

## ***Amblyrhynchichthys micracanthus*, a new species of cyprinid fish from Indochina (Cypriniformes: Cyprinidae)**

Heok Hee NG<sup>1</sup> & Maurice KOTTELAT<sup>2</sup>

<sup>1</sup> Fish Division, Museum of Zoology, University of Michigan, 1109 Geddes Avenue, Ann Arbor, Michigan 48109-1079, USA (email: heokheen@umich.edu)

Phone: 1-734-647-2192. Fax: 1-734-763-4080.

<sup>2</sup> Case postale 57, Cornol, CH-2952, Switzerland (email: mkottelat@dplanet.ch)

***Amblyrhynchichthys micracanthus*, a new species of cyprinid fish from Indochina (Cypriniformes: Cyprinidae).** - *Amblyrhynchichthys micracanthus* sp. n. is described from the Mekong, Chao Phraya, Mae Khlong and Tapi river drainages in Indochina (mainland Southeast Asia). It can be distinguished from its only congener, *A. truncatus*, in having a more truncate snout (with a straight vs. gently rounded lateral profile), shorter dorsal spine (15.5–25.7 %SL vs. 26.7–29.9), smaller eye when similar-sized individuals of larger than ca. 70 mm SL are compared (28.7–34.9 %HL vs. 32.7–36.3), and fewer gill rakers (34–37 vs. 39–40).

**Key-words:** *Amblyrhynchichthys* - Cyprinidae - new species - Indochina.

## INTRODUCTION

Fishes of the cyprinid genus *Amblyrhynchichthys* Bleeker, 1860 (type species *Barbus truncatus* Bleeker, 1851) are easily distinguished from other cyprinids in having an extremely blunt snout, anteriorly situated nostrils, last simple dorsal-fin ray stout and serrated posteriorly, and a well-developed hyaline eyelid. To date, the genus has been considered monotypic, being found in river drainages throughout Sumatra, Borneo and Indochina (mainland Southeast Asia). The other nominal species referred to *Amblyrhynchichthys*, *A. altus* Vaillant, 1893, is considered a junior synonym of *Kalimantania lawak* (Bleeker, 1855) (see Bănărescu, 1980).

A comparison of Indochinese, Sumatran and Bornean specimens previously identified as *A. truncatus* shows that two distinct species can be recognised, with the Indochinese one described herein as *Amblyrhynchichthys micracanthus*. In previous literature on Indochinese fishes (e.g. Roberts & Warren, 1994: 100; Rainboth, 1996: 86, Pl. VII Fig. 50; Kottelat, 2001: 38, Fig. 25), *A. micracanthus* has been identified as *A. truncatus* (type locality: Banjarmasin in southern Borneo). The situation in *Amblyrhynchichthys* is one more example of a species once considered to have a very wide distribution in large rivers throughout Southeast Asia and now found to consist of two distinct species: one Sundaic (Borneo, Java, Sumatra and Malay Peninsula) and one northern Indochinese (Mekong and Chao Phraya basins). Other cases reported in



recent years include: *Belodontichthys dinema* and *B. truncatus*, *Laides hexanema* and *L. longibarbis*, *Bagrichthys macropterus* and *B. obscurus*, and *Helicophagus waandersii* and *H. leptorhynchus* (Kottelat & Ng, 1999; Ng 1999a, b; Ng & Kottelat, 2000) and we are aware of numerous other cases awaiting re-analysis. A model of the historical biogeography of species with this pattern of distribution has been proposed by Bornbusch & Lundberg (1989), who hypothesized that the post-Pleistocene isolation of the North Sunda River system resulted in speciation.

## MATERIAL AND METHODS

Measurements were made point to point with dial callipers and data recorded to 0.1 mm. 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 and counts were made following Hubbs & Lagler (1947), except for scale counts, which follow those of Kottelat (1984, 1990), and pharyngeal tooth counts, which follow those of Jenkins & Burkhead (1994), but exclude the replacement teeth.

