

## NOTE ON SELASPHORUS TORRIDUS SALVIN.

By ROBERT RIDGWAY.

By an error of identification this species is given as *S. flammula* in Mr. Nutting's catalogue of birds obtained on the Volcan de Irazú, Costa Rica (cf. these "Proceedings," vol. 5, p. 497). The National Museum has obtained additional specimens of *S. torridus* from Costa Rica, through Dr. Van Patten, and also of *S. ardens*, both species being additions to the fauna of that country.

*S. flammula* is as yet unrepresented in the National Museum collection.

JANUARY 7, 1884.

## A REVIEW OF THE SPECIES OF THE GENUS CALAMUS.

By DAVID S. JORDAN and CHARLES H. GILBERT.

In a recent visit to Key West and Havana Professor Jordan has collected a large number of specimens of the genus *Calamus*, representing five species. In attempting to identify these we have had many difficulties, owing to the scanty and miserable character of most of the literature pertaining to the subject. We have here redescribed the five species mentioned above, and have attempted to collate the synonymy of these as well as that of the remaining species.\* Those features common to all known species of *Calamus* are not repeated in the descriptions. A series of specimens representing each of these species is in the United States National Museum.

The following is an analysis of the five species obtained at Key West:

- a. Scales comparatively small, about 55 in the course of the lateral line.
- b. Upper jaw with two strong canines directed forwards; body deep, the depth about half the length; preorbital with horizontal wavy blue lines. PENNATULA, 1.
- bb. Upper jaw without antrorse canines.
- c. Anterior canines scarcely enlarged, about two to four in number in each jaw; body deep, the depth about half the length; cheeks bluish, with roundish bronze spots..... CALAMUS, 2.
- cc. Anterior canines strong, about 6 in number in each jaw; body rather oblong, the depth  $2\frac{2}{3}$  in length; cheeks plain..... BAJONADO, 3.
- aa. Scales comparatively large, about 46 in the lateral line; anterior teeth rather small, uniform.
- d. Dorsal outline forming a comparatively regular arch, the back elevated; depth about 2 in length; ventrals dusky; a small, ink-like spot above base of pectoral ..... MILNERI, 6.
- dd. Dorsal outline not forming a regular arch, the profile of the head being very convex, the back straightish; body rather elongate, the depth less than half length; preorbital usually bluish, with bronze spots and dashes; no black spot at base of pectoral above; ventrals pale..... ARCTIFRONS, 9.

\* *Chrysophrys taurinus* Jenyns (= *Pagellus cyanopterus* Val.), from the Galapagos Islands, is omitted, as we are not sure that it belongs to this genus.

1. *Calamus pennatula* Guichénot.—*Little-head Porgy*; *Pez de Pluma*.

*Calamus pennatula* Guichénot, Rév. Pagels, 116. (Martinique.) Poey, Monogr. Sparini 1872, 178 (in part).

*Calamus megacephalus* Jordan & Gilbert, Syn. Fish. N. A., 1883, 926. (Florida Keys.) (Not of Swainson.)

Head,  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in length ( $4\frac{1}{4}$  in total); depth, 2 to  $2\frac{1}{3}$  ( $2\frac{2}{3}$  to 3); D. XII, 12; A. III, 10. Scales 9–58–16.

Body much elevated, more so than in any other known species except in *calamus*. In adults the anterior profile rises in a straight line very steeply to the nape, thence in a gentle curve to front of dorsal. In the young the profile rises less rapidly and is convex. Greatest depth of preorbital slightly more than half length of head in adults.

Mouth not large, the maxillary scarcely reaching vertical from front of orbit, two-fifths length of head. Anterior teeth of outer series slightly longer and more robust than those of the cardiform band. In the upper jaw on each side one of these outer teeth becomes much enlarged, canine-like, directed obliquely forwards and downwards, and strongly curved, the upper surface concave; there are usually seven teeth of the outer series between these two canines. No evident accessory series of molars. Eye moderate, 4 in head in adults (11 inches long), 3 in head in young of 6 inches.

Dorsal spines slender and high, the longest half head. Pectorals reaching vertical from origin of anal fin, one-third length of body. Ventrals 5 in length. Upper lobe of caudal as long as head, slightly longer than lower lobe.

