

these measurements secured by matching two broken pieces. The growth may well become much more extensive.

Some years ago (*Mycologia* **24**: 508-511, 1932) I discussed the genus *Protodontia* with particular reference to our commonest species, which I referred to *P. uda* v. Höhn., and at that time commented on the genus *Protohydnum* Möll., in which *Protodontia* is often included. Recently (*Univ. Iowa Stud. Nat. Hist.* **19** (3): 63, 1952), I reported *P. piceicola* (Kühner) Martin from Ontario. A collection from Louisiana by Langlois, determined by him as *Protohydnum lividum*, in the herbaria of the U. S. Dept. of Agriculture and the Missouri Botanical Garden, may well be that species and a *Protodontia*, but the generic transfer should be made only by one who has access to adequate European ma-

terial. These seem to be the only species known from the United States and Canada.

Dr. M. A. Donk has been kind enough to let me see some of his notes on *Protodontia*. He believes that what I have referred to *P. uda* is in reality distinct from the European form. This may be correct. I have not seen enough European material to be certain it is not and have depended mainly on published descriptions for the determination of our collections. These, however, show substantial variation but nothing beyond what may, in my opinion, be considered as due to differences in degree of maturity or as responses to local environmental fluctuations. Whelden (*Mycologia* **29**: 100-115, 1937), who studied cytologically an American collection referred to *P. uda*, reports that his material had been compared with von Höhnel's type by Dr. D. P. Rogers, who found them to agree exactly.

ICHTHYOLOGY.—*Ten new American gobioid fishes in the United States National Museum, including additions to a revision of Gobionellus.* ISAAC GINSBURG, U. S. Fish and Wildlife Service. (Communicated by L. P. Schultz.)

During revisional studies of the genera of American fishes, the following 10 undescribed species and subspecies discovered in the U. S. Fish and Wildlife Service and the U. S. National Museum are here named and briefly described. All holotypes are deposited in the National Museum.

Figures of proportional measurements given below refer to percentages of the standard length. Lengths of the pectoral and ventral fins denote the length of their longest rays, from their point of articulation, as determined at the surface without dissection, to their distal margin. The given lengths of specimens refer to the total length, including the caudal fin, unless otherwise stated.

The numbers of fin supports are of paramount importance in the classification of fishes, including gobies. The precise structure of the fins of fishes in general, namely, the different kinds of fin supports comprising the fins, differs largely by family or other major taxonomic groupings. The variability and relative numbers of the different supports differ by species or population of lower rank, and also by higher taxonomic groups. The numbers of fin supports have been widely used in taxonomy; but the broader problem of the comparative morphology of the fins of fishes in general has been largely

neglected. Lately, this subject began to engage the attention of investigators. Hubbs (*Copeia*, 1943: 134; 1945: 75) raises the question of the use of a certain fin formula in describing gobioid fishes, in connection with a discussion of the structure of the fins of other fishes. Beebe (*Zoologica* **27**: 45, 1942) is of the opinion that the last two approximated dorsal rays of *Dixonina*—a genus belonging to a different order than gobies—and related genera should be enumerated separately instead of counting them together as one ray. However, a thorough study of the comparative morphology of the fins in the major groups of fishes still remains to be made. As the fin structure differs largely by major groups, the proper and most advantageous method of enumeration, and any formula expressing such enumeration, will differ by such major groups.

In the superfamily Gobiodea the structure of the fins is as follows: The first dorsal consists of flexible (with few exceptions), unsegmented fin supports which are evidently homologous with the pungent spines of other fishes having two dorsal fins. The first fin support of the second dorsal is, as the fin supports of the first dorsal, likewise flexible and unsegmented, and is presumably also homologous with the pungent spine in

the same position of other fishes (although no thorough study has as yet been made to verify this assumption). The first unsegmented fin support of the second dorsal is followed by a variable number of segmented, and variously branched rays, the last two of which are very closely approximated at the base. The structure of the anal is the same as that of the second dorsal.

The above described structures apply to all the species in the superfamily and virtually to all the individuals of any species. Exceptions from the general rule that are now and then found in individual fish—and such exceptions comprise less than 1 percent of the combined counts of all the species examined—are to be considered as slight abnormalities rather than as representations of a normal individual variability. As these are superfamily characters, there seems no point in repeating these facts under each species, either in words or by a formula, as it is unnecessary to repeat any other superfamily character in the species descriptions. Consequently, in the descriptions here given the following uniform method is adopted in enumerating those rays that are of importance in separating the species: All counts are given in Arabic numerals. A semicolon separates the counts of the two dorsals and a hyphen connects the extremes of the range of the count of any given fin. The first unsegmented fin support of the second dorsal, and anal, is included in the count, while the last two approximated rays of both fins are counted as one. This is the method I used uniformly in previous publications on gobioids. If it is desired to get the number of segmented rays only, that is, to exclude the first fin support and count the last two as one ray, 1 is to be subtracted from the figures given below; to include the first and count the last two separately, 1 needs to be added; excluding the first and counting the last two separately, the numbers will be the same as those given below.

