

## A review of the *Ompok hypophthalmus* group of silurid catfishes with the description of a new species from South-East Asia

H. H. NG

*Fish Division, Museum of Zoology, University of Michigan, 1109 Geddes Avenue, Ann Arbor, MI 48109-1079, U.S.A.*

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The identities of the nominal species in the *Ompok hypophthalmus* group of silurid catfishes, namely *Ompok hypophthalmus*, *O. macronema* and *O. urbaini* are verified in this study. *Ompok macronema* is hypothesized to be a junior synonym of *O. hypophthalmus*, and *O. urbaini* (previously considered a junior synonym of *O. hypophthalmus*) is hypothesized to be valid, distinct species. *Ompok hypophthalmus* is restricted to Java and the Barito River drainage in southern Borneo, and the material previously identified as *O. hypophthalmus* from Sumatra, the Malay Peninsula and Borneo represents *O. rhadinurus*, a new species. © 2003 The Fisheries Society of the British Isles

Key words: catfish; new species; *Ompok*; Siluridae; South-East Asia.

### INTRODUCTION

Catfishes of the genus *Ompok* La Cepede, are medium-sized members of the Siluridae usually found in lakes and large rivers throughout South and South-East Asia. The genus has been demonstrated to be paraphyletic by Bornbusch (1995), who recognized four distinct clades within *Ompok*, namely the *O. bimaculatus* (Bloch) group, *O. leiacanthus* (Bleeker) group, *O. hypophthalmus* group (Bleeker) and the *O. eugeneiatus* (Vaillant) group. The *O. hypophthalmus* group is diagnosed by each of the cartilaginous plates supporting the mandibular barbels having two posterior processes (*v.* plates poorly developed or with a single dorsolateral process or elongate and hourglass-shaped and without processes).

A detailed examination of *O. hypophthalmus* from throughout its range reveals that there are distinct differences among the populations from Java, Indo-China and the rest of Sundaic South-East Asia (Borneo, Sumatra and the Malay Peninsula). These differences are considered distinct enough to warrant recognition of the three populations as belonging to distinct species. Therefore, the material from Java is assigned to *O. hypophthalmus*, those from Indo-China assigned to *O. urbaini* (Fang & Chaux) and those from the rest of Sundaic

South-East Asia assigned to a third species, which is described here as *O. rhadinurus*, a new species. The purpose of this study is to rediagnose and redescribe all three species of *Ompok* belonging to the *O. hypophthalmus* group.

## MATERIALS AND METHODS

Measurements were made with a dial calliper and data recorded to 0.1 mm. Counts and measurements were made on the left side of the specimens when possible. In tables and text, subunits of the head are presented as proportions of head length ( $L_H$ ). Head length and measurements of body parts are given as proportions of standard length ( $L_S$ ).

The measurements and terminologies follow largely those of Bornbusch (1991), with the following exceptions: length of the dorsal base includes the base of the first and last dorsal-fin ray and the distance between them. Pelvic-fin length is measured from the base to the tip of the longest ray. Caudal-fin length is the length of the longest ray of the upper lobe measured from the posterior margin of the hypural complex. Body depth at the anus is measured as the vertical distance from the midline of the dorsal surface to the midline of the ventral surface at the anus. Head width is measured across its widest point (at a point immediately anterior to the base of pectoral spine) but discounting any lateral projection of the branchiostegal membranes. Head depth is measured at the base of the occipital process. Interorbital length is the shortest distance across the bony interorbit.

Drawings of the specimens were made with a Wild M5 microscopic camera lucida. Institutional acronyms follow Eschmeyer (1998).

## RESULTS

### *OMPOK HYPOPTHALMUS* (BLEEKER, 1846) [FIGS 1 AND 5(A)]

*Silurus hypophthalmus* Bleeker, 1846a: 149 (type locality: Batavia); 1855b: 395, 396.

*Silurus hijpopthalmus* Bleeker, 1846b: 284.

*Silurus macronema* Bleeker, 1851a: 203 (type locality: Bandjermassing); 1851b: 420; 1852: 412; 1853: 432; 1854: 65; 1855a: 156.

*Silurodes hypophthalmus* Bleeker, 1858: 272 (in part); 1862: 83, Pl. 87 Fig. 2 (in part); Weber & de Beaufort, 1913: 205 (in part).

*Silurodes macronema* Bleeker, 1857: 8; 1860a: 19.

*Callichrous hypophthalmus* Günther, 1864: 48 (in part).

*Callichrous macronema* Günther, 1864: 49.

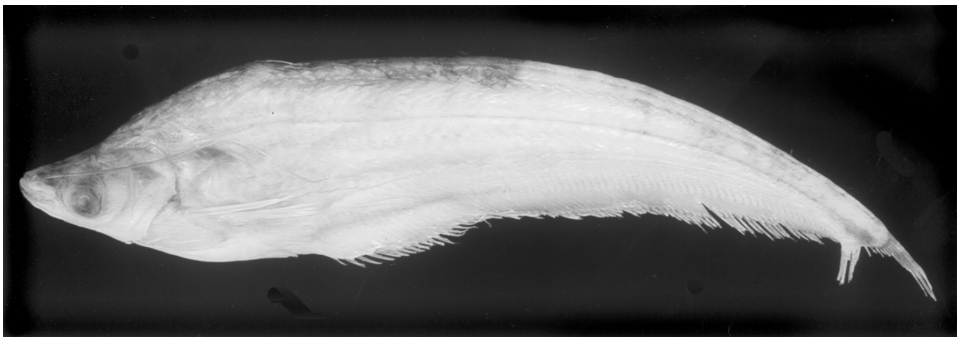


FIG. 1. *Ompok hypophthalmus*, ZRC 40036, 175.3 mm  $L_S$ ; Borneo: Banjarmasin.

