

# ***Bagrichthys vaillantii* (Popta, 1906), a valid species of bagrid catfish from eastern Borneo (Teleostei: Siluriformes)**

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Ng, H.H. *Bagrichthys vaillantii* (Popta, 1906), a valid species of bagrid catfish from eastern Borneo (Teleostei: Siluriformes).

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*Bagrichthys vaillantii* (Popta, 1906), a species of bagrid catfish previously considered a junior synonym of *B. macracanthus* Bleeker, 1854, is found to be a valid species distinct from the latter. It can be differentiated from *B. macracanthus* in having a shorter dorsal spine, smaller eye and steeper dorsal profile.

## **Introduction**

Members of the highly specialized and unusually-shaped bagrid catfish genus *Bagrichthys* Bleeker, 1858, live in large muddy rivers throughout Southeast Asia and are characterised by their elongate and laterally compressed caudal peduncle, the dorsally-directed serrations on the posterior edge of the dorsal-fin spine, gill membranes united but free from the isthmus, and a long adipose fin without a free posterior margin (Roberts, 1989). There are currently five nominal species in the genus, but Roberts (1989) recognises only four, viz. *B. hyselopterus* (Bleeker, 1852), *B. macracanthus* (Bleeker, 1854), *B. macropterus* (Bleeker, 1854) and *B. micranodus* Roberts, 1989. *Bagrichthys vaillantii* (Popta, 1906), described from the Mahakam River in eastern Borneo, is considered a junior synonym of *B. macracanthus*.

Recently, I had the opportunity to examine specimens of *Bagrichthys* from the Mahakam River drainage. Comparisons of these specimens with the holotype and specimens of *B. macracanthus* from other parts of Southeast Asia and the holotype of *B. vaillantii* convinced me that the two species are distinct. The purpose of this paper is therefore to revalidate and redescribe *B. vaillantii*.

## **Methods**

Measurements were made point to point with dial callipers and data recorded to tenths of a millimetre. Counts and measurements were made on the left side of specimens whenever possible. Subunits of the head are presented as proportions of head length (HL). Head length and measurements of body parts are given as proportions of standard length (SL). Measurements and counts were made following Ng and Ng (1995) with the following exceptions: head length is measured from the anterior point of SL to the posteriormost extremity of the fleshy opercular flap. Length of the adipose-fin base is measured from the anteriormost point of origin to the posteriormost point of the adipose-fin base. Post-adipose distance is measured from the posteriormost point of the adipose-fin base to the posterior point of SL.

The following additional measurements were made: predorsal, preanal, prepelvic and prepectoral lengths are those measured from the anterior point of SL to the ante-

rior basis of the dorsal, anal, pelvic and pectoral fins respectively. Lengths of the dorsal- and anal-fin bases include the respective bases of the first and last rays and the distance between them. Pelvic- and pectoral-fin lengths are measured from the origin to the tip of the longest filament. Dorsal and pectoral spine lengths are measured from the base to the tip. Dorsal to adipose distance is measured from the base of the last dorsal-fin ray to the origin of the adipose fin. Adipose maximum height is the maximum height of the adipose fin. Caudal-fin length is the length of the longest ray of the upper lobe measured from the posterior margin of the hypural complex. The length of the caudal peduncle is measured from base of the last anal-fin ray to the posterior point of SL. Nasal-, maxillary- and mandibular-barbel lengths are measured from the base to the tip.

Fin ray counts were obtained under a binocular dissecting microscope using transmitted light. Numbers in parentheses following a particular fin-ray, branchiostegal-ray or gill-raker count are the numbers of examined specimens with that count. Vertebral counts were taken from radiographs following the method of Roberts (1994). Numbers in parentheses following a particular vertebral count are the numbers of radiographed specimens with that count.

Drawings of the specimens were made with a Nikon SMZ-10 microscopic camera lucida. Institutional codes follow Eschmeyer (1998).

### Taxonomy

#### *Bagrichthys vaillantii* (Popta, 1906) (fig. 1)

*Leiocassis macropterus* Vaillant, 1902: 58.

*Bagroides vaillantii* Popta, 1906: 228.

*Bagrichthys macracanthus* (non Bleeker); Kottelat, 1994: 412.

*Bagroides macracanthus*; Weber & de Beaufort, 1913: 350 (in part).

*Bagroides* cf. *macracanthus*; Christensen, 1992: 600.

*Bagroides* cf. *macropterus*; Christensen, 1992: 600.

