J. South Asian nat. Hist., ISSN 1022-0828. April, 1995. Vol. 1, No. 2, pp. 241-246; 1 fig.; 1 tab.

Zebrias captivus, a new species of sole (Pleuronectiformes: Soleidae) from the Persian Gulf

John E. Randall*

Abstract

The new soleid fish *Zebrias captivus* is described from two specimens taken by trawl in the Persian Gulf off Bahrain. Although similar in color pattern to other zebra soles, it is distinct in its meristic data: dorsal rays 62-65, anal rays 52-54, pectoral rays 7, lateral-line scales 74-78; and vertebrae 9 + 31. It is also separable from some by the structure of its scales (14-18 moderate ctenii of moderate size), having a small tentacle on the upper part of each eye, and the complete confluence of its dorsal and anal fins with the caudal fin (the last dorsal and anal rays about equal in length to the adjacent caudal rays).

Introduction

Regan (1905) was the first to report a soleid species of the genus *Zebrias* from the Persian Gulf, based on collections made by F. W. Townsend. Regan listed the species by name only, *Synaptura zebra* Bloch. In Part II of a review of the flatfishes of India, Norman (1928) placed Regan's record in the synonymy of *Zebrias quagga* (Kaup) but with a question mark. Norman wrote, in reference to the Townsend Persian Gulf specimens, that they agree closely to those he identified as Z. *quagga* from India, but he added, "the orbital tentacles are absent, and the form and arrangement of the cross-bands is different. They may represent a new species, but as all my examples are immature I do not feel justified in describing them as such."

Curiously, Blegvad (1944) failed to collect any specimens of *Zebrias* from his extensive trawl survey of the Persian Gulf and Gulf of Oman.

Kuronuma and Abe (1972: 107, pl. 18) reported *Aesopia cornuta* in their "Fishes of Kuwait", but they corrected their identification in "Fishes of the Arabian Gulf" (1986: 253, pl. 28) to *Zebrias synapturoides* (Jenkins), and they added a second species, *Zebrias quagga*, from a single specimen 62 mm in standard length.

In 1983 the author was invited to Bahrain to assist Mrs. Wajeeha S. Al-Baharna in the preparation of her book, "Fishes of Bahrain" (1986). Among the fishes landed at Bahrain from a government trawler were two specimens of a species of *Zebrias* which could not be identified at that time (and were not included in the Bahrain fish book). Recently these specimens were re-examined with the intention of including an account of the species for a book on the coastal fishes of Oman by the author (which will include Persian Gulf fishes, since the northern part of Oman borders on the Gulf). The two specimens proved to be an undescribed species most closely related to Z. *quagga*, but differing notably in lower fin-ray and later-line scale counts.

*Bishop Museum, Box 19000, Honolulu, Hawaii 96817, USA; and Hawaii Institute of Marine Biology, University of Hawaii, Box 1346, Kaneohe, Hawaii 96744, USA.

Figure 1. *Zebrias captivus*, holotype, male, 81.3 mm SL.

In the expectation that the Townsend specimens from the Persian Gulf might be the new species, a loan of these fish, BMNH 1903.7.8:29, 55 mm SL, and BMNH 1911.2.23: 53-7, 5 : 26-41 mm SL, was requested of the Natural History Museum in London. The largest specimen of the second lot is clearly different from the others, having very long pectoral fins and large eyes with a long white tentacle on each. Although the meristic data of these little specimens match those of *Z. quagga*, the fish do not appear to be this species. A radiograph of the largest revealed a count of 9 + 35 vertebrae, hence more than 9 + 31-32 which the author obtained for his two Indian specimens of *Z. quagga*. Therefore, these specimens may represent undescribed species, as suspected by Norman. Adults should be sought, along with color photographs and better collection data, before attempting their description.

The counts given by Kuronuma and Abe (1986) for the Persian Gulf specimen they tentatively identified as *Z. quagga*, dorsal rays 59, anal rays 53, and longitudinal scale series 70, also gave promise of being an additional specimen of the new species. A loan of this fish, now MTUF P20627, was obtained from the Tokyo University of Fisheries. Unfortunately, it proved to be *Z. synapturoides* with a deformed caudal region.

