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A NEW WORMFISH (GOBIOIDEA: MICRODESMIDAE)
FROM THE NORTHERN RED SEA

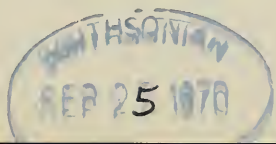
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The unique specimen discussed here is immature but the presence of scales and well developed coloration preclude its consideration as a larval or postlarval microdesmid. This represents the third species referable to the recently described genus *Paragunnellichthys* (Dawson, 1967) and constitutes the first record of the family Microdesmidae from the Red Sea. Since it appears unlikely that further collections can readily be obtained from the type locality or that additional study material will become available in the near future, description of this new wormfish seems warranted at this time.

Head length is measured from the tip of the lower jaw to base of the uppermost pectoral ray; body depth is measured at anal fin origin; caudal fin length is the distance from the rear of the hypural to the tip of the longest ray. All fin rays are counted separately and vertebral counts are from a radiograph. Proportions are shown as percentages of standard length (SL) or head length (HL). The specimen, deposited in the collections of the Smithsonian Institution (USNM), was collected with the financial support of a Smithsonian Institution foreign currency grant [SFC-7-0062(2)], Drs. W. Aron and H. Steinitz, principal investigators.

The drawing was prepared by Mr. Harry L. Moore, Jr. This study was supported in part by National Science Foundation Grants GB-6823 and GB-15295.



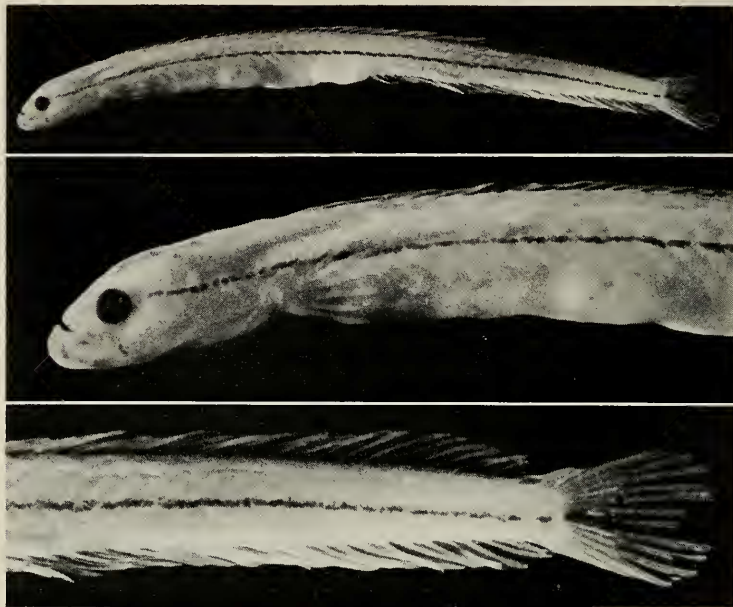


FIG. 1. *Paragunnellichthys springeri*. USNM 204613; holotype; 22.0 mm SL.

***Paragunnellichthys springeri* new species**

(Fig. 1)

Holotype: USNM 204613; 22.0 mm SL; Red Sea, southern Sinai Peninsula, Aristocrat Beach, Sharm el Moiya, approx. 27°51'30"N, 34°17'30"E (Admiralty Chart No. 756); from a depth of 20–30 cm over sand bottom; 29 Sept. 1969; V. G. Springer and L. Hughes-Games; Sta. No. VGS 69–32. This is the only known specimen.

Diagnosis: A species of *Paragunnellichthys* with short pelvic fins, separate to their bases; interradiar membranes of anterior dorsal fin with an interrupted series of submarginal dark blotches terminating just behind anal fin origin; with a narrow midlateral dark stripe originating just behind the eye and extending onto caudal fin; dorsum with a dark median stripe from nape to caudal peduncle; total dorsal elements 54; total vertebrae 54; anal fin origin beneath interspace between 24th and 25th dorsal fin elements.