*Ompok hypophthalmus* Haig, 1952: 105 (in part); Kottelat *et al.*, 1993: 70 (in part); Roberts, 1993a: 32.

#### *Material examined*

UMMZ 155798, 6 ex., 126.0–130.8 mm  $L_S$ ; Java: vicinity of Batavia. ZMA 120.543, 257.2 mm  $L_S$ ; Java: East Java, Surabaya. CMK 11856, 1 ex., 137.8 mm  $L_S$ ; Borneo: Kalimantan Tengah, market in Puruk Cahu. ZRC 40036, 1 ex., 175.3 mm  $L_S$ ; Borneo: Kalimantan Selatan, Banjarmasin, Pasar Kuin.

#### *Diagnosis*

A species of *Ompok* with a combination of the following characters: head width 10.0–10.7%  $L_S$ , depth of caudal peduncle 4.3–5.1%  $L_S$ , 74–80 anal-fin rays, and 54–55 vertebrae.

#### *Description*

Body and head laterally compressed. Dorsal profile somewhat humped with a distinct nuchal concavity, descending gently from dorsal-fin origin to snout tip, and again from the posteriormost dorsal-fin ray to the caudal peduncle. Anterior profile of snout rounded. Anterior pair of nostrils tubular and anteromedial to maxillary barbel base. Posterior pair of nostrils bordered by fleshy dorsal and ventral membranes and posteromedial to maxillary barbel base.

Mouth terminal; gape oblique. Rictal lobes narrowly continuous at rictus and deeply subtended by submandibular groove, with upper rictal lobe lacking skin fold.

Teeth villiform. Dentary teeth in slightly curved, elongate bands narrowing posteriorly, reaching from symphysis almost to mouth corners; premaxillary teeth in broader, slightly curved rectangular bands. Vomerine teeth in a single crescentic band.

Maxillary barbels slightly flattened for entire length, reaching to anterior third of anal fin. Single pair of mandibular barbels present; located slightly anterolateral to gular fold; barbels flattened for most of length, reaching to vertical through anterior orbital margin.

Eyes small, subcutaneous; located in middle of head; visible dorsally and more so ventrally.

Gill membranes separate and overlapping, free from isthmus. Branchiostegal rays 10 (2) or 11 (4). Gill rakers short, anteriormost rakers on lower first arch small and widely spaced; 3 on epibranchial and 11–13 on ceratobranchial.

Distal margin of pectoral fin broadly convex, with I,11 (1), I,12 (1), I,13 (2) or I,14 (2) rays. Proximal two-thirds of first pectoral-fin element co-ossified into a spine without anterior serrations. Pectoral spine with 2–4 distinct posterior serrations, increasing in size distally; proximal articulated segments with 2–5 smaller posterior serrations; distalmost segments lack dentition.

Distal margin of pelvic-fin convex, with i,5,i (6) rays. Distal margin of dorsal fin pointed, with i,2,i (4) or i,3 (2) rays; segments of first ray not co-ossified to form spine. Distal margin of anal fin straight, with 74 (1), 77 (1), 78 (1), 79 (1) or 80 (2) rays; separate from caudal fin. Integument over anal fin thickened proximally for slightly more than half of ray lengths; fin-ray erector muscles extending along anterior edges of anal-fin rays, ventralmost extent of muscles that of thickened integument. Caudal fin strongly forked; principal rays i,7,7,i

(2), i,7,8,i (2), i,8,7,i (1) or i,8,8,i (1). Urogenital papillae of both sexes located immediately posterior to insertions of pelvic fins.

In %  $L_S$ :  $L_H$  18.1–19.6, head width 10.0–10.7, head depth 10.1–10.7, pre-dorsal distance 28.1–31.2, preanal length 33.4–36.1, prepelvic length 31.0–31.6, prepectoral length 19.4–20.6, body depth at anus 18.9–21.9, depth of caudal peduncle 4.3–5.1, pectoral-spine length 10.6–12.4, pectoral-fin length 18.1–19.1, length of dorsal-fin 9.5–12.6, pelvic-fin length 5.1–6.4, length of anal-fin base 60.4–66.1, caudal-fin length 17.7–19.5; in %  $L_H$ : snout length 42.1–44.7, inter-orbital distance 46.8–51.9, eye diameter 16.9–21.1, maxillary barbel length 262.8–341.4, mandibular barbel length 27.8–43.0. Vertebrae 11 + 43 = 54 (1), 12 + 42 = 54 (1) or 12 + 43 = 55 (5).

### Colour

Dorsal surface and sides of head pale brown, fading to a lighter colour on flanks and thickened integument over anal fin. Lateral line with a thin black stripe. Another faint black midlateral line below lateral line variably present, usually as series of scattered melanophores broadening both at humeral region and base of caudal peduncle to form dark roughly elliptical spots. Maxillary and mandibular barbels pale brown, gradually fading in colour distally. Anal fin with hyaline ventral margin. All other fins hyaline, with small dark-brown spots present in some specimens.

### Distribution

Known from the Ciliwung and Brantas river drainages in Java and the Barito River drainage in southern Borneo (Fig. 2).

### Biology

The biology of *O. hypophthalmus* is unknown, but is most probably similar to *O. rhadinurus* and *O. urbaini*.

## *OMPOK RHADINURUS* NEW SPECIES [FIGS 3 AND 5(b)]

*Silurus hijpophthalmus* (non Bleeker) Bleeker, 1854: 65.

