Field Guide to the Snappers (Lutjanidae) of the Western Atlantic

By

William D. Anderson, Jr.

UNITED STATES DEPARTMENT OF THE INTERIOR
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By

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ABSTRACT

This guide is intended to implement both field and laboratory identification of western Atlantic snappers (Lutjanidae). Eight genera and 27 species, of which 7 are of doubtful validity, are considered. Illustrated keys are supplemented by tables that give the ranges of numbers of fin rays, lateral line scales, and gill rakers.

INTRODUCTION

Fishes of the family Lutjanidae (Percomorphi) occur throughout the world in tropical and subtropical seas and are found from shallow inshore areas to depths of over 350 fath. (fathoms). Most species live on or near the bottom and are largely confined to continental shelves and slopes and to corresponding depths around islands--but some enter estuaries and even fresh water. Some species have pelagic larvae, but early developmental stages for most species are not known. About 30 genera and about 150 species have been assigned to the Lutjanidae. Many of these are important commercial and sport fishes.

The Lutjanidae are spiny-rayed species having a typical "fishlike" appearance. Western Atlantic lutjanids show the following characters: head large, without a bony suborbital stay; mouth moderate to large, usually terminal; premaxillaries moderately protractile; maxillary long, without a supplemental bone, slipping under edge of suborbital (preorbital) for most of its length when mouth is closed; vomer and palatines usually with teeth; gills 4, a slit behind fourth; pseudobranchiae large; gill membranes separate, free from isthmus; dorsal fin single--sometimes deeply notched--or sometimes divided into 2 fins; dorsal fin usually with 10 to 12 spines and 10 to 14 soft rays (X to XII, 10 to 14); anal fin with 3 spines and 7 to 9 soft rays (III, 7 to 9); pectoral fin usually with 15 to 18 soft rays (15 to 18); pelvic fins thoracic with 1 spine and 5 soft rays (I, 5); pelvic fin with an accessory scale at base; caudal fin with 17 principal fin rays (9+8); and vertebrae usually 24 (10 precaudal + 14 caudal). Additional characters of the family Lutjanidae (particularly internal characters) were given by Jordan and Evermann (1898: 1241-1242).

This is one in a series of field guides to families of western Atlantic fishes. Almost all of the specimens examined during the preparation of this guide are from the western North Atlantic, and most of the literature reviewed concerns only species from this area.

The purpose of this paper is to facilitate both field and laboratory identification of Lutjanidae of the western Atlantic. The keys and notes are based on both the literature and personal study.

Percoids need much study before their familial relationships will be fully understood. Characters of dentition used to separate the Lutjanidae, Pomadasyidae, and Sparidae are of uncertain value, and characters used to distinguish the deeper water lutjanids from the "anthiid" serranids are questionable (Böhlke, 1960: 1). In this paper the lutjanids are considered distinct from the pomadasyids, sparids, and "anthiids."

The most useful references to western Atlantic Lutjanidae are: Ginsburg (1930, 1952), Hildebrand and Ginsburg (1925), Jordan and Evermann (1898), Jordan and Fesler (1893), Jordan and Swain (1884), Meek and Hildebrand (1925), Norman (MS),[3] and Rivas (1949). In the key to

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[3] Norman, J.R. Manuscript. A draft synopsis of the orders, families and genera of recent fishes and fish-like vertebrates. 649 p.

Lutjanus, I have relied heavily on Rivas (1949: 151) for the griseus group (griseus, apodus, jocu, and cyanopterus).

Several nominal species (Lutjanus megalophthalmus, L. brachypterus, L. hastingsi, L. ambiguus, and L. lutjanoides) may prove, after further study, to be conspecific with other species. These are not included in the key, but are discussed in a separate section.

In most instances, ranges of meristic characters used in the keys include those in the literature and my own counts, but only my data were used in the keys to Pristipomoides and Symphysanodon. Tables 1 and 2 give a comparison of my counts with selected counts from the literature. Rare or unusual counts for any character are placed in parentheses in the keys and tables. Additional information useful in the identification of some species appears in brackets in the body of the key.

Table 1.--Selected counts from the literature and by the author of species of western North Atlantic Lutjanidae (excluding Lutjanus; including Symphysanodon[1/])

[Number of specimens examined for each character in brackets. Rare or unusual counts in parentheses. *Holotype examined; **holotypes of Anthias aquilonaris and P. andersoni, and 18 paratypes of P. andersoni examined. My counts of lateral line scales are all of pored scales; my gill-raker counts include all rudiments. Literature references: a, Bleeker 1878; b, Fowler 1928; c, Ginsburg 1952; d, Günther 1880; e, Herre 1950; f, Jordan 1921; g, Jordan and Evermann 1898; h, Jordan and Fesler 1893; i, Kamohara and Katayama 1959; j, Norman (MS); k, Poey 1860; l, Weber and de Beaufort 1936; the numbers following the letters give the pagination. Lit., literature counts; WDA, my counts; rud., rudimentary gill rakers (i.e. rudiments); R, right side; L, left side.]