Fin rays were counted under a binocular dissecting microscope using transmitted light. Material for this study is deposited in the following collections: California Academy of Sciences, San Francisco (CAS), collection of the second author, Cornell (CMK), Museum of Comparative Zoology, Cambridge (MCZ), Nationaal Natuurhistorisch Museum, Leiden (RMNH), Museum of Zoology, University of Michigan, Ann Arbor (UMMZ), and the Zoological Reference Collection of the Raffles Museum of Biodiversity Research, Singapore (ZRC).

## DESCRIPTION

### *Amblyrhynchichthys micracanthus* sp. n.

Figs 1 and 2a

*Holotype*. UMMZ 232203, 100.2 mm SL; Cambodia: Kandal province, Tonle Sap River 22 km upstream from Phnom Penh; W. J. Rainboth and N. van Zalinga, 16 January 1995.

*Paratypes*. CAMBODIA: CAS 94193, 1 ex., 111.8 mm SL; market at Phnom Penh; T. R. Roberts and K. E. Witte, 18 January-20 February 1994. CAS 94285, 5 ex., 98.0-125.3 mm SL; Cambodia: Stung Treng; T. R. Roberts, 2-18 February 1994. UMMZ 181245, 2 ex., 97.0-122.2 mm SL; Pursat province, Great Lake at Kompong Luong; J. Bardach, 18 March 1959. UMMZ 232277, 1 ex., 103.3 mm SL; Stung Treng morning market; W. J. Rainboth, N. van Zalinga and C. Rotha, 26 January 1995. UMMZ 232527, 2 ex., 101.6-110.2 mm SL; Kandal province, Tonle Sap; W. J. Rainboth and C. Rotha, 13 February 1995. UMMZ 232622, 1 ex., 68.5 mm SL; Kandal province, Prek Mong Ya, just upstream from confluence with Bassac River at fishing lot 10; W. J. Rainboth and C. Rotha, 20 February 1995. UMMZ 232713, 1 ex., 91.5 mm SL; Kompong Thom province, Tonle Sap at exit to Great Lake, 4 km NW of Chhnok Trou, at Kompong Thom fishing lot 2; W. J. Rainboth, N. van Zalinga and C. Rotha, 28 February 1995. UMMZ 234374, 1 ex., 97.2 mm SL; Kandal province, Tonle Sap at Dai fishery row 9, 25 km upstream from Phnom Penh; W. J. Rainboth *et al.*, 22 January 1996. UMMZ 235499, 3 ex., 79.3-91.5 mm SL; Kandal province, Tonle Sap at Dai fishery row 9, 15 km upstream from Phnom Penh; W. J. Rainboth *et al.*, 27 January 1996. LAOS: CAS 94272, 1 ex., 102.4 mm SL; Champasak province, Mekong river at Ban Hang Khone, just below Khone Falls; T. R. Roberts, June-July 1993. CMK 13137, 6 ex., 59.4-68.1 mm SL; Vientiane province, Mekong River at mouth of Nam Mang and lower 100 m of Nam Mang, 18°21'48"N 103°14'16"E; M. Kottelat *et al.*, 22 February 1997. UMMZ 235320, 2 ex., 135.8-170.6 mm SL; Champasak province,



