

## *Gordiichthys combibus*, a new species of eastern Pacific sand-eel (Anguilliformes: Ophichthidae)

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**Abstract:** A new species of bascanichthyin ophichthid, *Gordiichthys combibus*, is described from shallow water along the Pacific coast of Colombia. It is the first known eastern Pacific species of *Gordiichthys* and is very similar to *G. randalli* from Puerto Rico. It differs from its other western Atlantic congeners in vertebral number and other characters. A key to the genus is provided.

**Key words:** New species, geminate species, nearshore Ophichthidae, Pisces, Pacific Colombia

The elongate, nearly character-less species of sand-eels of the ophichthid eel genus *Gordiichthys* are appropriately named for King Gordius, whose complicated knot was cut by Alexander. The four western Atlantic species have confounded ichthyologists because they are extremely similar in appearance and differ primarily in their vertebral numbers and snout condition (McCosker *et al.* 1989). Several years ago the senior author obtained a collection of juvenile *Gordiichthys* made by Leslie Knapp from the west coast of Colombia, recognized them as the first eastern Pacific species of *Gordiichthys*, but did not describe them in anticipation of the capture of an adult specimen (McCosker and Rosenblatt 1995). The junior author discovered such an adult, also collected by Knapp from Colombia, and we herein describe the new species.

### MATERIALS AND METHODS

Measurements are straight-line, made either with a ruler with 0.5 mm gradations (for total length, trunk length, and tail length) and recorded to the nearest 0.5 mm, or with dial calipers (all other measurements) and recorded to the nearest 0.05 mm. Body length comprises head and trunk lengths. Head length is measured from the snout tip to the posterodorsal margin of the gill opening; trunk length is taken from the end of the head to mid-anus; maximum body depth does not include the median fins. Vertebral counts (which include the hypural) are taken from radiographs. Institutional abbreviations follow the Standard Symbolic Codes for Institutional Research Collections in Herpetology and Ichthyology (Leviton *et al.* 1985).

### Taxonomy

*Gordiichthys* Jordan & Davis, 1891

*Gordiichthys* Jordan & Davis, 1891: 644 (Type species *G. irretitus* Jordan & Davis, 1891, by original designation.)

**Diagnosis:** Characteristics of the genus are described by McCosker *et al.* (1989: 343-344).

**Etymology:** From *Gordius*, the horsehair worm (named after Gordius, the king whose complicated knot was cut by Alexander), and *ichthys* (fish), masculine.

**Remarks:** McCosker (1977) placed *Gordiichthys* in the tribe Bascanichthyini on the basis of his examination of radiographs of the holotype and only known specimen of *G. irretitus*. McCosker and Böhlke (1984) described two additional Atlantic species and differentiated the species of *Gordiichthys* from those of *Ethadophis* Rosenblatt and McCosker (1970). McCosker *et al.* (1989) provided the first osteological diagnosis for the genus and described a fourth Atlantic species. Based on McCosker *et al.* (1989), McEachran and Fechhelm (1998) treated the Gulf of Mexico species but did not provide additional information.

#### *Gordiichthys combibus*, new species

(Figs. 1-3, Table 1)

*Gordiichthys* sp. McCosker and Rosenblatt 1995: 1331.

**Holotype:** ANSP 130223, 406 mm TL, an imma-

ture female? From Colombia, Bahia Utria, 05°59'30"N, 77°21'22"W. Collected with rotenone ichthyocide over a gray sand beach in 0-1.5 m by L. Knapp, field number LK 70-27A, on 13 Nov. 1970.

**Paratypes:** ANSP 138561, 2(89-103 mm TL), CAS 208467, 2(87-126 mm TL), and USNM 356856, 97 mm TL, collected with the holotype.

**Other material examined:** USNM 44303, ~790 mm TL, holotype of *Gordiichthys irretitus*, Gulf of Mexico. ANSP 151690, 537 mm TL, holotype of *Gordiichthys randalli*, Puerto Rico. CAS 52673, 614 mm TL, paratype of *Gordiichthys randalli*, Puerto Rico. USNM 272462, 339 mm TL, holotype of *Gordiichthys ergodes*, Gulf of Mexico. ANSP 110417, 336 mm TL, holotype of *Gordiichthys leiby*, Florida Atlantic.

**Diagnosis:** An elongate bascanichthyin with nearly uniform pallid coloration, brown-er above lateral midline; depth 52-59 times in TL; head 10-17 times in TL; dorsal fin arises above mid-head; anterior nostrils nearly flush with snout; vomerine teeth uniserial except for an anterior pair; four mandibular pores; vertebrae 178-186,  $x = 181.3$  ( $n = 6$ ).