The rays in the pectoral fin of gobies generally do not differ in essential structure, except that some of the marginal rays grow progressively shorter, and the extent of branching decreases outwardly. In the following descriptions all the pectoral rays are included without distinction in the same count.

Family ELEOTRIDAE

Dormitator cubanus, n. sp.

D 7; 8–9. A 8–9. P 15. Sc 33–35. No mucous pores on preopercular sulcus. Total number of gill rakers in outer row of first gill arch, in a 94-mm specimen, 29. Head 30–31, postorbital part of head 15.5–16.5, caudal 27–28, ventral 23.5–24.5, pectoral 23–25.5. Body with a median longitudinal row of very diffuse spots; a dark shoulder spot above pectoral base; a dark, narrow, short, oblique band on cheek, under anterior margin of pupil to end of maxillary; the two dorsals and caudal with rows of small dark spots, roughly transverse on caudal and oblique on dorsals. (No oblique transverse light bands on body against a darker background as in related species, but their absence possibly due to fading.)

Holotype.—U.S.N.M. no. 55668. San Cristóbal, Cuba; C. H. Eigenmann; 1902; female 82 mm.

Paratypes.—U.S.N.M. no. 123234, a male obtained with the holotype, 73.6 mm in standard length with the caudal broken, approximately 94 mm in total length. U.S.N.M. no. 55688; Pinar del Río, Cuba; C. H. Eigenmann; March 1902; female 48 mm.

Remarks.—This is a well-marked species and differs sharply from its congeners in the number of gill rakers. Specimens of comparable size, with that stated above, of the other species have a total of 51 or more gill rakers in the outer row of the first gill arch. It also differs in lacking pores on the preopercular sulcus, and in averaging fewer dorsal and anal rays and shorter fins; although there is more or less intergradation in these latter characters. Taking its character pattern as a whole, *cubanus* is sharply defined and rather easily distinguishable. It is probably a highly localized species and confined to some fresh-water streams in Cuba, as 445 specimens of *Dormitator* examined from the western Atlantic coasts, ranging from Texas to Brazil, and from several West Indian Islands including Cuba, all belong to the common Atlantic species, *maculatus*.

The three specimens forming the basis of this account were collected by Eigenmann (Bull. U. S. Bur. Fish. 22 (1902): 211–236. 1903) during his investigation of the cave inhabiting fishes of Cuba, in 1902, when he made many striking discoveries. He then obtained both *maculatus* and *cubanus* and recorded them together under the former designation.

Dormitator latifrons mexicanus, n. subsp.

D(6) 7 (8); (8) 9-10. A (9) 10-11. P 14-16. Sc 34-36.—Preopercular sulcus with pores, usually 4 in number. Total number of gill rakers in outer row of first gill arch, in 3 specimens 242-256 mm (from Colima, Mexico), 132-145, and in the same specimens, head 30.5-32.5, post-orbital 16-18, caudal 30.5-32.5, ventral 20-22, pectoral 22.5-24. In the holotype, gill rakers 107, head 33, postorbital 19, caudal 34.5, ventral 21.5, pectoral 25.5. Body dark with rather narrow, obliquely transverse, diffuse, lighter cross bands; a large very dark shoulder spot near and over pectoral base; a narrow dark band on cheek under anterior margin of pupil to end of maxillary; posterior part of head with dark longitudinal, nearly parallel bands, rather faint to well defined; a somewhat curved band at pectoral base.

Holotype.—U.S.N.M. no. 7350. San Lucas, Lower California; I. Xanthus; male 140 mm.

Remarks.—Other 49 specimens 24-256 mm examined from the Pacific coast of Mexico ranging from La Paz in the Gulf of California to Salina Cruz in the gulf of Tehuantepec.

The subspecies *mexicanus* differs from *latifrons* chiefly in the number of gill rakers and the head length. Both of these characters differ also intraspecifically with the size of the fish and it is necessary to compare specimens of like size. Two specimens of *latifrons* from the Pacific coast of Panamá, 235-259 mm, comparable in size with the large specimens described above, have gill rakers 149-164 and head length 33.5-38. *D. mexicanus* also averages a shorter caudal, ventral, pectoral and postorbital part of the head; but it intergrades considerably with *latifrons* in these characters. The two are apparently allopatric populations on the Pacific coast of Mexico and Central America, respectively. In this preliminary account the few largest specimens are compared and they do not show intergradation in the two chief characters. However, a comparison of the 50 specimens examined of *mexicanus* with 47 specimens of *latifrons*, segregated by comparable size groups shows that they intergrade with a degree of divergence of subspecies magnitude.