Species and references	Size range in SL	Dorsal fin rays		Anal fin rays		Pectoral fin rays		Lateral line scales		Gill rakers, anterior arch (upper + lower)	
		Lit.	WDA	Lit.	WDA	Lit.	WDA	Lit.	WDA	Lit.	WDA
	mm.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
*Verilus sordidus g:1284 h:458 k:125	307	IX-10;g,h IX-I,10;k	IX-I,10 [1]	III,7;g,h,k	III,7 [1]	15;k	15 [1]	43(41 pores); g,h 45;k	43 [1]	? + 17;g X + 17;h	8 + 17[R] 8 + 16[L] [1]
Etelis oculatus g:1282 h:457	44-580	X,11;g,h	X,11 [12]	III,8;g,h	III,8 [12]		16-17 [12]	53(50 pores); g,h	48-50 [12]	12 + 15;g	7-10 + 16-18 [11]
Pristipomoides sp.	59-175		X,11 [29]		III,8 [29]		(15)16(17) [29]		50-51 [29]		(8)9(10)+(19)20-21(22) [29]
**Pristipomoides aquilonaris c:92	25-195	X,(10)11;c	X,(10)11 [53]	III,8;c	III,(7)8 [54]	14-16;c	(14)15-16(17) [54]	49-53;c	(48)49-51(52) [128]	7-10 + 16-18;c	7-9 + (16)17-19(20) [124]
Pristipomoides macrophthalmus c:92 g:1280 h:456	49-322	X,11;g,h	X,11 [38]	III,8;g,h	III,8 [39]		(15)16 [39]	55-57;c 60(52 pores);g 60;h	54-56(57) [64]	6-7 + 13-16;c 5 + 15;g ? + ca.17;h	6-7(8) + (13)14-16(17) [65]
Apsilus dentatus g:1278-1279 h:455	203-343	X,10;g,h	X,9-10 [4]	III,8;g,h	III,8 [4]		15-16 [4]	60(60 pores);g 60;h	58-60,62-63 [4]	? + ca.17;g,h	7-8 + 15-16 [4]
Rhomboplites aurorubens g:1277-1278 h:453	68-355	XII(XIII),11;g XII,11;h	XII,10-11 [20]	III,8;g,h	III,8 [14]		17-18(19) [14]	72(50 pores);g 72;h	(48)49-50(51-53) [14]	6 + 21;g ? + ca.18;h	8-10 + 19-21 [14]
Ocyurus chrysurus g:1275 h:452 j:276	38-285	X,13;g,h 13-14;j	X,12-13 [13]	III,9;g III,8-9;h	III,(8)9 [13]		15-16 [13]	65(51 pores);g 65;h	46-49 [12]	8 + 21;g ? + ca.20(+ ? rud.);h	9-10 + 21-22(23) [13]
Symphysanodon typus[1/] a:62 b:186 d:39 e:151 f:647 i:2-3 l:309		IX,10-11;a IX,9;b IX,10;d,e,i IX,7;f IX,9-10;l		III,7;a,b,d, e,f,i,l		16;a,l 15;f 16-17;i		ca.50;a 40;b 60;d 46-50;e 53;f 50;i 50-60;l		8 + 21;b 11-12 + 22-23;i	
Symphysanodon sp. A	49-137		IX,(9)10 [95]		III,7 [95]		(16)17(18) [90]		48-51(52) [29]		(9)10-11(12) + (24)25-27(28) [95]
Symphysanodon sp. B	69-101		IX,10 [8]		III,8 [8]		16 [8]		45-46 [3]		12-13 + 27-28 [8]

1/ Symphysanodon typus is an extralimital species, see text.

Table 2.--Selected counts from the literature and by the author of nominal species of western North Atlantic Lutjanus

[Number of specimens examined for each character in brackets. Rare or unusual counts in parentheses. *Holotype examined; **holotype and paratype examined. My counts of lateral line scales are all of pored scales, and in my gill-raker counts for cyanopterus, griseus, apodus, and jocu--"A" denotes lower limb rudiments excluded and "B" denotes lower limb rudiments included (all of my other gill-raker counts include all rudiments). Literature references: a, Bean 1898; b, Cope 1871; c, Evermann and Marsh 1900; d, Ginsburg 1930; e, Hildebrand and Ginsburg 1925; f, Jordan and Evermann 1898; g, Meek and Hildebrand 1925; h, Poey 1870; and i, Rivas 1949; the numbers following the letters give the pagination. Lit., literature counts; WDA, my counts; rud., rudimentary gill rakers (i.e. rudiments); R, right side; L, left side.]