COLOR IN LIFE.—Silvery, with bright reflections above, much more brightly colored than in other species. Each scale above middle of sides with a spot of rich violet-blue on its basal portion, these forming distinct longitudinal streaks along the rows of scales. On lower part of body these blue spots are replaced by pale orange spots, faint in the young, very distinct in adults. In life the sides have dark bands, which disappear after death.

A diffuse, ill-defined horizontal violet-blue area above opercle extending back onto the shoulder. A well-defined horizontal deep-blue stripe below eye; another, somewhat less distinct, above orbit. Preorbital region, snout, cheeks, and opercles brassy or bronze, crossed with horizontal, wavy, non-reticulating lines of violet-blue, these colors more marked on preorbital and snout; the streak crossing snout above nostrils wider and rather more conspicuous than the others.

Dorsal marked with orange and very bright violet, its margin always orange, more or less bright in life. Caudal banded with dull orange. Anal distinctly blue shaded. Ventrals not dark, with more or less light yellow. Axil slightly dusky.

Iris dark, with gilt ring.

A single young specimen from Key West, 5 inches long, has all the teeth of the anterior row in the upper jaw uniformly small and vertical.

In all other characteristics it agrees with older examples of the present species, and we refer it here with little doubt. The colors are as described above, and the eye is small,  $3\frac{1}{2}$  in head. It is probable that the antrorse canine of the upper jaw is not developed in very young specimens. We find it perfect, though small, in one of 8 inches. In adults it becomes very large and conspicuous.

This species is very abundant in the channels among the Keys about Key West, and is taken in great numbers by the hook and line fishermen. It is known to them as the *Little-head Porgy*. In life it is a very brightly colored fish, but at death its colors change and fade very rapidly. This change of hue is in this species as striking as in any known to us, and far greater than that of the dying dolphin.

This species is also constantly found in the Havana market, where it is known as *Pez de Pluma*. Neither at Havana nor at Key West is it as common as *Calamus bajonado*, but in both markets it exceeds in abundance all the remaining species combined.

SYNONYMY.—Guichénot's description of *Calamus pennatula* must have been based upon a specimen of this species as he mentions the characteristic canines directed forwards in the upper jaw, and the horizontal blue stripes on the preorbital. The depth assigned by him (3 in total length) is too small, but this is probably a slip of the pen, inasmuch as he states that the height is greater in *pennatula* than in any other species of the genus except *calamus*.

*Calamus megacephalus* Poey, *l. c.*, includes characteristics of both *calamus* and *pennatula*. The characters drawn from the dentition are entirely those of *pennatula*, while the color and general description undoubtedly refer to *calamus*; the life-color being given in detail and very accurately.

2. *Calamus calamus* (Cuv. and Val.) Jor. and Gilb.—*Saucer-eye Porgy*.

*Pagellus calamus* Cuvier and Valenciennes, *Hist. Nat. Poiss.* VI, 1830, 206, pl. 152. (Martinique: San Domingo.)

*Chrysophrys calamus* Günther, *Cat. Fish. Brit. Mus.* I, 487. (Bahia; Trinidad; Cuba; Jamaica; two or more species evidently confounded.)

*Calamus megacephalus* Swainson, *Nat. Hist. Fish., &c.*, II, 1839, 222 (name only, after Cuv. and Val.): Guichénot, *Révision du Genre des Pagels* in *Mém. Soc. Imp. Nat. Cherbourg*, XIV, 112 (description from C. and V. with a few verbal changes).

? *Pagellus orbitarius* Poey, *Memorias Cuba*, II, 1860, 201. (Havana.)

? *Sparus orbitarius* Poey, *Syn. Pisc. Cubens.* 1868, 308. (Havana.)

? *Calamus orbitarius* Poey, *Ann. Lyc. Nat. Hist. N. Y.*, 1872, 179, Pl. VI, f. 2 (Havana): Guichénot, *Rév. du Genre des Pagels*, 123 (name only).

? *Calamus macrops* Jordan and Gilbert, *Syn. Fish. N. A.*, 1883, 927. (Young, Garden Key, Florida.)