The name *latifrons* was proposed by Richardson for two specimens from the "Pacific Ocean." It has since been used for the common eastern Pacific species of *Dormitator*, including Mexico and Central America, or the name was placed in

the synonymy of *D. maculatus*, depending on whether an author treated the eastern Pacific population as a distinct species, or he treated that population as being conspecific with that from the western Atlantic. As the common eastern Pacific species is here divided into two subspecies, the name *latifrons* is hereby restricted to the Panama population, since it is more likely that Richardson's specimens came from the coast of central America than that of Mexico.

Guavina micropus, n. sp.

D 7; 10. A 10. P 16. Sc 89. Almost completely scaled, except underside of head, and preopercular sulcus, and a small area on side of snout in front of eye, altogether or largely scaleless. Scales on posterior part of body rather weakly spinulose, others cycloid. Ventral 11.5, pectoral 16, body depth 22.5, least depth of caudal peduncle 15, head 31, postorbital 18, head depth directly behind eye 15, head width at same point 20, maxillary 13, snout 9, eye 5.5, interorbital 10.5, antedorsal distance 36.5. Color brownish, dark on dorsal aspect, much lighter below; no saliently distinctive markings, pigment somewhat concentrated on upper part of pectoral base forming a rather faint, diffuse blotch.

Holotype.—U.S.N.M. no. 123230. Miraflores Locks, Panama Canal; east chamber; A. O. Foster; April 28-29, 1937; female 90 mm in standard length, the caudal damaged.

Remarks.—Only one species of this genus was known heretofore, *G. guavina* from the western Atlantic coasts. The new species differs at a glance in having a strikingly short ventral fin, which also shows up well after measuring, 10 specimens of *guavina* having the ventral 18-19.5. This species also has a shorter pectoral and antedorsal, but these differences are not as great as that of the ventral; in the same 10 specimens of *guavina*, pectoral 20.5-22, antedorsal 39.5-41.5. It also has one ray less in the dorsal (in the specimens examined of *guavina*, the dorsal rays are constantly 11), and it further differs in having the preopercular sulcus naked instead of scaled over.

This is most probably a hitherto undiscovered Pacific species, corresponding to the Atlantic *guavina*, which has found its way into the Panama Canal.

Gobiomorus polylepis, n. sp.

D 6; 10. A 10. P 18. Sc 77-78. Caudal 24.5,

ventral 18.2–18.4, pectoral 17.8–18, depth about 20 (belly collapsed and not accurately determinable), peduncle 11.5–12, head 30–30.5, postorbital 18–18.1, head depth 12.3–12.4, head width 14.7–14.8, maxillary 12.5–13, snout 9.5–10, eye 3.4–3.8, interorbital 7–7.5, antedorsal 36.5–37. Irregularly shaded, without distinctive markings (perhaps faded from long immersion in preservative); pectoral, caudal and the two dorsals with rows of small diffuse spots.

Holotype.—U.S.N.M. no. 130917. Colima, Mexico; exhibited by Mexican Government at Chicago World's Fair, 1893; female 277 mm, 222 mm in standard length.

Paratype.—U.S.N.M. no. 123233; from same container as the type; female 243 mm in standard length with caudal end broken off, approximately 303 mm in total length.

Remarks.—Two common and widespread species of *Gobiomorus* were known heretofore, *maculatus* from the Pacific drainage and *dormitor* from the Atlantic drainage. In preparing a revision of the genus, *polylepis* was compared with 257 specimens of *maculatus* from localities ranging from the Gulf of California to Peru, including 14 specimens from the coast of Mexico, and 204 specimens of *dormitor* ranging from Texas to Venezuela. This is a strongly marked species and is easily distinguishable from the two common species by the number of scales. In 175 specimens of *dormitor* the range of the scale count is 58–64, in 241 specimens of *maculatus* the range is 54–60, as compared with 77–78 in *polylepis*. In the number of anal and pectoral rays, *polylepis* nearly agrees with the Atlantic *dormitor*, rather than with the Pacific *maculatus*, and in the number of scales it is also nearest *dormitor*. It is remarkable that such a sharply defined and large gobioid species from the North American continent escaped detection up to now. It is probably another one of those species having a narrowly circumscribed geographic range.

Erotelis smaragdus civitatum, n. subsp.