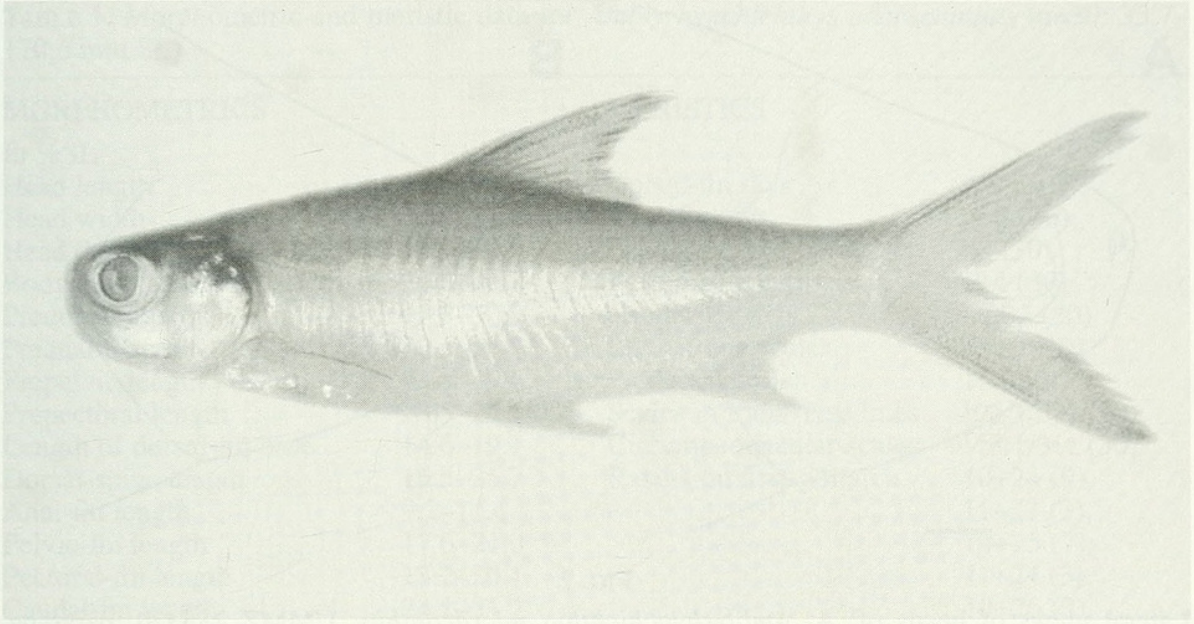


FIG. 1

*Amblyrhynchichthys micracanthus*, CMK 13137, paratype, 68.1 mm SL.

Mekong River at Ban Hang Khone, just downstream from Khone Falls; I. G. Baird, date unknown. THAILAND: CAS 61877, 2 ex., 128.1-141.4 mm SL; Ubon Ratchathani province, fish market at Ubon Ratchathani; T. R. Roberts, 28 June 1985. CAS 93243, 1 ex., 95.8 mm SL; Ayutthaya province, Ayutthaya market; T. R. Roberts, 5-7 March 1989. CAS 93921, 2 ex., 95.9-144.7 mm SL; Nakhon Sawan province, Nakhon Sawan market; T. R. Roberts, 4-5 February 1989. MCZ 47307, 165.2 mm SL; Mekong River at Nong Khai; T. R. Roberts, May 1970. UMMZ 195088, 1 ex., 125.1 mm SL; Nakhon Sawan province, Chao Phraya River, floodwaters 20 km N of Nakhon Sawan; K. F. Lagler, 15 October 1964. UMMZ 195364, 39 mm SL; Maharaj province, Chao Phraya River, 17.5 km N of Ayutthaya; S. Mekbahn, 27 December 1964. UMMZ 195856, 1 ex., 98.5 mm SL; Mae Nam Khwae Yai about 10 km upstream from Kanchanaburi; K. F. Lagler, 24 March 1965. UMMZ 195883, 5 ex., 84.3-168.1 mm SL; Mae Nam Mae Khlong at 2 km downstream of Ban Pong; K. F. Lagler *et al.*, 25 March 1965.