Material.— Holotype, ♂, 90.6 mm SL (RMNH 7839), Borneo: Mahakam River basin, Tepoe, coll. A.W. Nieuwenhuis, 1896-1897; 1 ♀, 102.1 mm SL (CAS 93398), Eastern Borneo, coll. Otte, date unknown; 1 ♀, 172.3 mm SL (CAS 93403), Borneo: Kalimantan Timur, Sungai Belayan from mouth of Sungai Sentekan southwards for about 6 km at all spots with overhanging branches, coll. M.S. Christensen et al., 15.vi.1982; 1 ♂, 190.0 mm SL (CAS 94730), Borneo: Kalimantan Timur, Sungai Sentekan about 1.5 km upstream from where it joins Sungai Belayan, coll. M. S. Christensen et al., 14-15.vi.1982; 5 ♀♀, 107.8-152.8 mm SL (CMK 7635), Borneo: Kalimantan Timur, stream connecting Mahakam River to Danau Semajong (0°14'S 116°33'E), coll. M. Kottelat, 1.viii.1991.

Comparative material.— *Bagrichthys hypselopterus* (Bleeker, 1852): CAS 49366, 2 ex., 228.4-242.7 mm SL; Borneo: Kalimantan Barat, fish market at Sintang; T.R. Roberts and S. Wirjoatmodjo, 19.vii.1.viii.1976. CAS 49367, 1 ex., 179.2 mm SL; Borneo: Kalimantan Barat, Sungai Tawang near Danau Pengembung; T.R. Roberts and S. Wirjoatmodjo, 14-15.viii.1976. ZRC 40472, 1 ex., 242.0 mm SL; Sumatra: Jambi, Pasar Angso Duo (fish market); H.H. Tan et al., 5-8.vi.1996. ZRC 41532, 15 ex., 166.1-279.5 mm SL; Sumatra: Jambi, Pasar Angso Duo (fish market); H.H. Tan and H.H. Ng, 23-29.vii.1997. ZRC 41898, 1 ex., 208.8 mm SL; Sumatra: Jambi, Pasar Angso Duo (fish market); H. H. Tan et al., 21-28.xi.1996. *B. macracanthus* (Bleeker, 1854): BMNH 1863.12.4.108, 1 ex., holotype, 183.0 mm SL; Sumatra: Muarakompeh; Bleeker collection. CMK 8352, 1 ex., 129.0 mm SL; Sumatra: Riau, vicinity of

Seberida, Sungai Sinegar; M. Kottelat, 1991-92. CMK 11278, 2 ex., 104.3-128.5 mm SL; Sumatra: Jambi, Danau Arang Arang near Arang Arang; M. Kottelat, 8.vi.1994. ZRC 38547, 2 ex., 36.2-67.3 mm SL; Sumatra: Jambi, Sungai Kumpeh in Arang Arang; M. Kottelat, 29.v.1994. ZRC 38633, 1 ex., 108.4 mm SL; Sumatra: Jambi, Danau Arang Arang and Sungai Kembang; M. Kottelat, 8.vi.1994. ZRC 38864, 2 ex., 104.8-107.5 mm SL; Borneo: Kalimantan Tengah, Sungai Barito between Muara Jan and Muara Untu; M. Kottelat, 22.vi.1995. ZRC 38876, 1 ex., 132.4 mm SL; Borneo: Kalimantan Tengah, market in Puruk Cahu; M. Kottelat, 22.vi.1995. ZRC 39034, 1 ex., 101.9 mm SL; Sumatra: Riau, Sungai Bengkwan, tributary of Indragiri (Batang Kuantan), 4 hrs downstream from Rengat; P.K.L. Ng et al., 13-14.vi.1995. ZRC 41533, 1 ex., 145.2 mm SL; Sumatra: Jambi, Pasar Angso Duo (fish market); H. H. Tan and H.H. Ng, 23-29.vii.1997. ZRC 41897, 1 ex., 169.2 mm SL; Sumatra: Jambi, Pasar Angso Duo (fish market); H.H. Tan et al., 21-28.xi.1996. *B. macropterus* (Bleeker, 1853): USNM 230275, 4 ex., 99.3-148.5 mm SL; Borneo: Kalimantan Barat, Kapuas mainstream 58 km NE of Sintang and 1 km downstream from Sebruang; T. Roberts and S. Wirjoatmodjo, 16.viii.1976. ZRC 38997, 1 ex., 224.8 mm SL; Sumatra: Jambi, Pasar Angso Duo (fish market); P.K.L. Ng et al., VI.1995. ZRC 41534, 5 ex., 199.7-296.9 mm SL; Sumatra: Jambi, Pasar Angso Duo (fish market); H.H. Tan and H. H. Ng, 23-29.vii.1997. *B. micranodus* (Roberts, 1989): CAS 49369, 2 ex., paratypes, 71.3-94.7 mm SL; USNM 230276, 3 ex., paratypes, 58.1-75.2 mm SL; Borneo: Kalimantan Barat, Kapuas mainstream 58 km NE of Sintang and 1 km downstream from Sebruang; T. Roberts and S. Wirjoatmodjo, 16.viii.1976. CMK 7015, 1 ex., 180.0 mm SL; Borneo: Kalimantan Barat, Kapuas River mainstream at Nanga Embaloh (0°50'N 112°35'E); M. Kottelat et al., 26-27.iv.1990.

