

A New Species of the Fish Genus *Danio* (Cyprinidae) from Kedah, Malaya

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THE SMALL SPECIES of the genus *Danio* which have the lateral line reduced or absent and which have a preorbital spine are sometimes placed in a separate genus, *Brachydanio*¹. Recently four specimens of an apparently new species of this group were sent to me by Mr. M. W. F. Tweedie, Director of the Raffles Museum and Library, Singapore. I wish to name this form in recognition of his many contributions to the natural history of Malaya.

Danio (*Brachydanio*) *tweediei*, new species, Plate 3

Holotype: Stanford University Natural History Museum 48130; an adult female, 31.5 mm. in standard length.

Paratypes: Stanford University Nat. Hist. Mus. 48131; an adult female, 26.5 mm. in standard length. U.S. National Museum no. 163996; two adults, 26.5 and 27.4 mm. in standard length.

Type Locality: Sungei Patani, Kedah, Malaya.

Collector: Major H. C. Neath, of the Brigade of Gurkhas of the British Army.

Description: In general body form this species closely resembles *Danio* (*Brachydanio*) *rerio*, the zebra danio, and *D. (B.) albolineatus*, the pearl danio, both popular aquarium fishes, as well as *D. (B.) kerri* and *D. (B.) pulcher*.

Depth of body from dorsum to belly in front of anus 3.8 (3.6-4.0) in standard length, depth from dorsum to belly between pelvic fins 3.6 (3.5-3.8); the same in total length 4.9 (4.8-5.1) and 4.7 (4.5-4.8), respectively. Breadth 7.1 (6.6-7.6) in standard length, 9.4 (8.8-9.9) in total length. Head length to end of opercular flaps 4.2 (4.0-4.3) in standard length, in total length 5.4 (5.2-5.6); head length to end of opercular bones 3.7 (3.6-4.0) in standard length, 4.8 (4.5-5.1) in total length.

Head with dorsal profile relatively flat. Lower jaw slightly projectant, the symphyseal knob well developed. Eye 3.4 (3.3-3.5) in head length minus opercular skin flap; 3.7 (3.7-3.8) including opercular flap. Snout 3.7 (3.6-3.8) in head length to opercular bones, 4.1 (4.0-4.4) in head with flap. Interorbital space strongly arched, 2.3 (2.1-2.6) in head length minus flap, 2.5 (2.3-2.9) in head with flap. Depth of head through eye 1.6 (1.6-1.7) in head length minus flap, 1.8 (1.7-1.9) in head with flap. Postorbital head depth 1.3 in head length minus flap, 1.4 (1.4-1.5) in head with flap. Rostral barbel reaching to middle of eye, or a little beyond, 3.4 (3.2-3.5) in head minus flap, 3.7 (3.5-3.9) in head with flap. Maxillary barbel reaching to base of pectoral fin, 1.1 (1.1-1.3) in head minus flap, 1.3 (1.2-1.4) in head with flap, 4.7 (4.3-5.1) in standard length.

¹. Regarded by Smith, 1945, p. 96, as a subgenus.

Dorsal fin ii, 6 or 7, rounded, its upper margin convex, 5.6 (5.0-6.3) in standard length, 6.5 (6.3-6.7) in total length. Dorsal height (longest ray) 1.3 (1.3-1.4) in depth of body from dorsum to belly in front of anus, 1.4 (1.3-1.4) in depth of body from dorsum to ventrum between pelvics. Length of dorsal base 1.7 in its height, 1.9 (1.7-2.1) in anal base-length, 8.2 (7.0-9.1) in standard length, 2.0 (1.7-2.2) and 2.2 (2.0-2.5) in head length without and with opercular flap, respectively. Predorsal distance 1.6 in standard length, 2.1 (2.0-2.1) in total length.

Anal fin iii, 13 (in one specimen iii, 12), the tip broadly pointed, the lower margin concavo-convex. Anal height (longest ray) 1.5 (1.4-1.7) in body depth to anus, virtually the same in body depth to between pelvics. Anal height 1.3 (1.1-1.5), in anal base-length, 5.6 (5.0-6.3) in standard length, 7.2 (6.7-8.0) in total length. Anal base-length 4.7 (4.5-4.9) in standard length, 1.1 (1.1-1.2) and 1.2 (1.1-1.3) in head length without and with opercular flap, respectively. Preanal distance 1.6 in standard length, 2.1 (2.0-2.1) in total length.