*Non-types.* CAMBODIA: UMMZ 234483, 2 ex., 36.1-51.2 mm SL; Kandal province, floodplain lake near Mekong. THAILAND: UMMZ 185226, 1 ex., 94.3 mm SL; vicinity of Bangkok. UMMZ 195396, 17 ex., 35.3-53.3 mm SL; Maharaj province, Kok Tong Canal (tributary of Chao Phraya River) 17.5 km N of Ayutthaya. UMMZ 195722, 4 ex., 62.9-73.5 mm SL; Ubon Ratchathani province, Mun River, about 20 km downstream from Ubon Ratchathani. UMMZ 195739, 1 ex., 64.1 mm SL; Ubon Ratchathani province, Mun River, about 5 km downstream from Ubon Ratchathani. UMMZ 224265, 1 ex., 101.3 mm SL; Ubon Ratchathani province, Khong Chiam district, Mun River at Ban Dan, 1.2 km upstream from confluence with Mekong River. UMMZ 224296, 1 ex., 114.7 mm SL; Nakhon Phanom province, Mekong River, island off Ban Tha Kai, 20 km downstream from Mukdahan, 1 km from Thai, 5 km from Laos side. UMMZ 224311, 1 ex., 111.5 mm SL; UMMZ 224353, 1 ex., 128.4 mm SL; UMMZ 224364, 1 ex., 137.7 mm SL; UMMZ 224391, 1 ex., 132.9 mm SL; UMMZ 224398, 1 ex., 121.6 mm SL; UMMZ 224448, 2 ex., 114.7-196.7 mm SL; UMMZ 224455, 1 ex., 111.5 mm SL; Ubon Ratchathani province, Khong Chiam district, Mun River at Ban Dan, 3 km upstream from confluence with Mekong River. UMMZ 224508, 1 ex., 95.8 mm SL; Ubon Ratchathani province, stream from Bung Klang Huen to Mun River, 10 km from Mun River, 3 km E of Ubon Ratchathani. UMMZ 233820, 1 ex., 43.0 mm SL; Ubon Ratchathani province, Huay Mark, 8 km N of Khong Chiam at confluence with Mekong River. UMMZ 237228, 30 ex., 36.2-58.7 mm SL; Maharaj province, Kok Tong, 15 km N of Ayutthaya, tributary of Lop Buri and Chao Phraya rivers. VIETNAM: UMMZ 218147, 13 ex., 29.0-59.1 mm SL; Phong Dinh province, Bassac



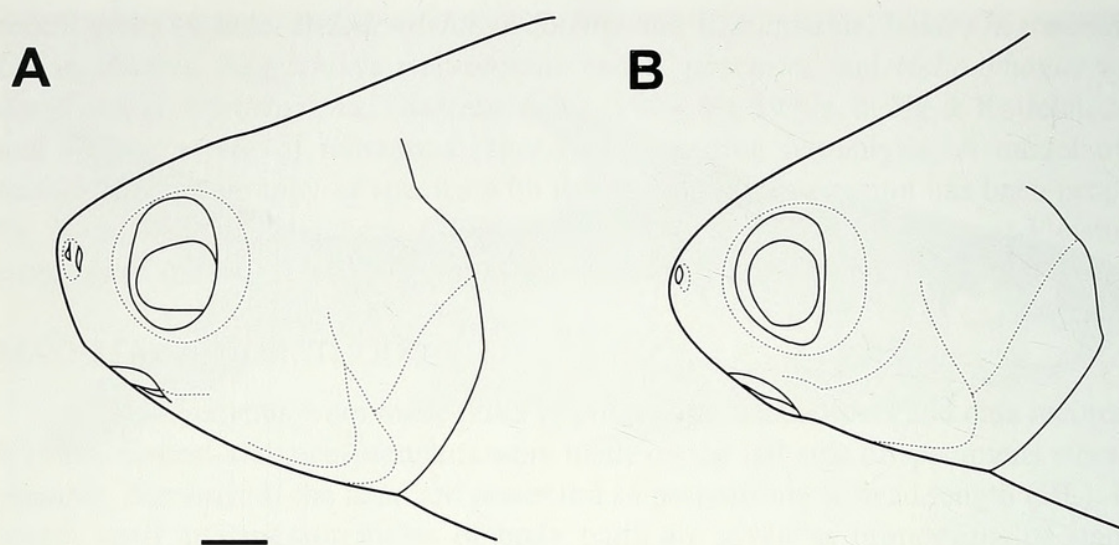


FIG. 2

Lateral views of heads of: A. *Amblyrhynchichthys micracanthus*, UMMZ 235320, paratype, 135.8 mm SL; B. *A. truncatus*, CMK 4763, 137.8 mm SL. Scale bar indicates 5 mm.