D 6; 12. A 10. P 17. Sc 105. Scales on dorsal aspect extending to within a short distance of eyes; opercle entirely scaleless; cheek almost naked, only a few scales present posteriorly near its middle; all scales cycloid. Preopercular spine rather reduced and concealed under the skin. Caudal 27.5, ventral 13, pectoral 15.5, depth 15, peduncle 10, head 20.5, postorbital 13.5, head depth 9, head width 9.5, maxillary 7.5, snout 4.2, eye 3.2, interorbital 4.3, antedorsal 32.5.

Color almost uniformly dusky, darker on dorsal and somewhat lighter on ventral aspect; pigment somewhat concentrated on upper part of pectoral base to form a diffuse blotch; otherwise no distinctive color marks.

Holotype.—U.S.N.M. no. 123229. St. Vincent Island, Fla.; taken with seine in deep soft mud in large pond on the bay side of the island; Isaac Ginsburg; July 23, 1932; female 123 mm.

Remarks.—The above description is drawn from the holotype. Two small specimens 46–57 mm from Harbor Island, Tex., collected by John C. Pearson, have the following counts: D 6; 12. A 10. P 18. and D 6; 11. A 10. P 17.

This subspecies differs from *smaragdus* chiefly in the number of dorsal rays. In 26 specimens of *smaragdus* the dorsal rays number 11 in 25 and 10 in 1. In 11 specimens of the Pacific *armiger* the dorsal rays number 13 in 9 and 12 in 2. The dorsal count in *civitatum*, 12 in 2 specimens and 11 in 1, is intermediate between *smaragdus* and *armiger*. While only 3 specimens of *civitatum* are available, fair composite samples of *armiger* and *smaragdus* were examined to show that it diverges at least subspecifically from the latter. The samples examined indicate a divergence of subspecies degree. In general appearance, *civitatum* is not as excessively slender as *smaragdus* which is almost anguilliform, but somewhat approaches in this respect the species of the closely related genus *Eleotris*. This difference is rather marked on direct comparison of specimens, but does not show up well in measurements.

Of the 26 specimens of *smaragdus* examined 7 are from Key West, the others are from Cuba, Haiti, Puerto Rico, Curaçao, Panamá, and Venezuela. Consequently the Key West population of *smaragdus* is nearer to those of the West Indies and Central America than to that on the northern Gulf coast of the United States.

Chriolepis tagus, n. sp.

D 7; 12. A 11. P 19. Anterior part of body naked, posterior part scaled, scales extending forward to under end of first dorsal; caudal base with modified scales. (The single specimen described is in but indifferent condition, the squamation especially is defective and nearly all scales have fallen. The scale pockets indicate the extent of squamation. On the caudal base only one scale is now remaining, at its outer angle, a conspicuously modified, large ctenoid scale, very similar to the scale present in *Chriolepis minutillus* in the same position.) Lower jaw with

two inner posterior caninoids. Eye large, the interorbital narrow. Ventral falling considerably short of anus. Pectoral reaching beyond a vertical through origin of first dorsal. Tongue moderately emarginate. (Color apparently faded, only a few large scattered chromatophores on head.)

Holotype.—U.S.N.M. no. 123232. Tagus Cove, Albemarle Island, Galápagos Archipelago; dredged in 10–18 fathoms; Hancock Expedition, W. L. Schmitt; January 15, 1934; male 16.3 mm in standard length, 21 mm to end of partly broken caudal.

Remarks.—The squamation is more extensive in this species than in any known species of *Chriolepis*. The number of anal and pectoral rays is higher than in any other species. The number of dorsal rays is higher than in any species, except some individual variants of *minutillus*. Altogether, *tagus* is a sharply divergent and strongly marked species.

Chriolepis benthonis, n. sp.

D 7; 9. A 8. P 16. Anterior part of body naked, posterior part scaled; scales extending forward to a point near midline under base of seventh dorsal ray; in 12 oblique rows to base of caudal; a few scales on posterior part of peduncle ctenoid, most scales cycloid; modified scales on caudal base present (most modified scales missing and cannot be described in detail). Lower jaw without posterior inner caninoids. Eye very large; interorbital very narrow. Ventral reaching anus. Pectoral reaching to under base of first dorsal ray. Tongue entire. Ventral 28.5, pectoral 27.5, depth 21, peduncle 12, head 30.5, postorbital 14.5, head depth 17, head width 19, maxillary 12, snout 8, eye 10.5, interorbital 2, antedorsal 37.5. (Color a rather uniform light yellowish, probably faded.)

Holotype.—U.S.N.M. no. 47641. *Blake* Expedition, station CCXLI, Alexander Agassiz; off Progreso, Yucatán, Mexico; lat. 23° 13' N., long. 89° 10' W.; 84 fathoms; male 30.7 mm in standard length, the caudal damaged.

