Northeast Gulf Science

Volume 3
Number 1 *Number 1*

Article 3

6-1979

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DOI: 10.18785/negs.0301.03

Northeast Gulf Science Vol. 3, No. 1, p. 27-47 June, 1979

TWO NEW WESTERN ATLANTIC SPECIES OF THE GOBIID FISH GENUS *Gobionellus*, WITH REMARKS ON CHARACTERISTICS OF THE GENUS

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ABSTRACT: Two new western Atlantic species of *Gobionellus* (family Gobiidae) are described and figured. *G. comma*, which is presently known only from the southern Caribbean Sea, off Venezuela, is characterized primarily by a dark, comma-shaped bar in the suborbital area. *G. atripinnis*, which has been found only in the western Gulf of Mexico, from southern Texas to Veracruz, Mexico, is most readily distinguished by an elongate black blotch in the male's spinous dorsal fin and in having 16 pectoral fin rays. *G. comma* is closely related to the eastern Pacific *G. manglicola* The relationships of *G. atripinnis* are more obscure.

Important diagnostic characters of *Gobionellus* are presented, together with preliminary conclusions concerning the interrelationships of the genera *Evorthodus* and *Oxyurichthys*, which closely resemble *Gobionellus* in several important ways. Although groundwork is laid for possible synonymization of these genera (including discussion of nomenclatural problems), such action is deferred until more comprehensive studies are completed.

A total of 14 coarse-scaled species of *Gobionellus* are recognized. These are included in a taxonomic key, which also includes a geographic range statement for each species. Also included in the key are the two species of *Evorthodus*, which are frequently confused with the coarse-scaled *Gobionellus*. This key does not include the recently-described *G. munizi* Vergara 1978, specimens of which we have not had the opportunity to examine. Comments are included, however, regarding this species' validity and probable relationships, based on text of the original description and accompanying figures.

The genus *Gobionellus* Girard was reviewed by Ginsburg (1932), who recognized a total of 11 species in the western Atlantic and eastern Pacific oceans, plus two (in the subgenus *Biat*) in the Indo-Pacific region. Several other new species were subsequently described (Pfaff, 1933; Ginsburg, 1953; Mead and Böhlke, 1958; Gilbert and Randall, 1968; and Gilbert and Randall, *in* Gilbert and Kelso, 1971), and these, together with several previously described forms later recognized by Ginsburg (1953), increased the total to 20. One recently named species (*Gobionellus pseudofasciatus* Gilbert and Randall), for which only a brief diagnosis was originally provided (Gilbert and Kelso, 1971), has since been described in greater detail (Hastings, 1979) particularly with regard to color and pigmentary variation.

We have been engaged for some time in a review of the "coarse-scaled" species of *Gobionellus* (i.e., those forms having 46 or fewer scales in the lateral series). Although final publication of this work is not yet ready, we consider it desirable to accord formal status to the two remaining undescribed coarse-scaled species, and to provide a key (with range statements) to the recognized species. We also present evidence suggesting a close relationship to *Gobionellus* of the genera *Evorthodus* and *Oxyurichthys*, but stop short of synonymization, primarily on the recommendation of

Douglass F. Hoese, of the Australian Museum. Dr. Hoese, who is actively working on the systematics of Indo-Pacific gobies, agrees that these groups likely are closely related, but points out (*in litt.*) that basic morphological differences exist among *Oxyurichthys,* coarse-scaled *Gobionellus,* fine-scaled *Gobionellus* and *Evorthodus.* He also notes that complexities remain concerning relationships of these groups to certain other genera (e.g., *Waitea, Oligolepis* and *Paroxyurichthys*). Inasmuch as further study is necessary before these relationships can be completely resolved, Dr. Hoese advocates a conservative approach regarding nomenclatural changes. Although this leaves the status of certain species (notably *Gobionellus stigmalophius*) temporarily in limbo, we feel that this is preferable to making changes that might ultimately require retraction.

The coarse-scaled *Gobionellus* are morphologically conservative in many respects, and such characters as lateral-scale count and proportional measurements usually are of limited value in distinguishing the various species. Fin-ray counts (second dorsal, anal and pectoral) are of greater taxonomic value, but even these may not help when identifying closely related species. Probably the most important feature in species identification are details of body and fin pigmentation, which are unique for each species; when small specimen size or poor preservation obscures such detail, identification may be difficult. Other characters that may be of value in the taxonomy of this group are (in no specific order of importance) (a) development of squamation on anterior part of body, particularly in predorsal area; (b) aspects of dentition, particularly degree of development of the canine teeth in adult males; (c) development of filamentous extension of third (sometimes also second) dorsal spine in adult males; (d) position and morphology of the anterior nares; (e) length of caudal fin; (f) details of cephalic lateralis system, particularly development of lateral canal; (g) cephalic papillae patterns; (h) morphology of neural spine lying between first and second dorsal pterygiophores; and (i) number of epural bones (1 or 2) in the caudal skeleton.

Separation of the genus *Gobionellus* into fine-scaled and coarse-scaled forms appears to be essentially natural (judging from differences in anterior head and body squamation, gut morphology, gill raker size and number, and second dorsal and anal fin-ray counts), although the possibility exists that some species (e.g., the coarse-scaled *G. daguae* and the fine-scaled *G. sagittula*) may ultimately be shown to deviate from this arrangement. We currently recognize a total of 14 coarse-scaled species, including the two new species herein described. (This total does not include the recently-described *G. munizi,* specimens of which we have not examined). Of these, one (*G. lepturus*) is confined to the eastern Atlantic Ocean; two (*G. manglicola* and *G. daguae*) occur only in the eastern Pacific; and 11 (*G. boleosoma, G. smaragdus, G. stigmaticus, G. stigmaturus, G. shufeldti, G. fasciatus, G. claytoni, G. pseudofasciatus, G. saepepallens, G. comma* n. sp. and *G. atripinnis* n. sp.) are endemic to the western Atlantic region. This list, together with the key appearing subsequently, provides a preliminary summary of our conclusions regarding the systematic status of several taxa, for which confirmatory evidence will be presented in a later paper: (a) recognition of *Gobionellus claytoni* and *G. fasciatus*

DOI: 10.18785/negs.0301.03

as distinct, though intimately related species; (b) recognition of *G. daguae* as a senior synonym of *G. panamensis;* and (c) recognition of *G. lepturus* as a member of the "coarse-scaled" group.

MATERIALS AND METHODS

Counts were made using standard methods (Hubbs and Lagler, 1958). Terminology of the cephalic lateralis system follows Bailey (1956). All lengths are expressed in standard length (SL). In the descriptions, numbers in parentheses following various counts indicate the number of specimens involved.

Specimens referred to in this paper are from the following museum collections: Academy of Natural Sciences of Philadelphia (ANSP); Florida State Museum, University of Florida (UF); Los Angeles County Museum of Natural History (LACM); Rosenstiel School of Marine and Atmospheric Sciences, University of Miami (formerly University of Miami Marine Laboratory) (UMML); Museum of Zoology, University of Michigan (UMMZ); United States National Museum of Natural History (USNM); and Estacion de Investigaciones Marinas de Margarita (Venezuela) (MHNLS). We thank the curators in charge of these collections for making the specimens available.

STATUS OF GENUS *Evorthodus*

Ginsburg (1931) reviewed the status of *Evorthodus,* and showed that two previously recognized species, which had been placed in different genera (*Gobius lyricus* and *Evorthodus breviceps*), were based on males and females, respectively, of the same species, to which the name *Evorthodus lyricus* should be applied. Separation of the two forms had been based on sexually dimorphic differences in teeth structure and development (Ginsburg, 1931: Fig. 2). He also showed that in the young the teeth are essentially the same in both sexes, but subsequently the males undergo pronounced changes in dental morphology not seen in females, which include development of a second row of teeth in the lower jaw. This dimorphism is also manifested in certain aspects of external morphology (as is true of many goby species), such as degree of development of the spinous dorsal fin and structure of the genital papilla. Ginsburg included a diagnosis and description of *Evorthodus* in his paper, as well as a synonymy of *E. lyricus.* Dawson (1967) subsequently compared the western Atlantic *E. lyricus* with the eastern Pacific *E. minutus,* which he concluded were distinct geminate species.