River 0.5 km downstream from Can Tho. UMMZ 218533, 9 ex., 27.2-47.2 mm SL; UMMZ 218547, 19 ex., 31.0-48.8 mm SL; UMMZ 218568, 11 ex., 26.5-43.1 mm SL; UMMZ 218583, 1 ex., 49.5 mm SL; Phong Dinh province, Bassac River at Can Tho. UMMZ 218675, 8 ex., 40.8-73.0 mm SL; Phong Dinh province, Bassac River adjacent to Dong Phu. UMMZ 218651, 91 ex., 24.0-62.2 mm SL; An Giang province, Bassac River 1.3 km S of Long Xuyen. UMMZ 224853, 1 ex., 49.5 mm SL; An Giang province, rice paddy 1 km S of Highway 10 in Hoa Binh Thanh district. UMMZ 224956, 1 ex., 97.5 mm SL; Phong Dinh province, Can Tho fish market.

**Diagnosis.** *Amblyrhynchichthys micracanthus* can be distinguished from its sole congener, *A. truncatus*, in having a more truncate snout (with a straight vs. gently rounded lateral profile), shorter dorsal spine (15.5-25.7 %SL vs. 26.7-29.9), smaller eye when similar-sized individuals of larger than ca. 70 mm SL are compared (28.7-34.9 %HL vs. 32.7-36.3), and fewer gill rakers (34-37 vs. 39-40).

**Description.** Morphometric and meristic data are given in Table 1. Body moderately deep and strongly compressed, with narrow predorsal midline. Predorsal profile smoothly rounded, with small concavity at nape and then sloping gently ventrally from origin of dorsal fin to end of caudal peduncle. Ventral profile less convex than dorsal profile, sloping gently ventrally to anterior end of anal-fin base, then sloping more steeply dorsally from there to end of caudal peduncle. Lateral line complete. Scales with strongly convergent radii.

Head narrow, snout extremely blunt, with a vertical lateral profile. Nostrils large and anteriorly situated. Eye in upper half of head, visible from dorsal and ventral aspects; moderately large. Hyaline eyelid well developed, covering anterior and posterior quarters of orbit. Suborbital bones fairly large, narrowest directly below eye. Mouth subterminal, with well-developed groove separating lips from both upper and lower jaws. Lips thick; lower lip present medially and with complete post-labial groove. Gill membranes broadly joined to isthmus. Gill rakers long, one third as long as opposing filaments on epibranchial and half as long as opposing filaments on ceratobranchial. Pharyngeal bones stout, with three rows (2,3,4-4,3,2) of curved,



TABLE 1. Morphometric and meristic data for *Amblyrhynchichthys micracanthus* (n=30: 35.7–170.6 mm SL)

MORPHOMETRICS		MERISTICS	
In %SL			
Head length	23.5–28.6	Dorsal-fin rays	iv,9 (30)
Head width	12.0–16.4	Anal-fin rays	iii,5 (30)
Head depth	16.9–20.6	Pelvic-fin rays	i,8 (30)
Body depth at dorsal origin	24.4–36.3	Pectoral-fin rays	i,14 (30)
Predorsal length	46.8–50.9	Caudal-fin rays	i,9,8,i (30)
Preanal length	70.6–77.2	Lateral line scales	35+2 (30)
Prepelvic length	43.9–49.6	Predorsal scales	11 (30)
Prepectoral length	23.5–27.5	Scales in transverse lines	1/25/1/3 1/2 (30)
Length of dorsal-fin base	14.6–19.1	Circumpeduncular scales	1/23/1/3 1/2 (30)
Dorsal-spine length	15.5–25.7	Rakers on first gill arch	10+24 (9), 11+23 (3), 10+25 (7), 11+24 (3), 10+26 (3), 11+25 (3) or 10+27 (2)
Anal-fin length	9.2–11.4		
Pelvic-fin length	17.6–21.0		
Pectoral-fin length	18.2–20.1		
Caudal-fin length	24.2–31.2		
Length of caudal peduncle	16.2–21.0		
Depth of caudal peduncle	7.6–13.0		
In %HL		Vertebrae	20+12=32 (4) or 20+13=33 (26)
Snout length	22.0–28.0		
Interorbital distance	21.1–39.9		
Eye diameter	28.7–34.9		

chisel-shaped teeth. Grinding surfaces of distalmost major teeth widest, width progressively decreasing proximally.