Remarks.—This species has the lowest number of dorsal and anal rays of any known species of *Chriolepis*. The extent of scalation is nearly as in the Pacific *zebra*; it differs from that species, besides the difference in the number of dorsal and anal rays, also in having smaller teeth, a larger eye and narrower interorbital.

Psilotris, n. gen.

Genotype.—*Psilotris alepis*, n. sp.

This genus is characterized by and differs from all known American eleotrid genera, by a combination of two characters: the total lack of scales and the absence of mucous pores. Full grown specimens of *Eleotrica* also lack scales; but *Psilotris* differs in lacking pores as well. A detailed study of American gobioids leads to the conclusion that the character of the pores is more important as a phylogenetic criterion than the character of the squamation. It follows then that *Psilotris* is more nearly related to *Chriolepis* which also lacks pores, although the latter has the body partly scaled. With respect to the squamation, and other characters as well, *Psilotris* and *Chriolepis* present a closely analogous, parallel development to the genera *Gobiosoma* and *Garmannia* in the family Gobiidae.

Etymology.—*Psilotris*, an abbreviated form of *psiloeleotris* (naked eleotris).

Psilotris alepis, n. sp.

D 7; 10. A 9. P 15. Scales altogether absent, on caudal base as well as on the body and head. Body moderately elongate, compressed; head moderately depressed. Maxillary ending under anterior margin of pupil. Mouth subterminal, lower jaw but slightly projecting; gape very moderately inclined, a horizontal through distal margin of upper lip passing through lower part of eye. Teeth in bands; outer teeth well enlarged; inner posterior teeth in lower jaw also enlarged, but hardly large enough to be described as caninoid. Ventral falling considerably short of anus; pectoral slightly short of a vertical through base of first dorsal ray. Gill opening restricted, attachment of branchiostegal membrane near lower part of pectoral base. Female anal papilla large, thick, globose. No mucous pores on head. Caudal 27.5, ventral 23.5, pectoral 27.5, depth 23.5, peduncle 13.5, head 30.5, postorbital 18, head depth 16, head width 17.5, maxillary 11.5, snout 7, eye 7, interorbital 3, antedorsal 42.5. (Because of the very small size of the specimen measured, and the comparative crudeness of the instrument used, an ordinary Vernier caliper, the preceding measurements are rough approximations only.) Diffusely cross-banded; body with 5 broad, irregular, diffuse bands, the anterior 2 somewhat Y-shaped; a subvertical, diffuse band under anterior part of eye; a wider, oblique band under posterior part of eye.

Holotype.—U.S.N.M. no. 123231. St. Croix Island, Virgin Islands; on reef; Smithsonian Hartford Expedition, W. L. Schmitt; April 8, 1937; female 17 mm. The small specimen examined appears to be an adult. It apparently represents a very small species, rather than the young of a larger species.

This species is readily distinguished from all known western Atlantic eleotrids by its total lack of scales. Its relationship is discussed above under the genus account.

Family GOBIIDAE

Genus *Gobionellus* Girard

Since my revision of this genus was published (Bull. Bingham Oceanogr. Coll. 4 (art. 2). 1932), I had the opportunity to study many more samples of nearly all species, comprising for most species many more specimens than those forming the basis of the revision. Besides the additional specimens examined, characters hitherto generally neglected and not considered in the revision, have been studied in detail. The more striking results of this study of additional samples and characters are as follows: (1) Two new species were discovered. (2) It was concluded that two American species, previously described and referred to *Euctenogobius*, are more properly placed in *Gobionellus* as their character pattern, in general, fits in well with the other species of the latter genus. (A discussion of the status of *Euctenogobius* has been published by me in Proc. U. S. Nat. Mus. 82: 19. 1933.) (3) The relationship of one species as treated in the revision, needs emendation. The two new species are here described, and also three new subgenera are established, in accordance with the additional information to place all species in their proper place in the scheme of classification employed in the revision.

Gobionellus mystax, n. sp.

D 6; 13. A 14. P 17–19. Sc 70–73. Scales extending on antedorsal area to a vertical plane through preopercular sulcus, a narrow naked area on midback, corresponding to predorsal keel, extending from origin of first dorsal, all the way forward; dorsal area in front of preopercular sulcus, and side of head scaleless; throat largely naked, except a rather narrow longitudinal median strip of scales; pectoral base scaleless; ventral aspect of belly scaled, except a rather moderate naked area directly behind base of

ventral fin; anterior scales and those on belly cycloid, posterior scales nearly all ctenoid, the ctenoid scales beginning at a point near midline under base of fourth dorsal spine. Teeth in narrow bands, those in outer and inner rows only a little larger than others. Second and third dorsal spines in male notably prolonged, the third longest, reaching base of fifth dorsal ray. Maxillary notably long, its end reaching preopercular margin or nearly so. Caudal 55.5–57.5, ventral 20.5–21, pectoral 19, depth 16–17, peduncle 9–9.5, head 22, postorbital 10.5–11, head depth 13, head width 11–11.3, maxillary 15.5–16, snout 8–8.5, eye 4.5, interorbital 3.5–4, antedorsal 29. (Color dark all over without distinctive markings, probably the color pattern obliterated from long immersion in preservative.)