Evorthodus bears a close morphological similarity to the coarse-scaled species of *Gobionellus* (*see* Ginsburg, 1931: Fig. 1; 1932: various figs.), and it seems likely that they are closely related. This relationship is further suggested by (a) inclusion of six specimens of *Gobionellus boleosoma* in the original syntypic series of *Gobius lyricus;* (b) periodic inclusion of *E. lyricus* in *Gobionellus* by past workers (Poey, 1868, 1876; Meek and Hildebrand, 1928); (c) frequent misidentification of *E. lyricus* as a species of *Gobionellus* during routine identifications; and (d) original description of one of the junior synonyms of *E. lyricus* (*E. costalesi*) in the genus *Smaragdus,* the generic type of which is *Gobionellus smaragdus.* Despite this, neither Ginsburg (1931, 1932, 1953) nor others have ever suggested possible synonymization of the two genera.

Ginsburg (1931) gave the following

diagnosis for *Evorthodus:* "Small gobies with a moderately elongated body; scales on body rather large, ciliated; cycloid scales present on upper part of opercle to about the level of the lower margin of the eye; antedorsal area with smaller cycloid scales extending to eyes, with small, partly embedded scales also present on chest and ventral surface of abdomen; mouth medium, maxillary narrow and weak in both sexes, not quite reaching posterior margin of eye; caudal fin moderately elongated and pointed in full-grown males, shorter and nearly rounded in females and young of both sexes; teeth in females and young males in a single row in both jaws, small, compressed, notched, proximate; in full-grown males teeth rather long, somewhat pointed, spaced, their distal margin entire, and with a second row of enlarged teeth in lower jaw behind the outer row, four to eight in number; the very young have teeth like the females but with entire margins; first dorsal with 6 spines, second dorsal with 11, and anal with 12 rays; ventral disk well developed, free, infundibuliform; shoulder girdle without flaps of skin; tongue free, with entire edge." Other important diagnostic features not mentioned by Ginsburg include the pattern of the cephalic lateralis system (see discussion below and Fig. 1B); well-developed tubular anterior nares; positions of the anterior and posterior nares in relation to the nasal pores (Fig. 1B); the short and blunt snout in combination with a partly included mouth; gut long and folded; and one epural bone in the caudal skeleton.

Ginsburg (1932) earlier had characterized *Gobionellus* as having biserial dentition in the upper jaw, but he (Ginsburg, 1953) subsequently modified this as a result of his inclusion in *Gobionellus* of *G. panamensis* (= *G. daguae*) and *G. liolepis,* both species of which usually have a single row of teeth in the upper jaw. Mead and Böhlke (1958) discussed this situation in the description of their new species, *Gobionellus stigmalophius,* which also has uniserial dentition in this area.

Each tubular anterior naris in *Evorthodus* is well separated from the anterior nasal pore, whereas each posterior naris is located beside this pore (Fig. 1B). This is in contrast to the species of *Gobionellus* examined (Figs. 1A, C-D), all of which have the anterior nares more poorly developed, and which in turn are closely proximate to the respective anterior nasal pores.

Evorthodus differs from both fine and coarse-scaled species of *Gobionellus* in having the gut long and folded instead of long and coiled (fine-scaled *Gobionellus*) or relatively short and not coiled (coarse-scaled *Gobionellus*). It is similar to the coarse-scaled *Gobionellus* in having only a few short rakers on the outer face of the first gill arch, but differs in morphology of the gill flap (or pad) situated on the upper part of this arch. In coarse-scaled *Gobionellus* the flap is simple and elongated, with a single, medium-long, pointed projection at the anterior end (*G. shufeldti, G. pseudofasciatus* and *G. boleosoma* examined); in *Evorthodus* the flap is much more complex (two flaps conceivably could be recognized) and covered with numerous fleshy, pointed projections (both long and short) (see Hoese and Allen [1977] for illustrations of outer gill arch and flaps in other goby genera). Fine-scaled *Gobionellus* lack flaps, but have numerous rakers, with those on the upper part of the arch quite elongate.

Although not illustrated or discussed elsewhere in this paper, the cephalic

DOI: 10.18785/negs.0301.03

papillae pattern in *Evorthodus* differs from those seen in all coarse-scaled *Gobionellus*. Specific differences were noted among the various *Gobionellus* species, however, and more study will be required to determine if the pattern seen in *Evorthodus* is of generic significance.

Other than the features discussed above, other characters analyzed in *Evorthodus* also occur in the various species of *Gobionellus*, though not necessarily in other coarse-scaled forms. *Evorthodus* differs from all coarse-scaled *Gobionellus* in having scales extending substantially farther forward on the head (to just behind the eyes), all or part of the opercle, and on the chest. In certain fine-scaled species (e.g., *gracillimus, hastatus, oceanicus* and others), scales are also present in these areas, in addition to the upper part of the cheek. Most coarse-scaled species have two epural bones in the caudal skeleton, but at least four (*stigmaturus, saepepallens, manglicola* and presumably *comma*) have only one.

The most trenchant characters shared by *Evorthodus* and *Gobionellus* are the relative number of second dorsal and anal fin elements and the morphology of the cephalic lateralis system (Figs. 1A-D). All species of *Gobionellus* either have an equal number of second dorsal and anal elements or (more often) one more anal than second dorsal element. Counts for the second dorsal fin range from 11 to 14 and for the anal fin 12 to 15. Second dorsal and anal-ray counts for both species of *Evorthodus* are 11 and 12, respectively. The consistency of this character, when considered in conjunction with other features, seems to confirm its evolutionary significance.

All species presently included in *Gobionellus* have the supraorbital canal divided over its entire length and connected at the level of the posterior margin of the orbits by a median coronal pore (Figs. 1A, C-D). An interorbital pore is situated at the anterior end of each of the two sections of this canal. All species of *Gobionellus* except *G. stigmalophius* (Fig. 1D) possess an incomplete preoperculomandibular canal, with two or three pores, on the vertical margin of the preoperculum (Figs. 1A, C). (This canal is absent in *G. stigmalophius;* see discussion of this species in subsequent account of genus *Oxyurichthys*). The lateral canal may contain four pores, and extend almost to the upper margin of the preopercular bone (Figs. 1A,D); however, in either case the second pore in the lateral series is always situated just posterior to the margin of the preopercle. The lateral canal is complete and unconstricted throughout its entire length in *G. hastatus, G. oceanicus, G. gracillimus* and their close relatives (Fig. 1C). Until recently the same condition was believed to exist for *Evorthodus* as well, but it has now been determined that no tubular connection exists between pores two and three in this genus (Fig. 1B). Examination of two specimens (USNM 81838) of the only coarse-scaled *Gobionellus* with four lateral pores (*G. daguae;* not illustrated) indicates an essentially intermediate condition, the connection in question either being sharply constricted or completely absent.