Dorsal fin moderately high, with concave distal margin, sharply pointed at apex; origin slightly anterior to pelvic-fin origin. Last unbranched ray longest; spinous part with 11 to 18 serrations on posterior edge. Pectoral fin long and falcate, extending to scale row at pelvic-fin origin; distal margin concave near tip but straight otherwise. Pelvic fin moderately falcate, extending to slightly more than midway between pelvic-fin origin and anterior base of anal-fin; distal margin nearly straight. Anal fin with strongly concave distal margin and last three posterior rays equal in length; when adpressed against body, extending to middle of caudal peduncle. Two scale rows between urogenital opening and anal-fin origin. Caudal peduncle strongly compressed and moderately long. Caudal fin deeply forked, upper and lower lobes pointed.

Sexual dimorphism absent. Breeding tubercles absent and body depth between sexes not different.

Colour. Preserved material with a pale brown body and a faint broad stripe consisting of aggregations of melanophores on sides of body immediately above lateral line. Dorsal and caudal fins hyaline, with a faint black posterior margin. All other fins hyaline. Colour in life an overall silvery white.

*Distribution.* Lower and middle Mekong, Chao Phraya, Mae Khlong and Tapi river drainages in Indochina (mainland Southeast Asia). In the Mekong, it reaches upriver to Vientiane.

*Etymology.* From the Greek mikros, meaning small, and akantha, meaning thorn. In reference to the smaller dorsal spine of this species compared to *A. truncatus*. Treated as an adjective.



**Ecology.** *Amblyrhynchichthys micracanthus* is found mainly in rivers, with juveniles occasionally entering swamps and flooded fields (Taki, 1978). In the Mekong River drainage, this species moves into the inundated forest during the flood season (June–September) and return to the river in October and November (Rainboth, 1996). It feeds mainly on periphyton; other minor food items include phytoplankton, zooplankton and benthic algae (Rainboth, 1996).

## DISCUSSION

The difference in eye diameter between *A. micracanthus* and *A. truncatus* is only apparent when similar-sized individuals are compared. We were able to examine only two specimens smaller than 90 mm SL for *A. truncatus*, but when eye diameter is plotted against SL for both species (Fig. 3), the graph indicates that the comparison is only meaningful when specimens of the same size (larger than ca. 70 mm SL) are used.