Pelvic fins i, 7, broadly pointed at the tips, the posterior margins convex. Pelvic length (longest ray) 7.6 (7.4-8.1) in standard length, 9.8 (9.6-10.3) in total length, 1.8 (1.8-1.9) and 2.0 (2.0-2.1) in head without and with opercular flap, respectively. Prepelvic distance 2.1 (2.0-2.2) in standard length, 2.7 (2.6-2.8) in total length. Small, elongate axillary scale present, going about 5 times into length of longest pelvic ray.

Pectoral fins i, 11 (i, 10-i, 12), slightly rounded at the tips. Pectoral length (longest ray) 4.6 (4.2-5.0) in standard length, 6.0 (5.6-6.4) in total length, 1.1 (1.0-1.2) and 1.2 (1.2-1.4) in head length without and with opercular flap, respectively.

Caudal with two principal unbranched rays, and with 15 principal branched ones between them. Shortest caudal rays 1.6 (1.3-2.0) in longest.

Depth of caudal peduncle 1.4 (1.3-1.5) in its length, 2.0 (1.9-2.2) and 2.2 (2.1-2.5) in head length without and with opercular flap, respectively.

Lateral line absent. Scales in horizontal midlateral series 33 (31-34), in front of dorsal 16 (15-16), $\frac{1}{2}$ 8 $\frac{1}{2}$ in transverse line from dorsum to belly in front of pelvic origin, $\frac{1}{2}$ 6 or 7 plus 1 (latter a sheath scale) in transverse line to anal origin ($\frac{1}{2}$ 7 plus 1 if count is made to first scale of anal sheath, $\frac{1}{2}$ 6 plus 1 if it is made to the second sheath scale), circumpeduncular scales $\frac{1}{2}$ 5 $\frac{1}{2}$ ($\frac{1}{2}$ 4 $\frac{1}{2}$, rarely). Origin of dorsal opposite 15th, origin of anal opposite 16th, origin of pelvics opposite 9th or 10th scale of midlateral series.

Pharyngeal bones and teeth as in other species of the genus, and strongly resembling those of *Rasbora*. Teeth 5, 4, 2, conical, pointed, slightly curved at the tips.

Coloration of Preserved Material (Formalin-fixed):

Ground-color yellowish-brown. Entire back medium brown, made so by the innumerable fine dots, not visible to the naked eye, which overlie the basic ground-color. Scales on the back are delicately edged along their posterior margins with brown spots a little darker and larger than those on the back generally. The top of the head is darker than the back, and there is a dark brown middorsal or vertebral stripe running down the back from occiput to caudal root; this latter is from 1/6 to 1/4 the mid-dorsal scales in width.

On the sides there are three stripes, two brownish dark ones and a broader light stripe between them. The upper dark stripe starts a little in front of the anterior dorsal insertion and runs above the central axis of the body backward to the caudal base. The lower dark stripe starts about halfway between verticals drawn upward from the pectoral

and the pelvic insertions, and runs backward to the caudal base. Both stripes tend to be broken up into serially arranged blocks of pigment anteriorly, especially the lower, but become solid at about the level of the middle of the dorsal insertion. The light stripe between them is formed by the underlying ground color and is about as wide as the eye-pupil posteriorly, but is "pinched out" anteriorly (about midway between verticles drawn from pelvic and pectoral origins) by the convergence of the two dark lateral stripes.

Axial lateral streak poorly developed, running from halfway between vertical levels of pelvic and pectoral insertions backward to just in front of the caudal base.

There are weak, scattered pigment spots on the lower flanks, nearly impossible to see.