Although no comprehensive survey of cephalic lateralis system patterns in the Gobiidae has been conducted, studies so far have clearly demonstrated the importance of this character in goby systematics (Böhlke and Robins, 1968; Gilbert, 1971). It seems likely that all truly congeneric goby species will be found to have basically similar patterns, and that sharp deviations from such

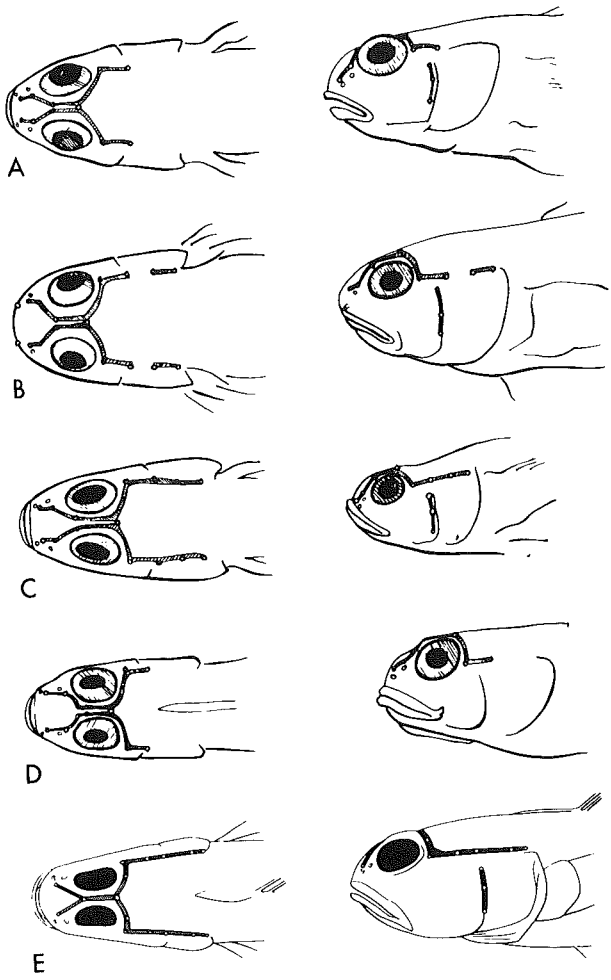

Figure 1. Cephalic lateralis system patterns in selected species of *Evorthodus* and *Gobionellus* and in *Biat* (=*Amblyeleotris*) *luzonicus.* A) *G. fasciatus;* B) *E. lyricus;* C) *G. oceanicus;* D) *G. stigmalophius;* E) *Biat* (=*Amblyeleotris*) *luzonicus.*

patterns within a genus are a strong indication that generic changes are in order. On the other hand, it should not necessarily be assumed that a similar pattern is, by itself, an absolute indication of close phylogenetic relationship. Dr. Hoese points out, for example, that such genera as *Awaous, Sicydium* and *Gnatholepis* each has a cephalic lateralis pattern similar to that found in *Gobionellus* and *Evorthodus,* although the combination of other characters does not suggest an intimate relationship. He attributes this situation to primitiveness of this particular pattern, and it is largely for this reason that he urges conservatism in making generic changes at this time.

STATUS OF GENUS *Oxyurichthys*

The genera *Oxyurichthys* and *Gobionellus* are considered to have exclusive geographic distributions (Indo-Pacific and New World, respectively), except in the eastern Atlantic Ocean where both *O. occidentalis* and *G. lepturus* occur.

DOI: 10.18785/negs.0301.03

Ginsburg (1932) was first to point out the apparent close phylogenetic relationship of the two genera. Mead and Böhlke (1958) expanded upon this in the description of their new western Atlantic species, *Gobionellus stigmalophius,* in which they summarized the situation as follows: "Our species is considered here a highly modified *Gobionellus,* and with this inclusion the generic limits of *Gobionellus* and *Oxyurichthys* closely approach one another."

We have compared adult specimens of *Gobionellus stigmalophius* (UF 11306 [1 spec.], UMML 3992 [3 spec.]; both sexes represented) with a series of five specimens of adult *Oxyurichthys microlepis* (the generic type species) from the Philippines (UMML 14353). (Latter species identified using keys in Koumans [1953] and Menon and Govindan [1977]). Comparison of these two species shows a close similarity, particularly in morphology of the cephalic lateralis system (Fig. 1D), fin-ray counts, gill raker morphology and gut morphology. Both species lack any trace of a preoperculomandibular canal and have an incomplete lateral canal. Based on the above specimens, pectoral fin-ray counts for *G. stigmalophius* range from 21 to 23 (usually 22) and for *O. microlepis* 22 or 23 (usually 22), whereas the respective second dorsal and anal fin-ray counts for both species are invariably 13 and 14. Contrary to the statement by Mead and Böhlke (1958), we can see no appreciable differences in morphology of the anterior nares. Both species have biserial dentition in the lower jaw, although there are pronounced specific differences in size and distribution of the teeth. Marked differences in scale size and distribution were noted: *G. stigmalophius* has 90-100 scales in the lateral series and a scaleless predorsal area, whereas *O. microlepis* has 50-55 lateral scales and a scaled predorsum. Gross examination of one cleared and stained specimen of each species (both adult females) shows no obvious osteological differences. Finally, the two species are markedly similar in their overall physiognomy.

In our opinion, *Gobionellus stigmalophius* and *Oxyurichthys microlepis* are congeneric. Despite this, we do not synonymize the two genera here and recommend that present generic allocations of the above two species not be changed at this time, for reasons discussed earlier in this paper. We should note that the status of various Indo-Pacific gobies currently included in *Oxyurichthys* is still unsettled, as at least one species referred to this genus by Menon and Govindan (1977) is misplaced (D. F. Hoese, *in litt.*).

Should synonymization of *Oxyurichthys* and *Gobionellus* eventually occur, we should point out that both genera were proposed in 1858, thus creating a potential problem of priority. Robins and Lachner (1966) noted that the exact publication date of Girard's (1858) paper, in which *Gobionellus* was first proposed, in the *Proceedings of the Academy of Natural Sciences of Philadelphia* (vol. 10, no. 12) is unknown, Nolan (1913) having listed neither the mailing date for this section by the Philadelphia Academy nor the earliest date of receipt by another institution. Robins and Lachner (1966), however, indicated that notice of receipt by the Elliott Society of Natural History (Charlestown, South Carolina) appeared in the minutes of the meeting of 1 November 1858 (under "Contributions to the Library"), which were published in that society's *Proceedings* (vol. 1, pp.

289-290). We interpret this to mean that the proper publication date for the paper in question should be 1 November 1858, according to Article 21b of the International Code of Zoological Nomenclature, London (1964: 19). We do not feel that the earlier date of 30 September 1858, suggested by Robins and Lachner (1966), is acceptable under the provisions of this article.

Determination of exact publication dates for most of the papers of Bleeker (the author of *Oxyurichthys*) is virtually impossible. Jordan (1919: 279) gave the year of publication of the paper in which the name *Oxyurichthys* was first proposed as 1858, although it should be noted that the series in which this paper appeared (*Nat. Tijdschr. Ned. Ind.*, vol. 16) covered the years 1858-1859. Based on Article 21b, and in the absence of evidence to the contrary, we consider the publication date for the paper in question to be 31 December 1858. According to this, the generic name *Gobionellus* Girard 1858 would have priority over *Oxyurichthys* Bleeker 1858.

STATUS OF SUBGENUS *Biat*

Ginsburg (1932) included the Indo-Pacific *Biat* as a subgenus of *Gobionellus,* based solely on superficial similarities in external morphology. Nothing more was said about this in subsequent papers by Ginsburg or others. D. F. Hoese (*in litt.*) informs us that he now considers *Biat* to be a synonym of the genus *Amblyeleotris.* We do not plan to dwell further on this matter, except to show the differences in cephalic lateralis pattern between this group (Fig. 1E) and *Gobionellus* (Figs. 1A-D), which at the same time offers confirmatory evidence of the value of this character in goby systematics.

