

***Xyrichtys trivittatus*, a New Species of Razorfish (Perciformes: Labridae) from Hong Kong and Taiwan**

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John E. Randall and Andrew S. Cornish (2000) *Xyrichtys trivittatus*, a new species of razorfish (Perciformes: Labridae) from Hong Kong and Taiwan. *Zoological Studies* 39(1): 18-22. *Xyrichtys trivittatus* is described as a new species of razorfish from 1 male specimen from Hong Kong and 1 male specimen from Taiwan. It is distinct in having the 1st 2 dorsal spines separated by a notch in the membrane, the spines not higher than the longest dorsal rays; a broad column of small scales extending ventrally from the eye to below the corner of the mouth; 15-16 gill rakers; and 3 blackish bars on the upper half of the body.

Key words: Taxonomy, *Xyrichtys*, Labridae, Hong Kong, Taiwan.

Labrid fishes of the genus *Xyrichtys* Cuvier, popularly known as razorfishes, are aptly named, not only because razorfish is the direct English translation of the Greek derivation of the generic name, but because it appropriately refers to the highly compressed body, and in particular to the sharp ridge at the front of the head. These fishes live over open stretches of sand substratum and are well known for their ability to quickly dive head-first into the sand with the approach of danger. If a scuba diver swims toward a razorfish, it may retreat, perceiving that the diver does not move with the speed of a large predaceous fish such as a species of *Caranx*. If the diver persists in pursuit, the razorfish may move to another location where the sand is without obstruction and provides easy entry. It will hover over the site with its head oriented slightly downward. At this moment any sharp movement or continued approach by the diver will result in an amazingly rapid dive by the fish into the sand. If one digs into the sand at this site, one usually fails to encounter the fish. If the digging is swift, one may touch the fish, only to find it moving away faster than one can dig by hand.

Some razorfishes have been described in the genera *Hemipteronotus* Lacepède, *Novacula* Cuvier, and *Iniistius* Gill. The 1st genus was suppressed in

order to conserve *Xyrichtys* by Opinion 1799 of the International Commission on Zoological Nomenclature, and the last 2 are junior synonyms of *Xyrichtys*.

Randall (1965) reviewed the 5 Atlantic species of *Xyrichtys* (as *Hemipteronotus* spp.), but the Indo-Pacific species of the genus have not yet been revised.

The 2nd author purchased a specimen of *Xyrichtys* from a fisherman in Hong Kong in October 1996 that had been caught at Ha Mei Wan, a bay on the west coast of Lamma Island in the southern waters of Hong Kong. He was unable to identify it, so showed it to the 1st author during the latter's visit to Hong Kong in June 1998; it was concluded that the fish represents an undescribed species. The catches of fishermen operating around Lamma Island were inspected frequently for 2 yr following the initial purchase, but no additional specimens were obtained.

We later noted that this species was illustrated in color as *Xyrichtys* sp. 1 from a single male specimen in a review of the razorfishes of Taiwan by Shen and Yeh (1987). It was misidentified as *X. pavo* Valenciennes by Shen et al. (1993) and again illustrated in color, along with 8 other species of razorfishes known from Taiwan waters (we prefer to

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classify their *X. woodi* in the genus *Novaculichthys*). Dr. Shen kindly sent the specimen of *Xyrichtys* sp. 1 on loan from the National Taiwan University Museum so that it could be included in the present description.

MATERIALS AND METHODS

The holotype has been deposited in the Bernice P. Bishop Museum, Honolulu (BPBM), and the specimen from the National Taiwan University Museum, Taipei (NTUM) has been designated a paratype.

Lengths of specimens are given as standard length (SL), which is measured from the most anterior end of the upper lip to the base of the caudal fin (posterior end of the hypural plate); head length is measured from the same anterior point to the posterior end of the opercular flap; body depth is the greatest depth from the base of the dorsal spines to the ventral margin of the abdomen (correcting for any obvious malformation of preservation); body width is measured just posterior to the gill opening; orbit diameter is the greatest fleshy diameter, and interorbital width the least bony width; upper-jaw length is taken from the front of the upper lip to the posterior end of the maxilla; caudal-peduncle depth is the least depth, and caudal-peduncle length the horizontal distance between verticals at the rear base of the anal fin and the caudal-fin base; lengths of fin spines and rays of median fins are measured from their extreme bases; pectoral-fin length is the length of the longest ray; pelvic-fin length is measured from the base of the pelvic spine to the tip of the longest soft ray. Lateral-line scale counts include the last pored scale that overlaps the end of the hypural plate; pectoral-ray counts include the upper rudimentary ray; gill-raker counts include all rudiments.

