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A NEW FISH FROM NORTH BORNEO

Genus *Tetraodon*

ROBERT F. INGER

ASSISTANT CURATOR, DIVISION OF FISHES

The Borneo Zoological Expedition (1950) of Chicago Natural History Museum obtained what appears to be a new species of Tetraodontidae. The new form was collected in the drainage of the Kretam Kechil River, which flows into Dewhurst Bay on the north-east coast of Borneo about 35 miles southeast of Sandakan. This species is common in brackish water, occurring near the banks of the larger streams, in the nipa palm and mangrove swamps fringing them, and in the lower reaches of the smaller fresh-water tributaries near the upper limits of tidal water.

***Tetraodon kretamensis* sp. nov.**

Type.—Chicago Natural History Museum no. 51558, from the Pinang River, a tributary of the Kretam Kechil River, Kinabatangan District, East Coast Residency, North Borneo. Collected May 10, 1950, by Robert F. Inger.

Description of type.—Body oblong, cylindrical anteriorly, last third of trunk slightly compressed; dorsal profile rising steeply to interorbital, more gradually to point above end of pectoral, sloping downward to center of caudal peduncle, concave above peduncle; ventral profile sloping steeply from mouth to below hind margin of orbit, deepest opposite base of pectoral; body broadest just behind eyes; head subconical before orbit; snout truncate; lips plicate, very thick; single large tooth in each half of both jaws, the teeth subequal and forming a beak; nasal apparatus a solid oblong tentacle bifid in distal two-thirds, apposed surfaces of terminal "lobes" smooth (fig. 27, *b*); nasal tentacle 2.3 mm., antero-mesad from orbit; eye in center of head, longitudinal axis slightly above line connecting upper end of branchial opening and corner of mouth; branchial opening immediately anterior to base of pectoral, shorter than pectoral base, half diameter of eye.

Scaleless; erectile spines with bifid base covering back, sides, and belly anterior to level of vent, top of head and throat to anterior level of eyes, and sides of head behind eyes; lateral line system indistinct, a line across snout between nasal tentacles and mouth, a supraorbital line strongly curved inward, a transverse occipital line curving backward from hind corner of eyes, a lateral line arching high above pectoral and becoming invisible anterior to level of dorsal.

Pectorals broad, base slightly off vertical, in mid-line, margin feebly rounded, third and fourth branched rays the longest, subequal to eye; origin of dorsal equidistant from end of pectoral and mid-base of caudal, margins rounded; anal origin opposite that of dorsal, margin rounded; caudal truncate; vent 2.5 mm. before anal origin.

Dorsal ii,10; pectoral ii,16; anal i,9; caudal ii,9; total length 64 mm.; standard length 52.0 mm.; head length 22.5 mm., width 19.0 mm.; eye 6.1 mm.; snout 8.4 mm.; postorbital head length 8.0 mm.; maximum body depth (uninflated) 17.8 mm.

Color (in life) olive-green dorsally and laterally, with round and oblong black spots of varying sizes; a black occipital chevron; a partially interrupted ventro-lateral black stripe running from mouth below eye and pectoral and fading anterior to vent; ventral surface of head and trunk anterior to vent white; fins unmarked; caudal dusky.

Paratypes.—C.N.H.M. 51559 (34 specimens) from the type locality; C.N.H.M. 51562 (12 specimens) from the Gaja River, approximately one and one-half miles above its mouth; C.N.H.M. 51560–61 (7 specimens) from the Kretam Kechil River near its mouth; C.N.H.M. 51563 (3 specimens) from a tributary of the Gaja River.

Variation in color among these involves the presence or absence of the ventro-lateral band and its intensity. The distribution, size, and shape of the black spots also vary. The occipital chevron is almost always present. Some specimens have an interorbital bar, others only a spot. Occasionally spots coalesce to form a partial or complete cross on the back. In no specimen is the caudal barred.

Dorsal ii–iii,8–11; pectoral ii,15–18; anal i–ii,7–9; total length 10.5–60 mm.; standard length 7.9–46.6 mm.; head in standard length 2.10–2.26 (mean of eleven including type 2.19 ± 0.02).

Remarks.—The new species is similar to *leiurus* Bleeker (type locality Java) and *fluviatilis* Hamilton (type locality Bengal) but

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differs from both in fin ray counts. It also differs from *fluviatilis* in having smooth rather than spongy or cellular inner surfaces on the nasal flaps (fig. 27). The following table sets forth differences distinguishing these species. The counts of *leiurus* are taken from Bleeker's original description (1852) and one other specimen collected by Bleeker and now in the British Museum. The Ganges *fluviatilis* is represented by four specimens (also in the British Museum)

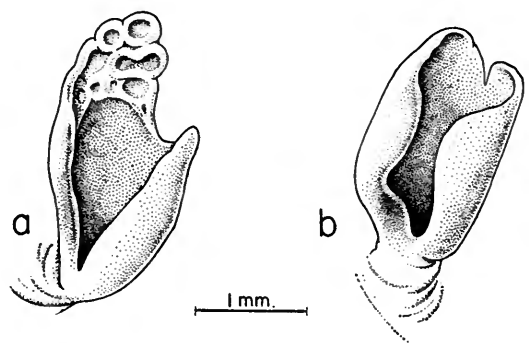


FIG. 27. Nasal tentacles of *Tetraodon* showing difference between (a) *T. fluviatilis* Ham. (42 mm.) and (b) *T. kretamensis* sp. nov. (52 mm.).

from Allahabad, which is not far from the type locality. Data on the British Museum specimens were generously supplied by Mr. N. B. Marshall. Information on Bornean *fluviatilis* is based on twelve specimens from North Borneo.

