

Kryptopterus paraschilbeides, a New Species of Catfish (Teleostei: Siluridae) from Mainland Southeast Asia

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ABSTRACT.—A new species of silurid catfish of the genus *Kryptopterus* is described from the Mekong River drainage in mainland Southeast Asia. The fish, *Kryptopterus paraschilbeides*, differs from congeners in having a unique combination of the following characters: lack of dorsal fin, vomerine teeth in two separate patches, head width 7.9–9.4% SL, more laterally-positioned eyes with only ventral half of orbital margin visible when head is viewed from below (interorbital distance 34.2–43.4% HL), 24–28 gill rakers on first gill arch, and 9 branchiostegal rays.

KEY WORDS: *Kryptopterus paraschilbeides*; Siluridae; mainland Southeast Asia; new species

INTRODUCTION

Silurid catfishes of the genus *Kryptopterus* Bleeker, 1858 are found in streams and rivers throughout Southeast Asia. The genus comprises 20 nominal species (Bornbusch, 1995; Ng, 2001; 2002) and is traditionally diagnosed as silurid catfishes with a rudimentary or absent dorsal fin and the posterior nostril located anterior to the anterior orbital margin (Kottelat et al., 1993).

The group has been shown to be paraphyletic and consisting of six clades (the *K. apogon*, *K. bicirrhis*, *K. cryptopterus*, *K. hexapterus*, *K. limpok* and *K. schilbeides* groups) by Bornbusch (1995). However, his resolution of the interrelationships between the groups remains poor and the matter needs further study.

In mainland Southeast Asia (here defined as the region traditionally known as Indochina and consisting of continental Southeast Asia, south of China and west of Myanmar, but excluding the Malay Peninsula), nine valid species of *Kryptopterus* have been recorded (Rainboth, 1996; Kottelat, 2001; Ng, 2001; 2002) of which six, viz. *K. bicirrhis* (Valenciennes in Cuvier and Valenciennes, 1840), *K. cheveyi* (Durand, 1940), *K. cryptopterus* (Bleeker, 1851); *K. dissitus* (Ng, 2001), *K. hesperius* (Ng, 2002) and *K. schilbeides* (Bleeker, 1858), have been retained in *Kryptopterus* (s. str.). The other three species of mainland Southeast Asian *Kryptopterus*, viz. *K. apogon* (Bleeker, 1851), *K. bleekeri* (Günther, 1864) and *K. micronema* (Bleeker, 1846), have been placed in *Micronema* (Bleeker, 1858) by recent authors (Rainboth, 1996; Kottelat, 2001) on the account of Bornbusch's results and the following characters: absence of dorsal fin, 9–10 pelvic fin rays and short maxillary barbels (not extending beyond opercle).

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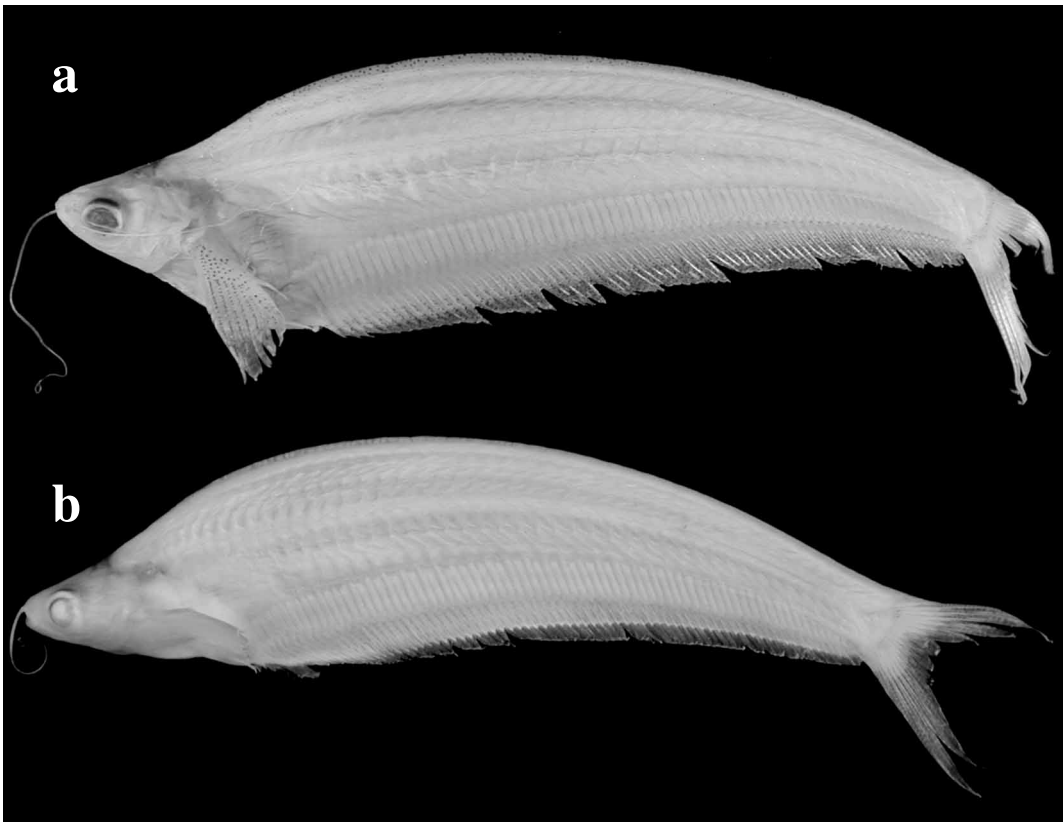


