply

pointed, slender spine. Anterior surface of spine irregular basally and smooth distally. Posterior margin of spine with very fine retrorse serrations along distal one-half of margin. Distal margin of dorsal fin straight with rays becoming progressively shorter posteriorly; length of last ray about one-third that of first ray. Dorsal-fin rays II,7(17). Adipose fin small, located above posterior one-third of anal-fin base.

Caudal fin deeply forked, lobes pointed and symmetrical; outer principal rays about three times length of middle rays. Principal caudal-fin rays i,7,8,i(17).

Anal-fin origin located just anterior to vertical through middle of SL. Anal-fin base long. Anal-fin margin slightly concave anteriorly, nearly straight posteriorly; posterior ray shortest. Last ray without membranous connection to caudal peduncle. Anal-fin rays v,44(4), iv,45(1), v,45(5), iv,46(1), v,46(2), iv,47(2), v,47(2), or v,48(2).

Pelvic fin small, its length only slightly less than one-half that of pectoral fin. Pelvic-fin insertion located slightly posterior of vertical through dorsal-fin origin; adpressed fin extending ventral of anus with tip of fin reaching approximately to urogenital pore. Pelvic-fin rays i,5(14).

Pectoral fin triangular, first branched ray longest. Tip of adpressed fin extends posteriorly to slightly beyond base of pelvic fin. Pectoral-fin spine slender, but more robust than that of dorsal fin, with fine roughened ridge anteriorly and with retrorse serrations along distal two-thirds of posterior margin. Pectoral-fin rays I,14(9) or I,15(5).

Coloration in alcohol.—Body variably brown on dorsal and dorsolateral surfaces, with lateral surface of body in area between rear of operculum and vertical through insertion of pelvic fin somewhat darker. Body silvery on remainder of lateral surface and over ventral surface. Head dark dorsally, silvery from snout to postorbital region and across ventral portion of operculum. Patch of dark pigmentation covering bony portion of dorsal one-half of operculum; dark patch on operculum bordered posteriorly by unpigmented area. Ventral surface of head pale. Dorsal fin unpigmented other than for dusky pigmentation on distal one-half of fin in smaller individuals; dark pigmentation reduced to diffuse marginal dark band on anterior rays of larger specimens. Adipose fin unpigmented. Caudal fin unpigmented other than for diffuse dark pigmentation along distal portions of all rays and with dark pigmentation also more concentrated along interradial membranes. Anal and pelvic fins unpigmented. Pectoral fin with diffuse dusky pigmentation along anterior rays

and remainder of fin unpigmented. Maxillary barbel and outer mental barbel dusky on dorsal surfaces. Nasal barbel and medial mental barbel unpigmented.

Distribution.—Examined material originated in the region from eastern Pakistan to Calcutta, India (Fig. 9; see also Remarks). Jayaram (2006) reported that this species has been found throughout much of northern and northeastern India, as far south as the Mahanadi River basin in Orissa State. Outside of India, the species has been reported from Pakistan (Mirza, 2003), Nepal (Shrestha, 1981; Rajbanshi, 1982), Bhutan (Tamang, 1993), and Bangladesh (Rahman, 1989). Herein, we consider all of those citations as referring to *Eutropiichthys vacha*, as restricted herein, excluding all specimens of the genus from Myanmar and western Thailand fitting the previous broader definition of that species. In light of that extensive literature, we do not list each use of the name in the synonymy of that species but, instead, refer the reader to the publications cited above.

Remarks.—The concept of *Eutropiichthys vacha* common in the years prior to this study was of a single species that ranged from the Indus River system of eastern Pakistan to the Salween River basin of western Thailand. The results of the study indicate that the eastern limit of the distribution of *E. vacha* is rather apparently in eastern India and Bangladesh, with reports of that species from Myanmar and Thailand, being based on *E. britzi*, *E. burmannicus*, or *E. salweenensis*, either singly or in combination (see Remarks under accounts of those species).

Comments on Hypophthalmus goongwaree.—Sykes (1839:193) described *Hypophthalmus goongwaree* based on material collected in the Mota Mola River near Poona, Maharashtra, in peninsula India. The original description was followed by a more comprehensive description and accompanying illustration in Sykes (1841:369, pl. 64, fig. 3), which showed a species with a relatively small mouth that was both distinctly shorter than the orbit and terminated posteriorly distinctly in advance of the vertical running through the anterior margin of the eye. Day (1877:471, pl. 109, fig. 3), apparently following Günther (1864), considered this nominal species to be a valid species of the genus *Pseudeutropius*, a taxon that was much more encompassing at that time and included *Eutropiichthys murius* and species currently placed in *Clupisoma* and *Proeutropiichthys*. Day's account included an illustration of a specimen with a relatively short mouth that

also originated in peninsula India (Kurnool, Andhra Pradesh). Day's illustration included an inset showing tooth plates of the upper jaw and palate. The illustration shows a premaxillary tooth plate that is slender and curved, with no indication of an accessory lateral tooth plate, no medial vomerine tooth plate, and a relatively small, teardrop-shaped, tooth plate on the palate, which is remote from the midline of the palate. This combination of features differs substantially from those present in all of the material of *Eutropiichthys* examined during this study.