Head,  $3\frac{1}{3}$ ; depth,  $1\frac{9}{10}$  to  $2\frac{1}{4}$  ( $2\frac{3}{4}$  in total). D. XII, 12 (XIII, 11); A. III, 10, or III, 11. Scales 9-54-16.

Body elevated more than in any other known species of this genus, the depth in adults being slightly more than half length of body. The anterior profile is less steep than in *pennatula*, the outline of snout

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being slightly curved; in adults the antedorsal region is very sharply compressed and somewhat gibbous, forming above eye an angle with rest of profile. Greatest depth of preorbital more than half head in adults.

Mouth small, the maxillary scarcely reaching vertical from front of eye,  $2\frac{2}{3}$  in head.

Anterior teeth of outer series in both jaws enlarged and strong, well differentiated from the cardiform band within. In both jaws one or two pairs of these teeth are usually larger than the others, perhaps meriting the name of canines; they are occasionally wanting. The normal number of these enlarged teeth seems to be 10 in the upper jaw and 8 in the lower. A small accessory band of molars behind the cardiform band above and below.

Eye large,  $3\frac{3}{4}$  in head in adults (12 inches long).

Dorsal spines stronger and lower than in *pennatula*, the longest  $2\frac{1}{3}$  in head. Pectorals reaching slightly beyond vertical from front of anal, rather more than  $\frac{1}{3}$  length of body. Ventrals  $4\frac{1}{2}$  in length. Anal spines robust.

COLOR IN LIFE.—Silvery with bluish reflections; the base and central portions of each scale golden, forming distinct longitudinal stripes, the stripes between these pearly or bluish; rows of scales on cheeks and opercles with the pearly stripe median, the golden marginal. A deep violet streak below orbit, not extending forward on snout nor backward on opercles. Preorbital deep dull violet like the snout, the ground color forming reticulations around conspicuous round brassy spots which cover half the surface. Naked part of preopercle sometimes similarly marked, more often colored like the body. Edge of opercle gilt. Lower jaw dusky violet. Axil golden; base of pectoral above with a violet bar. Fins all pale, vaguely blotched with dull orange. Ventrals more or less dusky on inner rays. Commissure of lips yellow. Iris golden.

This species is common at Key West, where it is taken in considerable numbers with the hook and line in the channels. It reaches a length of about 15 inches, and is known to the fishermen as the Saucer-eye Porgy. It is less abundant than *C. pennatula*, and much less brightly colored in life.

But a single specimen was seen by Professor Jordan in the Havana market, it being far less abundant there, in the winter at least, than *C. bajonado* or *C. pennatula*. It is confounded by the Cuban fishermen with the latter as *Pez de Pluma*.

The description and figure given by Cav. & Val. of *Pagellus calamus* agrees with this species in all respects except the color, which was taken from an old specimen in alcohol. Thus the "bluish points on the sub-

orbital" appearing on a darker background were in life the light bronze spots surrounded by the network of dark blue.

The name *megacephalus* was given to the species by Swainson as a substitute only for *calamus* C. & V., in accordance with the common but very objectionable practice of altering the specific name when it resembles or is identical with the generic one.

Guichénot's description of the species is based upon that of Cuv. & Val., with some few corrections and additions.

The descriptions of Professor Poey of his *C. orbitarius* seem to have been chiefly based on this species, but there is evidence of a confusion in his notes, some of his remarks applying rather to *C. pennatula*, which species is the common *Pez de Pluma* of the Havana markets. Thus his description of the canines (those of the upper jaw small, except the second, which projects; those of the mandible scarcely larger than the cardiform teeth) and the color of the preorbital (blue streaks, forming a network) indicate *calamus*, while the diffuse blue streak across opercular region behind eye is found in *pennatula* but not in *calamus*.

NOTE.—It has been a frequent custom in zoölogy, dating from the immediate followers of Linnæus, to take for a generic name the original specific name of the typical species, and then, to prevent the tautological use of the same word for both genus and species, to change the specific name, thus establishing a "new species," as well as a new genus. In such cases at least six different modes of procedure have been advocated and more or less consistently followed by different writers. These are the following:

1. To change the generic name so derived from a specific one. This arrangement was once recommended by the British association, but after a time it seems to have been abandoned by common consent. In ichthyology it would necessitate the change of many of the generic names best known, as, for example, a large share of those of Cuvier in the Règne Animal. Again, and still more important, this rule is in itself a direct violation of the law of priority, as important in regard to genera as in regard to species.