Species and references	Size range in SL	Dorsal fin rays		Anal fin rays		Pectoral fin rays		Lateral line scales		Gill rakers, anterior arch (upper + lower)	
		Lit.	WDA	Lit.	WDA	Lit.	WDA	Lit.	WDA	Lit.	WDA
	mm.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
mahogoni f:1272 g:504-505	28-184	X,12;f,g	X,(11)12 [20]	III,8;f,g	III,8 [20]		14-15 [20]	62(50 pores);f	47-49 [20]	? + ca.14-15;f ? + 8-9(+ ? rud.);g	7-8 + 15-17 [20]
synagris f:1270 g:505-506	37-178	X,12;f,g	X,12(13) [33]	III,8;f,g	III,8(9) [33]		15-16 [33]	60(50 pores);f	(47)48-50 [33]	5 + 9;f ? + 8(+ ? rud.);g	6-7 + (12)13-14(15) [33]
*"megalophthalmus" c:177	232	X,12;c	X,12 [1]	III,8;c	III,8 [1]		15 [1]	64(ca.57 pores);c	48-49[R] ca.48[L] [1]	? + 10;c	6 + 12-13 [1]
*"brachypterus" b:470 f:1268	183	X,12;b,f	X,12 [1]	III,8;b,f	III,8 [1]		15 [1]	57;b 51(47 pores);f	ca.47[R] ca.48[L] [1]	few;f	7-8 + 12-13[R] 6 + ca.14[L] [1]
cyanopterus f:1254-1255 g:499 i:151	105-250	X,14;f,g	X,14 [4]	III,8;f,g	III,7-8 [4]		16-18 [4]	50(50 pores);f	45-47 [4]	? + 8;f ? + 6;g ? + 5-7(+ ? rud.);i	5-7 + 7-8;A 5-7 + ca.11-15;B [4]
griseus f:1255-1256 g:511-512	58-520	X,14;f X,(13)14;g	X,14 [11]	III,8;f,g	III,7-8 [11]		(15)16-17 [11]	50(47 pores);f	(43)44-47 [11]	? + 8;f ? + 7-8;g	6-8 + 8-9;A 6-8 + ca.12-14;B [7]
apodus f:1258-1259 g:509-510	33-170	X,14;f,g	X,14 [10]	III,8;f,g	III,8 [10]		16-17 [10]	42-45(36 pores);f	(40)41-45 [10]	? + 9;f ? + 7-8;g	5-7 + 7-9;A 5-7 + ca.11-15;B [10]
jocu f:1257 g:508	27-540	X,14;f X,14(15);g	X,13-14 [10]	III,8;f,g	III,8 [10]		16-17 [10]	56(45 pores);f	46-48(49) [10]	? + 9;f ? + 7-8;g	6-8 + 8-11;A 6-8 + ca.12-14;B [8]
buccanella d:274 f:1261-1262	51-375	X,14;d,f	X,14 [31]	III,8;d,f	(II)III, 8(9) [31]		(14)16-17(18) [31]	51;d 63(50 pores);f	(47)48-49(50) [28]	8 + 17;d ? + ca.17-18;f	7-9 + 17-18(19) [23]
vivanus d:265-266 f:1262-1263	51-592	X,14;d,f	X(XI),13-14 [54]	III,8;d,f	III,(7)8 [60]		(16)17(18) [54]	51;d 72(50 pores);f	(47)48-50 [51]	7 + 17;d ? + ca.16;f	(6)7-8(9) + 16-17 [16]
"hastingsi" a:45-46		X,14;a		III,8;a		16;a		65;a		7 + 9;a	
aya f:1264 g:507	46-780	X,14;f,g	(IX)X, (13)14(15) [123]	III,9;f,g	III(IV), (7)8-9(10) [131]		(15-16)17(18) [117]	60(46 pores);f	(46)47-48(49-51) [86]	? + 8;f ? + 9-10;g	(6)7-8 + 14-16 [24]
*"blackfordii" d:269 e:80-81	544	X,14;e	X,14 [1]	III,9;d,e	III,9 [1]		17 [1]	47-48;e	49-50[R] 46-47[L] [1]	? + 14;d 7 + 12;e	7 + ca.14 [1]
**?"campechanus" d:268 e:82	157-273	X,14;e	X,14 [2]	III,8;d,e	III,8 [2]		17 [2]	50;e	48-50 [2]	? + 15;d 7 + 14;e	7-8 + 15-16 [2]
analis f:1265-1266 g:501-502	18-465	X,14;f X,(13)14;g	X(XI), (13)14 [42]	III,8;f,g	III,(7)8 [41]		(15)16(17) [38]	67(51 pores);f	(47)48-50(51) [24]	? + 8;f ? + 7-8(+ ? rud.);g	6-8 + 12-13 [11]
*?"ambiguus" f:1271	193-198	X,13;f	X,13 [2]	III,9;f	III,9 [2]		16 [2]	53(50 pores);f	48-49 [2]	? + ca.15(+ ? rud.);f	8-9 + 16-18 [2]
*?"lutjanoides" h:319-320	210	X,14;h	X,14 [1]	III,8;h	III,9 [1]		16 [1]	ca.55;h	ca.46[L] [1]		8 + ca.17 [1]

The term gill rakers (as used in this paper) refers to the projections on the anterolateral surface of the anterior gill arch (see figs. 10 and 11); rudiments are poorly developed gill rakers, wider at their bases than high. It is difficult to interpret many gill raker counts in the literature, and I have assumed that the counts given are total counts, unless it was stated or implied that rudiments were present and not counted. My gill raker counts, unless otherwise indicated, include all rudiments on both upper and lower limbs of the anterior gill arch. The rudiments on the lower limb of the anterior arch are difficult to count in some species and almost impossible to enumerate accurately in others. In table 2, I have listed my lower limb gill raker counts for Lutjanus cyanopterus, L. griseus, L. apodus, and L. jocu in two ways (i.e. excluding rudiments and including rudiments).

All body lengths are recorded in SL (standard length)--tip of snout to end of base of caudal fin. Body proportions are given either as % SL (percent of standard length) or as times in SL (ratio of the part to standard length).

KEY TO THE GENERA

1A. Dorsal fin not continuous, divided into two sections--an anterior fin of spines only and a posterior fin of a single spine followed by soft rays [fig. 1] . . . . . Verilus.

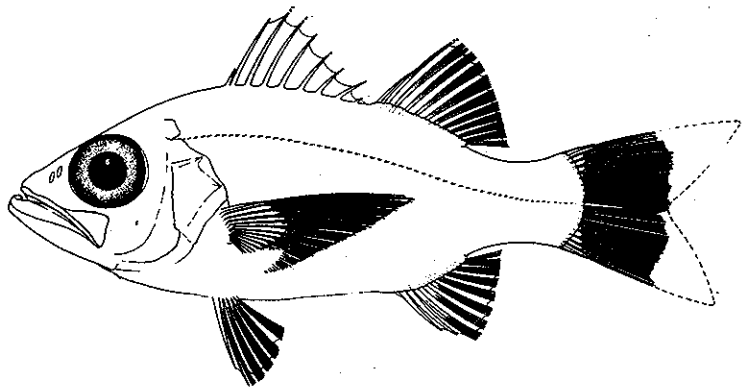

Figure 1.--Verilus sordidus, holotype (Museum of Comparative Zoology 21764) 307 mm. SL.

1B. Dorsal fin continuous, the anterior spines and posterior soft rays connected by a membrane, although the junction of the two sections may be deeply incised [see figs. 4 and 5] . . . . . 2.

2A. No scales on dorsal and anal fins. Last ray of dorsal fin and anal fin more or less produced [fig. 2] . . . . . 3.

2B. Scales on soft dorsal and anal fins. Last ray of dorsal fin and anal fin not produced [fig. 3] . . . . . 5.