FIGURE 1. (a) *Kryptopterus paraschilbeides*, UMMZ 238788, holotype, 73.7 mm SL; Cambodia: Kompong Chhnang; (b) *K. schilbeides*, ZRC 40334, 91.0 mm SL; Sumatra: Jambi.

While comparing material identified as *Kryptopterus schilbeides* from Sundaic Southeast Asia (Sumatra and Borneo) and the Mekong River drainage in mainland Southeast Asia, differences were observed which suggested that the Mekong River material belong to an undescribed species, which is described herein as *K. paraschilbeides*.

MATERIALS AND METHODS

Measurements were made point to point with dial calipers and data recorded to tenths of a millimeter. 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 itself and measurements of body parts are given

as proportions of standard length (SL). Measurements follow those of Ng and Ng (1998).

Institutional codes for depositories of specimens follow Leviton et al. (1985) except for the Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore (ZRC).

Comparative material.—*Kryptopterus schilbeides*: BMNH 1863.11.157, 1 syntype, 81.7 mm SL; BMNH 1864.5.15.6, 1 syntype, 85.0 mm SL; Sumatra: Palembang or Borneo: Banjarmasin. UMMZ 209891, 1 ex., 80.2 mm SL; Borneo: Kalimantan Barat, Kapuas River drainage, Danau Mawan and “Danau Bahru” near Kampung Nibung, approximately 7 km NE of Selimbau. ZRC 41894, 1 ex., 83.8 mm SL; ZRC 43017, 1 ex., 92.5 mm SL; Sumatra: Jambi, Pasar Angso Duo. ZRC 40334, 10 ex., 71.9–93.6 mm SL; Sumatra: Jambi.