**Diagnosis.**— *Bagrichthys vaillantii* can be differentiated from its congeners in having the following unique combination of characters: the mouth opening relatively large and broad, the oral dentition well-developed with numerous exposed teeth forming well-defined tooth bands, a moderately elongate dorsal spine (dorsal-spine length 18.2-21.9 %SL) with 15-19 serrae in adults; eye diameter 11.3-15.7 %HL

**Description.**— Head and body compressed. Dorsal profile rising steeply from tip of the snout to origin of the dorsal fin, then sloping gently ventrally from there to the end of the caudal peduncle. Ventral profile horizontal to origin of anal, then sloping dorsally to the end of the caudal peduncle. In %SL: head length 19.7-21.3, head width



Fig. 1. *Bagrichthys vaillantii* (Popta), CAS 94730, 190 mm SL; Borneo: Mahakam River basin.

12.9-13.9, head depth 15.2-19.0, predorsal distance 35.6-39.8, preanal length 55.7-59.9, prepelvic length 37.8-42.3, prepectoral length 17.6-19.8, body depth at anus 19.3-24.4, length of caudal peduncle 29.4-31.4, depth of caudal peduncle 6.8-7.5, pectoral-spine length 11.5-14.4, pectoral-fin length 15.2-19.7, dorsal-spine length 18.2-21.9, length of dorsal-fin base 9.4-15.2, pelvic-fin length 14.7-18.5, length of anal-fin base 11.9-13.1, caudal-fin length 23.7-28.1, length of adipose-fin base 46.2-49.9, adipose maximum height 8.2-11.1, post-adipose distance 8.9-12.6; in %HL: snout length 29.7-34.5, interorbital distance 29.4-35.4, eye diameter 11.3-15.7, nasal barbel length 26.5-38.3 (females) or 78.9 (male), maxillary barbel length 52.4-67.1 (females) or 89.3 (male), inner mandibular barbel length 15.7-20.5 (females) or 20.0 (male), outer mandibular barbel length 26.2-30.2 (females) or 37.3 (male). Branchiostegal rays 5 (7) or 6 (1). Gill rakers 3+8=11 (1) or 4+11=15 (1). Vertebrae 19+23=42 (1), 20+25=45 (1) or 19+27=46 (1).

Fin ray counts: dorsal I,7 (8); pectoral I,8,i (1), I,9 (1), I,9,i (3) or I,10 (1); pelvic i,5 (8); anal iii,11 (1), iv,10 (1), iv,11 (4), v,11 (2); caudal 8/9 (7) or 9/8 (1). Dorsal origin nearer tip of snout than caudal flexure. Dorsal spine stout, with 15 (1), 16 (2), 17 (1), 18 (1) or 19 (1) serrae posteriorly. Pectoral spine stout, with 10 (1), 14 (1), 15 (2) or 16 (1) large serrae posteriorly.

Colour: dorsolateral surface of head and body almost uniformly brown, with very faint lighter-coloured bands located on sides of body below anterior part of adipose-fin base and on caudal peduncle. Ventral surfaces paler. Fins hyaline.

Nomenclatural note.— *Bagrichthys vaillantii* (Popta, 1906) was originally described as *Leiocassis macropterus* by Vaillant (1902). Popta (1906) then placed this species in *Bagroides*, but the name became secondarily preoccupied by *Bagroides macropterus* Bleeker, 1853. A new name was therefore necessary and in a footnote on page 228, Popta (1906) renamed Vaillant's species *Bagroides vaillantii*.

According to Article 59(b) of the International Code of Zoological Nomenclature, a junior secondary homonym replaced before 1961 is permanently invalid. Therefore the valid name of this species is *B. vaillantii* (Popta, 1906). The reader is referred to Vaillant (1902) for the original description of this species (as *L. macropterus*).

Remarks.— *Bagrichthys hypselopterus*, *B. macracanthus* and *B. vaillantii* can be differentiated from other species of *Bagrichthys* in having the mouth opening relatively large and broad (vs. small and narrow), the oral dentition well-developed with numerous exposed teeth forming well-defined tooth bands (vs. extremely reduced with few scattered teeth buried in soft tissue) and a moderately or extremely elongate (vs. short) dorsal spine with 18 or more (vs. 15 or less) serrae in adults (Roberts, 1989).