*Silurodes hypophthalmus* (non Bleeker) Bleeker (1858): 272 (in part); 1858–59: 263, 264; 1860b: 6, 47; 1862: 83, Pl. 87 Fig. 2 (in part); Weber & de Beaufort, 1912: 534; 1913: 205 (in part); Smith, 1933: 77 (in part); 1945: 336; Hardenberg, 1936: 232; Suvatti, 1936: 72 (in part); 1950: 291 (in part); 1981: 87 (in part); Imaki *et al.*, 1981: 40; Mizuno & Furtado, 1982: 324, Pl. 4C Fig. 4.

*Callichrous hypophthalmus* (non Bleeker) Günther, 1864: 48 (in part); Volz, 1904: 465; 1907: 163.

*Callichrous pabda* (non Hamilton) Duncker, 1904: 172.

*Ompok hypophthalmus* (non Bleeker) Haig, 1952: 105 (in part); Roberts, 1989: 150; Kottelat *et al.*, 1992: 10; Ng *et al.*, 1992: 21; Kottelat *et al.*, 1993: 70, Pl. 34 (in part); Lim *et al.*, 1993: 7; Khan *et al.*, 1996: 39; Lim *et al.* (1999): 383; Ng & Tan, 1999: 357; Tan & Ng, 2000: 285.

*Ompok bimaculatus* (non Bloch) Mohsin *et al.*, 1977: 76; Mohsin & Ambak, 1983: 140, Fig. 106.

*Ompok pabda* (non Hamilton) Mohsin & Ambak, 1982: 110.

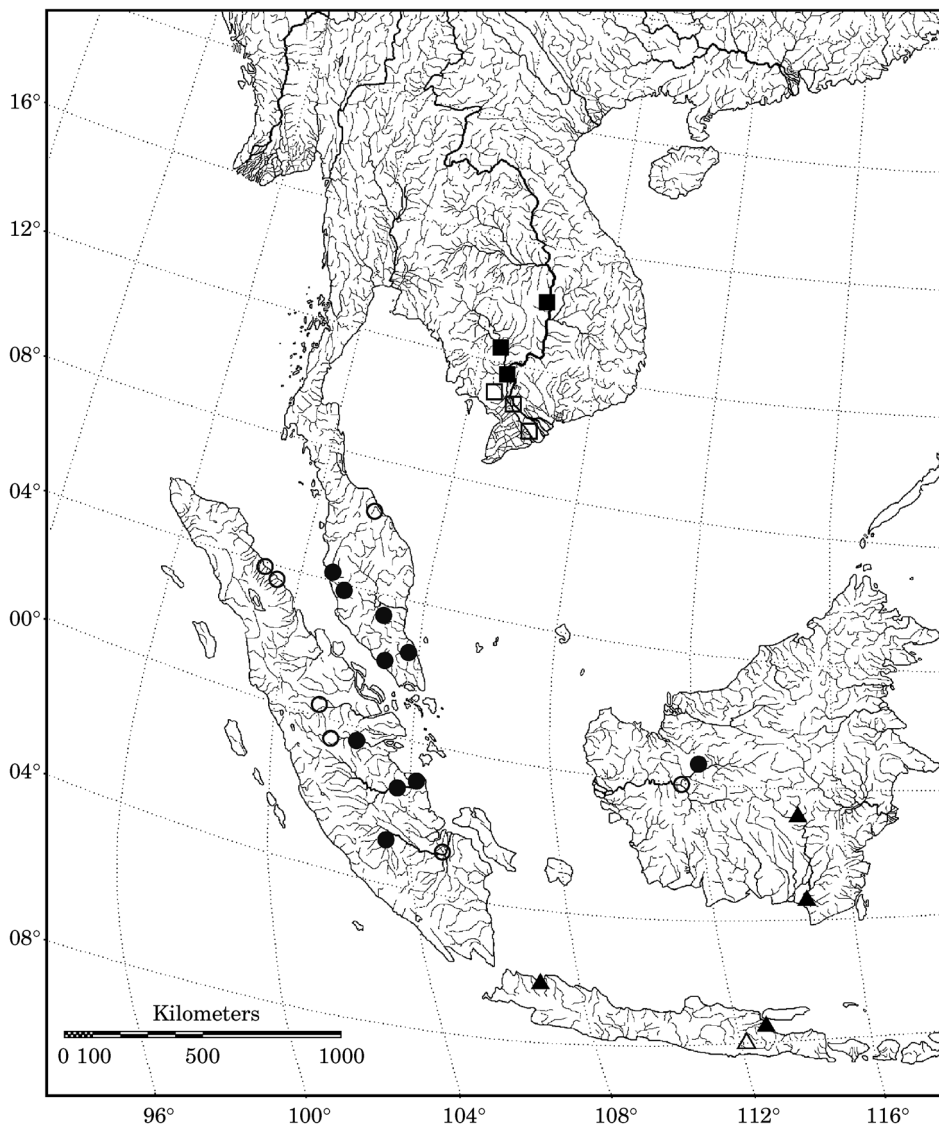


FIG. 2. Map of South-East Asia showing distributions (according to collection localities) of: *Ompok hypophthalmus* (▲), *O. rhadinurus* (●) and *O. urbaini* (■□). Closed symbols denote records based on material examined. Open symbols denote published records.

### *Holotype*

ZRC 14897, 190.8 mm  $L_S$ ; Peninsular Malaysia: Selangor, North Selangor Peat Swamp Forest, irrigation canal on western boundary, NUS 1991–92 Zoology Honours Class, 20 June 1991.