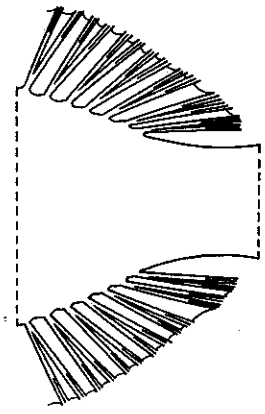

Figure 2.--No scales on soft dorsal and anal fins; last ray of dorsal fin and anal fin more or less produced.

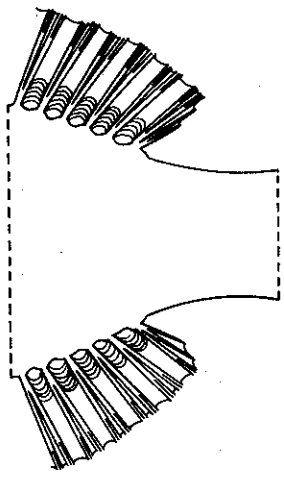

Figure 3.--Scales on soft dorsal and anal fins; last ray of dorsal fin and anal fin not produced.

3A. Dorsal fin deeply notched [fig. 4]. Scales on maxillary. Interorbital region flattened . . . Etelis.

3B. Dorsal fin not notched [fig. 5]. No scales on maxillary. Interorbital region flattened or not. . . . . 4.

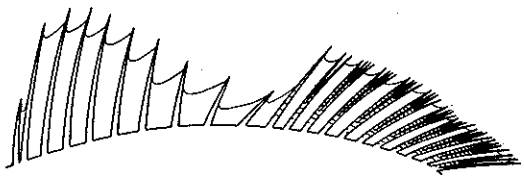

Figure 4.--Dorsal fin deeply notched (Etelis).

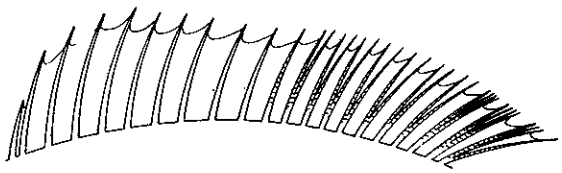

Figure 5.--Dorsal fin not notched (Pristipomoides and Apsilus).

4A. Interorbital region flattened; not convex [fig. 6]. Last ray of dorsal fin and anal fin moderately produced [fig. 8]. Color reddish in life, becoming pale in preservative. . . Pristipomoides.

4B. Interorbital region not flattened; convex [fig. 7]. Last ray of dorsal fin and anal fin slightly produced [fig. 9]. Color "dusky violet, paler below" in life and dark grayish-brown in preservative . . . . . Apsilus.

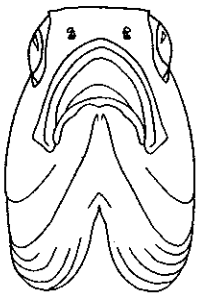

Figure 6.--Interorbital region flattened (Pristipomoides).

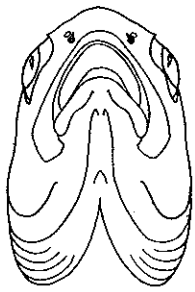

Figure 7.--Interorbital region convex (Apsilus).

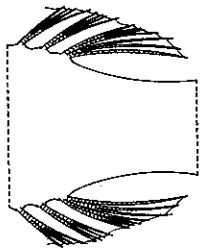

Figure 8.--Last ray of dorsal fin and anal fin moderately produced (Pristipomoides).

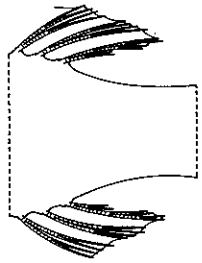

Figure 9.--Last ray of dorsal fin and anal fin slightly produced (Apsilus).

5A. Gill rakers, excluding rudiments, 17 to 22 on lower limb of anterior gill arch [fig. 10]. . 6.

5B. Gill rakers, excluding rudiments, 16 or fewer (17 on one specimen of L. buccanella) on lower limb of anterior gill arch [fig. 11]. . . . . Lutjanus.

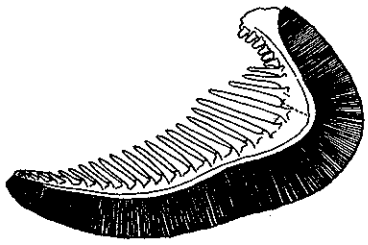

Figure 10.--Anterior gill arch (as in Rhomboplites and Ocyurus). In example 9+21 gill rakers (anteriormost gill raker on lower limb is rudimentary).

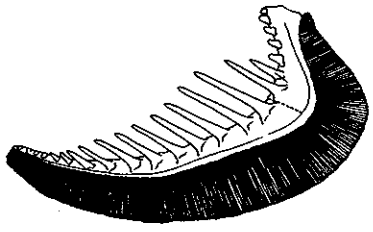

Figure 11.--Anterior gill arch (as in Lutjanus). In example 7+15 gill rakers (anterior 4 gill rakers on lower limb are rudimentary).

6A. Dorsal fin rays XII(XIII), 10 to 11 (11 in 18 of 20 specimens examined). Lobes of caudal fin not greatly produced [fig. 12]. Teeth on vomer in a rhomboid patch, the posterior extension on median line broad in large specimens, but relatively narrow in smaller ones [fig. 14]. Color vermilion in life, no yellow lateral stripe, color fading in preservative. . . Rhomboplites.

6B. Dorsal fin rays X, 12 to 14. Lobes of the caudal fin greatly produced in larger specimens [fig. 13]. Teeth on vomer in an anchor-shaped patch, with a narrow posterior extension on median line [fig. 15]. Ground color not vermilion; yellow stripe from tip of snout (passing under eye) to caudal peduncle, widening to cover dorsal area of anterior part of peduncle, posterior part of peduncle, and caudal fin; this stripe fading in preservative. . . . Ocyurus.