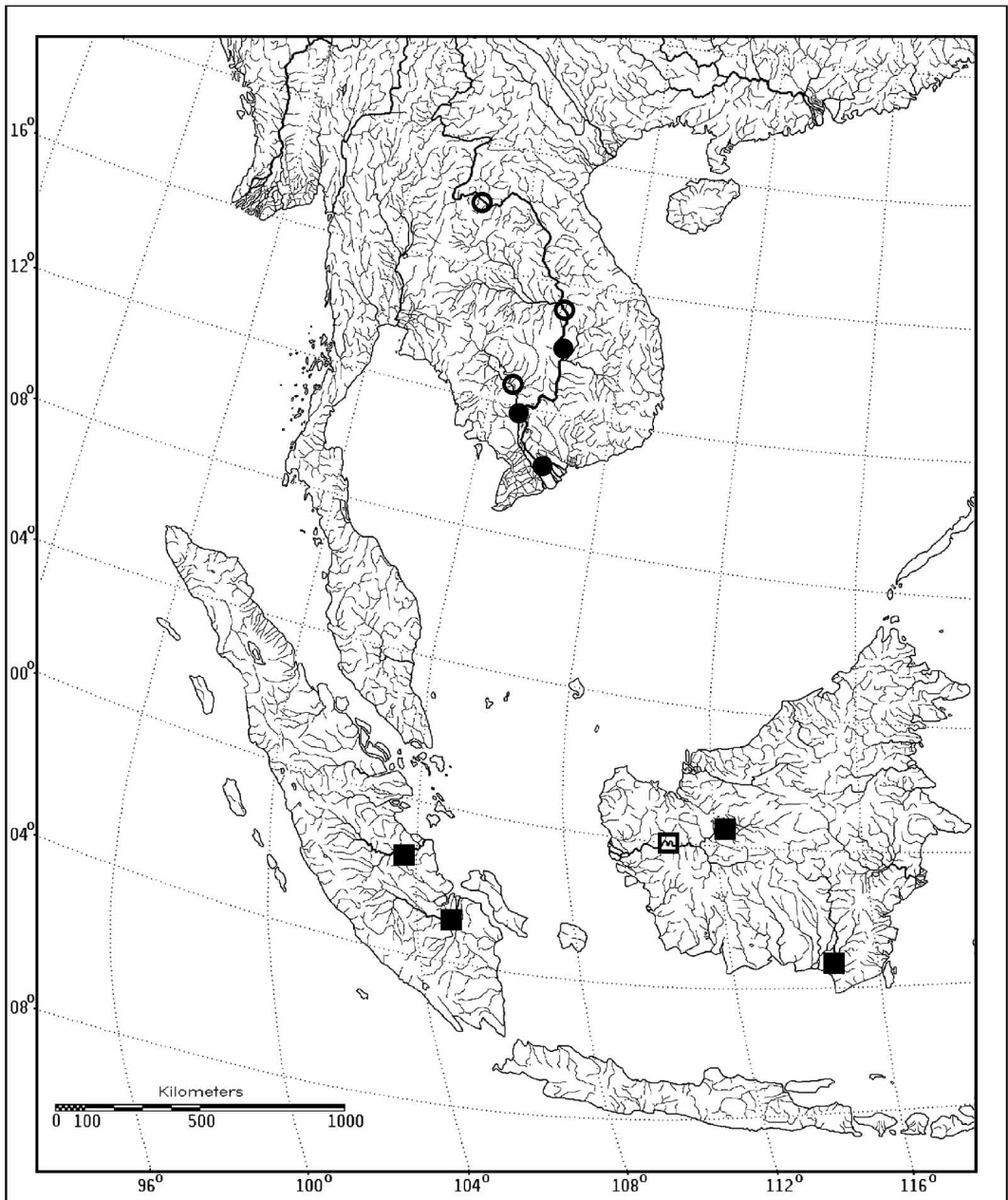


FIGURE 2. Map showing distribution of *K. paraschilbeides* (●○) and *K. schilbeides* (■□). Open symbols indicate records from the literature.

Kryptopterus paraschilbeides sp. nov.
(Figs. 1a and 3)

Kryptopterus schilbeides (non Bleeker, 1858):
Chevy and le Poulain, 1940: 20.

Kryptopterus schilbeides (non Bleeker, 1858):
Durand, 1940: 19; Orsi, 1974: 161.

Kryptopterus schilbeides (non Bleeker, 1858):
Kuronuma, 1961: 5; Taki, 1974: 66; Taki,
1978: 18; Bornbusch, 1995: 45 (in part);
Rainboth, 1996: 147, Pl. XIX Fig. 152.

Holotype.—UMMZ 238788, male, 73.7 mm SL; Cambodia: Kompong Chhnang, Tonle Sap River, 17 km upstream from Kompong Chhnang; W. J. Rainboth, N. van Zalinge and C. Rotha, 1 March 1995.

Paratypes.—UMMZ 232756, 3 males, 68.0–75.2 mm SL, 5 females, 75.2–83.1 mm SL; 1 female, c&s, 71.4 mm SL; data as for holotype. UMMZ 218561, 1 female, 57.5 mm SL, 1 male, 58.0 mm SL; Vietnam: Phong Dinh Province, Bassac River at Can Tho; R. E. Arden and O. K. Minh, 3 November 1974. UMMZ 231986, 2 females, 46.3–55.5 mm SL; Vietnam: Phong Dinh Province, Bassac River, 0.5 km downstream from Can Tho; R. E. Arden and O. K. Minh, 3 November 1974. UMMZ 231988, 1 male, 74.7 mm SL; Vietnam: Phong Dinh Province, Bassac River, adjacent to Dong Phu; R. E. Arden and O. K. Minh, 31 October 1974. UMMZ 232316, 1 female, 74.0, 1 male, 74.6 mm SL; Cambodia: Stung Treng morning market; W. J. Rainboth, N. van Zalinge and C. Rotha, 26 January 1995. UMMZ 234492, 1 female, 59.0 mm SL; Cambodia: Kandal Province, floodplain lake near Mekong; W. J. Rainboth et al., 25 January 1996. UMMZ 238523, 2 females, 69.6–80.4 mm SL; Cambodia: Stung Treng morning market; W. J. Rainboth et al., 31 January 1996.