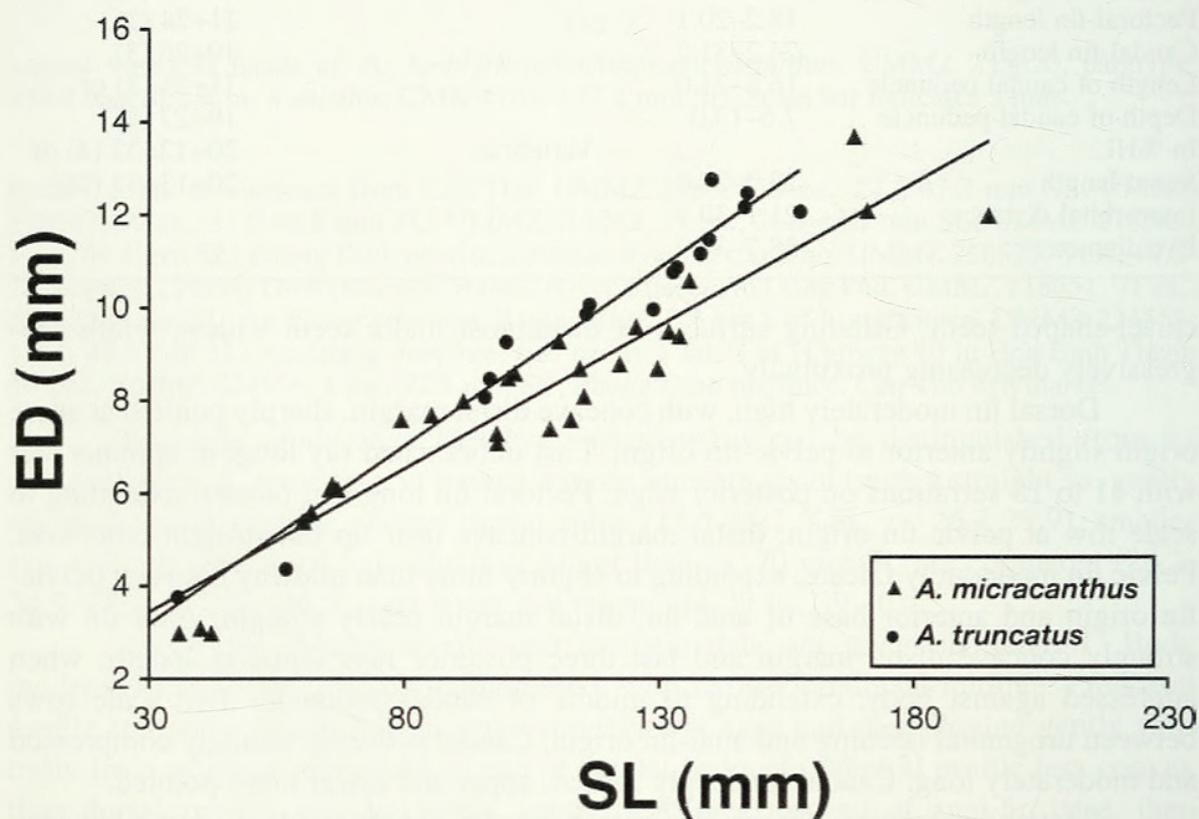


FIG. 3

Eye diameter (ED) plotted against standard length for *Amblyrhynchichthys* species.

The morphometric differences observed between *A. micracanthus* and *A. truncatus* cannot be explained by ontogeny alone. The regression lines in the biplots of eye diameter (Fig. 3) and dorsal-spine length (Fig. 4) against SL show are significantly different (ANCOVA,  $P=0.00111$  and  $P<0.0000005$  respectively).

Although the different snout shapes of *A. truncatus* and *A. micracanthus* would suggest that the shapes of the maxilla, premaxilla and possibly the circumorbital bones would differ, no significant differences in the osteology of the two species were observed, suggesting that the differences in shape are more likely caused by soft tissue.