**Measurements and counts of the holotype (measurements in mm):** Total length 406; head 27; head and trunk 220; tail 186; origin of dorsal fin 16.5; body depth at gill opening ~7; body width at gill opening ~5; body depth at anus ~5; body width at anus ~4.5; snout 4.0; upper jaw 8.4; gill opening height 2.5; isthmus 2; eye diameter 1.0; interorbital distance 1.2. Total vertebrae 184; predorsal vertebrae 2; preanal vertebrae 95. Total lateral line pores ~170; 9 pores before gill opening; 92 pores before anus.

### Key to species of *Gordiichthys*

- 1a. Anterior nostrils within a short tube which extends noticeably beneath underside of snout ..... *ergodes* McCosker, Böhlke and Böhlke 1989 (NE Gulf of Mexico)
- 1b. Anterior nostrils nearly flush with snout, not within a tube, partly set off by a groove from underside of snout ..... 2
- 2a. Body elongate, its depth 50-77 in TL; body coloration in preservative pale ventrally and darker above the lateral midline ..... 3
- 2b. Body extremely elongate, its depth 80-128 in TL; body coloration in preservative nearly uniform ..... 4
- 3a. Body depth 62-77 in TL; head 15-18 in TL; 2-3 pairs of biserial vomerine teeth anteriorly, followed by 3-5 uniserial teeth ..... *randalli* McCosker and Böhlke 1984 (Puerto Rico)
- 3b. Body depth 52-59 in TL; head 10-17 in TL; vomerine teeth uniserial except for a single anterior pair ..... *combibus* McCosker and Lavenberg sp. nov. (Pacific Colombia)
- 4a. Body depth 80-91 in TL; preanal vertebrae 92-98 and total vertebral vertebrae 168-176 ..... *leiby* McCosker and Böhlke 1984 (Atlantic coast of Florida and Puerto Rico)
- 4b. Body depth 100-128 times in TL; preanal vertebrae 105-111 and total vertebrae 193-206 ..... *irretitus* Jordan and Davis 1891 (Gulf of Mexico and Puerto Rico)

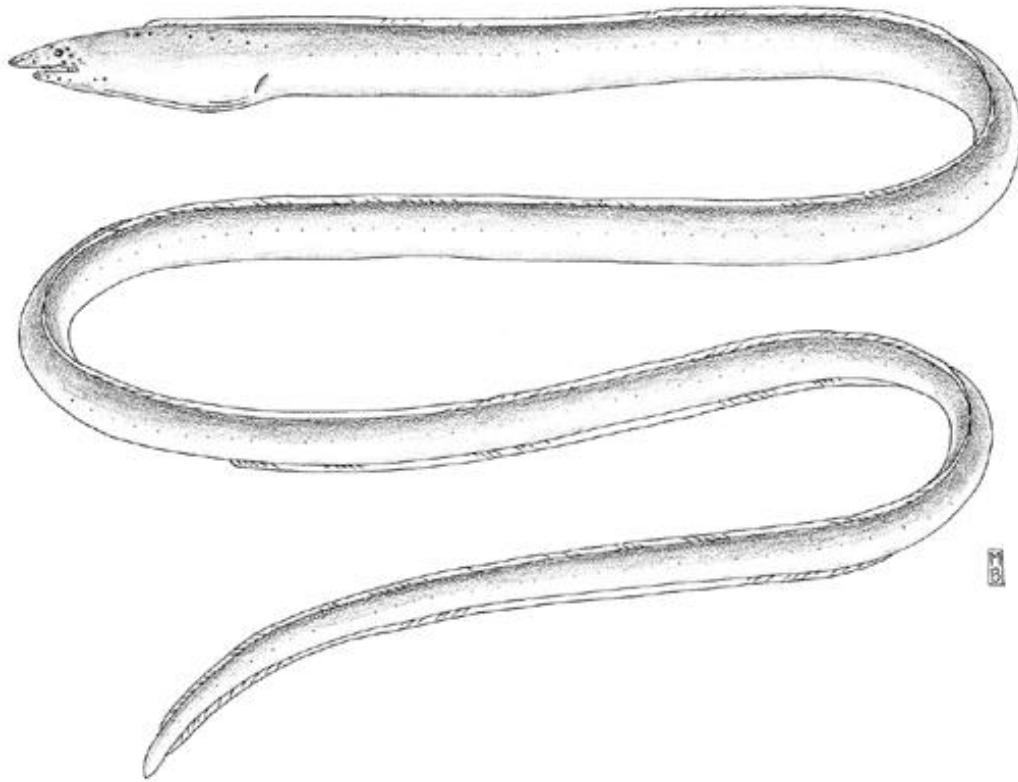


Fig. 1. Holotype of *Gordiichthys combibus*, ANSP130223, 406 mm TL.

