

***XYRICHTYS KOTEAMEA*, A NEW RAZORFISH
(PERCIFORMES: LABRIDAE) FROM EASTER ISLAND**

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ABSTRACT. – *Xyrichtys koteamea* is described as a new razorfish (family Labridae) from four bright red specimens, 194-202 mm in standard length, collected in 50-250 m at Easter Island in the southeast Pacific Ocean. It was initially identified as *Novaculichthys woodi* Jenkins, type locality Hawaiian Islands, because of a series of black spots, one per membrane on the anterior half of the dorsal fin and specimens sharing the same meristic data. It is now known to differ in life color (*woodi* not solid red and often with alternating white and dark oblique lines on the abdomen), and in having a deeper body and shorter pectoral fins.

KEY WORDS. – *Xyrichtys*, razorfish, Perciformes, Labridae, Easter Island, taxonomy, new species.

INTRODUCTION

Easter Island, also known by the Polynesian name Rapa Nui and the Spanish name Isla de Pascua, was discovered by the Dutch explorer Jacob Roggeveen on Easter Sunday, 1722. Located in the southeast Pacific Ocean at 29°9'S, 109°26'W, it is the most isolated inhabited island in the Indo-Pacific region. As a result of its isolation, its subtropical latitude, its small size, and few aquatic habitats, its marine fauna is very impoverished (DiSalvo et al., 1988).

The first author and associates collected fishes at Easter Island during visits in 1969, 1985, and 1986. As a result of these and other collections, 133 species of shore fishes are known for the island from depths less than 200 m. Twenty-nine of these species are presently found only at the island, resulting in a percentage of endemism for shore fishes of 21.8, second only to that of the Hawaiian Islands for the Indo-Pacific region.

During the 1969 visit, the second author (then a graduate student) and Bruce A. Baker, M.D., went fishing with Roberto Ika from the latter's small boat. Upon their return, Allen reported that they had caught a red wrasse by hook and line from 50 m, adding that it had bitten him. Randall replied that it was probably a razorfish, which it was. Two more specimens were provided later by a fisherman from 250 m during the 1969 visit. The species was initially identified as *Novaculichthys woodi* Jenkins, type locality Hawaiian Islands, largely because both Hawaiian and Easter Island specimens

share the series of black spots, one per membrane, on the anterior half of the dorsal fin and the same fin-ray, scale, and gill-raker counts. The Hawaiian *woodi* may be light red dorsally on the body, not overall deep red like the Easter Island fish. However, the more red coloration of the Easter Island fish was presumed to be due to the greater depth at which they were captured. The unusual large size of the Easter Island specimens remained enigmatic. Randall & Cea Egaña (1984) recorded the species as *N. woodi* and provided the native Rapanui name *kotea mea*.

A fourth large red specimen of razorfish from Easter Island was provided in 1986 by a fisherman who caught it in 75 m. The four specimens measure 192-206 mm SL, whereas the largest of 13 Hawaiian specimens of *Xyrichtys woodi* in the Bishop Museum measures only 143 mm SL. No Easter Island razorfish were seen by scuba-diving at the island, and none has been collected from shallow water. Bishop Museum specimens of *X. woodi* were collected from 15-40 m. The greatest depth reported for *woodi* in Hawaii is 48 m (Uchida & Uchiyama, 1986). Further study has confirmed that the Easter Island species of *Xyrichtys* is undescribed.

In a review of razorfishes of the Hawaiian Islands, Randall & Earle (2002) showed that the labrid genus *Novaculichthys* Bleeker should be restricted to the type species, *N. taeniourus* (Lacepède). They placed *N. woodi* Jenkins in the genus *Xyrichtys* Cuvier, and referred the genus *Novaculops* Schultz (type species *N. woodi*) to the synonymy of *Xyrichtys*. They reclassified most of the remaining Indo-Pacific razorfishes

Table 1. Proportional measurements of type specimens of *Xyrichtys koteamea* as percentages of the standard length.