STATUS OF *Gobionellus munizi*

While this paper was in preparation, we each received copies of a publication (Vergara, 1978) containing the description of a new *Gobionellus* from Cuba. The new species, *G. munizi,* was said to have 12 second dorsal and 13 anal rays; 22 to 26 lateral scales; 16 or 17 pectoral-fin rays; a large shoulder spot; five longitudinal markings along the side of the body, from which emanate anteriorly and posteriorly directed diagonal bars; two small but distinct spots at the pectoral base; and a relatively small body size (probably not exceeding 35 mm SL).

Vergara (1978) placed *G. munizi* in the subgenus *Ctenogobius* (as defined by Robins and Lachner [1966]), which he indicated as including the species *fasciatus, stigmaticus, boleosoma* and *shufeldti.* He concluded that *G. shufeldti* probably is its closest relative.

Study of the description and accompanying figures strongly indicates that *G. munizi* is very closely related to, if not identical with, *G. boleosoma.* The diagonal bars along the side of the body, in combination with the large shoulder spot, two small spots at the pectoral base, and relatively small body size are all characteristic of that species, which is one of the most distinctive coarse-scaled *Gobionellus.* The lateral-scale count usually attributed to *G. boleosoma* is 29 to 33 (Ginsburg, 1932), but the irregular placement of the more anterior scales in this series could easily result in counts different from this, depending upon the way these counts were made.

The one character of *G. munizi* clearly at variance with that usually attributed

DOI: 10.18785/negs.0301.03

to *G. boleosoma* is the combination of second dorsal and anal-ray counts, which is one higher in each case than that usually found in *G. boleosoma* (12 and 13 vs. 11 and 12). These counts are very important taxonomic characters in *Gobionellus,* and thus the consistently higher counts in *G. munizi* are quite significant. Nevertheless, aberrant fin-ray counts in *Gobionellus* are not particularly rare, and it sometimes happens that both the second dorsal and anal counts are simultaneously involved. Thus, the possibility of aberrant counts in the type series of *G. munizi* cannot be dismissed, but if so their uniform consistency in all 11 specimens is most unusual. We have examined four series of *G. boleosoma* from Cuba, two from the Havana area (USNM 192075 [20 spec.] and USNM 192076 [27 spec.] and two from the mouth of the Rio San Juan (USNM 55694 [2 spec.] and USNM 55695 [1 spec.]). Of these, all but four specimens have the typical combination of 11 second dorsal and 12 anal rays (11-11 in one specimen, 12-12 in three).

Another possibility is that Vergara miscounted the posteriormost ray in both the second dorsal and anal fins. This ray, unlike the preceding ones, is widely separated clear to the base, at which point the two sections come together from a common pocket. Considering this, it is readily understandable how the higher counts could have been obtained.

NEW SPECIES DESCRIPTIONS

Gobionellus comma, new species

Comma goby

Fig. 2

Diagnosis: A species of *Gobionellus* with a wide, dark suborbital bar, large scales (33 or 34 in lateral series), 15 or 16 pectoral-fin rays, and the combination of 12 total second dorsal and 13 total anal elements. Most closely related to *G. manglicola,* both species having a distinct black spot near tip of fifth dorsal spine (also near tip of fourth or fourth and sixth spines in *G. comma*); a broad, triangular-shaped patch of pigment on middle of opercle; no shoulder spot; five elongate blotches of pigment on mid-side of body; a completely scaleless nape; and a maximum standard body length probably less than 30 mm (largest of five specimens examined 26.2 mm SL).

Differs from *G. manglicola* in having a well-developed suborbital bar, the bar curving slightly posteriorly (no such bar in *G. manglicola*); two or three large black spots surrounding tips of fourth and fifth (females) or fourth, fifth, and sixth dorsal spines (males) (one spot, at tip of fifth spine, in *G. manglicola*); pigmented area in middle third of caudal fin (in males only) sharply delineated, tapering gradually toward tip of fin (not sharply delineated in males of *G. manglicola*); and third dorsal spine with a filamentous tip (in males only) that extends past base of fourth dorsal soft ray (apparently no such filament in *G. manglicola*).

In addition, *G. comma* appears to differ from *G. manglicola* in several other characters, which, however, cannot be fully substantiated until additional specimens are examined: Pelvic disc (in males) barely reaching anal opening (extending beyond anal opening in males of *G. manglicola*); alternating dark and light areas in dorsal fins more sharply defined; and the two elongate spots of dark pigment on upper margin of caudal fin near base more distinct.

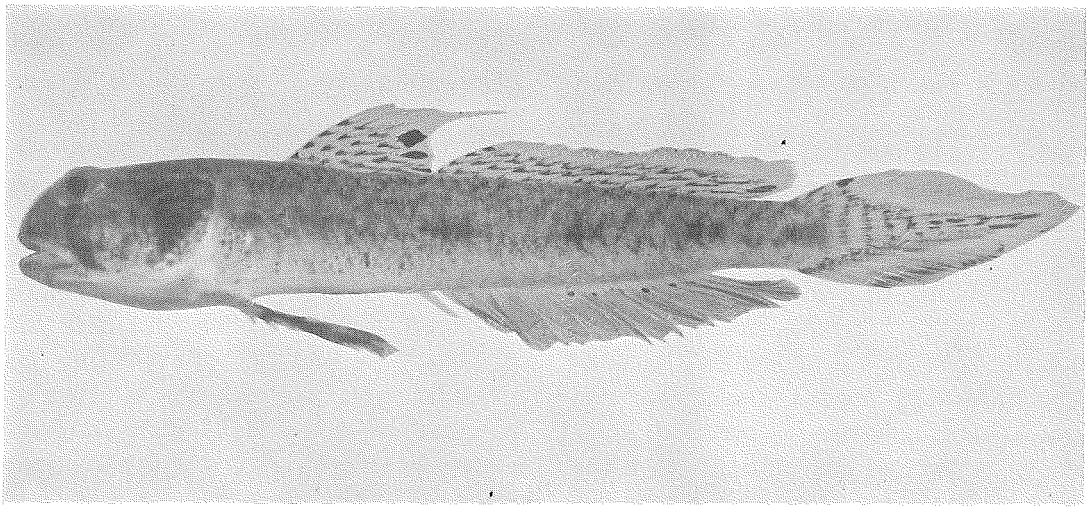

Figure 2. Holotype of *Gobionellus comma,* from Cubagua Island, Margarita Islands, Venezuela; ANSP 109181; adult male, 23.8 mm SL.

Description: Dorsal rays VI-12 (I,11) (5); anal rays 13 (I, 12) (5); pectoral rays 15 (4) or 16 (6); pelvic rays I, 5-I,5 (5); caudal-peduncle circumferential scales 12 (5).

Anterior profile of head rounded; mouth slightly oblique, situated at about a 15° angle to horizontal; upper and lower jaws coterminal; mouth extending posteriorly to below middle of eye; premaxillary frenum absent, the upper jaw protractile; gill openings restricted, extending from just forward and below anterior margin of pectoral base to just above uppermost pectoral fin ray; teeth in two rows in both jaws, those in outer row slightly larger; inner row of teeth in upper and lower jaws extending nearly to corner of mouth; outer row of teeth in upper jaw enlarged (particularly in males), with five or six moderately large, recurved canine teeth extending about one-third of distance from tip of jaw to angle of mouth; outer row of teeth in lower jaw also enlarged, extending about two-fifths of distance from tip of jaw to angle of mouth, with most posterior tooth in series distinctly caninoid and larger than any other tooth in either jaw; predorsal area (nape) completely scaleless; about 14 scales in an oblique row from origin of anal fin to base of dorsal fin; scales on antero-dorsal part of body slightly smaller and more rounded than elsewhere, those in area anterior to dorsal fin extending from half to two-thirds of distance from upper margin of pectoral base to mid-dorsal line; scales on sides of body with conspicuous ctenii on posterior edge, the ctenii inconspicuous or absent from scales in antero-dorsal area; breast scaleless; belly partly scaled, the scales absent from a narrow median strip extending posteriorly from base of pelvic fin to anus; pectoral fin broadly pointed, extending nearly to below end of first dorsal fin base; posteriormost rays of second dorsal and anal fins just reaching caudal base; third dorsal spine (in males only) with a filamentous tip that extends past base of fourth dorsal soft ray; length of caudal fin 32 to 36 percent of standard body length; united pelvic fins (disc) extending about 90 percent of distance from rear

DOI: 10.18785/negs.0301.03

of pelvic base to origin of anal fin (in males).