2. To adopt the generic name, and to change the specific name to *vulgaris* without regard to previous synonyms. This rule was largely followed by Cuvier and Valenciennes, but the fact that it has not been generally followed is sufficient argument against its use.

3. To use the name *typicus* in the above case, without regard to previous synonyms. This has had no general acceptance.

4. To use in the above cases a genitive formed from the name of the describer of the original species as a specific name. This has been consistently followed by Professor Mahn, who has changed the name of the typical species of many genera (*Trachurus*, *Motra*, *Lota*, etc.) to "*Linnæi*," without regard to other names or synonyms.

5. To choose as a new specific name when the former specific name is used as generic, the specific name next oldest in the synonymy. This rule is the one generally followed by authors who have endeavored to be consistent in their nomenclature, and it is the one adopted by nearly all recent authors in America. If the original specific name is regarded as having become ineligible, this seems the proper course to follow. One important disadvantage is that in nearly every case it necessitates the revival of some forgotten and often doubtful and, in itself, worthless synonym. For this reason, probably half the species so named have their proper nomenclature still unsettled. In case, also, the genus in question is of doubtful validity, the confusion made by this procedure is considerable. Thus if, with most European writers, we adopt the genus

*Pagrus*, we should say *Pagrus argenteus* using the half-forgotten synonym *argenteus*; but if, with the present authors, *Pagrus* be regarded as a subgenus only, its typical species should be *Sparus pagrus*.

6. In case of the adoption of a specific name as generic, to choose as the new specific name whatever name the author of the genus may have himself chosen to call the species, without reference to previous synonyms. This rule seems to have been followed with more or less consistency by Dr. Günther in his Catalogue of the Fishes of the British Museum. This rule has the advantage of definiteness, nor does it contain any injustice to earlier writers, for the earlier synonyms have no claims *per se*, being antedated by the specific name selected as generic. But no one has applied this rule in detail, and it seems not likely to receive general adoption.

7. To retain the earliest generic and earliest specific names, without regard to their similarity. This is the dictate of the law of priority, which is steadily becoming more and more urgent. The best system of rules is that which permits of fewest exceptions, and certainly exceptions to the application of this most important rule of priority should be very few indeed. It seems to us that no advantage worthy of consideration comes from the change of either specific or generic name when the two are alike, while the disadvantages are many and serious. There is, in fact, a certain degree of appropriateness in thus repeating the generic name for its typical species. Nor is this idea foreign to the Latinic languages, however uncommon it may be in classical Latin. The Cuban fishermen call all the species of *Hæmulon* "*Ronco*"; those of *Harpe* and *Lachnolamus*, "*Perro*"; those of *Echeneis*, "*Pega*." Now, the typical or most important species of each of these groups is further distinguished by the repetition of the same word in an adjective sense. Thus, *Hæmulon plumieri* is "*Ronco Ronco*"; *Lachnolamus siullus*, "*Perro Perro*"; and *Echeneis naucrates*, "*Pega-pega*." Thus, the true Eel, or *Anguilla* of the ancients, may be called *Anguilla anguilla*; the typical *Calamus*, *Calamus calamus*, and so on. This rule has been adopted in part by many authors. In his late publications it seems to have been fully adopted by Dr. Günther, who, without any formal statement of reasons, writes *Conger conger*, *Anguilla anguilla*, &c., as he had formerly written *Trachurus trachurus*.

Believing that the retention of the original specific name in all these cases will save much confusion, we propose to call the present species *Calamus calamus*, instead of *Calamus megacephalus*.