### *Paratypes*

SUMATRA: CMK 4726, 3 ex., 127.0–168.0 mm  $L_S$ ; market in Jambi; P.G. Bianco & M. Kottelat, 9 December 1984. UMMZ 155678, 1 ex.,

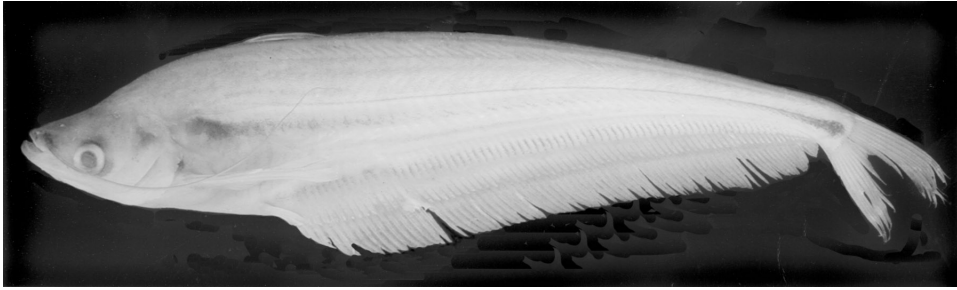


FIG. 3. *Ompok rhadinurus*, ZRC 41718, paratype, 167.4 mm  $L_S$ ; Sumatra: Danau Arang Arang.

151.7 mm  $L_S$ ; UMMZ 155679, 2 ex., 80.9–94.2 mm  $L_S$ ; Musi River, Moeara [=Muara] Klingi; A. Thienemann, date unknown. CMK 11222, 2 ex., 139.0–141.0 mm  $L_S$ ; ZRC 38665, 2 ex., 124.0–157.8 mm  $L_S$ ; Jambi, Batang Hari near Tanjung Johor, a few km downstream of Jambi; M. Kottelat & H.H. Tan, 5 June 1994. ZRC 38990, 8 ex., 149.2–186.1 mm  $L_S$ ; Jambi, Pasar Angso Duo; P.K.L. Ng *et al.*, June 1995. ZRC 39006, 4 ex., 140.2–167.8 mm  $L_S$ ; Riau, blackwater stream from degraded peat swamp, 6 km to Rengat on Jambi-Rengat Road; P.K.L. Ng *et al.*, 13 June 1995. ZRC 39033, 3 ex., 134.4–182.4 mm  $L_S$ ; Riau, Sungai Bengkwan, tributary of the Indragiri (Batang Kuantan), 4 h downstream of Rengat; P.K.L. Ng *et al.*, 14 June 1995. ZRC 39149, 1 ex., 158.1 mm  $L_S$ ; Jambi, Berbak Nature Reserve, Sungai Air Hitam Dalam; H.H. Ng & S.H. Tan, 16–17 June 1995. ZRC 41718, 2 ex., 166.3–179.6 mm  $L_S$ ; Jambi, Danau Arang Arang, brownwater lake (1°37'32.0" S; 103°47'19.0" E); H.H. Tan & H.H. Ng, 25 July 1997.

PENINSULAR MALAYSIA: ZRC 14898, 1 ex., 193.1 mm  $L_S$ ; data as for holotype. ZRC 15073, 1 ex., 182.5 mm  $L_S$ ; Selangor, North Selangor Peat Swamp Forest, irrigation canal at Bernam headwaters, NUS 1991–92 Zoology Honours Class, 19 June 1991. ZRC 15074, 1 ex., 103.5 mm  $L_S$ ; Selangor, North Selangor Peat Swamp Forest, irrigation canal on western boundary, NUS 1991–92 Zoology Honours Class, 18 June 1991. ZRC 23293, 1 ex., 139.3 mm  $L_S$ ; Johor, Muar-Labis road, Sungai Labis. ZRC 24581–24583, 3 ex., 169.2–173.0 mm  $L_S$ ; Selangor, Sabak Bernam; P.K.L. Ng, June 1992. ZRC 42755, 1 ex., 97.2 mm  $L_S$ ; Johor, Sungai Kahang; H.H. Tan *et al.*, 1 April 1998.

BORNEO: CMK 10126, 1 ex., 63.2 mm  $L_S$ ; Kalimantan Barat: Sungai Santik, a tributary of Sungai Tawang, immediately West of Danau Sentarum Field Centre; M. Kottelat *et al.*, 4 September 1993. CMK 10233, 1 ex., 73.2 mm  $L_S$ ; Kalimantan Barat: Nanga Semunak (dry season location); 0°56'37" N; 112°05'31" E; M. Kottelat *et al.*, 8 September 1993. CMK 10351, 1 ex., 193.0 mm  $L_S$ ; Kalimantan Barat: Sungai Tawang near Nanga Kenelang; from fishermen; M. Kottelat *et al.*, 10 September 1993. CMK 10364, 2 ex., 138.0–151.0 mm  $L_S$ ; Kalimantan Barat: Sungai Tengkidap in Nanga Sumbuk; 0°42'15" N; 112°06'26" E; M. Kottelat *et al.*, 11 September 1993. CMK 10411, 1, 133 mm  $L_S$ ; Kalimantan Barat: Sungai Tawang at Teluk Benanga, upriver of Nanga Pengembung; castnet; 0°49'15" N; 112°02'39" E; M. Kottelat *et al.*, 11 September 1993. CMK 10466, 1 ex., 155.0 mm  $L_S$ ; Kalimantan Barat: Sungai Kapuas at Nanga Al-Fazal, southern shore; 0°37'35" N; 112°03'58" E;

M. Kottelat *et al.*, 12 September 1993. CMK 11636, 1 ex., 132.0 mm  $L_S$ ; Kalimantan Barat: Sungai Embau between Kampung Kelampai and Kampung Temenang (first rapids); M. Kottelat *et al.*, 9 June 1995. CMK 11658, 1 ex., 84.2 mm  $L_S$ ; Kalimantan Barat: Danau Batuk, lake adjacent to Kapuas immediately downriver of Jongkong; 0°40'37'' N; 112°16'13'' E; M. Kottelat *et al.*, 10 June 1995.

