

**PANGASIUS BEDADO, A NEW SPECIES OF  
MOLLUSCIVOROUS CATFISH FROM SUMATRA (PISCES,  
SILURIFORMES, PANGASIIDAE)**

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ABSTRACT

*Pangasius bedado*, a new species of pangasiid catfish, is described from the Musi and Batang Hari river systems of southern Sumatra. Feeding mainly on clams, it grows to at least 1.3 m standard length and 21.5 kg. Its distinctive head and body shape and coloration distinguish it from other pangasiid species present in Sumatra. Cranial and other morphological characters indicate that it is most closely related to *P. conchophilus*, a mollusc-eating species endemic to the Mekong and Chao Phraya basins of Thailand and Indo-China, and to *P. nasutus*, a non-molluscivorous Sundaic species.

INTRODUCTION

The author visited fish markets in southern Sumatra observing Pangasiidae and other fishes in April–May 1999. All of the pangasiid species previously reported from Sumatra were found, and also *Pangasius bedado* new species which is described here. The survey failed to reveal any members of the subgenus *Neopangasius* in Sumatra. Thus *Neopangasius* is still known only from Borneo, where it accounts for 4 of the 10 known species of Pangasiidae. Of the 6 remaining pangasiid species known from Borneo, all except *Pangasius djambal* Bleeker 1846 and *P. macronema* Bleeker 1847 are also known from Sumatra. In addition, *Helicophagus waandersii* is known from the Mekong and Chao Phraya basins of Thailand and Indo-China, the Pahang basin in Peninsular Malaysia, and the Batang Hari and Musi basins in Sumatra (type locality Palembang) but not Borneo. This brings the number of pangasiid species known from Sumatra to six. All of them are significant in wild capture fisheries in southern Sumatra, with *H. typus*, *P. bedado*, and *P. nasutus* perhaps the most important. Apparently none of them has been utilized in aquaculture, or at least not extensively, and not in Sumatra, where the introduced species *Pangasius hypophthalmus* Sauvage 1881 is very commonly cultured. It is unknown whether *P. bedado* is restricted to Sumatra or also occurs in Borneo and perhaps Java. *Pangasius bedado* is most closely related to *P. conchophilus* Roberts and Vidhayanon 1991 and *P. nasutus* Bleeker 1862. This paper is part of the author's contribution to "Project Catfish Asia" (full title

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“Characterisation, utilization and maintenance of biological diversity for the diversification and sustainability of catfish culture in South-East Asia”), an effort to identify biological properties and evaluate aquaculture potential of species of Clariidae and Pangasiidae not previously utilized in aquaculture.

### Key to Sumatran Pangasiidae

This key should facilitate identification of pangasiid specimens from Sumatra including the new species. Some information in the key is based on specimens from localities other than Sumatra.

- 1a Snout relatively elongate and mouth narrow; roof of mouth with two vomerine tooth bands only (*Helicophagus*).....2  
 1b Snout relatively short and mouth relatively broad, roof of mouth with one or two vomerine and two palatine tooth patches (*Pangasius*).....3
- 2a Anal fin-rays 29–31; total gill rakers on first gill arch 27–30; mouth relatively broad, premaxillary teeth in one large, continuous broad band.....*H. typus* Bleeker 1858  
 2b Anal fin-rays 38–42; total gill rakers on first gill arch 8–12; mouth relatively narrow, premaxillary teeth in two small separate patches.....*H. waandersii* Bleeker 1858
- 3a Two palatine and two vomerine tooth patches.....*P. micronema* Bleeker 1847  
 3b Two palatine and one vomerine tooth patches.....4
- 4a Snout usually pointed; tooth band of upper jaw exposed when mouth is shut, at least in smaller specimens; eyes very small.....*P. nasutus* Bleeker 1862  
 4b Snout usually rounded; tooth band of upper jaw covered when mouth is shut; eyes relatively large.....5
- 5a First soft ray of dorsal fin with a filamentous projection; anal fin rays 32–44; head very short, its length at least six times in standard length; caudal fin uniformly dusky.....*P. polyuranodon* Bleeker 1852  
 5b Dorsal fin without filamentous projection; total anal fin rays 30–31; head length no more than 5 times in standard length; caudal fin with white distal margin.....  
 .....*Pangasius bedado* new species

### *Pangasius bedado* new species

Figures 1–3

?*Pangasius nasutus*: Kottelat, et al, 1993 (pl. 36).

Holotype.—MZB 2598, 375 mm, Palembang, 18 April 1999, T.R. Roberts.

Paratypes.—KUMF 3142, 410 mm, Jambi, 15 May 1999, T.R. Roberts; uncat., 390 mm, Hulu Rawas near Muara Rupit, Musi basin (Lubuklinggau market), 29 April 1999, T.R. Roberts (dry skeleton).

