

A Comparison of *Physiculus inbarbatum* and *P. jordani*

Giles W. MEAD and James E. BÖHLKE

(Natural History Museum, Stanford University, California)

In December of 1951 the writers published a description of a previously unknown species of the morid genus *Physiculus*, *P. jordani* (BÖHLKE and MEAD, 1951: 27). The description was based on a single specimen trawled by the U. S. Fish Commission Steamer "Albatross" off Suruga Bay, Japan. In March of the following year Dr. Toshiji KAMOHARA of Kochi University described *P. inbarbatum* as new (KAMOHARA, 1952: 94), designating as types three specimens obtained from the Mimase market (Kochi City, Shikoku). Since these two nominal species appeared to be strikingly similar in many respects, a direct comparison of the type material seemed desirable. This comparison was effected through the kind cooperation of Dr. KAMOHARA, who made available to us not only his types but also several specimens subsequently collected from the type locality.

Specimens of *P. jordani* and *P. inbarbatum* are similar in the absence of the mandibular barbel, in the extremely slender caudal peduncle, in color pattern and in many other general features. In several meristic and morphometric characters, however, the type of *P. jordani* differs significantly from those of *P. inbarbatum*. Counts and proportional measurements of the specimens at hand are recorded in Table 1. It is immediately apparent that our specimen has a greater number of dorsal and anal rays, a slightly longer and broader head, a longer snout, a wider interorbital space and more posteriorly placed pectoral and ventral fins than has Dr. KAMOHARA's material.

We cannot, therefore, assign *P. inbarbatum* a place in the synonymy of *P. jordani*, although it seems improbable that two closely related and morphologically similar populations could have evolved and maintained their identity while living together in waters off Shikoku and southern Honshu.

A third form apparently closely related to these two is *Physiculus edelmanni* (BRAUER, 1906: 274, pl. 12: 6, from the Indian Ocean off the coast of Africa. Counts and measurements of this species, taken from BRAUER's type description, are also included in the table. In many respects the specimens of *P. inbarbatum* appear to be intermediate between *P. jordani*, as originally understood, and *P. edelmanni*. A biometric study of the members of this complex based on material from various localities and depths may demonstrate the existence of but a single widespread and highly variable species. However, since available representatives of the three forms are in several respects at variance with one another the three nominal species must tentatively be considered distinct.

Table 1.—Counts and measurements on specimens referable to *Physiculus jordani*, *P. inbarbatum* and *P. edelmanni*. Measurements expressed in percent of standard length. Counts and measurements of *P. edelmanni* after BRAUER (1906: 274).

	SU. 121759-holotype of <i>P. jordani</i>	K. 338-holotype of <i>P. inbarbatum</i>	K. 170-paratype of <i>P. inbarbatum</i>	K. 177-paratype of <i>P. inbarbatum</i>	K. 80	K. 337	K. 83	<i>P. edelmanni</i> (from Brauer)
Counts:								
Dorsal fin	8-71	9+67	6+67	8+67	7+67	7+68	7+67	7+64
Anal fin.....	75	66	65	67	68	70	67	66
Ventral fin	6-6	6-6	6-6	6-6	6-6	6-6	6-7	5
Pectoral fin	22-22	22-23	22-22	22-22	21-21	22-22	23-23	20
Gill rakers	5+10	5+12	5+12	5+11	5+10	5+10	5+11	12-14
Measurements:								
Standard length (mm)	162.0	224.5	216.5	142.0	209.5	212.0	141.0	217.0
Greatest depth of body	16.7	18.0	17.0	16.2	16.7	16.3	21.3	18.0
Greatest width of body	11.7	14.0	13.2	12.0	13.1	11.6		
Depth of body at ventral fin ...	17.9	16.9	15.7		16.2	16.3	19.5	
Least depth of caudal peduncle ...	2.2	2.4	2.1	2.1	2.1	2.1	2.5	1.8
Least width of caudal peduncle6	1.1	1.2	.7	1.0	.9	1.4	
Length of head	24.7	21.2	21.0	23.6	22.0	21.5	23.0	22.1
Greatest width of head	16.0	12.7	13.0	12.0	12.9	12.0	11.3	
Interorbital width	9.6	8.2	8.3	9.1	8.6	8.5	8.9	8.8
Length of snout	8.0	6.5	6.5	7.4	5.7	7.3	7.8	5.3
Length of maxillary	11.7	10.9	10.1	12.0	11.0	10.8	12.1	
Length of mandible	10.5	9.1	9.5	10.9	9.3	10.0	10.6	
Diameter of eye	4.6	3.8	3.7	3.9	4.3	3.8	4.6	4.7
Length of postorbital	13.0	11.4	12.0	12.0	11.9	12.0	11.7	
Snout to origin of first dorsal fin	24.7	24.0	23.1	26.1	24.8	24.1	26.6	27.2
Length of base of first dorsal fin	4.6	6.7	5.5	5.6	4.8	5.7	7.1	
Snout to origin of second dorsal fin	30.6	31.4	29.8	31.3	30.4	30.0	31.9	
Length of base of second dorsal fin	63.0	60.1	61.4	58.5	62.3	63.2	61.7	
Snout to origin of anal fin	34.9	30.1	30.5		29.4	27.8	28.4	31.3
Length of base of anal fin	66.7	59.0	59.1	54.2	59.0	61.1	57.1	
Snout to insertion of pectoral fin	27.5	21.8	22.4	23.9	23.4	23.6	23.8	24.4
Length of pectoral fin	14.9	16.3	16.6	19.4	16.7	15.8	21.6	22.1
Snout to insertion of ventral fin	26.9	18.5	18.7		18.9	19.3	18.8	22.1
Length of ventral fin	15.1	18.0	21.5		21.5	23.8		12.4