The adoption of this rule would necessitate changes in nomenclature of American fishes from that given in our Synopsis of the Fishes of North America—

From—	To—
<i>Catostomus longirostris</i> .	<i>C. catostomus</i> (Forst.).
<i>Anguilla vulgaris</i> .	<i>A. anguilla</i> L.
<i>Conger niger</i> .	<i>C. conger</i> L.
<i>Hippocampus heptagonus</i> .	<i>H. hippocampus</i> L.
<i>Menidia bosci</i> .	<i>M. menidia</i> L.
<i>Sphyræna spet.</i>	<i>S. sphyræna</i> L.
<i>Remora squalipeta</i> .	<i>R. remora</i> L.
<i>Sarda mediterranea</i> .	<i>S. sarda</i> L.
<i>Trachurus saurus</i> .	<i>T. trachurus</i> L.
<i>Calamus megacephalus</i> .	<i>C. calamus</i> C. & V.
<i>Hemilepidotus tilesi</i> .	<i>H. hemilepidotus</i> (Tilesius).
<i>Liparis lineata</i> .	<i>L. liparis</i> L.
<i>Molva vulgaris</i> .	<i>M. molva</i> L.
<i>Lota maculosa</i> .	<i>L. lota</i> L.
<i>Merluceius smiridus</i> .	<i>M. merluceius</i> L.
<i>Hippoglossus vulgaris</i> .	<i>H. hippoglossus</i> L.
<i>Achirus lineatus</i> .	<i>A. achirus</i> L.
<i>Mola rotunda</i> .	<i>M. mola</i> L.

3. *Calamus bajonado* (Bloch & Schneider) Poey.—*Jolt-head Porgy*; *Bajonado*.

*Bajonado* Parra, Peces y Crustaceos de Cuba, 1787, 13, lam. 8 (Havana).

*Sparus bajonado* Bloch & Schneider, Syst. Ichth., 1801, 284 ("species dubia"; description from Parra); Poey, Synopsis Piscium Cubensium, 1868, 308 (Havana); Poey, Rep. Fis. Nat. Cuba, ii, 160.

*Pagellus bajonado* Poey, Proc. Ac. Nat. Sci. Phila., 1863, 177 (identification of Parra's figure).

*Calamus bajonado* Poey, Ann. Lyc. Nat. Hist. N. Y., 1872, x, 176, pl. vi, f. 1 (Havana); Poey, Enum. Pisc. Cubens. 55, 1875 (Havana); Poey, Anales Soc. Hist. Nat. Esp., x, 1881, 328 (Puerto Rico).

*Pagellus caninus* Poey, Memorias Cuba, ii, 199, 1860 (Havana); Poey, Rep. Fis. Nat. Cuba, 160 (Havana); Guichénot, Rév. Pagels, 123 (name only).

? *Calamus plumatula* Guichénot, Révision Pagels, 119 (Martinique; young).

Head, 3 in length (4 in total); depth  $2\frac{2}{5}$  (3 in total). D. XII, 12; A. III, 10. Scales, 7-54-17.

Body less elevated than in the two species preceding, the snout long and pointed, the anterior profile rising slowly in an even course to front of dorsal; in the young the anterior profile is more bluntly rounded, the supraorbital region more prominent, and the profile of snout steeper. Greatest depth of preorbital rather more than one-half length of head in adults 2 feet long,  $2\frac{1}{2}$  in head in young of 6 inches.

Mouth moderate, maxillary not reaching vertical from orbit except in the young; nearly half length of head in adults;  $2\frac{1}{2}$  in head in specimens of 8 inches.

Anterior teeth of outer series much enlarged and stronger than the cardiform band, even in the young; in adults these become very strongly developed, and are then nearly as robust as the molars; their number seems to be normally 2 or 3 on each side in the upper jaw and 3 or 4 on each side in the lower, but this is subject to much variation; the upper jaw has frequently one of these more enlarged than the others, and canine-like. The molars are, as usual in this genus, in three series in the upper jaw and two in the lower; besides these there is quite constantly towards the front of the jaw an interior supplemental series of molars, both above and below. Eye large.  $2\frac{1}{2}$  (in young) to 5 (in adults) in length of head.

Dorsal spines slender, the highest  $2\frac{2}{3}$  in head, the soft rays low; anal spines robust; pectorals long, reaching past origin of anal,  $2\frac{3}{4}$  to 3 in length; ventrals nearly reaching vent,  $1\frac{1}{2}$  in head.