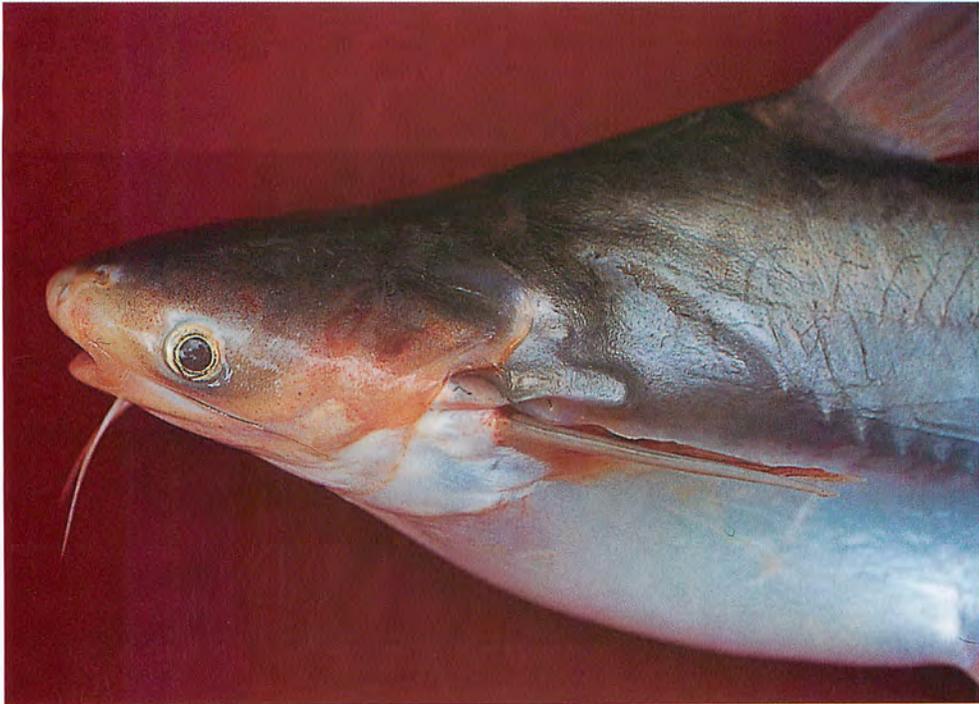
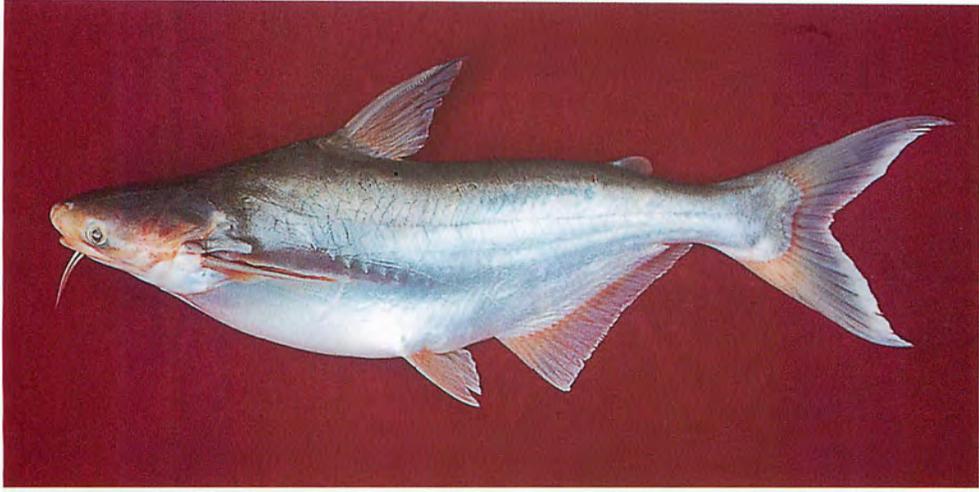


Figure 1. *Pangasius bedado*, 375 mm, holotype (Palembang).



Figure 2. *Pangasius bedado*, 390 mm, premaxillary and palatal tooth bands. Compare with ROBERTS & VIDTHAYANON, (1991, fig. 2) and VIDTHAYANON, (1993, fig. 25).