Coloration of Living Specimens:

The following color notes have been modified from Major Neath (*in litt.*), and are for aquarium specimens under reflected light:

When first taken the back is brown and the belly silvery; there are steel gray spangles on the back, and the whole body is overcast with a delightful powder blue sheen. After some time a mauve overcast develops, the spangles on the back becoming goldish. On the side are four stripes; the upper and lower are narrow, and are blue and pale orange, respectively. The two center stripes are wider, the upper being orange, the lower blue. The narrow stripes taper out at about the level of the dorsal fin, the two wider ones tapering up to the operculum. When first taken the orange stripes are paler and the others are sea green (probably a reaction to fright); later they become brighter orange and cobalt blue respectively. In direct sunlight the stripes fade and the whole fish is suffused with a powder blue color. The dorsal and caudal fins are yellow with wide white distal fringes. The anal fin has a line of black dots running parallel to the lower margin, about halfway out on the fin.

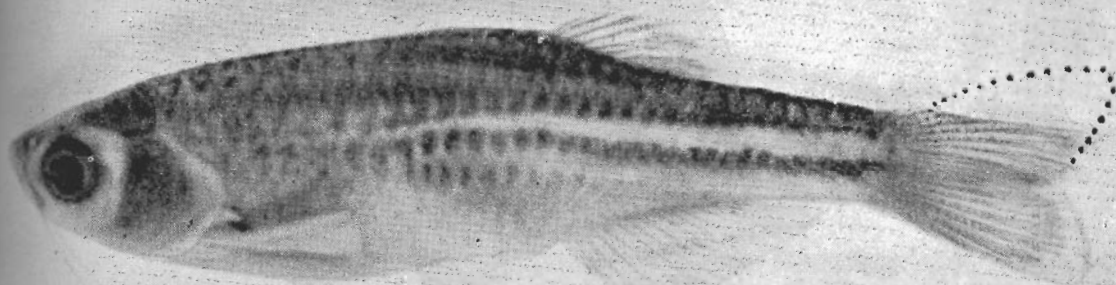
Comparisons and Relationships:

Major Neath describes the habitat from which the types were taken as follows: "It is extremely prolific in a small and rather filthy stream some little distance from Sungei Patani. The stream is a mud-bottomed drainage cut, and is literally carpeted with *Tubifex* . . . The water is full of detritus and is offensive in smell for some 20 yards away from it, yet . . . these (fishes) occur in large numbers and in splendid condition in it". He mentions having collected an unidentified *Rasbora* in the clear streams off Kedah peak, but says that, in general, this whole area (of Kedah) is, in comparison to Johore, disappointing, except for *Aplocheilichthys panchax*, anabantids, and estuarine fishes (he is here speaking as an aquarist, but the freshwater fish fauna is smaller than that of Johore, it is true). Brittan (1954, Bull. Raffles Mus. 25, p. 131) records only one species of *Rasbora*, *R. sumatrana* from Kedah, but this may reflect only insufficient collecting.

The species most closely related to *D. tweediei* appear to be *D. kerri* H. M. Smith (1934, Proceedings U.S. Nat. Mus., vol. 79, art. 7, p. 7), *D. pulcher* H. M. Smith (*ibidem*, p. 9), and *D. albolineata* (Blyth) (1860, Journ. Asiatic Soc. Bengal, vol. 29, p. 163). The latter may be distinguished by having an incomplete lateral line and a single scarlet midlateral stripe, which extend forward from the base of the caudal fin to a point on the side under or before the dorsal fin. The former may be distinguished by having longer rostral barbels (extending beyond eye) and different coloration: back reddish; on side and opercle a broad, dull blue band, within which are four narrow, bright scarlet longitudinal stripes, one from gill opening to caudal base; dorsal and

caudal fins dusky, with pale red edges; anal fin dusky, the rays pale red (Smith, 1945, Bull. U.S. Nat. Mus. 188, p. 97). *D. pulcher* is distinguished by having longer maxillary and rostral barbels (extending far beyond the base of the pectoral and beyond the preopercle, respectively) and different coloration: back and sides with longitudinal bands and stripes of blue, or orange, and orange-red; dorsal fin green basally, chrome yellow distally, with a broad vermilion margin; caudal fin pale green with central part and posterior margin scarlet; anal fin scarlet at base, distal half chrome-orange with a narrow sky-blue edge, a deep green median band (loc. cit.).

Major Neath (*in litt.*) remarks that in his aquarium males of *D. tweediei* participate in driving gravid *D. rerio* females.



Danio (Brachydanio) tweediei sp. n. (M. R. Brittan).