COLORS IN LIFE.—Brassy, rather dull, and with little blue marking, the middle of each scale shining, but scarcely bluish. A blue stripe below eye, narrower and duller than in the preceding species, and extending well forward on preorbital; a second duller streak above this, the two meeting on forehead. Preorbital dull, coppery, often with irregular and obscure blue lines, these sometimes forming obscure veining, and always growing duller with age. Lower jaw dull, purplish. Angle of mouth purplish and orange yellow. Axil yellowish; no violet band on base of pectoral.

Fins plain, the ventrals sometimes slightly dusky, the caudal obscurely barred.

A young specimen had four or five faint orange blotches along back.

This is the most abundant species of the genus at Key West, and it reaches a considerably larger size than any of the others. The largest specimen seen is 22 inches in length. It is known to fishermen as the Jolt-head Porgy. All the species are equally valued as food, ranking as average in quality with the Grunts (*Haemulon*), and rather below the Snappers (*Lutjanus*). This species is in life duller in color than most of the other porgies.

In the Havana market this species is proportionately about equally abundant, and it is known as *Bajonado*. The young are also obtained in considerable numbers in the seines at Cojúnar and Marianao. Some ill-informed fish-dealers call the banded young of this and other species "*Sargo*," but that name is never correctly applied to the *Calami*.

Poey's identification of his *Pagellus caninus* with the *Bajonado* of Parra was made on the supposition that the common name, *Bajonado*, is still used for the same species in the Havana market.

4. *Calamus brachysomus* Lockington.—*Mojarra Garabata*.

*Sparus brachysomus* Lockington, Proc. U. S. Nat. Mus., 1880, 284 (Magdalena Bay, Lower California); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 277 (Pichelnogo, Lower California; name only).

*Calamus bajonado* Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 107 (Mazatlan; no descr.; not of Poey).

? *Chrysophrys calamus* Günther, Fish. Centr. Amer., 1869, 386 (name only; "Atl. & Pac.; Panama").

This species is abundant in the Gulf of California and in neighboring waters. Numerous specimens are in the National Museum, having been taken by Professor Gilbert at Mazatlan.

5. *Calamus* sp. indescr.—*White-bone Porgy*.

*Calamus bajonado* Jordan & Gilbert, Syn. Fish. N. A., 1883, 926 (Charleston, S. C.); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 604 (Charleston, S. C.). (Not *Sparus bajonado* Bloch & Schneider.)

? *Calamus maerops* Jordan & Gilbert, Syn. Fish. N. A., 1883, 927 (Garden Key, Florida). (Not of Poey.)

This species is at Charleston an abundant and well-known food-fish, reaching a length of 18 inches. There is no positive record of its occurrence elsewhere. There is little doubt of its distinction from *C. milneri* and *C. brachysomus*, but as the published accounts of it above noticed are very meager, and as our own specimens of it have been destroyed by fire, we prefer not to give it a new name until we shall have been able to make a re-examination of specimens.

6. *Calamus penna* (C. & V.) Guichénot.—*Little-mouth Porgy*; *Sheepshead Porgy*.

*Pagellus penna* Cuv. & Val., Hist. Nat. Poiss., vi, 209, 1830 (Brazil)? Guichénot, Ramon de la Sagra, Poiss. Cuba, 82 (Cuba).

? *Calamus penna* Guichénot, Révision Genre Pagels, 114 (Brazil; Cuba; Martinique).

*Pagellus milneri* Goode & Bean, Proc. U. S. Nat. Mus., ii, 134, 1879 (Charlotte Harbor, Florida).

*Sparus milneri* Jordan & Gilbert, Syn. Fish. N. A., 1883, 556 (copied).

*Calamus milneri* Jordan & Gilbert, Syn. Fish. N. A., 1883, 928 (Southern Florida).

??? *Calamus macrops* Poey, Ann. Lyc. Nat. Hist. N. Y., 1872, 181, pl. vii, f. 3 (Havana).

Head 3 to  $3\frac{1}{4}$  in length; depth  $2\frac{1}{6}$  ( $2\frac{3}{4}$  in total). D. XII, 12; A. III, 10. Scales 6-18-13.