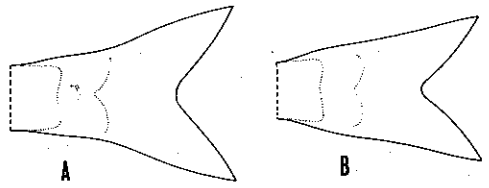

Figure 12.--Caudal fin lobes not greatly produced (Rhomboplites); A. specimen ca. 140 mm. SL, B. specimen ca. 85 mm. SL.

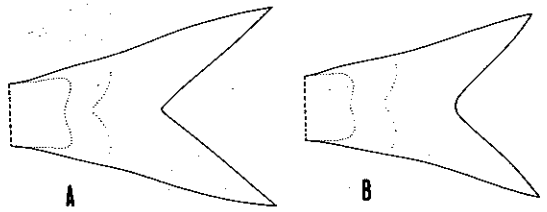

Figure 13.--Caudal fin lobes greatly produced in larger specimens (Ocyurus); A. specimen ca. 175 mm. SL, B. specimen ca. 80 mm. SL.

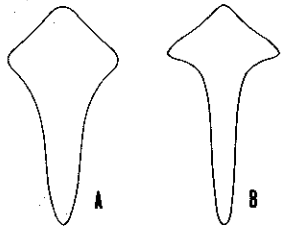

Figure 14.--Vomerine tooth patch (Rhomboplites); A. specimen ca. 225 mm. SL, B. specimen ca. 70 mm. SL.

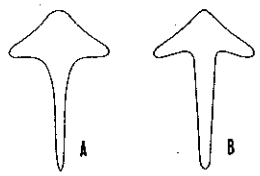

Figure 15.--Vomerine tooth patch (Ocyurus); A. specimen ca. 225 mm. SL, B. specimen ca. 60 mm. SL.

WESTERN NORTH ATLANTIC GENERA AND SPECIES

Verilus Poey 1860. One species; known only from the western North Atlantic. . . . . Escolar chino. Verilus sordidus Poey 1860 [fig. 1]. Verilus has been included in the Lutjanidae by some authors and in a separate family (Verilidae) by others. Its precise familial status is unknown.

Etelis Cuvier 1828. One species in western North Atlantic. . . . . Queen snapper. Etelis oculatus (Valenciennes 1828). If Etelis carbunculus Cuvier 1828 (described from a specimen from the Seychelles) is, as suggested by Jordan, Evermann, and Clark (1930: 328), conspecific with E. oculatus (described from a specimen from Martinique), then E. oculatus is found from the western Atlantic through the Indian Ocean to the Hawaiian Islands in the Pacific.

Pristipomoides Bleeker 1852. Three species in the western North Atlantic.

Key to the Species

1A. Depth of body (vertical at first dorsal spine) 3.5 to 4.2 times in SL (23.9 to 28.2% SL). Total number of gill rakers and rudiments on anterior gill arch 28 to 30(31) [(8)9(10) + (19)20 to 21(22)]. Lateral line scales 50 to 51. . . . . Pristipomoides sp.

1B. Depth of body 2.5 to 3.2 times in SL (31.1 to 40.5% SL). Total number of gill rakers and rudiments on anterior gill arch 19 to 28 . . . . . 2.

2A. Lateral line scales (48)49 to 51(52). Total number of gill rakers and rudiments on anterior gill arch (24)25 to 27(28) [7 to 9 + (16)17 to 19(20)]. . . . . Wenchman. Pristipomoides aquilonaris (Goode and Bean 1896).

Pristipomoides andersoni Ginsburg 1952, frequently used for this species, is a junior synonym of P. aquilonaris. The holotypes of both species in the U.S. National Museum were examined.

Jordan and Thompson (1905: 241-242) described a small specimen (47.5 mm. long) obtained "in the Gulf Stream toward the Carolina coast" and ascribed it to Anthias aquilonaris, for which they erected the genus Etelides. Their description and figure of Etelides resemble Pristipomoides aquilonaris, but the description differs from P. aquilonaris in stating "preopercle with both limbs entire" and "dorsal deeply notched." Until an examination is made of Jordan and Thompson's Etelides, the taxonomic status of their specimen is conjectural.

2B. Lateral line scales 54 to 56(57). Total number of gill rakers and rudiments on anterior gill arch (19)20 to 23 (24 to 25) [6 to 7(8) + (13)14 to 16(17)]. . . . . Voraz. Pristipomoides macrophthalmus (Müller and Troschel 1848).

Apsilus Valenciennes 1830. One species in western North Atlantic. . . . . Black snapper. Apsilus dentatus Guichenot 1853.

The description of color in life, "dusky violet, paler below," is based on Jordan and Evermann (1898: 1279).

Rhomboplites Gill 1862. One species; known only from the western Atlantic. . . . . Vermilion snapper. Rhomboplites aurorubens (Cuvier 1829).

Norman (MS: 276)[4] gave about 17 to 20 gill rakers on the lower limb of the anterior gill arch for Rhomboplites and Ocyurus. I assume that his counts excluded rudiments; my counts for this character in Rhomboplites and Ocyurus excluding rudiments were 18 to 22.

Ocyurus Gill 1862. One species; known from the eastern and western Atlantic (see Rhomboplites) . . . . . Yellowtail snapper. Ocyurus chrysurus (Bloch 1791).

Lutjanus Bloch 1790. Many species; occurring in most warm seas. In the western North Atlantic several species of Lutjanus are important commercial and sport fishes. Despite their importance, their taxonomy is poorly known. The following key can be used to identify most specimens larger than about 50 mm. SL; many smaller specimens are difficult to identify.