#### *Non-types*

ZRC 2987, 1 ex., 172.2 mm  $L_S$ ; Peninsular Malaysia: Pahang, Tasek Chini; L.F. de Beaufort, 20 July 1927. ZRC 2988, 1 ex., 188.3 mm  $L_S$ ; Peninsular Malaysia: Perak, Telok Anson; L.F. de Beaufort, 10 December 1922. ZRC 8062, 1 ex., 214.4 mm  $L_S$ ; Peninsular Malaysia: Pahang, Tasek Bera; J.I. Furtado, 11 December 1967. ZRC 8149–8150, 2 ex., 193.3–196.0 mm  $L_S$ ; Peninsular Malaysia: Pahang, Tasek Chini; J. Hutton, 18 April 1966. ZRC 12156–12158, 3 ex., 158.4–202.6 mm  $L_S$ ; Peninsular Malaysia: Pahang, Tasek Bera; J.I. Furtado, 9 October 1968. ZRC 41520, 2 ex., 169.0–194.7 mm  $L_S$ ; Sumatra: Jambi, Angso Duo fishmarket; H.H. Tan & H.H. Ng, 23–29 July 1997. ZRC 42264, 6 ex., 108.9–196.0 mm  $L_S$ ; Jambi, from fishermen at coffee-shop *c.* 15 min after Kampung Rantau Panjang along Batang Hari confluence; H.H. Tan *et al.*, 6 June 1996. ZRC 42339, 1 ex., 68.6 mm  $L_S$ ; Sumatra: Jambi, Pijoan, Danau Saut Padang; H.H. Tan *et al.*, 8 June 1996.

#### *Diagnosis*

A species of *Ompok* with a combination of the following characters: head width 11.4–13.3%  $L_S$ , depth of caudal peduncle 3.7–4.3%  $L_S$ , 76–85 anal-fin rays, and 56–58 vertebrae.

#### *Description*

Body laterally compressed. Head somewhat depressed. Dorsal profile straight, descending gently from dorsal-fin origin to snout tip. Anterior profile of snout rounded. Anterior pair of nostrils tubular and anteromedial to maxillary barbel base. Posterior pair of nostrils bordered by fleshy dorsal and ventral membranes and posteromedial to maxillary barbel base.

Mouth subterminal; gape horizontal or very slightly oblique. Rictal lobes narrowly continuous at rictus and deeply subtended by submandibular groove, with upper rictal lobe lacking skin fold.

Teeth villiform. Dentary teeth in slightly curved, elongate bands narrowing posteriorly, reaching from symphysis almost to mouth corners; premaxillary teeth in broader, slightly curved rectangular bands. Vomerine teeth in a single ovoid patch.

Maxillary barbels slightly flattened for entire length, reaching to anterior third of anal fin. Single pair of mandibular barbels present; located slightly anterolateral to gular fold; barbels flattened for most of length, reaching to vertical just beyond posterior orbital margin.

Eyes small, subcutaneous; located in anterior half of head; visible both dorsally and ventrally.

Gill membranes separate and overlapping, free from isthmus. Branchiostegal rays 11 (13) or 12 (1). Gill rakers short, anteriormost rakers on lower first arch small and widely spaced; 3–4 on epibranchial and 11–13 on ceratobranchial.

Distal margin of pectoral fin broadly convex, with I,12 (8), I,13 (3) or I,14 (3) rays. Proximal two-thirds of first pectoral-fin element co-ossified into a spine without anterior serrations. Pectoral spine with 2–6 distinct posterior serrations, increasing in size distally; proximal articulated segments with 2–6 smaller posterior serrations; distalmost segments lack dentition.

Distal margin of pelvic-fin convex, with i,7 (14) rays. Distal margin of dorsal fin pointed, with i,2 (2), i,2,i (3) or i,3 (9) rays; segments of first ray not co-ossified to form spine. Distal margin of anal fin straight, with 76 (1), 77 (1), 79 (6), 78 (1), 80 (2), 81 (2), 82 (1) or 85 (1) rays; separate from caudal fin. Integument over anal fin thickened proximally for slightly more than half of ray lengths; fin-ray erector muscles extending along anterior edges of anal-fin rays, ventralmost extent of muscles that of thickened integument. Caudal fin obliquely truncate or emarginate, upper lobe equal to or longer than lower lobe; principal rays i,7,7,i (3), i,7,8,i (10) or i,8,7,i (1). Urogenital papillae of both sexes located immediately posterior to insertions of pelvic fins. In %  $L_S$ :  $L_H$  18.2–20.6, head width 11.4–13.3, head depth 10.7–12.1, predorsal distance 28.9–31.5, preanal length 31.7–36.3, prepelvic length 28.2–31.7, prepectoral length 19.2–21.4, body depth at anus 21.2–24.5, depth of caudal peduncle 3.7–4.3, pectoral-spine length 10.5–14.0, pectoral-fin length 18.4–20.3, length of dorsal-fin 9.5–11.7, pelvic-fin length 5.0–5.9, length of anal-fin base 61.3–66.6, caudal-fin length 16.2–17.6; in %  $L_H$ : snout length 39.4–47.5, interorbital distance 53.1–61.2, eye diameter 16.6–21.6, maxillary barbel length 289.7–351.6, mandibular barbel length 19.1–41.7. Vertebrae 12 + 44 = 56 (2), 11 + 46 = 57 (1), 12 + 45 = 57 (8), 13 + 44 = 57 (1), 12 + 46 = 58 (1) or 13 + 45 = 58 (1).