Body somewhat higher than in *bajonado*. Anterior profile evenly convex to front of dorsal, rising slowly, and not strongly arched. Pre-orbital low,  $2\frac{2}{5}$  to 3 in head, about equaling interorbital width.

Mouth moderate, the maxillary scarcely reaching vertical from front of orbit,  $2\frac{1}{2}$  to  $2\frac{2}{3}$  in head. Outer series of teeth anteriorly in both jaws somewhat enlarged, small and uniform in size, 8 to 10 in each jaw. No accessory rows of molars in either jaw. Eye rather small,  $3\frac{3}{4}$  to  $4\frac{1}{3}$  in head in specimens from 6 to 11 inches long.

Dorsal low, the highest dorsal spine about  $2\frac{1}{3}$  in head; pectorals about reaching vertical from front of anal,  $3\frac{1}{2}$  in length; ventrals  $1\frac{2}{3}$  to 2 in head. Scales large, in about 5 vertical series on cheeks.

COLOR IN LIFE.—Smutty-silvery, with some faint large pearly spots on the scales of upper parts of body; preorbital light bluish, plain or with pearly mottlings, but without blue stripes; a faint pale streak above and one just below eye; sometimes a faint dusky bar on cheek below eye. Body with 4 to 6 dark cross-bars about as wide as the interspaces, very distinct in life, and never completely disappearing. Fins plain; the ventrals blackish, sometimes barred; pectoral yellowish, the axil with a small inky spot above.

The *Pagellus penna* Cuv. & Val., from Brazil, may be this species, which it seems to resemble in form and coloration more than any other. The descriptions extant of *penna* are so incomplete, however, that we prefer to retain the name *milneri* rather than to adopt one based on an uncertain identification.\*

The young of this species, from 4 to 6 inches in length, are very abundant in the algæ on rocky bottoms about the island of Key West. Numerous specimens were obtained in the seine. These young fishes are called by the fishermen Little-mouth Porgies. A single large individual about a foot in length was obtained from a hook-and-line fisherman. This adult is known as the Sheepshead Porgy. Its cross-bands are more distinct than in the other large species, giving it some resemblance to a Sheepshead (*Diplodus probatocephalus*). The small ink-like spot above the base of the pectorals, and the dusky ventrals, are good color marks of this species.

\* Since the above was written we have received from Dr. H. E. Sauvage, of the Museum at Paris, an account of the typical specimen of *Calamus penna*. This has the small ink-like black spot in its axil which is characteristic of *C. milneri*. There seems, then, to be no ground for doubting the identity of *C. penna* and *C. milneri*.

**7. Calamus macrops** Poey.

*Calamus macrops* Poey, Ann. Lyc. Nat. Hist. N. Y., 1872, 181, pl. vii, f. 3 (Havana).

? *Calamus medius* Jordan & Gilbert, Syn. Fish. N. A., 1883, 328 (Southern Florida).

This species is unknown to us. As Poey's type had blue lines in the cheek, we refer with doubt the young fish from Southern Florida, described by us (Syn. Fish. N. A., 328) to the present species. The deep-blue spot above base of pectoral attributed to this species is one of the characteristics of *C. milneri*, but that species has the eyes small and the cheek plain.

**8. Calamus microps** Guichénot.

Salgo (Sargo) Ramon de la Sagra, Album, Peces de Cuba, MSS., tab. 51, 1834.

*Pagellus microps* Guichénot, Ramon de la Sagra, Hist. Cuba, 188, tab. 3, f. 1 (Havana); Günther, Cat. Fish. Brit. Mus., I, 417, 1859 (copied).

*Calamus microps* Guichénot, Révision Pagels, 118 (Cuba); Jordan & Gilbert, Syn. Fish. N. A., 1883, 928 (copied).

*Pagellus humilis* Poey, Syn. Pisc. Cubens., 1868, 308 (Havana).

*Grammatens humilis* Poey, Ann. Lyc. Nat. Hist. N. Y., 1872, 182 (Havana); Poey, Enum. Pisc. Cubens., 1875, 56.

This species is unknown to us. Its very small eye (5 in head) would appear to separate it from the other large-scaled species. The water-color drawing of Señor de la Sagra, now before us, is extremely rude, and useless for purposes of comparison.