Materials and methods

The two Bahrain specimens of *Zebrias* represent the only known specimens of the new species and form the basis for the description below. The holotype is deposited at the Bernice P. Bishop Museum, Honolulu (BPBM) and the paratype at the U.S. National Museum of Natural History, Washington, D.C. (USNM).

Lateral-line scales are counted from the base of the caudal fin (posterior end of hypural plate) to the last scale in the straight part on the head. Standard length (SL) is taken from the most anterior point of the head to the base of the caudal

fin. Body depth is the greatest depth between the bases of the dorsal and anal rays. Body width is the greatest thickness. Head length is taken from the base of the upper pectoral ray to the most anterior point of the head (the usual head measurement for a fish to the posterior edge of the opercular membrane is not a good measurement for *Zebrias* because the membrane extends almost to the end of the pectoral fin). Eye diameter is the greatest length of eyeball of the lower eye. Snout length is taken from the anterior edge of the lower eye to the front of the upper lip. Caudal-fin width is measured from the outer edge of the first and last caudal rays at the extreme base of the fin; caudal-fin length is the length of the longest ray.

Table 1 presents 20 measurements of the type specimens as percentages of the standard length. Some of these measurments are given in the text as proportions of the standard length, head length, or body depth, rounded to the nearest 0.05. Data in the description in parentheses apply to the paratype.

Zebrias captivus, new species
Figure 1

Holotype. BPBM 29478, male, 81.3 mm SL, Persian Gulf off Bahrain, government trawler, J. E.Randall, 7 November 1983.

Paratype. USNM 334423, male, 59.5 mm SL, same collecting data as holotype.

Diagnosis

Dorsal rays 62-65; anal rays 52-54; caudal rays 18; pectoral rays 7; lateral-line scales 74-78; scales ctenoid on both sides of body, the ctenii of moderate size, 14-18 in on scale edge, the largest in middle; body depth 2.85 in standard length; head length 4.8-5.0 in standard length; eyes nearly contiguous, the lower eye diameter 3.2-4.0 in head length; upper eye anterior to lower; a small tentacle on upper part of each eye; dorsal and anal fins joined to caudal fin, the last dorsal and anal rays as long or nearly as long as adjacent caudal rays; pectoral fin of eye side 2.6-2.7 in head length; eye side light tan with nine dark-edged brown bars on body about equal in width pale interspaces except the first (which passes beneath pectoral fin) which is narrower, and the last which is 1.5 times broader than previous bar; three similar but narrower dark bars on head, the first two as double bars; dorsal and anal fins white, the dark brown edges of brown bars extending as double black bands into the fins; caudal fin broadly black in middle of fin, white at edges, with a narrow irregular white bar near base and three small pale yellow spots in outer upper part of fin and three in lower part; distal end of pectoral fin black.

Description

Dorsal rays 62 (65), the first 9 and the last 7 unbranched (first 16 and last 5 of paratype unbranched); anal rays 52 (54), the first 5 and the last 6 unbranched (first 5 and last 8 of paratype unbranched); caudal rays 18, the upper and lower three unbranched; pectoral rays 7; pelvic rays 4; lateral-line scales on eye side 74 (78); lateral-line scales on blind side 82 (85); scales above lateral line at deepest part of body 24; scales below lateral line 33 (35) (transverse scale counts taken to lower edge of fin membrane, not including those extending out on rays); vertebrae 9 + 31.

Body moderately elongate, and tapering anteriorly and posteriorly, the greatest depth 2.85 in SL; body compressed, the width 4.1 (4.15) in depth; greatest width of body at a point 42% of SL from front of head; head small, 5.1 (4.85) in SL; snout short, its length 3.8 (3.15) in head; eyes dextral and nearly contiguous (no scales in interorbital space except a few anteriorly and posteriorly); upper eye slightly in advance of lower in holotype (upper eye about one-third eye diameter in advance of lower on paratype); lower eye diameter 4.0 (3.2) in head length; width of caudal-fin base 13.5 (13.3) in SL.