| | Holotype | MNHNC 7227 | Paratypes | USNM 375852 |
|------------------------|--------------|---------------|--------------|----------------|
| | BPBM 6715 | | ZRC 49157 | |
| Standard length (mm) | 194 | 197 | 202 | 206 |
| Body depth | 37.4 | 38.6 | 36.4 | 38.7 |
| Body width | 12.8 | 13.6 | 13.1 | 13.8 |
| Head length | 34.5 | 34.0 | 33.9 | 33.7 |
| Snout length | 13.9 | 13.8 | 13.4 | 13.7 |
| Orbit diameter | 6.1 | 6.2 | 5.9 | 5.7 |
| Interorbital width | 8.4 | 8.2 | 8.3 | 8.1 |
| Upper-jaw length | 10.8 | 11.2 | 10.8 | 11.2 |
| Caudal-peduncle depth | 16.5 | 16.9 | 15.9 | 16.0 |
| Caudal-peduncle length | 10.1 | 9.6 | 9.7 | 10.2 |
| Predorsal length | 27.9 | 28.4 | 27.7 | 27.5 |
| Preanal length | 56.4 | 55.0 | 56.3 | 56.8 |
| Prepelvic length | 33.4 | 33.0 | 33.0 | 33.5 |
| Base of dorsal fin | 68.7 | 72.2 | 68.0 | 68.7 |
| First dorsal spine | 8.3 | 8.2 | 8.4 | 8.3 |
| Second dorsal spine | 7.3 | 7.4 | 7.4 | broken |
| Longest dorsal spine | 9.2 | 9.6 | 8.8 | 9.2 |
| Longest dorsal ray | 13.3 | 13.5 | 13.7 | 13.6 |
| Anal-fin base | 37.3 | 39.7 | 38.5 | 37.4 |
| First anal spine | 4.2 | 4.4 | 4.5 | 3.8 |
| Third anal spine | 9.2 | 9.4 | 9.2 | 8.7 |
| Longest anal ray | 14.0 | 14.1 | 13.9 | 14.2 |
| Caudal-fin length | 21.2 | 20.9 | 20.0 | 21.0 |
| Pectoral-fin length | 20.4 | 21.3 | 19.9 | 20.3 |
| Pelvic spine | 7.7 | 8.8 | 7.5 | 7.6 |
| Pelvic –fin length | 24.1 | 24.8 | 21.3 | 23.1 |

in the genus *Iniistius* Gill. In addition to osteological characters, they distinguished *Iniistius* from *Xyrichtys* by the forward position of origin of the dorsal fin over or less than a half eye diameter behind the eye, the very broad gap between the third and fourth dorsal spines, and the membrane between these two spines incised or absent.

Xyrichtys woodi is reported from Japan, but color differences suggest that it is specifically distinct there. The name *X. sciistius* Jordan & Thompson, 1914, type locality Sagami Sea, is available for this form. Randall & Lobel (2003) described *Xyrichtys halsteadii* from Papua New Guinea, Guam, Wake Island, and Tahiti; they noted that its juvenile and female phases closely resemble the young of *X. woodi*. Specimens of an undescribed species of *Xyrichtys* from Middleton Reef off southeastern Australia will be described by John L Earle and the first author, and the five species of the genus will be reviewed.

Randall & Earle (2002) reported that all of the razorfishes of the Atlantic are correctly classified in *Xyrichtys*. The Atlantic species were reviewed by Randall (1965) when the genus was believed to be *Hemipteronotus*, a name later suppressed (Randall & Bauchot, 1993). Six species of *Xyrichtys* are recognized for the tropical and subtropical eastern Pacific, two of which remain undescribed (Victor et al., 2001).

MATERIALS AND METHODS

Type specimens of the new species of *Xyrichtys* have been deposited at the following institutions: Bernice P. Bishop Museum, Honolulu (BPBM); Museo Nacional de Historia Natural, Santiago, Chile (MNHNC); U.S. National Museum of Natural History, Washington, D.C. (USNM); and the Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore (ZRC).

Lengths of specimens are given as standard length (SL), measured from the front 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 membrane; body depth is the greatest depth, and body width the maximum width; orbit diameter is the greatest fleshy diameter, and interorbital width the least fleshy 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 are measured to their extreme bases; pectoral-fin length is the length of the longest ray. Morphometric data presented in Table 1 are given as percentages of the standard length.

Proportional measurements in the text are rounded to the nearest 0.05.

The lateral-line of species of *Xyrichtys* is interrupted; the count of the anterior series is given first, followed by the peduncular series to include the pored scale on the base of the caudal fin. Gill-raker counts were made on the first gill arch and contain all rudiments. Meristic and morphometric data shown in parentheses refer to paratypes.

TAXONOMY

Xyrichtys koteamea, new species

(Figs. 1, 2)

Novaculichthys woodi - Randall & Cea Egaña, 1984: 12 (Easter Island) (non Jenkins).

Material examined. – Holotype – BPBM 6715, male, 194 mm, Easter Island, west coast off Rano Kau, 50 m, hook and line, coll. R. Ika, G. R. Allen & B. A. Baker, 13 Feb. 1969.

Paratypes – USNM 375852, male, 206 mm, Easter Island, off islets at southwest corner of island, 250 m, hook and line, local fisherman for J. E. Randall, 15 Feb. 1969; ZRC 49157, male, 202 mm, same data as preceding; MNHNC 7227, male, 197 mm, Easter Island, 75 m, hook and line, coll. local fisherman for J. E. Randall, 2 Feb. 1986.