A well-developed, thick, black suborbital bar present, the bar curving slightly posteriorly and extending to level of lower jaw; a broad, triangular-shaped patch of pigment on middle of opercle; shoulder spot absent; several short, poorly defined, and irregularly distributed saddle marks crossing mid-line of back in males (not evident in females), each saddle mark consisting of two closely approximated narrow bars; lateral part of back without distinct markings; five narrow, elongate blotches of pigment along mid-side of body, the blotches fairly well defined and contrasting with surrounding area; pectoral and both dorsal fins streaked with rows of elongate spots, these spots more distinct in dorsal fins; a large, black, rhomboidal-shaped blotch of pigment at tip of fourth dorsal spine, and smaller, narrower, more oblong blotches near tips of fifth and sixth spines; anal fin heavily pigmented throughout, without spots or other markings; pigmented area on caudal fin (in males only) sharply delineated, narrowly triangular in shape, the base of triangle encompassing all of caudal base, the apex tapering gradually toward tip of fin; approximately eight, narrow, well-defined, evenly-spaced bars of pigment situated within "caudal triangle;" brown pigment on pelvic disc of males covering all of fin except medial membrane connecting innermost (fifth) rays, which is entirely depigmented; brown pigment on pelvic disc of females also interrupted medially, but occurring only on membranes between third and fifth rays; posterior edge of pelvic frenum narrowly bordered with brown pigment (in males only; pigment absent from this area in females).

Life colors: The following color notes were made by Randall from the freshly preserved male holotype: Color of body translucent yellowish; edges of scales brown; head faintly reddish with a black bar running ventrally from eye and a large black spot on opercle; dorsal fins with broad yellow margins and rows of small black marks; caudal with yellow submarginal band (margins dusky), centrally with vertical rows of small black marks; anal and pelvic fins dusky.

Habitat: The holotype of *Gobionellus comma* was collected over a silty to sandy bottom in 48 feet of water. Two of the paratypes (UF and MHNLS specimens) were collected over a mud bottom at a depth of less than ten feet.

Distribution: Known only from Cubagua Island, Margarita Islands, Venezuela. Future collecting along the northern coast of South America should extend the range of this species.

Relationships: As indicated in the **diagnosis**, *G. comma* is most clearly related to the eastern Pacific *G. manglicola.* Its closest relative in the western Atlantic is *G. saepepallens.* The principal characters common to all three species are (a) a single epural bone in the caudal skeleton, (b) low pectoral fin-ray counts (15 or 16), (c) small maximum body size (largest specimen of *G. saepepallens* examined 35.8 mm SL; largest specimens examined of other two species each less than 27 mm SL), and (d) aspects of body pigmentation, particularly the distinct triangular-shaped blotch on the opercle.

Etymology: The name *comma* is in allusion to the thick, comma-shaped suborbital bar characteristic of the species.

Material: HOLOTYPE, ANSP 109181 (formerly University of Puerto Rico no. 2488), adult ♂, 23.8 mm SL (illustrated); off point near northwest end of Cubagua Island, Margarita Islands, Venezuela; depth 48 feet (14.5 m); 25

January 1965; John E. Randall.

PARATYPES, UF 12793 (1), MHNLS 1.886 (1) (2♀♀, 25.3-25.8), Faro el Brasil, Cubagua Island, Margarita Islands, Venezuela; 5-10 ft. (1.5-3 m); 21 February 1965; Fernando Cervigon. LACM 20634 (formerly Allan Hancock Foundation no. 3035) (1♂, 18.5), LACM 20635 (formerly AHF 3036) (1♀, 26.2), Cubagua Island; 12 ft. (3.5 m); 15 April 1939; VELERO III (stas. A27-39 and A 28-39, respectively).

Gobionellus atripinnis, new species
Blackfin goby
Fig. 3

Diagnosis: A species of *Gobionellus* with an elongate, jet-black blotch at tip of anteriormost spinous ray of males, large scales (32 to 37 in lateral series), the combination of 12 total second dorsal and 13 total anal elements, usually 16 pectoral-fin rays, a completely scaleless nape, no shoulder spot, no distinct markings on head, and the pectoral fin finely and irregularly dusted with discrete dark melanophores on rays and membranes over a background of more finely and evenly spaced micromelanophores. Males are also characterized by an elongate, jet-black blotch in the membrane adjacent to the anteriormost ray in both the spinous (first) and soft (second) portions of the dorsal fin, as well as a small, elongate, sharply-defined, jet-black spot centrally located at base of most (but not all) anal-fin membranes (usually beginning with the third membrane), the pigmented versus unpigmented membranes in no definite sequence. Females have dorsal spines two or three through six (but not adjacent membranes) tipped with darkish pigment that is never as intense as in the males, and also lack discrete black spots at the bases of the anal-fin membranes.

Description: Dorsal rays VI-12 (I, 11) (11), VI-13 (I, 12) (2); anal rays 13 (I, 12) (12); combination of second dorsal and anal rays 12-13 (11), 13-13 (1), 13-(1); pectoral rays 15 (2), 16 (17), 17 (6) (counts always same on both sides except for one specimen in which rays in right fin could not be counted; counts for holotype 17-17); scales in lateral series 32 (2), 33 (2), 34 (3), 35 (2), 36 (1), 37 (2); caudal-peduncle circumferential scales 12 in all.

Anterior profile of head rounded; mouth slightly oblique, situated at about a 15° angle to horizontal; upper and lower jaws coterminal; mouth extending posteriorly to below middle of eye; premaxillary frenum absent, the upper jaw protractile; gill openings restricted, extending from just anterior to and below lower margin of pectoral base to just above uppermost pectoral-fin rays; teeth in two rows in both jaws, those in outer row slightly larger; inner row of teeth in upper and lower jaws extending nearly to corner of mouth; outer row of teeth in upper jaw enlarged (particularly in males), with five or six moderately large, recurved canine teeth extending about two-fifths of distance from tip of jaw to angle of mouth, with the posteriormost two teeth distinctly larger than others in series and about equal in size to posteriormost large tooth in outer row of upper jaw; predorsal area (nape) completely scaleless; 13 or 14 scales in an oblique row from origin of anal fin to base of second dorsal fin; scales on anterior-dorsal part of body smaller and more rounded than elsewhere; scales on sides of body with conspicuous ctenii on posterior edge, the ctenii inconspicuous or absent from scales in anterodorsal area; breast naked; belly partly scaled, the scales absent from a narrow median strip extending posteriorly from base of pelvic fin to anus; pectoral fin