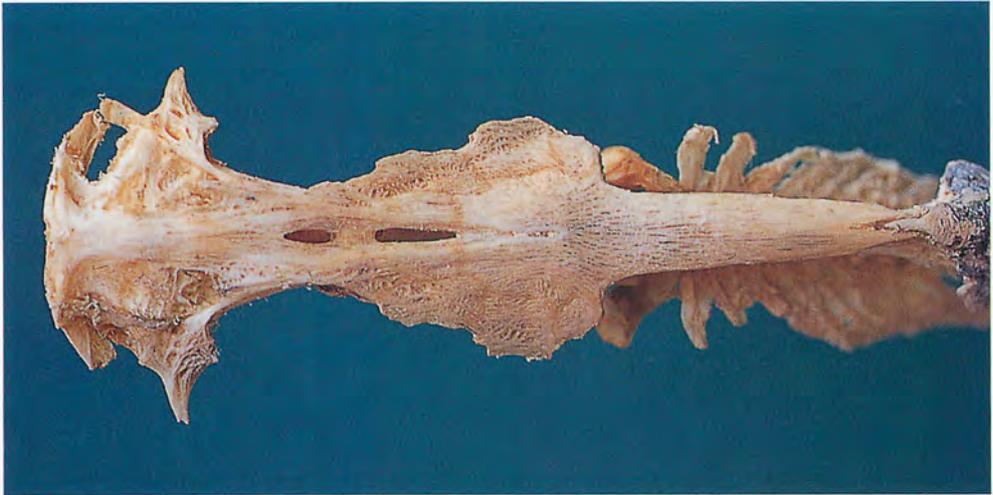


Figure 3. *Pangasius bedado*, 390 mm, dorsal view of cranium. Compare with VIDTHAYANON, (1993, fig. 27 and especially fig. 27h of *P. conchophilus*).

**Diagnosis.**—*Pangasius bedado* is a large molluscivorous species, attaining at least 1.3 m standard length (i.e., from snout-tip to base of caudal fin) and 21.5 kg (specimen observed in Palembang market on 18 May 1999), and feeding mainly on clams. It apparently differs from all other species of Pangasiidae except *P. nasutus* in having the caudal fin with a broad white distal margin (but caudal fin coloration is not known in all species of *Pangasius*). It differs from *P. nasutus* in having a much larger eye, and more rounded and less pointed snout and lower jaw, more gill rakers, and anal fin without pronounced white color distally. In *P. nasutus* almost the entire premaxillary tooth band is exposed when the mouth is closed, while in *P. bedado* all but the anteriormost teeth are covered when the mouth is closed. Also, in *P. nasutus* all of the teeth in the vomerine tooth band are conical with sharp tips, while in *P. bedado* only the anteriormost teeth are conical with sharp tips, the rest moliform with rounded tips (Fig. 2). Gill rakers on first gill arch simple, gradually increasing in size towards angle of arch; gill arch of 390-mm dried skeleton with 9+1+21–23=31–33 (count for rakers on lower limb of first gill arch includes 4 small rakers on basibranchial 1) (only 17–22 gill rakers on first gill arch in *P. nasutus*). Branchiostegal rays 8–9. Fins without filamentous extensions. Dorsal and pectoral fin spines moderately stout, equal in length and similarly serrated, with strong simple serrations of nearly uniform size. Humeral process slender and short, its length about one-fifth of that of the pectoral-fin spine. Pelvic fin-rays 6. Anal fin rays iv26–27 (last ray divided to base). Vertebrae 18+26=44 (first complete vertebra posterior to fused Weberian complex counted as fifth) in dried skeleton.

**Morphometrics.**—The following proportional measurements, expressed as times in standard length, are for the holotype followed by the paratype (in parentheses): head length 4.0 (4.5); head width (just anterior to pectoral fin origin) 5.1 (5.1); snout length 8.5 (10.1); eye diameter 33 (36); interorbital width 6.6 (6.4); premaxillary tooth band width 10.0 (–); vomerine tooth band width 16.3 (–); maxillary barbel length 6.6 (7.6); mental barbel length 11.7 (10.5); distance between mental barbels 20 (35); body depth (at dorsal fin origin) 3.75 (3.7); dorsal fin spine length 5.7 (5.5); pectoral fin spine 5.4 (5.8); pelvic fin length 7.3 (8.5); anal fin base 3.9 (3.7); predorsal length 2.5 (2.6); prepelvic length 2.0 (2.1); preanal length 1.65 (1.75); caudal peduncle length 6.4 (6.0); caudal peduncle depth 12.3 (12.4).

**Swim bladder.**—The swim bladder of the 390-mm specimen has three chambers, the first relatively broad, the second almost as long as the first but much more slender, and the third very short and slender, extending to the posteriormost part of the abdominal cavity to just in front of the anal fin origin. There is no indication of vascularisation of the inside of the chambers.

**Coloration.**—The most striking feature of the coloration of *P. bedado* is the white margin on the distal third of the caudal fin. Other fins dusky, without pronounced coloration. The anal fin may have a thin white margin, but it is not nearly so pronounced as the broad white margin observed in *P. nasutus*. Head and body brownish or brownish green dorsally and laterally, white ventrally. Coloration of juveniles unknown; coloration of smallest specimens observed, about 20 cm standard length, same as larger fish.