Literature Cited

- BÖHLKE, James and Giles W. MEAD. 1951: *Physiculus jordani*, a new gadoid fish from deep water off Japan. Stanford Ichthyol. Bull., iv, pp. 27-29.
- BRAUER, August. 1906: Die Tiefsee-Fische, I. Systematischer Teil. Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia" 1898-1899, Bd. xv, Lief. 1, pp. 1-432, pls. 1-18.
- KAMOHARA, Toshiji. 1952: Revised descriptions of the offshore bottom-fishes of Prov. Tosa, Shikoku, Japan. Rep. Kochi Univ., Nat. Sci., no. 3, pp. 1-122.

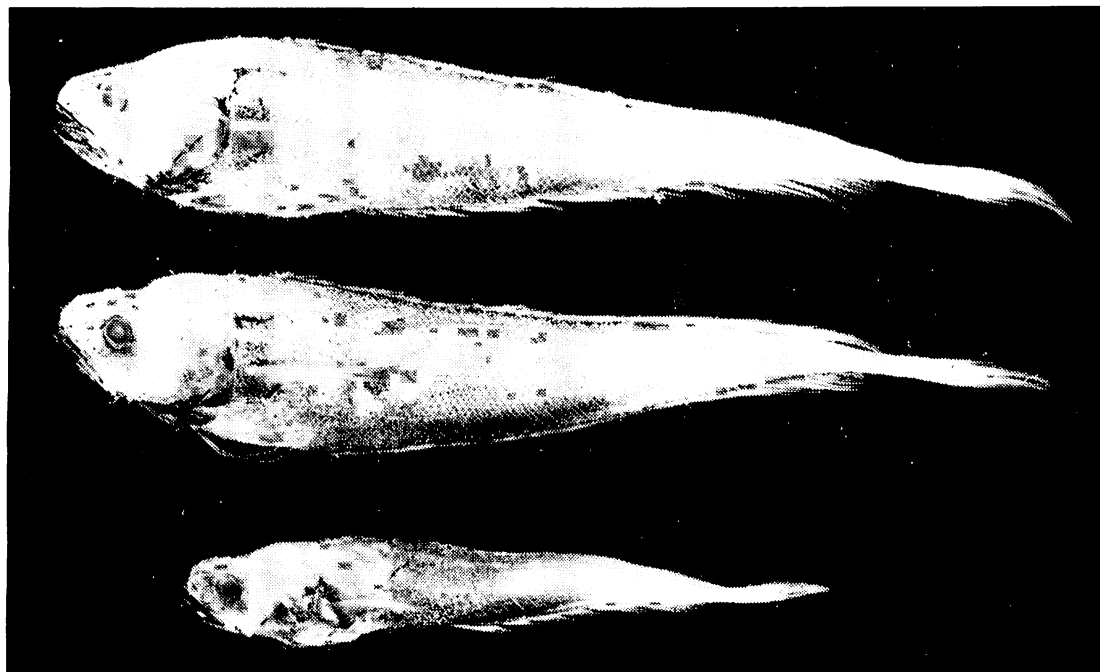


Figure 1. - *Physiculus inbarbatum*; holotype (above), 224.5 mm in standard length; paratype (center), 216.5 mm in standard length; and paratype (below), 142.0 mm in standard length.



Figure 2. - *Physiculus jordani*; holotype, 162.0 mm in standard length.