Diagnosis. – Dorsal rays IX,12; anal rays III,12; pectoral rays 13; lateral-line scales 20 + 5; head naked except for one or two small partly embedded scales dorsally on opercle; gill rakers 16-18; body depth 2.6-2.75 in SL; dorsal profile of snout forming an angle of about 50°; front of head with a slight median ridge; origin of dorsal fin a little posterior to preopercular margin; first dorsal spine flexible, slightly longer than second spine, 4.05-4.15 in head length; space between first two dorsal spines two-thirds space between second and third spines; caudal fin slightly rounded; pectoral fins short, 1.6-1.7 in head length; bright red, the edges of scales darker red; membranes of spinous portion of dorsal fin bluish gray, each with a black spot; each of first three membranes of soft portion of fin with a faint black spot. Attains at least 206 mm SL.

Description. – Dorsal rays IX,12; anal rays III,12; all dorsal and anal rays branched, the last to base; pectoral rays 13, the first rudimentary, the second unbranched; pelvic rays I,5; branched caudal rays 12; upper and lower procurent caudal rays 5 or 6, the most posterior segmented; lateral-line scales 20 + 5; scales above lateral line to origin of dorsal fin 3; scales below lateral line to origin of anal fin 8; circumpeduncular scales 16; gill rakers 18 (16-18); pseudobranchial filaments of holotype 32; branchiostegal rays 6; vertebrae 9 + 16; supraneural (predorsal) bones 1.

Body depth 2.7 (2.6-2.75) in SL; body compressed, the width 2.9 (2.75-2.8) in body depth; head length 2.9 (2.95) in SL; dorsal profile of snout forming an angle of about 50° to horizontal axis of body; snout length 2.5 (2.45-2.5) in head length; orbit diameter 5.65 (5.5-5.9) in head length; front of

head with a slight median ridge; interorbital width 4.1 (4.1-4.15) in head length; caudal-peduncle depth 2.1 (2.0-2.15) in head length; caudal-peduncle length 3.4 (3.3-3.55) in head length.

Mouth terminal and very slightly oblique; maxilla extending to below posterior nostril, the upper-jaw length 3.2 (3.0-3.15) in head length. Lips slightly fleshy, the dorsal part of upper lip extending beneath anterior edge of snout except posteriorly; lower lip with a lateral flap extending along side of jaw, fitting flush with surface due to a recessed area behind; inner surface of lips papillose, interdigitating with teeth anteriorly in jaws. A pair of strong projecting canine teeth at front of jaws, strongly curved laterally and slightly recurved, the lowers fitting inside uppers when mouth closed; side of jaws with a row of about nine conical teeth, the last few notably smaller; anterior third of upper jaw with an irregular inner row of about seven small bluntly conical teeth, partly hidden in papillose tissue; side of lower jaw with a narrow inner band of small, close-set, nodular teeth. Each half of paired upper pharyngeal plate triangular with about 20 teeth, the most anterior largest and bluntly conical, the next two lateral teeth also bluntly conical, the remaining teeth small and nodular; slender median anterior limb of lower pharyngeal plate with four small sharply conical teeth, followed by an irregular double row of small nodular teeth; transverse limb of lower pharyngeal plate with a posterior row of 13 teeth, the median three as small molars, flanked by smaller nodular teeth, the most lateral a small blunt conical tooth. Tongue broadly rounded, the upper surface densely papillose.

Anterior nostril a very small membranous tube in front of center of eye by a distance equal to two-thirds orbit diameter; posterior nostril a short slit about half pupil diameter behind and slightly dorsal to anterior nostril. Sensory pores of head extremely small and difficult to detect. Free margin of preopercle reaching dorsally to level of a pupil diameter below orbit and extending anteriorly to below front edge of orbit.

Lateral line interrupted, the anterior series ending below ninth dorsal soft ray; first pored scale of peduncular series below eleventh dorsal soft ray; tubule of pored scales unbranched and nearly reaching posterior scale edge; head naked except for one or two small partially embedded scales dorsally on opercle (one on left side of holotype and two on right side); no median predorsal scales; a vertical row of four scales on nape below first dorsal spine, preceded by a row of four scales, the lowermost reaching to within two-thirds orbit diameter of eye. Two or three small, partly embedded, median prepelvic scales, and a small scale-like process between bases of pelvic fins. No scales on fins except base of caudal fin with four to five vertical rows, progressively smaller posteriorly, on basal third of fin.