DOI: 10.18785/negs.0301.03

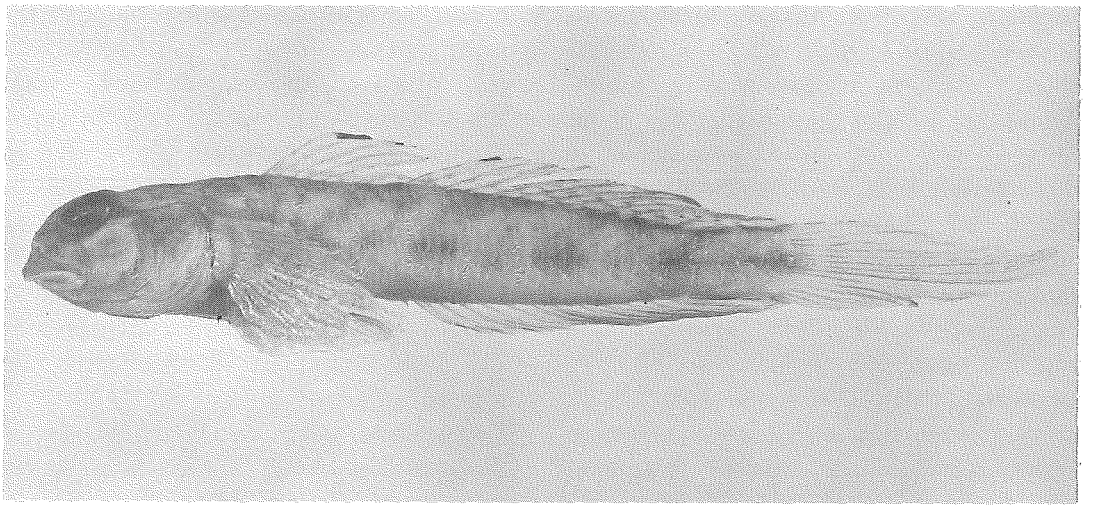

Figure 8. Holotype of *Gobionellus atripinnis*, from stream 7.7 miles E of Brownsville, Cameron Co., Texas; UMMZ 167639; adult male, 40.0 mm SL.

broadly pointed, extending nearly to below end of first dorsal-fin base; posteriormost rays of second dorsal and anal fins falling just short of caudal base (females) or extending just beyond (males); third dorsal spine (in males only) with a filamentous tip that extends to base of seventh dorsal soft ray (not present and possibly broken in holotype); lengths of caudal fin 29 to 34 percent of standard body length; pelvic fins (disc) extending (in males) over 90 percent of distance from insertion of pelvic fin to origin of anal fin and (in females) over 80 percent.

Small flecks of brownish pigment evenly distributed over sides of head, in no discernable pattern, with no prominent bars or blotches on sides of head; a broad patch of small melanophores on middle two-fifths of lower lip and on middle three-fourths of upper lip (in females), present on all of upper and lower jaws in males; no shoulder spot; two to four narrow, more-or-less evenly spaced narrow bars of pigment extending across midline of back anterior to dorsal fin; five narrow, slightly oblong blotches of pigment along mid-side of body, the posteriormost one most distinct, situated at base of caudal fin; a smaller, more distinct spot of pigment is situated between each blotch in the largest female specimen examined; diagonal bars of pigment extending posteriorly from third and fourth blotches of pigment on side of body; both parts of dorsal fin with large, irregularly-spaced blotches of chocolate pigment; anal fin of males with small, slightly elongate, sharply defined spots centrally located near base of anal membranes 3, 5, 7, 9 and 11 of holotype, in membranes 3, 4, 5, 6, 8, 10 and 12 of one paratype, and in membranes 4, 6, 7, 10, 11 and 12 of another paratype (some membranes in last specimen destroyed, so pigment perhaps present on other membranes as well); pigment in anal fin of females either absent or, if present, much more diffuse and absent from extreme outer margin of fin; males have an elongate, jet-black blotch at tip of anteriormost ray and in membrane adjacent to this ray in both spinous and soft parts of dorsal fin; females have dorsal spines two or three

through six (but not adjacent membranes) tipped with darkish pigment that is never as intense as in the males; caudal fin of males with pigment more or less uniformly distributed throughout membranes, with no well defined streaks of pigment; pigment in caudal fin of females less uniformly distributed, broken up into a series of narrow, elongate blotches, thus giving a more checkered appearance to fin; two or three, narrow, elongate blotches of black pigment situated, more or less in sequence, on upper anterior margin of caudal fin of both sexes (not readily observable in male holotype, however); no pigment observable in pelvic disc of females examined; pigment faint and uniformly distributed throughout pelvic disc in male holotype; pelvic frenum apparently unpigmented.

Maximum standard body length possibly not reaching 50 mm SL, the largest specimen examined 44.3 mm SL.

Habitat: *Gobionellus atripinnis* appears to be primarily a brackish to freshwater species, based on the localities where present collections have been made.

Distribution: Apparently confined to the extreme western part of the Gulf of Mexico, where it is known from extreme southern Texas to Veracruz, Mexico.

Relationships: We are not certain of the precise affinities of *Gobionellus atripinnis.* It does share several pigmentary features with *G. boleosoma,* however, which may indicate a distant relationship. Both species have (a) individuals of both sexes with diagonal lines of pigment emanating dorsally from the blotches along the mid-side of the body (the anteriorly directed line frequently absent or incomplete in *G. atripinnis;* both lines present in *G. boleosoma,* forming a "V"); (b) males with a jet-black blotch at tip of first spinous dorsal membrane (much larger and more prominent in *G. atripinnis*); (c) males with well-defined, small black spots along base of anal fin (more intense and located near center of base of membrane in *G. atripinnis;* less intense and located on or close to the rays in *G. boleosoma*); and (d) females lacking pigment on extreme outer margin of anal fin, although a diffuse band of dusky pigment borders this depigmented area.

Comparison with sympatric species of *Gobionellus:* Only three coarse-scaled species of *Gobionellus* are definitely known to occur in the western Gulf of Mexico, from extreme southern Texas southward (*G. claytoni, G. boleosoma* and *G. atripinnis*). Several others are found in adjacent geographic areas and may ultimately be found here (*G. smaragdus; G. stigmaticus, G. shufeldti* and *G. saepepallens*), although the last usually is associated with coral reefs, which are lacking from close inshore areas of the western Gulf. All Mexican specimens originally identified as *G. shufeldti* have proved, upon re-examination, to be either *G. claytoni* or *G. atripinnis. G. shufeldti* apparently occurs as far south as Galveston, Texas (Hoese and Moore, 1977: 234), but we have not examined specimens from that area and cannot confirm these identifications. *G. shufeldti* is common along the coasts of Mississippi and Louisiana, but apparently decreases markedly in abundance farther west. We have examined a number of collections of coarse-scaled *Gobionellus* from Texas, all of which have proved to be *G. boleosoma.* Inasmuch as *G. atripinnis* occurs in extreme southern Texas, any specimens of *Gobionellus* from this and adjacent areas to the north having the combination of 12 second dorsal and 13 anal

DOI: 10.18785/negs.0301.03

elements should be carefully examined.

Of the three coarse-scaled *Gobionellus* from the extreme western Gulf of Mexico, *G. boleosoma* is readily distinguished at all sizes from *G. claytoni* and *G. atripinnis* by the combination of second dorsal and anal fin-ray counts (11 and 12 vs. 12 and 13), together with various diagnostic pigmentary features. In addition, *E. lyricus* differs from the other three species in having scales on top of the head and upper part of the opercle and an interrupted lateral canal with four pores (Fig. 1B) versus an incomplete canal with two pores (Fig. 1A). Adults of *G. claytoni* and *G. atripinnis* may be distinguished by various pigmentary features, pectoral fin-ray counts (usually 16 in *G. atripinnis* [16 or fewer in 19 of 25 counts involving types] vs. usually 17 in *G. claytoni* [17 in 22 of 26 counts]) (80 percent separation), maximum length of filamentous extension of third dorsal spine in adult males (much longer in *G. claytoni*), and probably maximum body length. The largest specimen of *G. atripinnis* examined (an adult male) is 44.3 mm SL. The largest *G. claytoni* examined so far is 51 mm SL, but should this species attain the same size as the very closely related *G. fasciatus,* it would reach almost 70 mm SL. Unfortunately, insufficient comparative material of *G. claytoni* and *G. atripinnis* is available to substantiate this.