**Description:** Body elongate, depth at gill openings 52-59 in TL, tapering posteriorly to a blunt finless tip. Body and tail nearly cylindrical, becoming laterally compressed posteriorly. Head and trunk 1.7-1.8 and head 10-17 in TL. Snout acute, conical when viewed from above. Lower jaw included, not reaching posterior base of anterior nostrils, anterior intermaxillary teeth not exposed. Snout flat on underside, a median ventral slit extends to middle of anterior nostril bases. (The holotype possesses an aberrant growth along its left upper lip behind the anterior nostril; its right side is normal as are the lips of all of the paratypes.) Center of eye slightly in advance of midpoint of upper jaw. Posterior nostrils within upper lip, visible as a minute vertical slit in lip at level of eye. Ante-

rior nostrils nearly flush with surface of snout.

Median fins low. Dorsal arises above 1st or 2nd vertebra, about mid-head. Pectoral fins absent. Gill openings crescentic, low on body, their main axis ca.  $45^{\circ}$  from vertical, about equal to isthmus in length.

Head pores (Fig. 2) reduced but visible. Single median interorbital and temporal pores. Supraorbital (SO) 1 + 3; infraorbital (IO) 4 + 2; preoperculo-mandibular 4 + 2, those along lip not linear; supratemporal pores 3. Lateral line pores of holotype ~170, those of largest paratype ~160.

Teeth (Fig. 3) in jaws uniserial, nearly conical but slightly wedge-shaped when viewed laterally. An intermaxillary rosette of

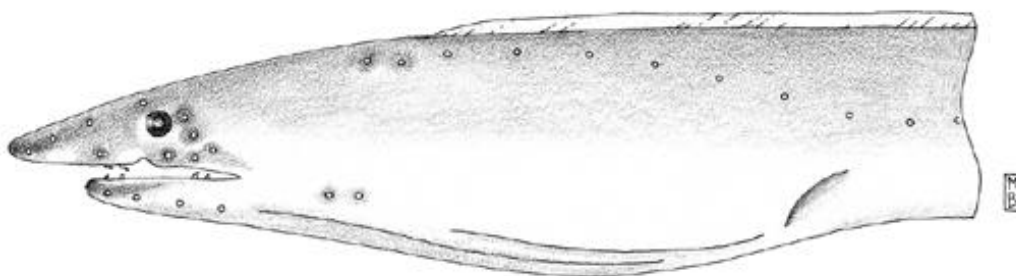


Fig. 2. Head (right side reversed) of holotype of *Gordiichthys combibus*, ANSP130223, 406 mm TL.

3 teeth, followed by 8 vomerine teeth. Eight maxillary and 11 mandibular teeth on each side. Anterior vomerine teeth and those at mandibular symphysis the largest.

Body coloration in preservative yellow ventrally, pale brown above lateral midline. Chin, snout, dorsal surface of head, and surrounds of SO and IO pores brown. Peritoneum pale. Median fins transparent.

**Etymology:** From the Latin *combibo*, to drink with a companion, in reference to the sibling nature of this, the first eastern Pacific species, to its Atlantic congener *G. randalli*.

**Remarks:** The new species is the first known *Gordiichthys* from the eastern Pacific Ocean. It is nearly indistinguishable from *G. randalli*, which is known only from four collections between 7.5-12 m depths over sand and algal beds of *Halophyla* in Puerto Rico. They are the only shallow water species of

the genus, and share a similar physiognomy and body coloration. They differ from each other in body depth (*combibus* is slightly stouter), head length (proportionately shorter in *randalli*), and in the condition of the vomerine teeth (nearly uniserial in *combibus* and partially biserial in *randalli*). Besides the disparity in dentition, a subtle difference can be seen in their infraorbital pore patterns. Whereas the posteriormost pores along the lip of *G. randalli* (infraorbital pores 2-4) are linear (cf. McCosker and Böhlke 1984: fig. 10), those of *G. combibus* are not (Fig. 2), in that the posteriormost pore is noticeably elevated. This difference is obvious when specimens of each species are compared side-by-side. Otherwise, we can find no other means to differentiate the two species. On the basis of morphological similarity, they are worthy of recognition as an amphi-American species pair.

TABLE 1

Counts and proportions (in thousandths) of the holotype and five paratypes of *Gordiichthys combibus*.

	mean	range
TL(mm)	151	87-406
HL/TL	84	60-95
Head and trunk/TL	563	542-587
Tail/TL	427	413-458
Depth at gill opening/TL	18	17-19
Dorsal fin origin/TL	44	39-46
Upper jaw/HL	284	253-311
Snout/HL	140	128-148
Eye/HL	34	32-37
Total vertebrae	181.3	178-186

(TL= total length, HL= head length). The small size of the paratypes has made measurement of several characters (eye diameter, snout length, jaw length, and body depth) difficult and therefore imprecise.