Mouth slightly inferior, asymmetrical, and curved, the maxilla reaching below anterior edge of pupil of lower eye, the upper-jaw length 2.9 (2.95) in head length; a dense band of small villiform teeth on blind side of upper jaw; lips fleshy and plicate on blind side. Nostrils on eye side tubular, in front of lower eye just above upper jaw, the anterior about twice as long as lower, approximately a pupil diameter in length (when laid back just reaching edge of eye); anterior nostril on blind side above anterior third of upper jaw (difficult to find among the fleshy cirri); posterior nostril on blind side a thin membranous tube about an eye diameter dorsoposterior to anterior nostril. Dense fleshy cirri anteriorly on head, covering leading edge and a little of surface of snout and chin on eye side, and on blind side to just behind mouth, continuing ventrally on blind side in a narrow band along lower edge of head to gill opening and extending narrowly dorsally on head to base of third dorsal ray.

Table 1. Proportional measurements of specimens of *Zebrias captivus* expressed as percentages of standard length (the last anal ray of the paratype is broken).

	Holotype BPBM 29478	**Paratype** USNM 334423
Standard length (mm)	81.3	59.5
Body depth	35.2	35.3
Body width	8.6	8.5
Head length	19.6	20.7
Snout length	5.2	6.6
Eye diameter	4.9	6.5
Upper jaw length	6.8	7.0
Predorsal length	7.5	7.7
Preanal length	19.0	18.3
Prepelvic length	15.4	14.8
Dorsal fin base	97.8	98.1
First dorsal ray	3.8	3.7
Last dorsal ray	14.8	15.1
Anal fin base	84.7	84.0
First anal ray	5.5	5.8
Last anal ray	14.0	—
Base of caudal fin	7.4	7.5
Caudal-fin length	19.3	21.0
Pectoral fin (eye side)	7.6	7.7
Pectoral fin (blind side)	4.6	4.5
Longest pelvic ray	6.2	6.4

A simple tentacle on upper part of each eye, the one on upper eye longer, about one-third eye diameter (one-half in paratype).

Gill openings confluent ventrally, the isthmus not connected ventrally to head; gill membranes confluent with opercular membrane, the latter curving posteriorly over upper part of pectoral fin, ending near distal end of second pectoral membrane.

Anus on ventral edge of body directly in front of first anal ray and between pelvic fins.

Scales ctenoid on both sides of head and body (except lateral-line scales which lack ctenii), the ctenii moderately large, 14-18 along scale edge, the middle ones largest; outer surface of scales with several rows of what appear to be short fused ctenii, resulting in a granular texture. Head and body fully scaled except for cirri-covered anterior part of head on blind side; margin of preopercle not detectable externally due to complete covering by scales; a band of scales basally on dorsal and anal fins about one-fourth distance to ray tips; a row of progressively smaller scales extending out on dorsal and anal rays about three-fourths distance to ray tips; basal two-fifths of caudal fin scaled like body, with small scales continuing farther out on individual rays; no scales on paired fins. Straight part of lateral line on eye side ending above base of pectoral fin at posterior edge of opercular dark bar of head; cephalic part of lateral line arching upward, curving anteriorly over upper eye, and ending about an eye diameter above middle of anterior edge of eye; several pored scales extending posterior to base of caudal fin.

Origin of dorsal fin above anterior edge of upper eye; dorsal and anal rays progressively longer, the first dorsal ray 26.3 (27.0) in SL, the last 6.75 (6.6) in SL; dorsal and anal fins confluent with caudal fin, the last dorsal and anal rays as long or nearly as long as adjacent caudal rays; caudal fin rounded, its length 5.2 (4.75) in standard length; pectoral fin of eye side short, the third (second) ray longest, 2.6 (2.7) in head length; pectoral fin of blind side shorter, 4.25 (4.6) in head length; pelvic fins side by side in front of anal fin, neither more anterior than the other, but the membrane linking last ray of the eye side to abdomen extends to side of first anal soft ray, whereas membrane of blind side ends at blind-side edge of anus; second pelvic ray of both fins longest, 3.15 (3.25) in head length.