Two series of specimens examined during this study (both from Mexico) are tentatively identified as *G. atripinnis,* but have not been designated as paratypes: UMMZ 97727 (3) and UMMZ 187703 (7). The three specimens in the former series (1♂, 2♀♀), from the Rio Paploapan, are faded and the fins (particularly the pectorals) badly mutilated. There appears to be an indication of faint brownish pigment near the tips of the more posterior dorsal spines, but the anal fin of the male individual is in such bad shape that one cannot determine if small dark spots of pigment might originally have been present on the membranes. The other seven specimens (UMMZ 187703), from the Rio Chiquito, Veracruz (at virtually the same locality as four of the paratypes [UMMZ 187725]), are small (14.4-21.8 mm SL) and cannot be accurately sexed. Although all are well pigmented, the diagnostic pigmentary features characterizing the adults are not readily evident. Identification is largely based on pectoral-ray counts, which number 16-16 in six specimens and 17-17 in the other, as well as close geographic proximity to one of the paratypic series.

Etymology: The species name *atripinnis* (black fin) refers to the black pigmentation in the spinous and soft dorsal fins of the males.

Material: HOLOTYPE, UMMZ 167639 (♂, 40.0 mm SL), stream 7.7 mi. (12.4 km) E of Brownsville, Texas, on st. rt. 4; 9 April 1952; C. L. Smith and H. E. Winn.

PARATYPES (all from Mexico), UMMZ 181796 (7 [2♂♂, 5♀♀], 38.5-44.3; one cleared and stained); brackish-water lagoon, 5 mi. (8 km) S of Tampico, Veracruz; 4 Jan. 1956; Clifton and Kuhn (sta. 5). UMMZ 187725 (4♀♀, 24.0-29.7); Rio Chiquito, arm of Rio Coatzacoalcon, 1/4-1/2 mi. (.65-.80 km) below Tenochtitlan, Veracruz; 28 Jan. 1968; R. R. Miller, M. B. Lackey, F. Donalson and O. Castro (sta. M 68-2). UMMZ 187763 (1♀, 34.0); small arroyo, ca. 1/2 mi. (.80 km) N of Tenochtitlan, adjacent to W bank of Rio Chiquito, Veracruz; 1 Feb. 1968; R. R. Miller and M. B. Lackey (M 68-9). USNM 118100 (1♂, 38.0) (*ex* USNM 62292); Tampico, Veracruz; J. O. Snyder.

OTHER MATERIAL EXAMINED (all from Mexico), UMMZ 97727 (3 [1♂, 2♀♀], 33.0-38.7); Rio Rapaloapan, San Cristobal, Veracruz; 21 May 1930; Creaser, Gordon and Ostos (CG 30-50 [sta. 53]). UMMZ 187703 (7, 14.4-21.8); west bank of Rio Chiquito, 1/4-1/2 mi. (.65-.80 km) below Tenochtitlan, Veracruz; 19 May 1968; J. A. and M. B. Lackey (L 68-6).

KEY TO SPECIES OF *Evorthodus* AND COARSE-SCALED *Gobionellus*

1a. Predorsal area heavily and continuously scaled forward to orbits; snout notably short and rounded, its length less than orbital length; opercle partly scaled 2

2a. Pectoral fin rays usually 14 (range 13-15) (Table 1); oblique scale rows between anal fin origin to below about middle third of second dorsal fin usually 8 (range 7-9); maximum size ca. 25 mm SL. . . . . *Evorthodus minutus* Meek and Hildebrand

Eastern Pacific: Panama to Nayarit, Mexico (apparently absent from Gulf of California)

2b. Pectoral fin rays usually 16 (range 15-17); oblique scale rows between anal fin origin to below about middle third of second dorsal fin usually 11 (range 10-12); maximum size ca. 77 mm SL. . . . . *Evorthodus lyricus* (Girard)

Western Atlantic: Chesapeake Bay south to at least Rio de Janeiro, Brazil; more or less continuously distributed in coastal (primarily estuarine) areas, often entering fresh water

1b. Predorsal area either scaleless or with scales present on nape area only; snout longer and more pointed, its length at least equal to orbital length; opercle scaleless 3

3a. Second dorsal fin rays usually 13; third dorsal spine not excessively long in males, not reaching base of third dorsal soft ray; lateral cephalic canal complete or interrupted (with four pores), reaching upper part of opercular opening; teeth uniformly small, with no enlarged canines in either sex . . . . . *Gobionellus daguae* (Eigenmann)

Eastern Pacific; fresh waters of northwestern South America and eastern Panama

3b. Second dorsal fin rays usually 11 or 12; third (occasionally also second and/or fourth) dorsal spine often excessively long in adult males, reaching at least to base of third ray of second dorsal fin (except in *G. boleosomea, G. shufeldti* and *G. stigmaturus*); lateral cephalic canal incomplete (with two pores), not reaching upper part of opercular opening; teeth variable, often with enlarged canine teeth present in one or both jaws (better developed in males) . . .4

4a. Second dorsal and anal fin rays usually 11 and 12, respectively; distinct shoulder spot present; a short, thin, black semicircular marking (ends of semicircle pointing posteriorly) present or absent on predorsal midline, above axil of pectoral fin 5

5a. Predorsal area always scaled; large, black-encircled light spots on sides of head and frequently on body; semicircular marking (described above) absent from predorsal area; third dorsal spine in adult males often elongate, reaching at least to base of fifth dorsal soft ray; lateral scales 39 to 46; thin, wavy vertical bands of pigment usually on pectoral fin . . . . . .

DOI: 10.18785/negs.0301.03

TABLE 1. Pectoral fin-ray counts in *Evorthodus* and in coarse-scaled species of *Gobionellus* (combined counts for both fins; species arranged in order of appearance in key).

	13	14	15	16	17	18	19
E. minutus	3	25	2				
E. lyricus			7	55	20		
G. daguae					5	7	
G. smaragdus			1	32	49	2	
G. boleosoma			4	17	38		
G. stigmaturus			11	55	18		
G. stigmaticus				19	40	3	
G. fasciatus				3	63	18	
G. pseudofasciatus				1	29	2	
G. comma			4	6			
G. saepepallens			23	78	7		
G. manglicola			11	41	5		
G. atripinnis			2	23	4		
G. shufeldti				14	70	18	2
G. claytoni				4	22		
G. lepturus[1]	—	—	—	—	—	—	—

[1]Pectoral fins of holotype of *Gobionellus lepturus* too mutilated to permit accurate counts.

..... *Gobionellus smaragdus* (Valenciennes)
Western Atlantic, where it apparently has a modified antitropical distribution; to the north occurs from central South Carolina to southwestern Florida (north to Charlotte Harbor) and Cuba, including Florida Bay and (rarely) Florida Keys; to the south is known from Belize, Venezuela and southern Brazil (Pernambuco)

5b. Predorsal area almost always naked (a few scales occasionally present); no large, black-encircled light spots on sides of head and body; semicircular markings (described above) present on predorsal area; third dorsal spine in adult males not elongate, not reaching origin of second dorsal fin; lateral scales fewer than 39 (usually 29 to 34); no thin, wavy, vertical bands of pigment on pectoral fin ..... *Gobionellus boleosoma*
Western Atlantic; widespread from Delaware to central Brazil (Recife), including many islands in West Indies.