Data in the "Description" from the paratype, when different from that of the holotype, are shown in parentheses. Table 1 presents 27 measurements of the type specimens as percentages of the standard length. Ratios of proportional measurements in the text of the "Description" are rounded to the nearest 0.05.

Xyrichtys trivittatus, n. sp.

(English common name: Triplebar Razorfish)
(Fig. 1; Table 1)

Xyrichtys sp. 1 Shen and Yeh, 1987: 64, fig. 12 (Nanfngao, Taiwan).

Xyrichtys pavo (non Valenciennes) Shen et al., 1993: 469, pl. 156, fig. 5 (Taiwan).

Holotype: BPBM 38550, male, 118 mm, Hong Kong, Lamma I., west side, Ha Mei Wan, from fisherman, A.S. Cornish, 17 Oct. 1996.

Paratype: NTUM 7136, 128 mm, Taiwan, northeast coast, Suao, Nanfangao, from fishermen, H.S. Yeh, 20 July 1986.

Diagnosis: A species of *Xyrichtys* with dorsal fin incised between 2nd and 3rd spines about 1/3 length of 2nd spine; gap between 2nd and 3rd dorsal spines about 1.5 times larger than that between 1st and 2nd or 3rd and 4th spines; 1st and 2nd dorsal spines not longer than longest dorsal soft rays; a broad band of small scales on cheek from below eye to slightly below corner of mouth; 2 or 3 scales dorsally on opercle; gill rakers 15-16; 3 blackish bars on upper half of body, a pink margin on dorsal and anal fins and dorsal edge of caudal fin, and a median pale blue line on forehead.

Description: Dorsal rays IX,12, the last 4 rays branched; anal rays III,12, the last 3 rays branched; pectoral rays 12, the upper 2 unbranched, the uppermost rudimentary; pelvic rays I,5; principal caudal

Table 1. Proportional measurements of specimens of *Xyrichtys trivittatus* expressed as percentage of standard length

	Holotype BPBM 38550	Paratype NTUM 7136
Sex	male	male
Standard length (mm)	118	128
Body depth	38.5	38.9
Body width	11.4	13.0
Head length	31.7	31.8
Snout length	17.5	18.5
Orbit diameter	5.5	5.1
Interorbital width	4.6	4.5
Upper-jaw length	10.0	10.4
Caudal-peduncle depth	16.9	16.0
Caudal-peduncle length	8.4	8.7
Predorsal length	28.1	28.4
Preanal length	51.5	52.1
Prepelvic length	28.1	28.8
Dorsal-fin base	75.0	75.3
First dorsal spine	13.8	14.9
Second dorsal spine	13.0	13.8
Third dorsal spine	12.7	broken
Ninth dorsal spine	15.1	14.1
Longest dorsal soft ray	17.7	18.3
Anal-fin base	44.0	42.2
First anal spine	broken	6.9
Second anal spine	broken	9.0
Third anal spine	10.4	11.8
Longest anal soft ray	17.0	17.3
Caudal-fin length	25.4	25.5
Pectoral fin length	22.6	24.8
Pelvic spine length	11.9	12.5
Pelvic fin length	22.9	26.5

rays 13 (12); upper procurrent caudal rays 5; lower procurrent caudal rays 4; lateral line interrupted, the pored scales 20 + 5; scales above lateral line to origin of dorsal fin 6; scales above lateral line to base of middle dorsal spines 2.5; scales below lateral line to origin of anal fin 11 (9); circumpeduncular scales 20 (19); gill rakers 16 (15); branchiostegal rays 5; vertebrae 25.