Description: Dorsal spines 20, dorsal segmented rays 34, total dorsal elements 54; anal rays 32; pectoral rays 10; pelvic fin I, 2; vertebrae 25 + 29 = 54.

Measurements (mm) are followed by percent SL or HL in parentheses.

Caudal fin length 2.2 (10.0); least depth of caudal peduncle 0.8 (3.6); body depth at anal fin origin 1.4 (6.4); predorsal length to tip of lower jaw 3.6 (16.4); preanal length 12.1 (55.0); pectoral fin length 1.6 (7.3); pelvic fin length 0.7 (3.2); distance from pelvic fin insertion to anal fin origin 9.2 (41.8); head length 3.1 (14.1). Diameter of fleshy orbit 0.5 (16.1); distance from anterior margin of eye to tip of lower jaw 0.8 (25.8); snout length 0.5 (16.1); postorbital length 1.8 (58.1); tip of lower jaw to angle of gape 0.7 (22.6).

Body moderately elongate; compressed, breadth at anal fin origin 3.6 percent of SL, greatest breadth (5.4 percent of SL) at opercle; caudal fin (now damaged) rounded. Head depth at opercle about 12 percent greater than body depth; interorbital convex, narrow, its width about 57 percent of eye diameter; eye lateral, high on head, its diameter subequal to snout length; lower jaw prominent, fleshy, extends about three-sevenths of eye diameter beyond snout tip, its lateral depth about 15 percent less than eye diameter, narrowing in front to a prominent subvertical symphyseal ridge; gape moderate, reaches a vertical from anterior margin of eye, slightly inclined; upper lip narrow in front, continuous across the symphysis and concealed by the overhanging snout, laterally expanded to form a broad fleshy fold posteriad; lower lip represented by a slight outfolding of the oral margin of the lower jaw, not distinctly pouchlike, includes anterior portion of upper lip when mouth is closed; anterior naris opens dorsolaterally at anterior terminus of a rather prominent lateral snout ridge, opening slightly larger than that of posterior naris, not distinctly tubiform; posterior naris dorsolateral on a vertical through anterior margin of eye, without a distinct tubule, minute, its diameter about 10 in eye; dentition difficult to determine even under high magnification (90 \times), apparently without enlarged caniniform teeth.

Gill opening originates on pectoral peduncle a short distance anterior of insertion of uppermost pectoral ray, continues almost perpendicularly ventrad across peduncle then angles forward to unite with lower margin of peduncle at or just posteriad of its ventral insertion; ventral terminus of gill opening concealed. Depressed tips of posteriormost dorsal rays fail to reach beyond hypural, depressed anal fin slightly longer; dorsal fin originates over anterior third of pectoral fin; interspace between 1st two dorsal spines about one-third shorter than those which follow; 1st dorsal spine about two-thirds the length of the 2nd; the 1st segmented ray about 20 percent longer than the last spine; the last two dorsal and anal rays separate, more closely spaced than their fellows but not approximated; all segmented dorsal and anal rays apparently simple; caudal fin with 9 branched rays and three simple segmented rays together with four or five simple spiniform elements above and below; pectoral fin elongate, narrowly rounded, fin-rays simple, the 6th ray the longest; pectoral peduncle not completely concealed by the opercle and branchiostegal membrane. Pelvic fins inserted two-thirds their length in advance of dorsal fin origin, separate to their bases, each with an outer spine

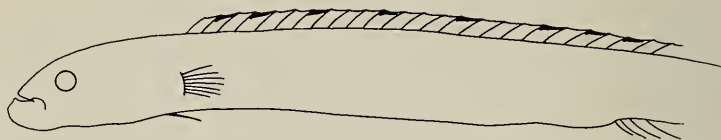


FIG. 2. *Paragunnellichthys springeri*. Semi-diagrammatic delineation of anterior body showing dorsal fin markings. The two posteriormost blotches are somewhat less distinct than shown here.

and two simple rays, the innermost the longer. Anal fin origin beneath interspace between dorsal elements 24 and 25.