Holotype.—U.S.N.M. no. 130859. Laguna de Mexcaltitan, Territory of Tepic [now the state of Nayarit], Mexico; exhibited by Mexican Government at Chicago World's Fair, 1893; male 227 mm, 144 mm in standard length.

Paratype.—U.S.N.M. no. 123235. In same lot with the type; male 251 mm, 161 mm in standard length.

Remarks.—This species is close to *microdon* and belongs in the same subgenus with it, *Gobatus*. It differs in having a longer maxillary and caudal. In the genus *Gobionellus* both of these characters differ with the species and also intraspecifically with sex and size, the caudal considerably and the maxillary moderately so. As the two specimens examined are very large males, it may be suggested that the seemingly specific differences are rather due to their size and sex. However, they were compared with a male of *microdon* 117 mm in standard length from Miraflores Lake, Panama Canal, not much smaller than the two specimens here described, and the differences in these two characters are too pronounced to be reasonably ascribed to intraspecific individual variability or sex and size differences. They are evidently interspecific differences and the two specimens represent a species close to but different from *microdon*. In the above male of *microdon*: caudal 34; maxillary 12.5, ending under posterior margin of eye. The maxillary in *mystax* is so strikingly long that the generic definition given in my revision of the genus needs to be emended to include this species.

The scales in the two specimens of *mystax* number 70–73, while in the two types of *micro-*

don from Río Ahome, México, they number 60-61, and it would seem that the two species also differ in the scale count. However, in two specimens of *microdon* from Río Juan Díaz, Panamá, the scales are 59-65, while in two from the Panama Canal they number 69-72. Consequently, the scale count in *microdon* seems to differ intraspecifically with the population, and its possible value as an interspecific character remains to be determined by more extensive samples.

***Gobionellus gracillimus*, n. sp.**

D 6; 14. A 15. P 18-20. Sc 83-99. Antedorsal area completely scaled to within a short distance of eyes; opercle with a moderate-sized patch of scales at upper anterior corner; cheek naked or a few scales present; throat partly scaled; pectoral base scaleless; ventral aspect of belly scaled over posteriorly, a rather large or moderate sized area behind base of ventral fin naked; anterior scales cycloid, posterior scales mostly ctenoid, the ctenoid scales beginning at a point variably situated under base of third dorsal spine to under base of fifth dorsal ray. Teeth in narrow bands, those in outer and inner rows a little larger than those in between. Maxillary generally ending under space between posterior margin of pupil and that of eye, slightly past eye in the largest males. Second to fourth dorsal spines notably prolonged in large specimens, the longest spine usually reaching to base of fifth or sixth dorsal ray, sometimes to base of third ray. Body notably slender and caudal notably long; depth 11.9-15.5 in female, 11-13.3 in male; caudal 41-46.5 in female, 51.5-63.5 in male. Other measurements not of paramount specific importance and only slightly or moderately different with sex, the range of both sexes as follows: ventral 17.5-21.5, pectoral 16.0-20.5, peduncle 7.5-9, head 18-21.5, postorbital 8.5-11.5, head depth 10.5-13, head width 9-10.5, maxillary 9.5-11.5, snout 6.5-7.5, eye 3.5-5, interorbital 2-3, antedorsal 25-29.5. (All preceding measurements, including that of caudal and depth, of specimens 106-165 mm in standard length.) A large, longitudinally oblong, dark spot below first dorsal and centered slightly above middle of body; a small spot on caudal base; 2 or 3 small dark spots on anterior margin of first dorsal; a median longitudinal row of many small spots, well marked in a recently preserved specimen, now faded, and not discernible in other pre-

served specimens; the large body spot and the caudal spot rather well marked in the smaller specimens, faint or imperceptible in large ones (color pattern seemingly becoming faint with growth and also fading in preserved specimens).

Holotype.—U.S.N.M. no. 123227. Apalachicola Bay, Fla.; trawl; July 16, 1932; Isaac Ginsburg; male 271 mm, 165 mm in standard length.

Remarks.—Thirteen other specimens 106-157 mm in standard lengths were studied from St. Johns River, New Smyrna, and Pensacola Bay, Fla.; Bayou St. Denis, La.; off Padre Island, Tex.