### Colour

Dorsal surface and sides of head pale brown, fading to a lighter colour on flanks and thickened integument over anal fin. Lateral line with a thin black stripe. Another faint black midlateral line below lateral line variably present, usually as series of scattered melanophores broadening both at humeral region and base of caudal peduncle to form dark roughly elliptical spots. Maxillary and mandibular barbels pale brown, gradually fading in colour distally. Anal fin with hyaline ventral margin. All other fins hyaline, with small dark-brown spots present in some specimens.

### Etymology

From the Greek *rhadinós*, meaning tapering, and *ouros*, meaning tail. In reference to the slender caudal peduncle of this species.

### Distribution

Known from the Kapuas River drainage in western Borneo, the Batang Hari, Deli, Indragiri and Musi River drainages in Sumatra, and the Bernam, Endau, Pahang, Pattani and Perak River drainages in the Malay Peninsula (Fig. 2).

### Biology

*Ompok rhadinurus* is found in large, slow flowing rivers and lakes, although juveniles are sometimes found in smaller streams. It feeds on smaller fishes and crustaceans (Mizuno & Furtado, 1982).



*OMPOK URBAINI* (FANG & CHAUX, 1949) [FIG. 4]

*Cryptopterus urbaini* Chaux & Fang, 1949: 197, Fig. 2 (type locality: Tonle Sap, Cambodia).

*Silurodes hypophthalmus* (non Bleeker) Smith, 1933: 77 (in part); 1945: 336; Suvatti, 1936: 72 (in part); 1950: 291 (in part); 1981: 87 (in part); Chevey & le Poulain, 1940: 20; Durand, 1940: 18; Kuronuma, 1961: 5; Orsi, 1974: 162; Taki, 1978: 18.

*Ompok hypophthalmus* (non Bleeker) Haig, 1952: 105 (in part); Kottelat, 1985: 269; 2001: 128, Fig. 354; Roberts, 1993*b*: 34; Bornbusch, 1995: 43 (in part); Rainboth, 1996: 149, Pl. XX Fig. 156; Vidthayanon *et al.*, 1998: 45; Lim *et al.*, 1999: 383; Kavanankul *et al.*, 2000: 38; Kottelat, 2001: 128, Fig. 354.

*Kryptopterus bicirrhis* (non Bleeker) Kottelat, 1985: 268 (in part).

*Siluroides hypophthalmus* [sic.] (non Bleeker) Mai & Nguyen, 1988: 49.

*Siluroides* [sic.] *hypophthalmus* (non Bleeker) Mai *et al.*, 1992: 156; Huong & Khoa, 1993: 158, Fig. 67 (figure caption misspelled *Siluroides hymenophthalmus*).

*Ompok cf. hypophthalmus* Roberts & Warren, 1994: 102.

*Kryptopterus cheveyi* (non Durand) Serov, 1994*a*: 24 (in part); 1994*b*: 64 (in part).

*Ompok urbaini* Bornbusch, 1995: 44.

*Material examined*

MNHN 1966-706, 1 ex., syntype, 181.0 mm  $L_S$ ; MNHN 1966-707, 1 ex., syntype, 165.0 mm  $L_S$ ; MNHN 1966-708, 1 ex., syntype, 112.6 mm  $L_S$ ; Cambodia: Tonle Sap. UMMZ 232360, 1 ex., 92.2 mm  $L_S$ ; Cambodia: Kompong Chhnang, Tonle Sap at Kompong Chhnang fishing lot 9 in second channel east of town. UMMZ 232378, 5 ex., 84.1–119.0 mm  $L_S$ ; UMMZ 234411, 2 ex., 85.5–96.8 mm  $L_S$ ; Cambodia: Kandal, Prek Ta Pov, 13 km south of Phnom Penh. UMMZ 232427, 4 ex., 90.0–107.7 mm  $L_S$ ; Cambodia: Siem Reap, floating village at mouth of Siem Reap River. UMMZ 232737, 39 ex., 92.5–125.2 mm  $L_S$ ; Cambodia: Tonle Sap at exit to Great Lake, 4 km north-west of Chhnok Trou at Kompong Thom fishing lot 2. UMMZ 235389, 1 ex., 108.8 mm  $L_S$ ; Laos: Champasak, Mekong River at Ban Hang Khone, just downstream from Khone Falls.

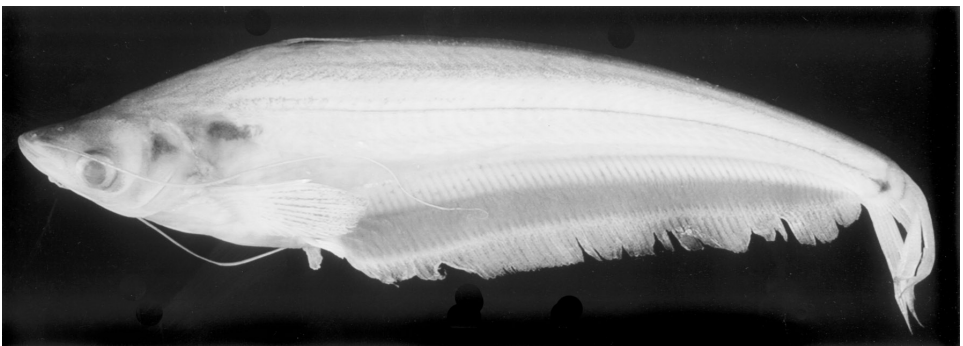


FIG. 4. *Ompok urbaini*, UMMZ 232737, 125.2 mm  $L_S$ ; Cambodia: Tonle Sap.