Hora (1937a:434–435, figs. 1a, 4a) reported on the examination of specimens that he considered conspecific to *Hypophthalmus goongwaree* and concluded that the specimens represented a valid species of *Eutropiichthys*. Hora did not indicate the location(s) from which his specimens originated and failed to cite catalog numbers for the material. Apparently based solely on the conclusions reached in that publication, subsequent authors have continued to recognize *Hypophthalmus goongwaree* within *Eutropiichthys* (Menon, 1999; Jayaram, 2006).

Comparisons between the brief statements in Hora (1937a) against the descriptions of *Hypophthalmus goongwaree* by Sykes (1839, 1841), together with those of Day (1877), raise doubts as to the generic assignment proposed by Hora (1937a). Of particular note is the relatively small extent of the gape of the nearly horizontal mouth of *Hypophthalmus goongwaree* as illustrated by Sykes (1841:pl. 64, fig. 3), which contrasts with the much longer, posteroventrally angled mouth that extends well under the orbit in the specimen considered conspecific with that species by Hora (1937a:fig. 1a). Hora commented (1937a:434–435) that “the characters italicized above are the most important diagnostic features of the genus and have afforded me a clue to refer . . . *Hypophthalmus goongwaree* . . . to the genus *Eutropiichthys*.” The externally most obvious of the features in question, “the mouth is wide and ascending” cited by Hora (1937a), is at variance with condition of the mouth illustrated by Sykes (1841:pl. 64, fig. 3) based on the type series and also by Day (1877) for a specimen very similar to that illustrated by Sykes and which also originated in peninsular India. The palatal tooth patch illustrated in Hora (1937a:fig. 4a) shows both an elongate palatal tooth plate and an accessory premaxillary tooth plate, neither of which are present in the illustration by Day (1877:pl. 109, fig. 3). The eight barbels in *Hypophthalmus goongwaree* reported by Hora (1937a) is the condition general to the Schilbidae as now defined and, thus, cannot serve to define *Eutropiichthys*. Thus, while it appears that the

one or more specimens examined by Hora (1937a) are possibly closely related to species of *Eutropiichthys* described above, there are a number of differences between Hora's specimen(s) and those described and illustrated by Sykes as *Hypophthalmus goongwaree* and redescribed by Day as *Pseudeutropius goongwaree*. Because of these discrepancies, and the lack of information on the provenance of Hora's specimens, we tentatively conclude that while Hora's specimen(s) may represent a species of *Eutropiichthys*, that species is not conspecific with *Hypophthalmus goongwaree* and, at this time, there is no basis for including *Hypophthalmus goongwaree* in *Eutropiichthys*.

KEY TO THE SPECIES OF *Eutropiichthys*

- 1a. Anal fin with 32 to 36 branched rays; pectoral fin with 11 or 12 branched rays (rivers of northern India, Bangladesh, and southern Nepal)..... *Eutropiichthys murius*
- 1b. Anal fin with 44 to 55 branched rays; pectoral fin with 14 to 17 branched rays 2
- 2a. Gill rakers on first arch 22 to 28 (rivers of Myanmar)..... *Eutropiichthys burmannicus*
- 2b. Gill rakers on first arch 15 to 20..... 3
- 3a. Fleshy narial flap extending medially past medial margin of naris, nearly reaching midline of head (Fig. 1B) (Irrawaddy River basin, Myanmar)..... *Eutropiichthys britzi*, new species
- 3b. Fleshy narial flap not extending medially much past medial margin of naris (Fig. 1A)..... 4
- 4a. Pectoral spine with smooth anterior margin; snout of larger individuals bluntly rounded in lateral view; total vertebrae 52 to 54 (lower Salween River basin, Thailand)..... *Eutropiichthys salweenensis*, new species
- 4b. Pectoral spine with rough anterior margin; snout of larger individuals distinctly pointed in lateral view; total vertebrae 49 to 51 (rivers of northern India, Bangladesh, and southern Nepal)..... *Eutropiichthys vacha*