Color. (Eye side of holotype when fresh). Body light tan with nine brown bars with dark brown edges; first bar on body passing under pectoral fin, a little narrower than posterior bars; last bar on body about 1.5 times broader than penultimate bar; pale interspaces between bars of approximately the same width as bars; head with three dark bars, the first as a double bar above anterior part of upper eye, irregular on snout and interorbital space, and again as a double bar on chin, the second as a double bar just behind eyes, the two parts joined dorsally and nearly confluent ventrally; third head bar across operculum, with its posteror dark border extending onto chest; dorsal and anal fins white with extensions of the dark brown edges as double black bands paralleling rays to edge of fins; posterior part of dorsal and anal rays with an elongate black spot edged anteriorly in light yellow and posteriorly in white (these spots adjacent to basal half of

caudal fin); caudal fin whitish at exteme base, otherwise black with a narrow irregular white band near base and small elongate pale yellow spots in outer part of fin near upper and lower edges; pectoral fins whitish basally, abruptly black distally; pelvic fins white. Blind side of body white.

Color of holotype in alcohol similar to that when fresh, the bars less strongly marked.

Etymology. This sole is named *Zebrias captivus* from the Latin for prisoner, in reference to its convict-like dark bars. The common name Convict Zebra Sole is proposed.

Discussion

The species seems most closely related to *Z. quagga* (Kaup), described from China. The two share the same vertebral counts, scale structure, and general mophology. Meristic data provided by Norman (1928) for nine specimens of *Z. quagga*, plus counts of two specimens collected in southern India by the author (BPBM 20633, 96-112 mm SL) are as follows: dorsal rays 66-73; anal rays 56-61; lateral-line scales 91-99. These are different from the counts of *Z. captivus*: dorsal rays 62-65; anal rays 52-54; lateral line scales 74-78. In addition, *Z. quagga* has 11-12 pectoral rays, whereas *Z. captivus* has 7. There are also differences in color. The dark bars on *Z. quagga* are broader, and the pattern of the caudal fin is not the same (see Norman, 1928: pl. 6).

Three other species of *Zebrias* are known from the African and Asian coast of the Indian Ocean: *Z. synapturoides*, described from India and sympatric with *Z. captivus* in the Persian Gulf, is easily distinguished by the posterior dorsal and anal rays joined to the basal half of the caudal fin, the more strongly ctenoid scales, lack of a tentacle on the eyes, 66-71 lateral line scales, and 43-44 vertebrae. *Zebrias altipinnis* (Alcock), known from the east coast of India to Indonesia, is distinctive in its high counts (dorsal rays 79-83; anal rays 64-71; lateral line scales 105-112); *Z. regani* (Gilchrist) from Natal has 46 vertebrae and most of the dark bars of the body as double bars.

Acknowledgements

Thanks are due Mrs. Wajeeha S. Al-Baharna and others of the Directorate of Fisheries of Bahrain for support of the field work in the Persian Gulf; Anthony C. Gill, Oliver Crimmen, Kiyoshi Fujita, and Hiroshi Kohno for the loan of specimens, and Richard L. Pyle for radiographs. I also thank Francois Chapleau for reviewing the manuscript.

Literature cited

Al-Baharna, W.S. 1986. Fishes of Bahrain. Directorate of Fisheries, Bahrain. 294 pp.

Blegvad, H. 1944. Fishes of the Iranian Gulf. Einar Munksgaard, Copenhagen. 247 pp.

Kuronuma, K. & Y. Abe. 1972. Fishes of Kuwait. Kuwait Institute for Scientific Research, Kuwait City. xiv + 123 pp.

Kuronuma, K. & Y. Abe. 1986. Fishes of the Arabian Gulf. Kuwait Institute for Scientific Research, Kuwait City. xii + 356 pp.

Norman, J.R. 1928. The flatfishes (Heterosomata) of India, with a list of the specimens in the Indian Museum. Part II. Rec. Indian Mus., 30: 173-215.

Regan, C.T. 1905. On fishes from the Persian Gulf, the Sea of Oman, and Karachi, collected by Mr. F. W. Townsend. J. Bombay Nat. Hist. Soc., 16: 318-333.