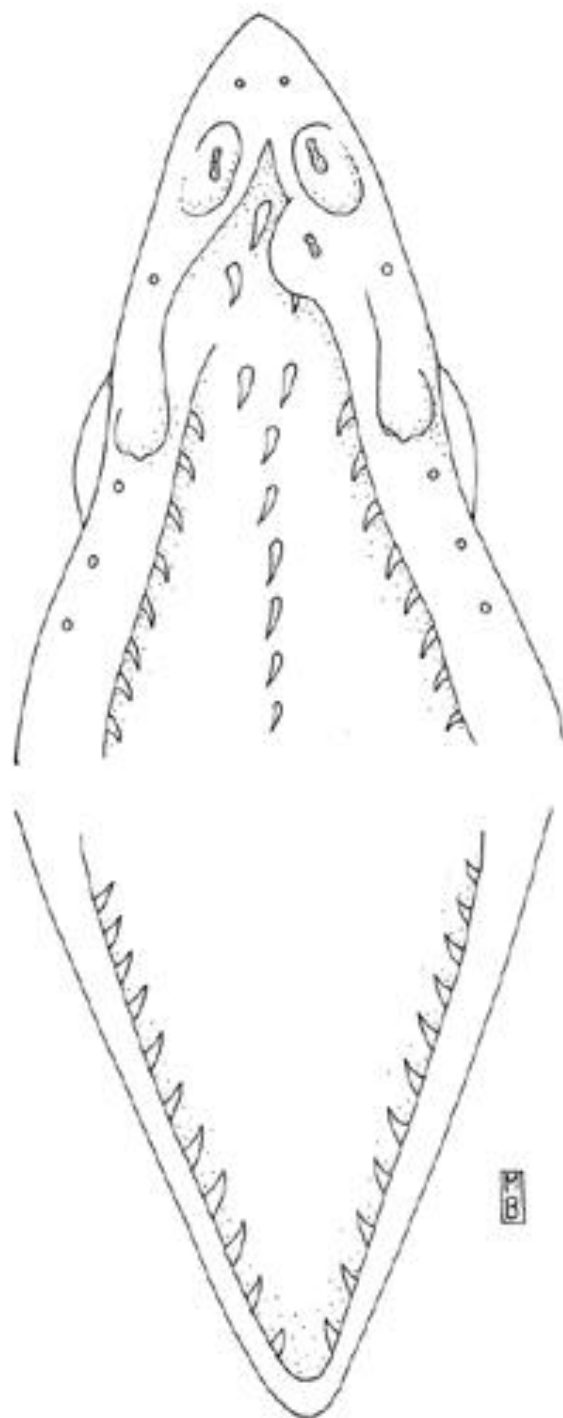


Fig. 3. Dentition of the holotype of *Gordiichthys combibus*, ANSP130223, 406 mm TL. The assymmetric appearance is due to an aberrant growth behind the anterior nostril of the left upper lip.

*Gordiichthys combibus* is similar in appearance but easily differentiated from the elongate deep water western Atlantic species *G. leiby* and *G. irretitus*. It differs from them in being deeper bodied and in having slightly more vertebrae than *leiby* and fewer vertebrae than *irretitus*. It differs from *ergodes* in having a less tubular anterior nostril. It shares the condition of four mandibular pores with both *randalli* and *leiby*, and differs from *irretitus* and *ergodes* which have five mandibular pores.

The new species is known only from a single collection made in shallow water (0-1.5 m) over a gray sand beach, not unlike *G. randalli* which is known from only four shallow water collections. The other species of *Gordiichthys* are also very rare in collections; *leiby* and *irretitus* have been trawled over sand and mud bottoms between 37-72 m and 90-200 m, respectively. *Gordiichthys ergodes* remains the rarest species within the genus, known only from the holotype which was collected by a box core somewhere between 10-189 m (based on collection data associated with the specimen).

*Gordiichthys combibus* can be differentiated from all other known eastern Pacific ophichthids using the characters in the diagnosis as well as the key provided in McCosker and Rosenblatt (1995). It might be mistaken for a species of *Bascanichthys*, which differ in possessing a minute pectoral fin, or for a species of *Ethadophis*, which differ in having a blunter snout and a tubular anterior nostril.

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#### RESUMEN

Se describe una nueva especie, *Gordiichthys combibus*, de aguas someras del Pacífico colombiano, el cual se asemeja a *G. randalli* de Puerto Rico. Difiere de sus congéneres del Atlántico Occidental en número de vértebras y otras características. Se incluye una clave del género.

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