Body depth 2.6 (2.55) in SL; body extremely compressed, width 3.35 (3.0) in body depth; head length 3.15 in SL; dorsal profile of snout nearly vertical, the remaining profile of head before and above eye strongly convex; snout long (as measured from orbit edge to upper lip) due to deep suborbital, snout length 1.8 (1.7) in head length; edge of snout a sharp ridge, this continuing through interorbital space to nape; chin also with a sharp anterior ridge; eye set high on head, fleshy orbit diameter 5.75 (6.25) in head length; interorbital space 6.9 (7.1) in head length; caudal-peduncle depth 1.9 (2.0) in head length; caudal-peduncle length (measured horizontally from rear base of anal fin) 3.8 (3.65) in head length.

Mouth small, a little oblique, with lower jaw slightly projecting, upper-jaw length 3.15 (3.05) in head length; a pair of long slender slightly incurved canines at front of each jaw extending well beyond lips with mouth closed, lower pair fitting inside the upper; upper pair of canines curving laterally, lowers more forward-projecting and flaring only slightly to side; side of jaws with a row of strong conical teeth (13-14 on holotype) and 2 irregular medial rows of small nodular teeth. Tongue slightly pointed, set far back in mouth. Lips thin, the lower with a prominent flap on side of mandible. Gill rakers short, the longest on 1st gill arch about 1/3 length of longest gill filaments.

Posterior edge of preopercle free to about an eye diameter below lower edge of orbit; ventral edge of preopercle free nearly to below posterior end of maxilla. A fleshy flap behind dorsoposterior quadrant of eye. Anterior nostril very small, with a slender dorsoposterior flap, in front of lower edge of eye, the distance from orbit 3/4 orbit diameter; posterior nostril a small semicircular slit dorsoposterior to anterior nostril, internarial distance about 1/6 orbit diameter. Suborbital pores 6, with 2 more pores ventroanterior to eye a distance greater than an orbit diameter; a series of 10 pores along edge of preopercle from behind lower edge of eye to end of free ventral margin, continuing as a series of 3 pores along side of mandible.

Scales cycloid, very thin, and membranous; lateral-line scales with a single horizontal tubule ending

in a posterior pore; scales on side of thorax about half height of scales on side of body; head naked except for 3 (2) small scales dorsally at base of opercle and a broad zone of small scales on cheek from below eye to slightly below corner of mouth, these scales in about 8 anterior-posterior rows and about 8 oblique dorsal-ventral rows (scales not in regular rows, so difficult to count); no scales basally on dorsal or anal fins; small scales basally on caudal fin extending nearly 1/3 distance to posterior margin; pelvic fins without an axillary scale; a single scale extending posteriorly from between base of pelvic fins, its length about 1/3 length of pelvic spine.

Origin of dorsal fin above posterior edge of orbit, predorsal length 3.45 (3.4) in SL; dorsal spines slender and flexible; dorsal fin incised between 2nd and 3rd dorsal spines, the notch about 1/3 length of 2nd spine; gap between base of 2nd and 3rd spines about 1.5 times larger than that of adjacent interspinous spaces; 1st dorsal spine 2.3 (2.15) in head length; 2nd dorsal spine 2.45 (2.3) in head length; 3rd dorsal spine 2.5 in head length; 9th dorsal spine longest, 2.1 (2.25) in head length; penultimate soft dorsal ray longest, 1.8 (1.75) in head length; origin of anal fin below base of 1st dorsal soft ray, preanal length 1.95 (1.9) in SL; 1st and 2nd anal spines broken in holotype; 1st anal spine of paratype (4.6) in head length, the 2nd spine (3.55) in head length; 3rd anal spine 3.1 (2.7) in head length; penultimate anal soft ray longest, 1.85 in head length; caudal fin rounded, its length 1.25 in head length; 3rd and 4th pectoral rays longest, 1.4 (1.3) in head length; pelvic fins of holotype not reaching anus, 1st soft ray longest, 1.4 in head length (pelvic fins of paratype reaching to base of 3rd anal spine, 1.2 in head length).



Fig. 1. Holotype of *Xyrichtys trivittatus*, BPBM 38550, male, 118 mm SL, Lamma I., Hong Kong (A. Cornish).