Diagnosis.—*Kryptopterus paraschilbeides* differs from all congeners in having a unique combination of the following characters: lack of dorsal fin, vomerine teeth in two separate patches, head width 7.9–9.4% SL, 24–28 gill rakers on first gill arch, 9 branchiostegal rays, and more laterally-positioned eyes with only ventral half of orbital margin visible when head is viewed from below (interorbital distance 34.2–43.4% HL).

Description.—Body and head laterally compressed. Dorsal profile slightly humped with a distinct nuchal concavity; descending gently from anterior quarter of body to snout tip, and from anterior quarter of body to 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 mem-

branes and posteromedial to maxillary barbel base.

Mouth terminal, gape oblique. Rictal fold present but poorly developed, consisting of upper lobe joined at corner of mouth with lower lobe, subtended by short submandibular groove.

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 2 lateral ovoid patches.

Single pair of barbels. Maxillary barbels slightly flattened for entire length, reaching to anterior third of anal fin.

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

Gill membranes separate, overlapping, free from isthmus. Branchiostegal rays 9 (n=20). Gill rakers short, anteriormost rakers on lower first arch small, widely spaced; 5+19 (n=1), 6+19 (n=4), 5+21 (n=1), 6+20 (n=3), 7+19 (n=2), 6+21 (n=5), 7+20 (n=1), 6+22 (n=2) or 7+21 (n=1) (holotype: 6+19).

Dorsal fin absent.

Distal margin of pectoral fin broadly convex, with I,10 (n=1), I,11 (n=10) or I,12 (n=9) (holotype: I,11) rays. Proximal two-thirds of first pectoral-fin element co-ossified into a spine. Pectoral spine and articulated segments sexually dimorphic in mature individuals. Males with spine broad and somewhat flattened dorsoventrally, with 2 distinct serrations on posterior edge, increasing in size distally; proximal articulated segments with 4–5 well-developed serrations on posterior edge; distal-most segments without serrations. Female or juvenile with spine slender, without serrations on posterior edges of either spine or articulated segments.

Distal margin of pelvic-fin convex, with i,4 (n=20) rays.

Distal margin of anal fin straight, with 68 (n=4), 69 (n=4), 70 (n=2), 71 (n=3), 72 (n=6) or 73 (n=1) (holotype: 72) 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, ventral most extent of muscles that of thickened integument.

Caudal peduncle moderately broad. Caudal fin strongly forked; principal rays i,8,7,i (n=20). Urogenital papillae of both sexes located immediately posterior to insertions of pelvic fins.

Vertebrae 9+39=48 (n=1), 10+38=48 (n=4), 10+39=49 (n=10) or 10+40=50 (n=5) (holotype: 10+39=49).

Morphometric data as in Table 1.

Color in alcohol: dark yellow throughout. Dorsal midline of body with a row of densely-situated melanophores running along the entire length of body. Another 2 patches of densely-packed melanophores located on dorsal tip of snout and base of caudal peduncle respectively. Interradial membranes of pectoral and anal fins with dense concentration of melanophores, pectoral- and anal-fin rays hyaline; other parts of all other fins hyaline. Barbels dark yellow throughout.

Fresh color: body translucent gray with silvery visceral area. Fins hyaline. Head silvery white with yellowish tint.

Distribution.—Known from the Mekong River drainage in mainland Southeast Asia (Fig. 2).

Etymology.—From the Greek *para*, meaning near; in reference to the close similarity of this species to *K. schilbeides*. Used as a noun in apposition.

Biology.—According to Rainboth (1996), *K. paraschilbeides* (as *K. schilbeides*) feeds on invertebrates and small fishes. In the Cambodian Mekong, the fish moves into the flooded forest during high water periods and return to the rivers in November, where they remain until March. *Kryptopterus paraschilbeides* is usually mixed with *K. cheveyi* and *K. kryptopterus* in the same catch, suggesting that the three species form mixed schools.