4b. Second dorsal and anal-fin rays usually 12 and 13, respectively; distinct shoulder spot usually absent (present in *G. stigmaticus*); short, thin, black semicircular marking absent from predorsal area 6

6a. Predorsal area completely scaled; narrow band of pigment paralleling posterior margin of cheek; third dorsal spine in adult males not excessively long, not reaching origin of second dorsal fin ..... *Gobionellus stigmaturus* (Goode and Bean)
Western Atlantic; restricted to southwestern Florida (Ft. Pierce Inlet through Florida Keys) and (possibly)

northern Cuba

6b. Predorsal area naked, or, when scales are present (in *G. shufeldti*) usually few in number; no narrow band of pigment paralleling posterior margin of cheek or, if present (in *G. fasciatus*), not in combination with scaled predorsal area; third dorsal spine in adult males usually elongate (except in *G. shufeldti*), reaching at least to base of third dorsal soft ray 7

7a. Four or five short, distinct vertical bars on lower part of cheek; shoulder spot present, usually distinct; a prominent, recurved canine tooth projecting laterally (often visible when mouth is closed) about midway along lower jaw in adult males . . . . . .*Gobionellus stigmaticus* (Poey) **Western Atlantic, where it apparently has an antitropical distribution; to the north has been definitely recorded only from Honduras, Cuba (type locality), Florida (three localities from Florida Keys to Pensacola) and southern North Carolina; to the south is known from southern Brazil (Rio de Janeiro)**

7b. No vertical bars on lower part of cheek (occasionally two faint vertical bars beneath orbit in *G. manglicola*); shoulder spot absent; no prominent recurved canine tooth projecting laterally (and visible when mouth is closed) from posterior part of lower jaw in adult males 8

8a. Distinct blotch on postero-ventral part of cheek (sometimes obscured in poorly preserved or faded specimens) . . 9

9a. Blotch on cheek running diagonally posterior from postero-dorsal part of maxillary, in a slightly diagonal direction, to just below and behind eye; six to eight small, evenly spaced spots usually in proximal area of anal-fin membranes in both sexes (occasionally obscured in adult males); intimately related to *G. claytoni,* from which it differs in having a blotch of pigment on cheek and a more completely scaled belly) . . *Gobionellus fasciatus* (Gill) **Western Atlantic; southern Caribbean, from Trinidad and Dominica to Costa Rica**

9b. Blotch on cheek running diagonally anterior (blotch sometimes broken), not paralleling posterior margin of cheek; no diagonal line extending from postero-dorsal margin of maxillary to behind eye (a faint, horizonal line may be present on middle of opercle); no spots in proximal area of anal-fin membranes in females (tiny, distinct spots present in males) . . . . . .*Gobionellus pseudofasciatus* Gilbert and Randall **Western Atlantic; mostly confined to southern and western Caribbean, where recorded from Trinidad, Panama, Costa Rica, Guatemala and Belize; a geographically disjunct population in southeastern Florida**

8b. No distinct blotch on postero-ventral part of cheek 10

10a. Suborbital bar present (in *G. comma* and *G. saepepallens* only) or absent; pectoral rays usually 15 or 16 (17 in 12 of 175 counts); maximum standard body length not over 40 mm (probably less); predorsal area always naked; large, distinct dark spots surrounding tips of fifth or of fourth to sixth dorsal spines in males (*G. comma* and *G. manglicola* only) 11

11a. A distinct, heavy suborbital bar extending from ventral margin of orbit, curving slightly posteriorly, and reaching ventral margin of cheek; distinct, relatively large dark spot surrounding tips of fourth to

DOI: 10.18785/negs.0301.03

sixth dorsal spines in males . . . . . *Gobionellus comma* new species

Western Atlantic; recorded only from Cubagua Island, Margarita Islands, Venezuela

11b. No distinct, heavy suborbital bar extending from ventral margin of orbit to ventral margin of cheek (a thin suborbital bar extending partway down cheek in *G. saepepallens*); no large dark spot surrounding tips of fourth to sixth dorsal spines in males (a spot surrounding tip of fifth spine in *G. manglicola*) 12

12a. A thin suborbital bar, curving slightly posteriorly, extending from lower margin of orbit about halfway to lower margin of cheek (distance varying somewhat with individual); no large dark spot surrounding tip of fifth dorsal spine in males; third dorsal spine in adult males usually very long, sometimes reaching base of 12th dorsal soft ray . . . . . *Gobionellus saepepallens* Gilbert and Randall

Western Atlantic; southern Florida and Bahamas to northern South America, primarily in insular areas

12b. No thin suborbital bar extending ventrally from orbit; a distinct dark spot surrounding top of fifth dorsal spine in males; third dorsal spine in adult males moderately long, sometimes reaching base of third dorsal soft ray . . . . . *Gobionellus manglicola* (Jordan and Starks)

Eastern Pacific; occurs at least from Mazatlan, Mexico, to Panama

10b. Suborbital bar absent; pectoral rays usually 17 or 18 (except in *G. atripinnis,* which usually has 16; 16 in 18 of 130 counts for other three species); maximum standard body length over 40 mm; predorsal area usually naked (partly scaled in *G. shufeldti*); no large, distinct dark spots surrounding tips of fourth, fifth or sixth dorsal spines 13

13a. A distinct, elongate black blotch at tip of first membrane in both spinous and soft dorsal fins in males (larger in spinous dorsal); a small but very distinct black spot in middle of some membranes near base of anal fin in males (spots absent in females); pectoral rays usually 16 (17 in 8 of 29 counts); one or more very small, but distinct, spots in spaces between three posterior blotches on middle of side of body in adult females . . . . *Gobionellus atripinnis* new species

Western Atlantic; western Gulf of Mexico, where recorded from Mexico (Veracruz) and southern Texas; often enters fresh water

13b. Dorsal fin pigmentation not as above; anal fin pigmentation not as above; pectoral rays usually 17 or 18, more often 17 (not determined for *G. lepturus*); pigmentation on side of body not as above 14

14a. Usually some scales (often five or fewer) in predorsal area, difficult to see in specimens under 40 mm SL (squamation here better developed in western population); third dorsal spine not elongate in adult males, not extending to origin of soft dorsal fin . . . . . *Gobionellus shufeldti* (Jordan and Eigenmann)

Western Atlantic; has a disjunct and antitropical distribution; one population ranges from North Carolina to east-central Florida (Daytona Beach area) and a second ranges from western Florida (Apalachicola Bay area) to eastern (possibly

central) Texas; also recorded from Venezuela and southern Brazil; often enters fresh water

14b. No scales in predorsal area; third dorsal spine elongate in males, extending posteriorly at least to third dorsal soft ray (in *G. claytoni;* situation not known for *G. lepturus*) 15

15a. Distinct dark blotches on midside of body; scale pockets on midside of anterior part of body not outlined by thin margin of dark pigment; (intimately related to *G. fasciatus,* from which it differs in lacking a blotch of pigment on cheek and having a less completely scaled belly)..... ..... *Gobionellus claytoni* (Meek) **Western Atlantic; western Gulf of Mexico, where definitely recorded only from Veracruz, Mexico**

15b. No distinct blotches on midside of body; scale pockets on midside of anterior part of body outlined by thin margin of dark pigment (above characters taken from female holotype ....*Gobionellus lepturus* (Pfaff) **Eastern Atlantic, recorded only from Lagos, Nigeria, but probably generally distributed in adjacent coastal waters bordering Gulf of Guinea.**

ACKNOWLEDGMENTS

We wish to thank Ms. Margaret Estey and Ms. Nancy Halliday, past and present staff artists, respectively, in the Department of Natural Sciences of the Florida State Museum, who executed the head-pore canal drawings in figures 1A-D (Estey) and 1E (Halliday). We also wish to thank Ms. Kay Purington, Florida State Museum, who took the photograph for figure 3. We particularly wish to thank Dr. Douglass F. Hoese, Australian Museum, for information and comments regarding goby classification in general and the genus *Gobionellus* in particular, and for permission to include much of this in the present paper.

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SHORT PAPERS AND NOTES

LEECHES OF SOME FISHES OF THE MOBILE BAY REGION

Brackish and marine fishes (2221 specimens of 151 species) from the Mobile Bay Region were examined for parasites from March 1969 to August 1973. Fishes were collected using