### Diagnosis

A species of *Ompok* with a combination of the following characters: head width 11.7–13.6%  $L_S$ , depth of caudal peduncle 5.2–5.9%  $L_S$ , 65–71 anal-fin rays, and 47–52 vertebrae.

### Description

Body and head laterally compressed. Dorsal profile somewhat humped with a distinct nuchal concavity; descending gently from dorsal-fin origin to snout tip, and again from the posteriormost dorsal-fin ray to the caudal peduncle. Anterior profile of snout rounded. Anterior pair of nostrils tubular and anteromedial to maxillary barbel base. Posterior pair of nostrils bordered by fleshy dorsal and ventral membranes and posteromedial to maxillary barbel base.

Mouth terminal; gape oblique. Rictal lobes narrowly continuous at rictus and deeply subtended by submandibular groove, with upper rictal lobe lacking skin fold.

Teeth villiform. Dentary teeth in slightly curved, elongate bands narrowing posteriorly, reaching from symphysis almost to mouth corners; premaxillary teeth in broader, slightly curved rectangular bands. Vomerine teeth in a single crescentic band.

Maxillary barbels slightly flattened for entire length, reaching to anterior third of anal fin. Single pair of mandibular barbels present; located slightly anterolateral to gular fold; barbels flattened for most of length, reaching to vertical just beyond posterior orbital margin.

Eyes small, subcutaneous; located in middle of head; visible dorsally, and more so ventrally.

Gill membranes separate and overlapping, free from isthmus. Branchiostegal rays 11 (14). Gill rakers short, anteriormost rakers on lower first arch small and widely spaced; 3–4 on epibranchial and 12–13 on ceratobranchial.

Distal margin of pectoral fin broadly convex, with I,11 (5), I,12 (8) or I,12,i (1) rays. Proximal two-thirds of first pectoral-fin element co-ossified into a spine without anterior serrations. Pectoral spine with 2–7 distinct posterior serrations, increasing in size distally; proximal articulated segments with 2–4 smaller posterior serrations; distalmost segments lack dentition.

Distal margin of pelvic-fin convex, with i,7 (14) rays. Distal margin of dorsal fin pointed, with i,2,i (2) or i,3 (12) rays; segments of first ray not co-ossified to form spine. Distal margin of anal fin straight, with 65(4), 66 (3), 67 (3), 68 (2), 70 (1) or 71 (1) rays; separate from caudal fin. Integument over anal fin thickened proximally for slightly more than half of ray lengths; fin-ray erector muscles extending along anterior edges of anal-fin rays, ventralmost extent of muscles that of thickened integument. Caudal fin strongly forked; principal rays i,7,7,i (1) or i,7,8,i (13). Urogenital papillae of both sexes located immediately posterior to insertions of pelvic fins. In %  $L_S$ :  $L_H$  20.1–21.3, head width 11.7–13.6, head depth 10.7–12.4, predorsal distance 30.3–33.8, preanal length 35.8–37.4, prepelvic length 32.0–34.1, prepectoral length 20.9–22.7, body depth at anus 21.1–24.2, depth of caudal peduncle 5.2–5.9, pectoral-spine length 10.7–13.1, pectoral-fin length 18.5–21.3, length of dorsal-fin 13.9–15.0, pelvic-fin length 5.1–6.5, length of anal-fin base 60.8–65.4, caudal-fin length 16.2–21.3; in %  $L_H$ : snout length 42.7–44.0, interorbital distance 49.6–56.2, eye diameter

20.0–25.2, maxillary barbel length 287.5–313.4, mandibular barbel length 45.8–65.2. Vertebrae 12 + 35 = 47 (1), 11 + 38 = 49 (1), 11 + 39 = 50 (1), 12 + 38 = 50 (3), 11 + 40 = 51 (1), 12 + 39 = 51 (5) or 12 + 40 = 52 (2).

### Colour

Dorsal surface and sides of head pale brown, fading to a lighter colour on flanks and thickened integument over anal fin. Lateral line with a thin black stripe. Another faint black midlateral line below lateral line variably present, usually as series of scattered melanophores broadening both at humeral region and base of caudal peduncle to form dark roughly elliptical spots. Maxillary and mandibular barbels pale brown, gradually fading in colour distally. Anal fin with hyaline ventral margin. All other fins hyaline, with small dark-brown spots present in some specimens.

### Distribution

Known from the Mekong, Chao Phraya and Pasak River drainages in Indo-China (Fig. 2).

### Biology

*Ompok urbaini* is found most frequently in large slow-flowing rivers and lakes. It feeds on fishes and crustaceans (Rainboth, 1996; Lim *et al.*, 1999), and migrates into inundated forest during periods of high water, where it can be found around submerged woody vegetation (Rainboth, 1996).

## DISCUSSION

As previously mentioned, the name *Ompok hypophthalmus* has been used for three distinct species that occur allopatrically: *O. hypophthalmus* s. str. from Java and southern Borneo, *O. rhadinurus* from Sumatra, Borneo and the Malay Peninsula, and *O. urbaini* from Indo-China (mainland South-East Asia).

*Ompok hypophthalmus* differs from both *O. rhadinurus* and *O. urbaini* in having a narrower head (10.0–10.7%  $L_S$  v. 11.4–13.6). *Ompok hypophthalmus* further differs from *O. rhadinurus* in having fewer vertebrae (54–55 v. 56–58) and a more slender snout (Fig. 5). *Ompok rhadinurus* differs from *O. hypophthalmus* and *O. urbaini* in having a more slender caudal peduncle (3.7–4.3%  $L_S$  v. 4.3–5.9). *Ompok urbaini* can be distinguished from *O. hypophthalmus* and *O. rhadinurus* in having fewer vertebrae (47–52 v. 54–58) and anal-fin rays (66–71 v. 74–85). The morphometric and meristic differences between the three species are summarized in Table I.