**Sexual dimorphism.**—None observed. The anal fin appears to of the same size and shape in both sexes.

Etymology.—The species name is from the local name “bedado”, by which the species is well known in Palembang, meaning “broad-chested.” The species actually is relatively broad-chested compared to other Sumatran pangasiids.

Synonymy.—*Pangasius bedado* apparently has not been discussed or recognized previously. The photograph attributed to *P. nasutus* by KOTTELAT, *ET AL.* 1993 (locality not stated) probably represents *P. bedado* (eye too large for *P. nasutus*). The photograph attributed to *P. lithostoma* Roberts 1989 looks more like *P. nasutus* (KOTTELAT, *ET AL.* 1993, pl. 35).

## DISCUSSION

Molluscivory in Pangasiidae.—The exclusively or almost exclusively mollusc-feeding habits of *Helicophagus typus* and *H. waandersii* are relatively well-documented (ROBERTS & VIDTHAYANON, 1991; MUSIKASINTHORN, 1998). Molluscivory also occurs in several species of *Pangasius*, notably in *P. conchophilus* and in the new species described here. These four species swallow large numbers of shelled molluscs (mainly clams) whole, without crushing or damaging the shells. Only the soft parts of the molluscs are digested. The vent is greatly expandible to facilitate defecation of the shells. Additional pangasiids that occasionally eat mollusks include *P. bocourti*, *P. pangasius*, and *P. polyuranodon* (ROBERTS & VIDTHAYANON, 1991: 116). Several *P. bedado* handled in markets had the guts more or less full of shelled molluscs (determined by palpitation). Guts were opened and their contents observed in three specimens. The holotype has the stomach nearly empty, with only a small amount of gritty detritus, the 410-mm paratype has substantial quantities of gritty detritus, and the 390-mm specimen that was skeletonized had the guts full of shelled molluscs, mainly clams but also some small snails.

Little is known about food habits of *P. nasutus*, but it is apparently not a molluscivore. Specimens of 148 and 170 mm standard length from the Kapuas River in Borneo had stomach contents consisting of prawns, insects, a *Leiocassis* catfish, and carp scales (ROBERTS & VIDTHAYANON, 1991: 133). Two specimens of 282–292 mm in standard length from the Batang Hari River basin of Sumatra collected in May 1999 have the guts full of detritus, one with bits of seeds or fruits but neither with molluscs.

Relationships.—*P. bedado* is closest to *P. conchophilus*, a mainland Southeast Asian species known only from the Chao Phraya and Mekong basins, and to *P. nasutus*, a non-molluscivorous species known from Sumatra, Borneo, and the Malay Peninsula. The three species share 1) a tendency to have a pointed snout (best observed in dorsal view), most pronounced in juveniles and in *P. nasutus*, least pronounced in *P. bedado*; 2) similar appearance overall, including head and body shape; 3) mental barbels relatively long and maxillary barbels relatively short, length of maxillary barbel about 1.3–2.0 times that of mental barbel; and 4) distinctively-shaped crania, involving marked narrowing of the frontal bones greatest near the end of the anterior cranial fontanel (not present in any other pangasiids) and very long supraoccipital processes (see Fig. 3 for *P. bedado*). These tendencies in modified cranial shape compared to other pangasiids are most pronounced

in *P. conchophilus* and least pronounced in *P. nasutus*, with *P. bedado* intermediate. *Pangasius bedado* differs from *P. conchophilus* in having a broader ethmoid region, with correspondingly broader upper and lower oral tooth bands; and total gill rakers on first gill arch 31–33 (instead of only 13–20). It is unclear whether the molluscivorous pangasiid genus *Helicophagus* is more closely related to these two molluscivorous *Pangasius* species than to other species of *Pangasius*. Shape of cranium and of tooth bands in *Helicophagus waandersii* differs substantially from that in *P. badado* and *P. conchophilus*.

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#### REFERENCES

- KOTTELAT, M., A.J. WHITTEN, S.R. KARTIKASARI, AND S. WOERJOATMODJO. 1993. *Freshwater Fishes of Western Indonesia and Sulawesi*. Periplus Editions Ltd., lvii+293 pp., 84 pls.
- MUSIKASINTHORN, P., K. UTSUGI, AND K. WATANABE. 1998. Rediscovery of the pangasiid catfish *Helicophagus typus* in Borneo. *Nat. Hist. Bull. Siam Soc.* 46 (2): 197–201.
- ROBERTS, T.R., AND C. VIDTHAYANON. 1991. Systematic revision of the Asian catfish family Pangasiidae, with biological observations and descriptions of three new species. *Proc. Acad. Nat. Sci. Philadelphia* 143: 97–144.
- VIDTHAYANON, C. 1993. *Taxonomic revision of the catfish family Pangasiidae*. PhD thesis, Tokyo University of Fisheries, v+205 pp.