Key to the Species

1A. Dorsal fin rays usually X,12 (rarely 11 or 13 soft rays). A black spot below anterior part of soft dorsal fin, persisting throughout life . . . . . 2.

1B. Dorsal fin rays usually X,14 (rarely IX or XI spines and 13 or 15 soft rays). Black spot below anterior part of soft dorsal fin present or absent. . . . . 3.

2A. About one-fourth to one-half of black lateral spot extending below lateral line. Gill rakers 7 to 8 + 15 to 17 including rudiments (in specimens I examined). . . . . Mahogany snapper. Lutjanus mahogoni (Cuvier 1828).

2B. Less than one-fourth or none of black lateral spot extending below lateral line in specimens larger than about 60 mm. SL. Gill rakers 6 to 7 + (12)13 to 14(15) including rudiments (in specimens I examined) . . . . . Lane snapper. Lutjanus synagris (Linnaeus 1758). [see also Lutjanus megalophthalmus and Lutjanus brachypterus]

3A. A large, pronounced black spot at base and in axil of pectoral fin. No black spot below anterior part of soft dorsal fin. Anal fin rounded. [A dark area on scales at base of soft dorsal fin (not always obvious on preserved specimens) [fig. 16]. Dorsal portion of caudal peduncle, caudal fin, and most of anal fin greenish-yellow in life in specimens up to about 160 mm. SL; this color fading in preservative.] . . . . . Blackfin snapper. Lutjanus buccanella (Cuvier 1828).

[4] See footnote 3, p. 1.

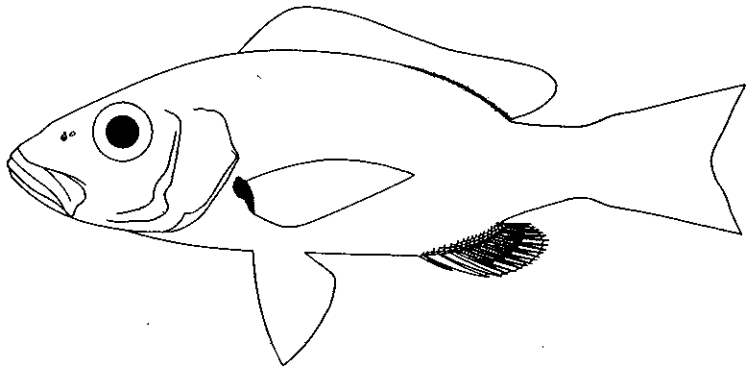

Figure 16.--Lutjanus buccanella.

3B. No large and pronounced black spot at base and in axil of pectoral fin. Black spot below anterior part of soft dorsal fin present or absent. Anal fin rounded or angulated . . . . . 4.

4A. Anal fin rounded at all sizes, the middle rays considerably less than half length of head. No black spot below anterior part of soft dorsal fin [fig. 17] . . . . . 5.

4B. Anal fin angulated in larger specimens, the middle rays produced, the longest almost half to greater than half length of head. (Anal fin rounded in analis less than about 40 mm. SL, in aya less than about 50 mm. SL, and in vivanus less than about 60 mm. SL.) A black spot below anterior part of soft dorsal fin, at least in young (this spot present in the largest analis seen (465 mm. SL) but disappearing by about 250 to 300 mm. SL in aya, and by about 200 to 250 mm. SL in vivanus) [fig. 18]. . . . . 8.

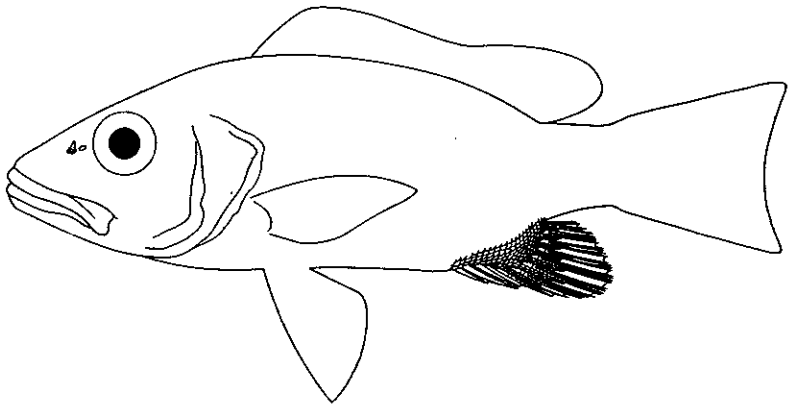

Figure 17.--Anal fin rounded at all sizes; no black spot below anterior part of soft dorsal fin.

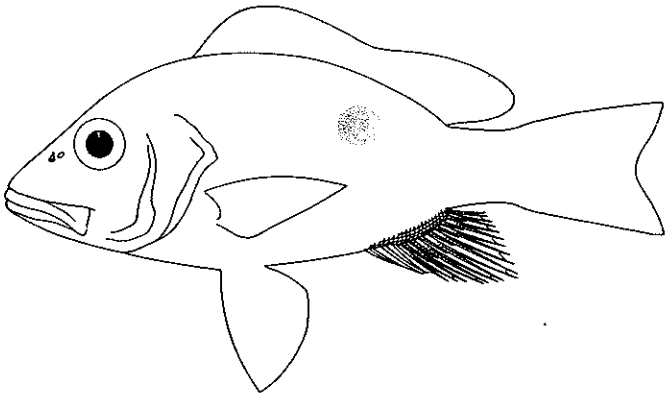

Figure 18.--Anal fin angulated in larger specimens; black spot present below anterior part of soft dorsal fin (at least in young).

5A. Vomerine tooth patch without a distinct posterior extension on median line [fig. 19]. Upper and lower canines very strong, about equally developed. Cheek scales in 8 to 10, usually 9, rows[5] . . . . . Cubera snapper. Lutjanus cyanopterus (Cuvier 1828).