Origin of dorsal fin slightly behind posterior preopercular margin, the predorsal length 3.6 (3.5-3.65) in SL; first dorsal spine flexible, 4.15 (4.05-4.15) in head length; second to ninth dorsal spines sharp-tipped, the second shorter than first, 4.75 (4.6) in head length; space between first two dorsal spines

equal to two-thirds space between second and third spines; membrane between second and third dorsal spines not incised; eighth and ninth dorsal spines longest, 3.75 (3.55-3.85) in head length; sixth to eighth dorsal soft rays longest, 2.6 (2.5) in head length; origin of anal fin below base of first dorsal soft ray, the preanal length 1.75 (1.75-1.8) in SL; first anal spine 8.2 (7.55-8.85) in head length; third anal spine 3.75 (3.6-3.9) in head length; fourth or fifth anal soft rays longest, 3.45 (3.4-3.45) in head length; caudal fin slightly rounded and short, 4.7 (4.75-5.0) in SL; pectoral fins short, the first and second branched rays longest, 1.7 (1.6-1.7) in SL; origin of pelvic fins below upper base of pectoral fins, the prepelvic length 3.0 in SL; pelvic spine 4.5 (3.9-4.5) in head length; first pelvic ray filamentous, reaching to or beyond anus, 4.15 (4.05-4.7) in SL.

Color of holotype in alcohol: yellowish brown, the edges of scales darker than centers; head paler yellowish brown than body; spinous portion of dorsal fin blackish, each membrane with a black spot behind preceding spine about half way to margin of fin; soft portion of dorsal fin dusky with a similar but fainter spot on first three membranes at same level as spinous portion of fin, continuing progressively less pigmented for a few more membranes; anal fin pale yellowish; caudal fin with dusky membranes and pale rays, the basal scaled part colored like body; pectoral fins with pale rays and blackish membranes dorsally, progressively less pigmented ventrally; pelvic fins pale.

Color of holotype when fresh (Fig. 1): bright red, edges of scales darker red; membranes of spinous portion of dorsal fin bluish gray, each with a black spot approximately half pupil size about half way to spine tip, closer to anterior than posterior spine; soft portion of dorsal fin light red, membranes



Fig. 1. Holotype of *Xyrichtys koteamea*, male, BPBM 6715, 194 mm SL, Easter Island, 50 m (J. E. Randall).



Fig. 2. Print from x-ray of 202-mm paratype of *Xyrichtys koteamea* showing the hook that caught the specimen.

streaked with white on about basal half, first three membranes with a blackish spot as seen on spinous membranes, but more diffuse; anal fin colored like soft portion of dorsal fin but without any dark markings; caudal fin with light red rays and dusky light red membranes; pectoral fins with light red rays, outer half of membranes blackish red, becoming progressively less pigmented ventrally; pelvic fins with light red rays and white membranes.

Etymology. – Named *koteamea* from the Rapanui word for the fish. Kotea is “generic” for three species of wrasses, and mea in Rapanui means red.

Remarks. – Although presently known only from Easter Island, this razorfish might be expected from southern subtropical islands to the west such as the Pitcairn Islands and Rapa, where fish collections have been made mainly in shallow water.

The most obvious differences of *Xyrichtys koteamea* from *X. woodi* are its much larger maximum size and color pattern. Although both have the series of black spots, one per membrane on the anterior half of the dorsal fin, and *X. woodi* can be light red dorsally on the body, it is not overall deep red in color. Furthermore, adults of *X. woodi* have oblique dark red to black lines ventrally on the otherwise white lower abdomen (at least when alive or freshly caught), as shown by Severns & Fiene-Severns (1993: 40) and Randall (1996: 133, lower fig.). These markings were the basis for Jenkins (1900: 53, fig. 9) describing *Novaculichthys entargyreus* on the page following his description of *N. woodi*, the former now a synonym of the latter. Also, Seale (1901: 5, fig. 2) named another junior synonym, *Novaculichthys tattoo*, for the same markings. These distinctive abdominal lines are not present on *X. koteamea*. In addition, *X. koteamea* differs from *X. woodi* in having a deeper body, the depth 2.6-2.75 in SL, compared to 2.75-3.0 for *X. woodi*, and shorter pectoral fins, 1.6-1.7 in head length, compared to 1.4-1.55 for *X. woodi*.

All four specimens of *X. koteamea* are males. Because male razorfishes attain larger size than females, and because Easter Islanders fish for the larger fishes for food, they use hooks of moderate to large size. The x-ray of the 202-mm paratype (Fig. 2) shows the hook that caught the specimen. Knowing the relatively small mouth of razorfishes, it is remarkable that this fish swallowed so large a hook. It is doubtful that even a large female of this species could take a hook of this size.

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