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LITERATURE CITED

- BLEEKER, P. 1862. Notice sur les genres *Parasilurus*, *Eutropiichthys*, *Pseudeutropius*, et *Pseudopangasius*. Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen (Afdeling Natuurkunde), Amsterdam 14:390-399.
- DAY, F. 1877. The fishes of India; being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon; part 3, p. 369-552. Bernard Quaritch, London.
- DAY, F. 1889. Fishes. In: The Fauna of British India, Including Ceylon and Burma. W. T. Blanford (ed.). Taylor and Francis, London.
- GÜNTHER, A. 1864. Catalogue of the fishes in the British Museum, Vol. 5.—Catalogue of the Physostomi, containing the families Siluridae, Characidae, Haplochitonidae, Sternoptychidae, Scopelidae, Stomiatidae in the collection of the British Museum. Trustees, London.
- HAMILTON, F. 1822. An Account of the Fishes Found in the River Ganges and its Branches. Printed for A. Constable and company, Edinburgh & London.
- HORA, S. L. 1929. An aid to the study of Hamilton Buchanan's "Gangetic Fishes". *Memoirs of the Indian Museum* 9:169-192.
- HORA, S. L. 1937a. The game fishes of India. II.—The Bachhwa or Butchwa. *Journal of the Bombay Natural History Society* 39:431-446.
- HORA, S. L. 1937b. The game fishes of India. III.—Garua bachcha or Gaurchcha. *Journal of the Bombay Natural History Society* 39:659-678.
- HORA, S. L. 1941. Siluroid fishes of India, Burma and Ceylon. XI.—Fishes of the schilbeid genera *Silonepangasius* Hora, *Pseudeutropius* Bleeker, *Proeutropiichthys* Hora, and *Ailia* Gray. XII.—A further note on fishes of the genus *Clarias* Gronovius. *Records of the Indian Museum* 43:97-115.
- JAYARAM, K. C. 2006. Catfishes of India. Narendra Publishing House, Delhi.
- KOTTELAT, M. 1989. Zoogeography of the fishes from Indochinese inland waters with an annotated check-list. *Bulletin Zoologisch Museum, Universiteit van Amsterdam* 12:1-56.
- LEVITON, A. E., R. H. GIBBS, JR., E. HEAL, AND C. E. DAWSON. 1985. Standards in herpetology and ichthyology: part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia* 1985:802-832.
- MENON, A. G. K. 1999. Check list, freshwater fishes of India. *Records of the Zoological Survey of India, Miscellaneous Publication, Occasional Paper* 175:1-366.

- MIRZA, M. R. 2003. Checklist of freshwater fishes of Pakistan. Pakistan Journal of Zoology, Supplement Series no. 3. 1–30.
- NAIR, K. K. 1938. Changes in the internal structures of the air-bladders of *Eutropichthys vacha* (Ham.) and *Ailia coila* (Ham.) during growth. Records of the Indian Museum 40:183–187.
- PRASHAD, B., AND D. D. MUKERJI. 1929. The fish of the Indawgyi Lake and the streams of the Myitkyina District (Upper Burma). Records of the Indian Museum 31:161–223.
- RAHMAN, A. K. A. 1989. Freshwater fishes of Bangladesh. Zoological Society of Bangladesh, University of Dhaka, Dhaka, Bangladesh.
- RAJBANSHI, K. G. 1982. A General Bibliography on Fish and Fisheries of Nepal. Royal Nepal Academy, Kathmandu, Nepal.
- SHRESTHA, J. 1981. The Fishes of Nepal. Tribuvan University, Kathmandu.
- SMITH, H. M. 1945. The fresh-water fishes of Siam, or Thailand. Bulletin of the United States National Museum 188:1–622.
- SWAINSON, W. 1839. The natural history and classification of fishes, amphibians, and reptiles, or monocardian animals. Vol. 2. Longman, Orme Brown, Green and Longmans, and John Taylor, London.
- SYKES, W. H. 1839. On the fishes of the Deccan. Proceedings of the Zoological Society of London 1838:157–165.
- SYKES, W. H. 1841. On the fishes of the Dukhun. Transactions of the Zoological Society of London 2:349–378.
- TALWAR, P. K., AND A. G. JHINGRAN. 1991. Inland Fishes of India and Adjacent Countries. Oxford & IBH Publishing Co., New Delhi, Bombay, Calcutta.
- TAMANG, P. 1993. A Preliminary Annotated List of Fish Expected to Occur in Bhutanese River Systems. National Environmental Commission, Thimphu.
- VINCIGUERRA, D. 1890. Viaggio di Leonardo Fea in Birmania e regioni vicine. XXIV.—Pesci. Annali del Museo Civico de Storia Naturale di Genova (Ser. 2a) 9:129–362.
- WHITEHEAD, P. J. P., AND P. K. TALWAR. 1976. Francis Day (1829–1889) and his collections of Indian fishes. Bulletin of the British Museum (Natural History), Historical Series 5:1–189.
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