5B. Vomerine tooth patch anchor-shaped, with a median posterior extension [fig. 20]. Upper canines much larger than lower. Cheek scales in 6 to 9, usually 7 or 8, rows[5] . . . . . 6.

Figure 19.--Vomerine tooth patch (Lutjanus cyanopterus).

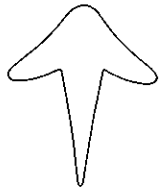

Figure 20.--Vomerine tooth patch with posterior extension.

6A. Pectoral fin length about equal to distance from tip of snout to posterior edge of preopercle, 3.7 to 4.2 times in SL. Body comparatively slender, greatest depth 2.6 to 3.2, usually 2.7 to 3.1, times in SL . . . . . Mangrove, or Gray, snapper. Lutjanus griseus (Linnaeus 1758).

6B. Pectoral fin longer than distance from tip of snout to posterior edge of preopercle, 3.0 to 3.5 times in SL (in Lutjanus apodus of 75 to 96 mm. SL pectoral fin length approximately equal to that of L. griseus of similar size). Body comparatively deep, greatest depth 2.3 to 2.8, usually 2.4 to 2.7, times in SL . . . . . 7.

7A. Scales relatively large, 39 to 44, usually 40 to 43, transverse rows between "scale bone" and caudal base (Rivas, 1949: 151); (40)41 to 45 pored lateral line scales (in specimens I examined). Five to 6(7) scales between dorsal origin and lateral line in a posteroventrally directed row (i.e. counting downward and backward) [fig. 21]. No whitish bar below eye. . . . . Schoolmaster. Lutjanus apodus (Walbaum 1792).

7B. Scales of moderate size, 45 to 49, usually 46 to 48, transverse rows between "scale bone" and caudal base (Rivas, 1949: 151); 46 to 48(49) pored lateral line scales (in specimens I examined). Eight to 11 scales between dorsal origin and lateral line in a posteroventrally directed row (i.e. counting downward and backward) [see fig. 21]. "A somewhat diffuse whitish bar between eye and area immediately posterior to maxillary" (Rivas, 1949: 151)--not obvious in all preserved specimens. . . . . Dog snapper. Lutjanus jocu (Bloch and Schneider 1801).

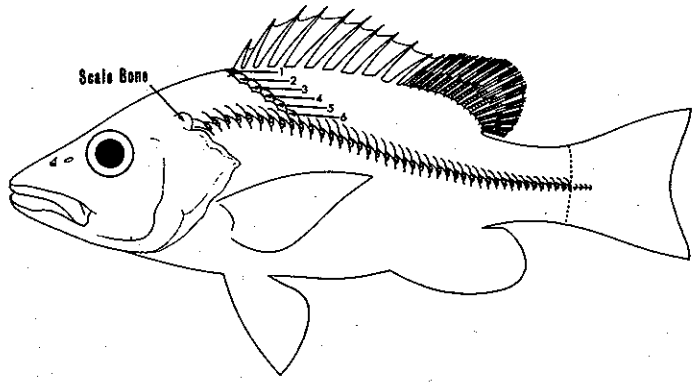

Figure 21.--Scale arrangement between dorsal fin origin and lateral line (Lutjanus apodus). In example 42 pored scales in lateral line.

8A. Vomerine tooth patch without a distinct posterior extension on median line [fig. 22]. [Anal soft rays (7)8, 8 in more than 97 percent of specimens examined. Iris red in life. Spot below anterior part of soft dorsal fin relatively large in small specimens, small but distinct in large specimens (see 4B.)]. . . . . Mutton snapper. Lutjanus analis (Cuvier 1828).

[5] Personal communication, Luis R. Rivas, Department of Zoology, University of Miami.

8B. Vomerine tooth patch anchor-shaped, with a median posterior extension [fig. 23]. . . . . 9.

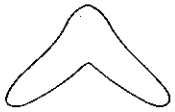

Figure 22.--Vomerine tooth patch (Lutjanus analis).

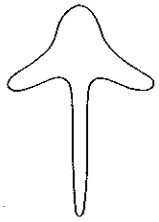

Figure 23.--Vomerine tooth patch with posterior extension (as in Lutjanus vivanus and L. aya).

9A. Anal soft rays (7)8, 8 in more than 98 percent of specimens examined. Iris yellow in life. Gill rakers on lower limb of anterior arch 16 to 17, including rudiments (in specimens I examined). . . . . . Yelloweye, or Silk, snapper. Lutjanus vivanus (Cuvier 1828). [see also Lutjanus hastingsi]

9B. Anal soft rays (7)8 to 9(10), 9 in 84 percent, 8 in about 15 percent of all specimens examined (9 in 25 percent and 8 in 75 percent of specimens from the West Indies, Caribbean, and South American coast; 9 in about 88 percent and 8 in about 11 percent of those from the Gulf of Mexico and the Atlantic coast of the United States). Iris red in life. Gill rakers on lower limb of anterior arch 14 to 16, including rudiments (in specimens I examined). . . . . Red snapper. Lutjanus aya (Bloch 1790).[6]

Ichthyologists disagree whether one or two species of red snapper occur in the western Atlantic. If there are two, they are very closely related. Until additional specimens from the West Indies, Caribbean, and Atlantic coast of South America can be compared with specimens of similar size ranges from the Gulf of Mexico and the Atlantic coast of the United States, I think it best to consider the western Atlantic red snapper as a single species.

Two additional nominal species are herein included under aya (which was originally described after Marcgrave and presumably based upon a Brazilian specimen); campechanus (Poey 1860), type locality not designated, but possibly Cuba or Campeche Bank, and blackfordii Goode and Bean 1878, described from Pensacola, Fla.