Color of holotype in alcohol: pale yellowish tan with 3 brown bars about as wide as orbit diameter on upper half of body, the 1st below base of 6th and 7th dorsal spines, the 2nd below 3rd and 4th soft dorsal rays, and the 3rd centered below 9th dorsal soft ray.

Color in alcohol of paratype similar, but the body a little browner, the posterior caudal peduncle and caudal-fin base a little darker than rest of body, and the caudal fin membranes dusky.

Color of holotype when fresh (Fig. 1): pale yellowish gray, the edges of scales on body a little darker than centers; 3 blackish bars on body as described above; a median pale blue line on forehead; iris with an inner rim of yellow and an outer ring of lavender, blue, and magenta; median fins pale yellowish, the dorsal and anal with a pink margin; a thin wavy orange line at base of dorsal fin posterior to 6th spine, and upper edge of dorsal row of scales on body narrowly orange (thus appearing as a closely set parallel pair of wavy lines at dorsal-fin base); upper edge of caudal fin pink, breaking into small pink spots at corner of fin, with a few small pink spots submarginally in corner, and a trace of pink margin on lower corner of fin; pectoral fins transparent, edges of rays dusky to dusky orange, the dusky orange at base of rays forming an arc of this color at fin base; pelvic fins pale yellow.

Color of paratype shown as figure 12 in Shen and Yeh (1987).

Etymology: This species of *Xyrichtys* is named *trivittatus* from the Latin, in reference to the 3 blackish bars on the body.

Remarks: *Xyrichtys trivittatus* is presently known only from the holotype from Hong Kong and the paratype from Taiwan. Nearly all of the bay where the holotype was collected is less than 10 m deep.

Xyrichtys aneitensis (Günther) sometimes has 3 dark bars on the body in the same position as those of *X. trivittatus*; however, the dark bars in *aneitensis* end in a black spot dorsally, and only the spots remain in large adults. Also *aneitensis* has a large white area on the side of the body in the pectoral region, preceded by a black area in females and a yellow one in males, and a blue line extending ventrally from the anterior edge of the eye. The small scales beneath the eye of *aneitensis* vary greatly in number, but never reach the level of the corner of the mouth; also they tend to form a V-shaped patch instead of a rectangular one as in *trivittatus*. The 1st dorsal spine of *aneitensis* is longer than the longest dorsal soft ray, the latter 9.6%-12% SL; the longest dorsal soft ray of *trivittatus* is 17.7%-18.3% SL, and it is longer than the 1st dorsal spine. *X. aneitensis* differs further in having 19-21 gill rakers, compared to 15-16 for *X. trivittatus*.

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Addendum

While the above was in press, a third specimen of *Xyrichtys trivittatus* was obtained by the junior author from a fisherman in Hong Kong who caught it off Hung Shing Ye, west of Lamma Island on 3 July 1999. The specimen is a male, 103 mm SL, and has been deposited as a paratype at the Swire Institute of Marine Science of the University of Hong Kong under number SWIM CH099014.

During a recent visit to the U.S. National Museum of Natural History, the senior author discovered another male specimen of *Xyrichtys trivittatus*, USNM 330073, 118 mm SL. It was obtained from the market in Vung Tau (10°21'N, 107°15'E), Viet Nam by Donald P. de Sylva on 19 Jan. 1973. This specimen is also designated as a paratype.

三帶虹彩鯛(*Xyrichtys trivittatus*)，記產於香港及臺灣隆頭魚科
虹彩鯛屬之一新種

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本文記述自香港及臺灣各採獲一尾雄魚標本之新種隆頭魚，三帶虹彩鯛 (*Xyrichtys trivittatus*)。本種魚之特徵為第一背鰭的前二鰭棘在鰭膜上有一凹痕與其他鰭條分隔，鰭棘高度不超過最長的背鰭鰭條；有一列由小鱗片組成之寬帶，由眼部向下延伸到口角下；鰓耙有 15-16 根；身體上半部有 3 塊黑斑等。

關鍵詞：分類學，虹彩鯛屬，離鰭鯛屬，隆頭魚科，香港，臺灣。

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