DISCUSSION

Bornbusch (1995) diagnosed the *K. schilbeides* group (with *K. schilbeides* as the sole member) having the interossicular portion of intercalarium nodular and without an ascending process, upper hypurals fused as a single plate, broadly expanded and roughly triangular coracoids, and lack of a dorsal fin.

TABLE 1. Morphometric data for *Kryptopterus paraschilbeides* (n=20). Values for holotype in brackets.

	Range (holotype)	Mean ±SD
In %SL		
Preanal length	24.5–35.4 (29.4)	28.4±2.6
Prepelvic length	22.1–29.5 (25.5)	26.3±2.2
Prepectoral length	17.0–19.9 (18.3)	18.5±0.7
Anal-fin length	68.2–75.7 (70.8)	71.6±2.3
Pelvic-fin length	2.2–4.3 (3.7)	3.3±0.6
Pectoral-fin length	16.2–19.0 (17.0)	17.6±0.7
Pectoral-spine length	8.6–11.8 (9.9)	9.9±0.8
Caudal-fin length	16.6–23.6 (17.5)	19.5±2.2
Body depth at anus	17.0–24.3 (22.4)	20.5±1.9
Caudal peduncle depth	6.2–8.5 (7.7)	7.4±0.7
Head length	15.2–17.6 (16.1)	16.5±0.7
Head width	7.9–9.4 (9.2)	8.8±0.4
Head depth	9.2–12.3 (10.3)	10.8±0.8
In %HL		
Snout length	29.2–36.0 (32.8)	33.1±2.2
Interorbital distance	34.2–43.4 (42.0)	40.7±2.7
Eye diameter	26.3–33.1 (31.1)	30.2±1.8
Maxillary barbel length	195.1–328.5 (213.4)	241.9±33.6

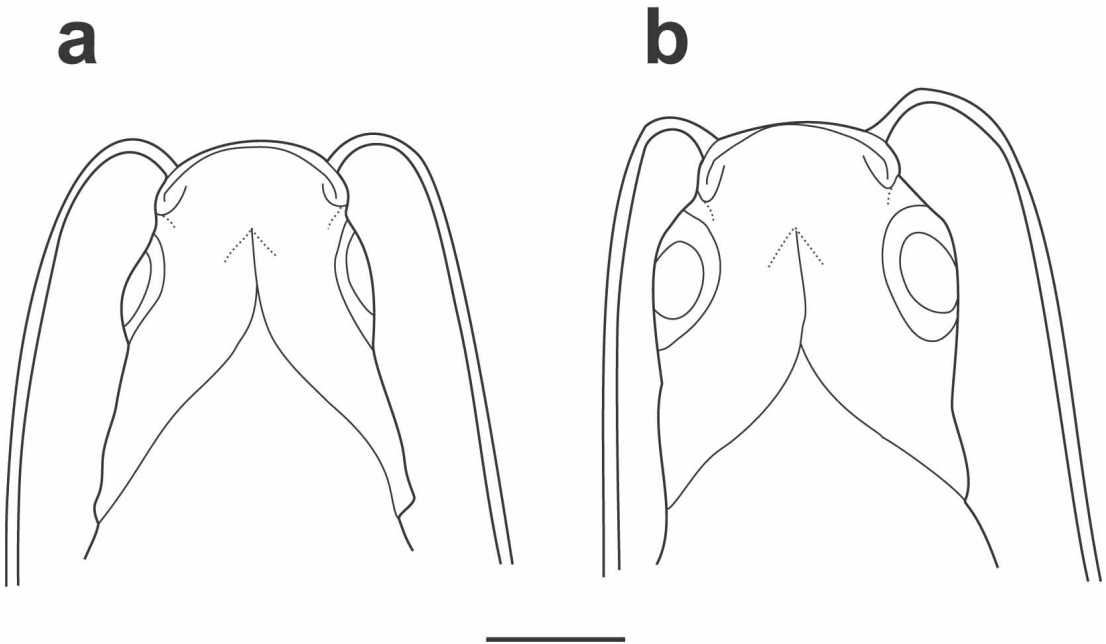


FIGURE 3. Ventral views of heads of: (a) *Kryptopterus paraschilbeides*, UMMZ 232756, paratype, 83.1 mm SL; (b) *K. schilbeides*, ZRC 40334, 89.7 mm SL. Scale bar represents 5 mm.