Squamation incomplete, apparently not fully developed; scales embedded, difficult to see, present on lateral body, not seen on head. Dermal papillae inconspicuous, short rows cross upper portion of eye, preorbital and interorbital, a longitudinal row on upper cheek and another on suborbital, one or two lateral rows on lower jaw, apparently with two or three vertical series between pelvic fin and pectoral peduncle, four short vertical rows above pectoral and pectoral peduncle, lateral body with short vertical rows of three or four papillae crossing midline of most myomeric impressions.

First dorsal spine inserted over interspace between 3rd and 4th abdominal vertebrae; frontals poorly ossified and fail to reach mesethmoid in radiograph.

Ground color, in alcohol, pale tan; a narrow midlateral stripe formed by a more or less continuous series of large dark brown melanophores extends from just behind eye to the hypural where it continues for two-thirds of the caudal length as a darker brown streak along the 8th segmented ray and portions of its ventral membrane; a few smaller black melanophores are superimposed on this stripe between verticals from the 5th and 20th anal-fin rays; there are several irregular brown blotches on lower jaw, preorbital and lower cheek and there is a short but prominent vertical bar below middle of eye; ventral aspect of lower jaw with an irregular scattering of brown blotches. Dorsum with a median brown spot near snout tip and a brown bar crosses anterior interorbital; there is a small median interorbital spot and a posteriorly directed chevronlike bar crosses the posterior interorbital; a short broad transverse bar crosses the nape and this is continued posteriad as a narrow stripe to the dorsal fin origin; a dense scattering of lighter brown melanophores continues posteriad as a stripe along either side of dorsal fin to the caudal peduncle. Anterior dorsal fin membranes with an interrupted series of 8 submarginal longitudinal brown streaks which terminate slightly behind the anal fin origin (Fig. 2), the anterior 6 are very dark and prominent whereas the remainder are pale and indistinct, each dark streak narrowly margined above by the hyaline membrane; remaining interradian

membranes, anal, caudal and paired fins immaculate; some scales finely but incompletely margined with brown.

Etymology: I take pleasure in naming this species after the collector, Dr. V. G. Springer, in recognition of his many contributions to modern ichthyology.

Comparisons: Presence of dark blotches on the dorsal fin membranes and similar meristic counts suggest a close relationship between *P. springeri* and *Paragunnellichthys fehlmanni* (Dawson, 1969). The latter species differs from *springeri* in having united pelvic fins. Fin markings are more numerous, of different configuration, and occur on both dorsal and anal fins in *fehlmanni* and there are no distinctive color marks on either head or body. The present species differs from its only other known congener, *P. seychellensis* Dawson, in both meristics and coloration, but both species have separate pelvic fins. Compared with a 25 mm SL specimen of *fehlmanni*, the snout and gape are about two percent longer and the postorbital is about four percent shorter in *springeri*.

Remarks: Incomplete squamation and the presence of 9 branched caudal rays, rather than 11 as recorded for its congeners, indicate the juvenile status of the type of *springeri*. Nevertheless, I consider the color pattern to generally represent that which will be found in adults. I have shown that adult coloration may develop at early stages in *Microdesmus* (Dawson, 1968) and a similar situation, confirmed by my own unpublished observations, has been reported for *Gunnellichthys* (Smith, 1958). Specimens of *Paragunnellichthys seychellensis* may be sexually mature at 31–34 mm SL and it is likely that *springeri* is also a small species.

The striped color pattern is superficially similar to that occurring in *Gunnellichthys pleurotaenia* Bleeker and *Clarkichthys bilineatus* (Clark). The lateral stripe is, however, much narrower and not continued on the snout in *Paragunnellichthys springeri*.

Paragunnellichthys has previously been known only from the Seychelles and the Chagas Archipelago and the present specimen represents the northernmost and easternmost Indo-Pacific record of the family Microdesmidae.

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