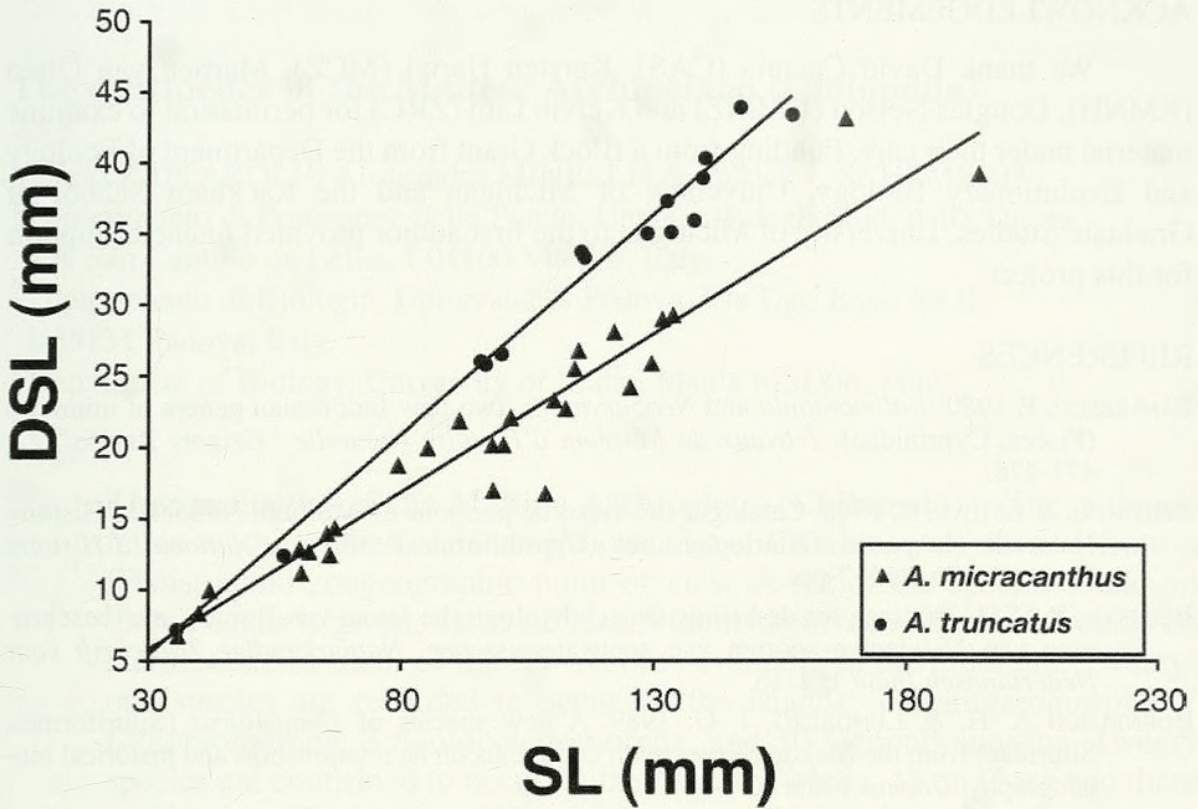


FIG. 4

Dorsal-spine length (DSL) plotted against standard length for *Amblyrhynchichthys* species.

Bleeker (1851) described *A. truncatus* on the basis of three specimens 50-110 mm TL [total length] from Banjarmasin, Borneo. We have examined 2 specimens from Bleeker's collection which were registered as syntypes. RMNH 9091 is 35.3 mm SL, which corresponds to a total length of 50 mm and therefore seems to be the 50 mm TL syntype. RMNH 7032 is 56.5 mm SL and is probably the third specimen, for which Bleeker did not indicate the size (between 50 and 110 mm TL). Other Bleeker specimens of *A. truncatus* in RMNH are too large to be syntypes (RMNH 17176, 4, 96.5-203.4 mm SL; the 96.5 mm SL specimen would have been at least 120 mm TL). The whereabouts of the third syntype are not known. The 'cotype' listed by Bertin & Estève (1948) cannot have a type status as it is too large and is from Sumatra. The two syntypes agree with *A. truncatus* as diagnosed above and RMNH 9091 is hereby designated as lectotype.

#### COMPARATIVE MATERIAL

*Amblyrhynchichthys truncatus*: BORNEO: RMNH 7032, paralectotype, 56.5 mm SL; RMNH 9091, lectotype, 35.3 mm SL; Kalimantan Selatan, Banjarmasin. CMK 10190, 2 ex., 116.1-157.3 mm SL; Kalimantan Barat, Danau Genting, between Danau Pengembung and Danau Belida. UMMZ 209912, 2 ex., 95.5-115.4 mm SL; Kalimantan Barat, Sungai Tawang near Danau Pengembung. ZRC 40025, 1 ex., 146.5 mm SL; Kalimantan Selatan, Banjarmasin, Pasar Lima Beton. SUMATRA: CMK 4763, 2 ex., 133.2-137.8 mm SL; ZRC 38556, 1 ex., 147.0 mm SL; ZRC 43160, 2 ex., 132.4-140.0 mm SL; ZRC 44109, 2 ex., 128.5-139.5 mm SL; Jambi, Pasar Angso Duo. MALAY PENINSULA: ZRC 1764, 1 ex., 175.8 mm SL; Malaysia: Pahang, King George V National Park. ZRC 1765, 1 ex., 173.0 mm SL; Malaysia: Pahang, Kuala Tahan.



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