	<i>leiurus</i>	<i>fluviatilis</i>		<i>kretamensis</i>
		Ganges	Borneo	
Dorsal.....	14	15-16	13-15	10-13
Pectoral.....	22-23	19-20	21-23	17-20
Anal.....	11	13-14	11-12	9-11
Nasal surface.....	smooth	spongy	spongy	smooth

The exact relationship between *leiurus* and *kretamensis* is not clear. They may prove to be geographic representatives of a wide-ranging species. There can be no doubt, however, of the distinction between *fluviatilis* and *kretamensis*. Both species were collected at the same stations on the Pinang River. The two groups of specimens, separated on the basis of the inner surfaces of the nasal flaps, showed striking differences in fin ray counts as may be seen in the preceding table and the following comparisons of means.

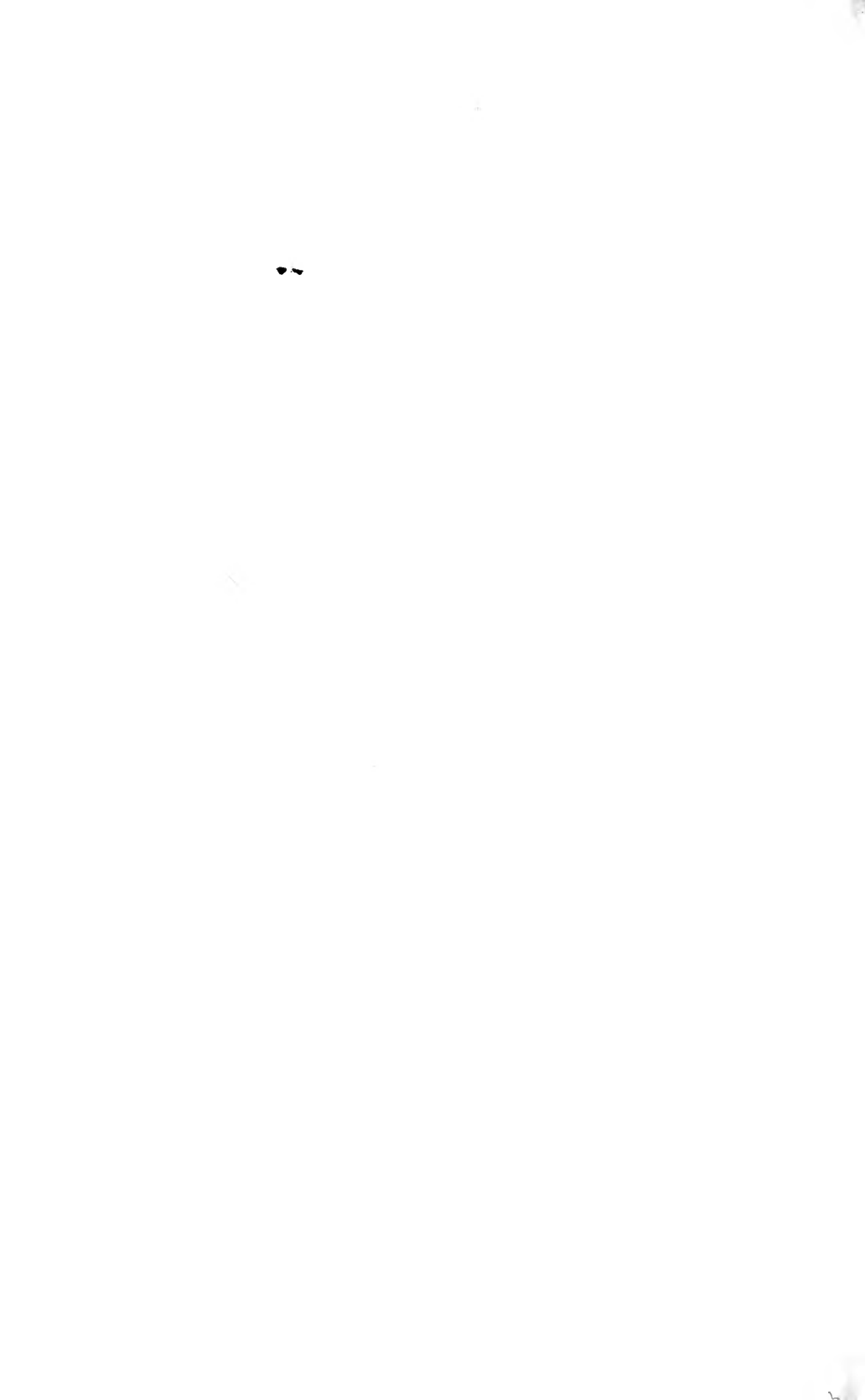
	<i>fluvialis</i> (12 specimens)	<i>kretamensis</i> (24 specimens)	Difference	<i>t</i>	<i>P</i>
Dorsal.....	13.8±0.2	11.7±0.1	2.1	9.012	<0.001
Pectoral.....	21.8±0.2	18.5±0.1	3.3	13.750	<0.001
Anal.....	11.8±0.1	10.2±0.1	1.6	9.580	<0.001

Differences among *fluvialis*, *leiurus*, and *kretamensis* in coloration of the tail (usually without bars in the last two and with bars in *fluvialis*) may not be reliable. The bars of *fluvialis* may be obscure or completely lacking. The ability of these fishes to change color pattern may account for the apparent difference.

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