In the revision of the genus, the populations of the extremely long bodied, western Atlantic gobies which belong to the subgenus *Gobionellus*, were divided into two species on the basis of the scale count, *hastatus* with more numerous scales from the northern Gulf coast, and *oceanicus* with fewer scales from Key West, the West Indies, and Central America. On the basis of the samples examined for the revision of the genus, the two species showed both a morphologic and geographic gap between them. Hildebrand and Cable later found that their geographic ranges overlap and that both species occur at North Carolina (Bull. U. S. Bur. Fish. 48: 365. 1938). By an examination of many more specimens, I now find that these two species also intergrade somewhat in the scale count and are not as easily separable as the smaller samples indicated. Furthermore, I now find that the finer scaled gobies from the coast of the United States (58 specimens were now examined instead of the 7 specimens examined for the revision), fall into two groups, rather roughly separable by four correlated characters. One group, here distinguished as *gracillimus*, has a longer caudal, more slender body, longer dorsal spines and more numerous scales. The data for the four characters seem to form four bimodal curves, and we are evidently dealing with two distinct populations, *gracillimus* and *hastatus*. However, they intergrade in all four characters and individual specimens cannot always be placed with certainty. If a specimen has all four, or at least three, of the characters typical or close to the mode of its population, it can be placed with a measure of assurance, and this is so with the large majority of specimens. But, if a specimen has less than three characters correlated, or if three or four of its characters fall near the borderline its proper position is doubt-

ful. (Such doubtful specimens constitute approximately 10 percent of the total.) Consequently, the proper taxonomic status of these two evidently distinct populations is uncertain. If they were to occupy separate geographic ranges, they should properly be treated as two geographic subspecies, and such a course could hardly be questioned. As it is, they either constitute two coordinate, sympatric subspecies, in which case they form an exception to the general rule that two subspecies occupy separate territories, perhaps they are ecological subspecies having nearly the same geographic range; or they constitute two full species which are but incompletely distinguishable by current taxonomic methods. These questions might be resolved by a more elaborate sampling of the populations, perhaps supplemented by ecological studies. The distinguishing characters, except the scale count, differ also with size and sex, and hence it would take very extensive samples to work out the finer details.

Large males, 120 mm or over in standard length, diverge most, and such specimens are well separable by species.

It is probable that depth of water is a factor in the distributional basis of the separation of the two species. Detailed records of capture are wanting or incomplete for most of the constituent samples examined. But judged by the available records, it seems that *gracillimus* is usually taken with a trawl, while *hastatus* is taken with a seine as often as with a trawl. However, neither species is a real deep water fish. The greatest depth recorded is 10 fathoms for a specimen of *gracillimus* taken off Padre Island, Tex. Eight of the 14 specimens of *gracillimus* examined, comprising 5 constituent samples, were taken in Pensacola Bay and that body of water seems to be the center of distribution of the species.

Gobidus, n. subgen.

Genotype.—*Gobionellus longicaudus* (Jenkins and Evermann) = *Gobius longicaudus* Jenkins and Evermann.

Before this subgenus is characterized, two new symbols are herewith proposed to be used for two mucous pores placed over the opercle. In Sanzo's (Mitth. Zool. Stat. Neapel 20: 251-328, 1911) system of symbols for the various parts of the lateral line organs of gobies, the anterior and posterior pore which form the openings of

the mucous channel over the opercle, are designated as ρ' and ρ'' , respectively. His symbols for these pores are rather cumbersome, somewhat confusing, and to a certain extent misleading in that those two pores are often present or absent independently of ρ , at least I find it so in the American species. The symbols θ and τ are, therefore, here proposed to designate the anterior and posterior pore, respectively.

Extreme groups of species of *Gobionellus* are sharply distinguished by three striking characters, in addition to others. Those of the subgenus *Gobionellus* have a notably long and slender body, small scales, and they possess θ and τ ; while those of *Gobica* have a body more like the usual gobiid shape, large scales and they lack θ and τ . The subgenus *Gobidus* lacks θ and τ like *Gobica*, its scales are nearly as in *Gobionellus*, while the body shape is rather intermediate or nearer to *Gobionellus*. Its dorsal spines are not at all prolonged and shorter than in any other subgenus, except *Congruogobius*. In the revision, the species of this subgenus was included with *microdon* in the subgenus *Gobatus*, largely on the basis of the scale and fin ray counts. However, the latter has θ and τ , and in other characters as well is much nearer the subgenus *Gobionellus*. *Gobidus* essentially agrees with *Gobica* in the lateral line organs and the color pattern, and in spite of superficial appearances, it is nearer to that subgenus than to *Gobatus*.