All three species are diagnosed by each of the cartilaginous plates supporting the mandibular barbels having two posterior processes [Bornbusch (1995) had examined all three species in his study] and interestingly, the historical biogeography of this clade follows very closely that of the major drowned river systems of the Sunda shelf (which were exposed during the last glacial maxima 17000 years b.p.; Voris, 2000). The present distributions of the three species, as mapped out in current reconstructions of the ancient river systems of the Sunda shelf, are: *O. hypophthalmus* (East Sunda River system), *O. rhadinurus* (North

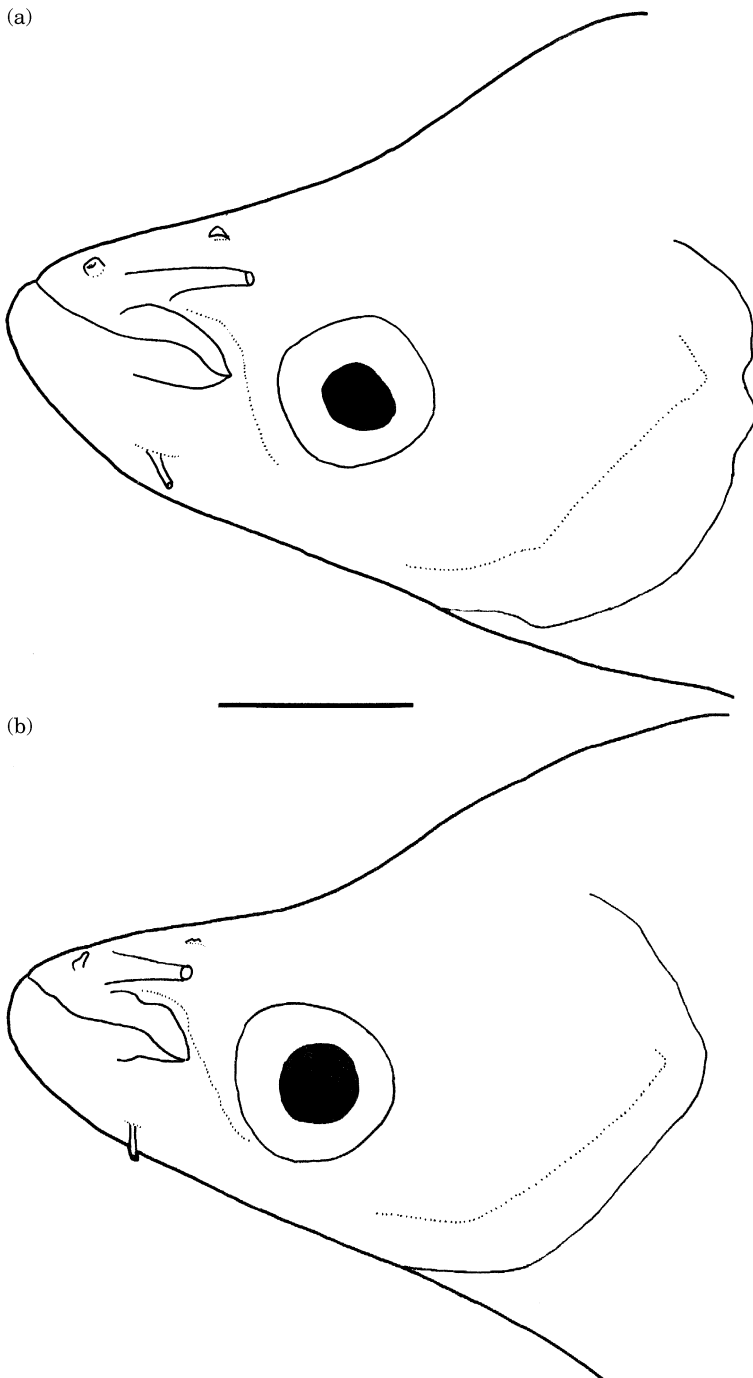


FIG. 5. Lateral views of heads of (a) *Ompok hypophthalmus*, ZRC 40036, 175.3 mm  $L_S$  and (b) *O. rhadinurus*, ZRC 14897, holotype, 190.8 mm  $L_S$ . Scale bar represents 10 mm.

TABLE I. Diagnostic morphometric and meristic characters of *Ompok hypophthalmus*, *O. rhadinurus* and *O. urbaini* to be used in combination

	<i>O. hypophthalmus</i> (n = 7)	<i>O. rhadinurus</i> (n = 16)	<i>O. urbaini</i> (n = 16)
Head width (% $L_S$ )	10.0–10.7	11.4–13.3	11.7–13.6
Depth of caudal peduncle (% $L_S$ )	4.3–5.1	3.7–4.3	5.2–5.9
Anal-fin rays	74–80	76–85	65–71
Vertebrae	54–55	56–58	47–52

Sunda and Siam River systems) and *O. urbaini* (Mekong and Siam River systems).

The occurrence of *O. hypophthalmus* in the rivers that comprised the East Sunda River (Barito River in southern Borneo and the rivers in Java) is the most interesting, since it is one of the few examples that corroborate the reconstruction of the East Sunda River. It also suggests that the freshwater fish fauna of Java is more unique than previously thought, a suggestion that is supported by increasing evidence that freshwater fishes previously thought to be conspecific throughout the Sunda shelf have been shown to consist of distinct Javanese and Sundaic (Sumatra + Borneo + Malay Peninsula) species (Ng, 2002).

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