Kryptopterus schilbeides was described from two syntypes of 96 and 99 mm TL from Palembang (Sumatra) and Banjarmasin (Borneo) by Bleeker (1858), both of which are deposited in the Natural History Museum, London. Comparison of the syntypes with the fresh material from Sumatra and Borneo show that they are conspecific.

Both *K. paraschilbeides* and *K. schilbeides* can be distinguished from all other congeners in having a unique combination of the following characters: lack of a dorsal fin (also seen in the *K. apogon* and *K. hexapterus* groups), the vomerine teeth in two separate patches (also seen in some members of the *K. limpok* group, viz. *K. baramensis*, *K. dissitus* and *K. lumholtzi*), and a nodular interossicular portion of the intercalarium lacking an ascending process (also seen in *Silurus*, *Wallago*, *Pterocryptis*, *Hito*, and the *Ompok bimaculatus* group). The combination of the characters is unique and restricted to only these two species (and therefore indicative of a sister group relationship).

Kryptopterus paraschilbeides differs from *K. schilbeides* in having fewer gill rakers on the first gill arch (24–28 vs. 30–31) and branchiostegal rays (9 vs. 10–11), and more laterally-positioned eyes: only the ventral half (vs. two-thirds) of the orbital margin is visible when the head is viewed from below (Fig. 3). This is also reflected in the interorbital distance being smaller in *K. paraschilbeides* (34.2–43.4 vs. 43.7–52.1% HL). Although interorbital distance may increase with ontogeny, a plot of interorbital distance versus standard length for the two species (Fig. 4) shows that the difference cannot be due to ontogeny alone, as there is an increasing trend of the interorbital distance with ontogeny for *K. paraschilbeides*, but a decreasing trend for *K. schilbeides*, without the values for the two species overlapping. *Kryptopterus paraschilbeides* also has a narrower head than that of *K. schilbeides* (7.9–9.4 vs. 10.0–11.6% SL), although in this case, head width increases with ontogeny (Fig. 5). Since most of the specimens of *K. schilbeides* examined were larger

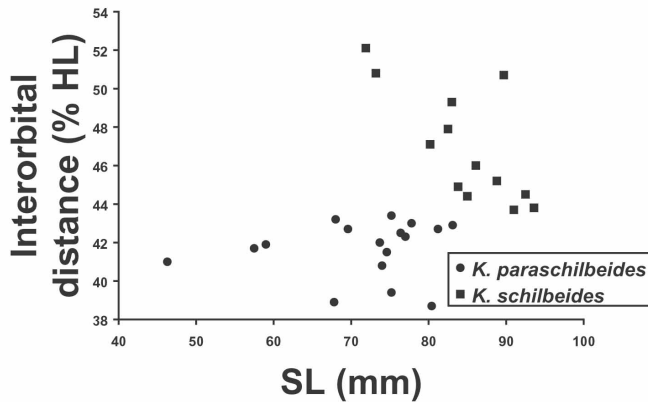


FIGURE 4. Interorbital distance (% HL) plotted against SL (mm).

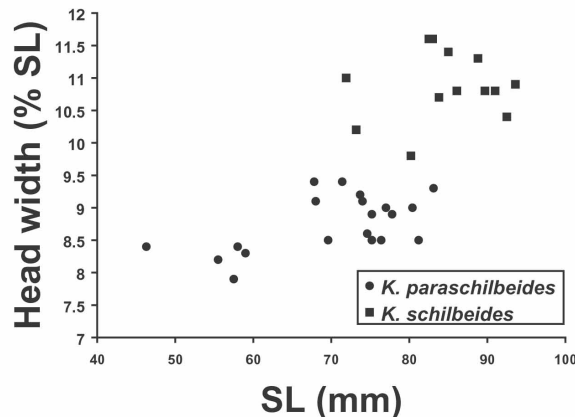


FIGURE 5. Head width (% SL) plotted against SL (mm).

than *K. paraschilbeides*, the diagnostic value of this character should be further ascertained with the examination of a larger series.

The historical biogeography of *K. schilbeides* and *K. paraschilbeides* probably follows that of the model proposed by Bornbusch and Lundberg (1989) for *Hemisilurus* where speciation resulted from the post-Pleistocene isolation of the North Sunda River system.

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