Gobionellus longicaudus has generally been placed by authors in the synonymy of *sagittula*, and in the revision of the genus I disposed of that name in the same manner; but the study of additional samples and characters show that the Mexican *longicaudus* and the Panamanian *sagittula* diverge markedly in the number of pectoral rays (a character not studied in detail in the revision) and scales, although they intergrade to some extent and may perhaps be treated as coordinate geographic subspecies. Without a definite commitment as to the taxonomic rank of *longicaudus* for the present, I prefer to designate it as the genotype of *Gobidus* because I have examined the type specimens and am certain of its position, while *sagittula* I identify only from its description.

Gobatinus, n. subgen.

Genotype.—*Gobionellus panamensis* (Meek and Hildebrand) = *Euctenogobius panamensis* Meek and Hildebrand.

This subgenus also is in a sense intermediate between the two groups noted above in that it has a combination of important characters of both groups, but in a manner reverse from that of the subgenus *Gobidus*. The scales are large (34-37) as in *Gobica*, while it has θ and τ like *Gobionellus*. The body shape is intermediate between that of the last two named subgenera. *Gobatinus* has the teeth in the upper jaw usually in one row, sometimes a second incomplete inner row is present. In the other subgenera, the teeth in the upper jaw are in 2-5 rows, depending on the subgenus.

Congruogobius, n. subgen.

Genotype.—*Gobionellus liolepis* (Meek and Hildebrand) = *Euctenogobius liolepis* Meek and Hildebrand.

This subgenus differs from all others in having the two dorsal fins confluent and the scales cycloid, except that the scales on a narrow strip

along a median area on the posterior part of the body are weakly ctenoid or cycloid. In these two characters it is somewhat intermediate between the genera *Gobionellus* and *Gobioides* but much nearer the former. Indeed, *Gobionellus* and *Gobioides* are nearer in relationship than has been heretofore suspected. This is shown not only by the somewhat intermediate positions occupied by the subgenus *Congruogobius*, but by other characters as well, especially by the lateral line organs, a discussion of which would take us too far afield here. The scales in *Congruogobius* are 77-84; θ and τ are present. In the latter two characters, as well as in the shape of the body and the number of fin rays, it nearly agrees with or is nearest to the subgenus *Gobionellus*. The interorbital is rather wide as in the subgenus *Gobionellus*, while the eye is even smaller than in that subgenus when specimens of the same size are compared. In the latter two characters it also somewhat approaches *Gobioides*.

MALACOLOGY.—*Amnicola brandi*, a new species of snail from northwestern Chihuahua. ROBERT J. DRAKE, Biblioteca y Museo de Sonora, Hermosillo, Sonora. (Communicated by Joseph P. E. Morrison.)

In the middle of April 1949, the writer was in northwestern Chihuahua with Prof. C. Clayton Hoff, of the Department of Biology of the University of New Mexico. At that time, Dr. Hoff was the recipient of a grant-in-aid from the United States Public Health Service for collecting and studying ectoparasites (fleas and lice) of rodents in northern Chihuahua and southern New Mexico. During this trip, at Las Palomas, Distrito Galeana, Chihuahua, the type material of the species of fresh-water amnicolid snail here described was collected. The Las Palomas region is the type locality of another amnicolid, described as *Bythinella palomasensis* by Henry A. Pilsbry (1895: 68-69; Dall, 1898: 369-370). He based his description on two dead shells that had been collected in April 1892 by Edgar A. Mearns, military medic and naturalist of the International Boundary Commission of the United States and Mexico. Mearns, assisted by Frank X. Holzner, made daily collecting visits to Lake Palomas during the period from April 7 to April 15, 1892. (Mearns, 1907: 10). In the description of *Bythinella palomasensis*, Mearns's locality

was given as merely at "Lake Palomas, northeastern [sic] Mexico."

Lake Palomas in northwestern Chihuahua, as it normally existed in the later 1800's, is no more. Then it consisted of a chain of shallow and marshy ponds connected by a small running stream, all of which terminated in a more or less broad and shallow permanent lake. The area of the old lake bed now fills with water only during the short rainy season; otherwise, it is a dusty and waterless flat.

The small town of Columbus, Luna County, N. Mex., is on the border. The small Mexican port-of-entry and customs station at Palomas, Chihuahua, is 1 mile south of Columbus. Las Palomas is a small collection of adobe houses 6 miles south of Palomas and the border. It is at Las Palomas, Chihuahua, that "some fine, bold springs" as noted in the International Boundary Commission report (1898, pt. II: 16) are located. The species of Amnicolidae described, lives in the Las Palomas springs with another amnicolid (undetermined, perhaps a *Lyrodes*), the common pea-clam *Pisidium abditum* Haldeman, and