**9. Calamus arctifrons** Goode & Bean.—*Grass Porgy*; *Shad Porgy*.

*Calamus arctifrons* Goode & Bean, Proc. U. S. Nat. Mus., 1882, 425 (Pensacola); Jordan & Gilbert, Syn. Fish. N. A., 1883, 928 (description from original type); Jordan & Swain, Proc. U. S. Nat. Mus., 1884 (Cedar Key).

Head  $3\frac{1}{4}$  in length; depth  $2\frac{1}{2}$ . D. XII, 12; A. III, 10. Scales 6-46-12.

Body comparatively little elevated, the anterior profile evenly curved, very strongly convex forward; the head is narrowest above, becoming conspicuously wider below; profile rising but little from nape to front of dorsal. Preorbital deep,  $2\frac{1}{5}$  to  $2\frac{1}{3}$  in head.

Mouth moderate, maxillary scarcely reaching vertical from front of orbit,  $2\frac{1}{2}$  in head. Outer series of teeth anteriorly enlarged, conspicuously stronger than those of cardiform band, (8 to) 10 in number in each jaw. Molars in three series above and two below, without accessory inner series. Eye very small, four-fifths interorbital width, one-half width of preorbital,  $4\frac{1}{3}$  in length of head.

Dorsal spines compressed and rather strong, the longest  $2\frac{1}{2}$  in head. Anal spines short, the third about  $4\frac{1}{2}$  in head. Pectoral short, barely reaching vertical from vent,  $3\frac{2}{5}$  in length of body. Ventrals about 5 in length. Scales large, in five vertical series on cheeks.

COLOR IN LIFE.—Silvery, bluish or iridescent olive above, the centers

of many of the scales pearly, especially above and between the spots. A conspicuous black blotch on lateral line anteriorly. A row of about six salmon-olive spots along lateral line; above these and below base of dorsal is a row of large faint diffuse blotches of the same color, and below them a series of faint smutty tinges, the whole forming a series of about six obscure and broken cross-bars. Snout olive, mottled with bluish; a bright yellow band between eyes above, a very obscure pearly-blue streak below eye, and two or three similar ones before eye. Preorbital usually bluish, with more or less numerous longitudinal streaks and dashes of golden yellow, around which the ground color forms reticulations; the preorbital sometimes pale salmon yellow, with a few light bluish streaks. Cheeks, preopercle, and opercle pearly, with yellow shades and spots. Opercular membrane coppery orange. Vertical fins bluish, marked with small dusky salmon spots, which form undulating cross-bars on caudal; several blackish spots along base of dorsal. Ventrals, bluish white, faintly barred.

This species is rather common in the eel-grass about the Florida Keys, where it is known as the Grass Porgy, and sometimes as "Shad Porgy," from its occurrence with the "Broad Shad" (*Gerres cinereus*). It is taken in less numbers by the hook-and-line fishermen than the Jolt-head, Little-head, and Sancer-eye Porgy, and it reaches a larger size than any of these, the largest seen being less than a foot in length. A few were taken in the seine near the shore. A single specimen was obtained by Professor Jordan at Cedar Key. This specimen and one of those taken at Key West have the preorbital plain, as in the original type from Pensacola. Most of the specimens have the preorbital marked with bright dashes, somewhat as in *C. calamus*.

**10. *Calamus medius* (Poey) Jordan & Gilbert.**

*Grammateus medius* Poey, Ann. Lyc. Nat. Hist. N. Y., 1872, 183, pl. vii, f. 4 (Havana); Poey, Enum. Pisc. Cubens., 1875, 56 (Havana).

This species is unknown to us.

INDIANA UNIVERSITY, *January 25, 1884.*

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**DESCRIPTIONS OF TEN NEW SPECIES OF FISHES FROM KEY WEST,  
FLORIDA.**

**By DAVID S. JORDAN and CHARLES H. GILBERT.**

The month of December, 1883, was spent by Professor Jordan in making collections of the fishes of Key West, Fla., in the interest of the United States National Museum and of the museum of the Indiana University. About 190 species were obtained, of which those enumerated below appear to be new. Typical specimens of each of these are