*Bagrichthys vaillantii* most clearly resembles *B. macracanthus* and has been considered its junior synonym by most authors (see synonymy list above). As such, it can be clearly differentiated from *B. hypselopterus* in having the nape and dorsal-fin base with a moderately steep (vs. very steep) profile, a much shorter dorsal spine with 15-19 serrae (vs. 60 or more) in adults, jaw teeth not noticeably (vs. markedly) heterodont, inner and outer mandibular barbels with straight (vs. extremely convoluted) anterior margins, and upper and lower caudal fin lobes lacking (vs. with) long filamentous extensions.

*Bagrichthys vaillantii* can be differentiated from *B. macracanthus* in having a smaller eye (eye diameter 11.3-15.7 %HL vs. 17.1-20.7) and dorsal spine (dorsal-spine length 18.2-21.9 %SL vs. 26.9-32.9), and a more steeply sloping dorsal profile (fig. 2). *Bagrichthys vaillantii* is only known from the Mahakam River drainage in eastern Borneo.

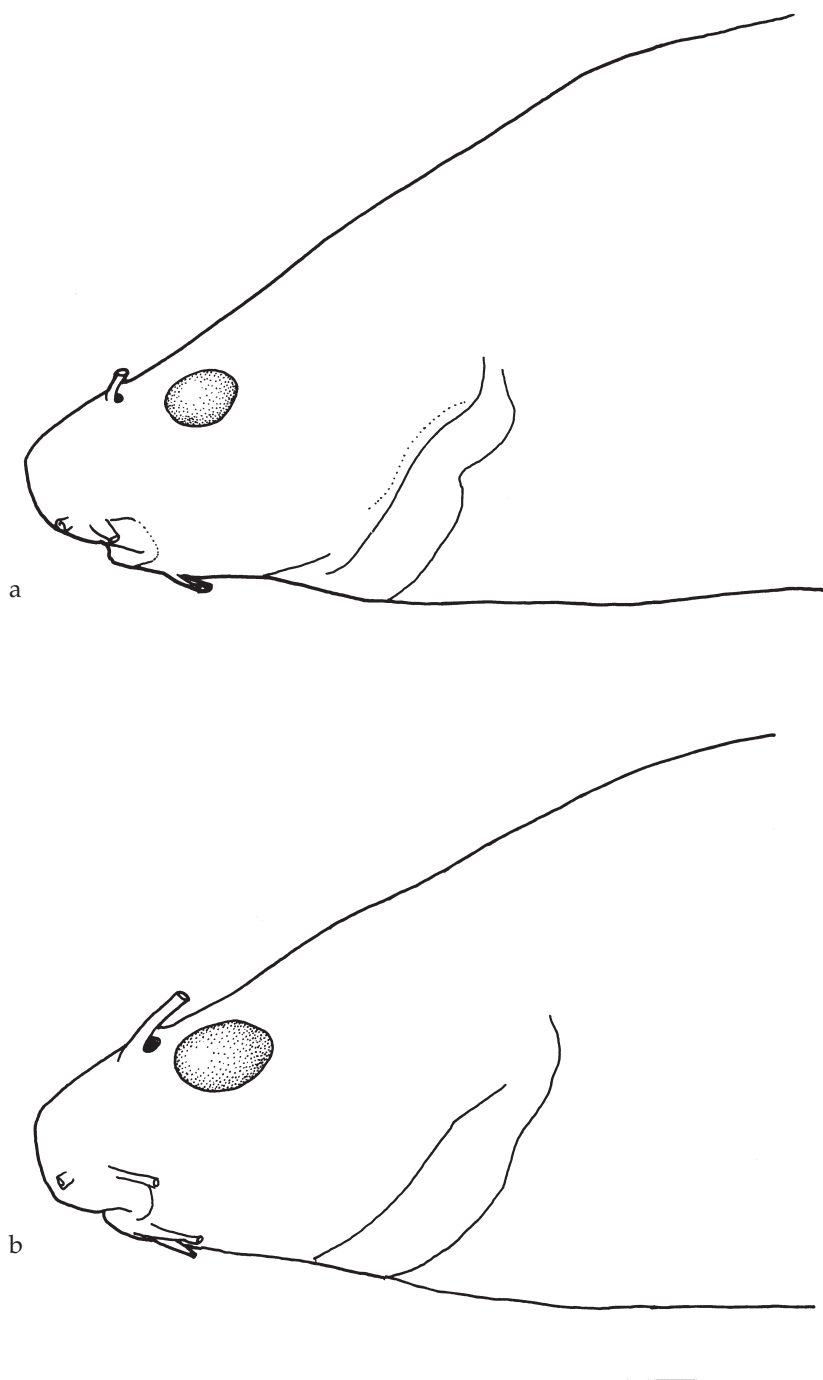


Fig. 2. Schematic illustration showing dorsal profiles of: a. *Bagrichthys macracanthus* Bleeker, CMK 11278, 104.3 mm SL, and b. *B. vaillantii* (Popta), CMK 7635, 107.8 mm SL. Scale bar represents 10 mm.

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