Which name should be used is debatable. The holotype of aya is apparently not extant, and it is difficult to determine what species Bloch's description refers to--in fact his description of aya may not even be of a lutjanid. Since aya has priority and has had wide usage, I choose to use it until the nomenclature has been adequately studied.

NOMINAL SPECIES OF WESTERN NORTH ATLANTIC LUTJANUS OF UNCERTAIN STATUS

(see Table 2 for meristic data)

Lutjanus megalophthalmus (Evermann and Marsh 1900). This species was described from a specimen from Puerto Real, Puerto Rico. A specimen bearing the catalogue number of the holotype (U.S. National Museum 49531, examined 14 November 1964) has the vomerine tooth patch anchor-shaped with a short median posterior extension and no obvious sign of a black spot beneath the anterior part of the soft dorsal. Evermann and Marsh (1900: 178) in their original description of megalophthalmus stated: "a large black blotch, somewhat smaller than eye, just above lateral line and below first 4 dorsal rays, this spot smaller and less conspicuous than in N. synagris." If the specimen I examined is the holotype of megalophthalmus, the "large black blotch" has faded and is no longer distinguishable. L. megalophthalmus appears to be conspecific with L. synagris.

Lutjanus brachypterus Cope 1871. This species is known only from the holotype from the Bahamas. Jordan and Evermann (1898: 1268) hypothesized that brachypterus might be a hybrid of L. griseus and L. synagris. The holotype (Academy of Natural Sciences of Philadelphia 13309) has the vomerine tooth patch anchor-shaped with a short median posterior extension and slight evidence of a black spot beneath the anterior part of the soft dorsal. L. brachypterus may be conspecific with L. synagris.

[6] A recent report by Rivas, Luis R., 1966 ("Review of the Lutjanus campechanus complex of red snappers." Quart. J. Fla. Acad. Sci. 29 (2): 117-136), states that Bloch's name aya does not refer to a lutjanid and recognizes two species of red snappers in the western Atlantic--L. campechanus in the Gulf of Mexico and along the South Atlantic coast of the United States and L. purpureus in the Caribbean Sea and southeastward along the coast of the Guianas probably to Brazil.

Lutjanus hastingsi (Bean 1898). Bean described this species from specimens from Bermuda and stated (p. 46): "Vomerine teeth in an arrow-shaped patch with a backward extension which is fully one-third as long as the eye" and "Some living examples show a faint dark lateral blotch much like that of N. synagris, and similarly placed." After studying the original description, I believe that hastingsi is conspecific with vivanus. This cannot be determined with certainty until the holotype of hastingsi (at the American Museum of Natural History) is examined, and C. Lavett Smith (in correspondence, 27 March 1964) stated that it is in poor condition.

Lutjanus ambiguus (Poey 1860). Poey described this species from a specimen from Havana and hypothesized that it might be a hybrid of L. synagris with Ocyurus chrysurus. Rodriguez Pino (1961) reported on 18 specimens of a lutjanid from Cuba that were considered to be the same as Poey's ambiguus. I examined two specimens (Museum of Comparative Zoology 9951 and U.S. National Museum 13036), one of which may be the holotype. They have the vomerine patch of teeth anchor-shaped with a median posterior extension and no black spot beneath anterior part of soft dorsal fin. I compared a number of meristic and morphometric characters of six specimens of O. chrysurus (162 to 225 mm. SL), nine specimens of L. synagris (174 to 212 mm. SL), and two specimens of L. ambiguus (193 and 198 mm. SL) and found that in many of the characters L. ambiguus is intermediate between O. chrysurus and L. synagris. L. ambiguus may be a hybrid.

Lutjanus lutjanoides (Poey 1870). This species is known only from the holotype from Cuba. Jordan and Evermann (1898: 1249) stated that lutjanoides is probably a hybrid of Ocyurus chrysurus and Neomaenis (=Lutjanus) jocu and later (p. 1261) said "Its describer has suggested the possibility of its being a hybrid between Ocyurus chrysurus and Neomaenis apodus." I examined a specimen at the U.S. National Museum that had with it a note, presumably by Isaac Ginsburg, stating: "There is a possibility that this is the type of Ocyurus lutianoides Poey. It agrees fairly well with his description except that it appears to be a trifle smaller than the length given by Poey but the caudal is broken off at the end. The author also states that he possibly sent his specimen to Brevoort and since this specimen came from Brevoort, it is some further indication that this is the type. I. G. 1948." In several characters the original description of O. lutjanoides differs from this specimen (USNM 33238)--e.g. eight anal soft rays were described, whereas the specimen has nine. This specimen also has the vomerine tooth patch anchor-shaped with a median posterior extension and no black spot below the anterior part of the soft dorsal. I am uncertain of the status of lutjanoides.

GENUS SYMPHYSANODON

Some authors have placed Symphysanodon in the Lutjanidae, and others have placed it in the Serranidae. It is very different from the other genera considered here, and its true familial status is uncertain. It is easily distinguished from these genera as follows:

1A. Dorsal fin not continuous, divided into two sections--an anterior fin of spines only and a posterior fin of a single spine followed by soft rays [fig. 1]. . . . . Verilus.

1B. Dorsal fin continuous, the anterior spines and posterior soft rays connected by a membrane, although the junction of the two sections may be deeply incised. . . . . 2.

2A. A pronounced angular bony elevation on dorsal surface of dentary [fig. 24]. Only dorsalmost border of maxillary covered by narrow suborbital when mouth is closed [fig. 27]. No scales on dorsal and anal fins, but with low scaly sheaths at fin bases. Dorsal spines nine . . . . . Symphysanodon.

2B. No pronounced angular bony elevation on dorsal surface of dentary [figs. 25 and 26]. A great part of maxillary or most of dorsal part of maxillary covered by relatively wide suborbital when mouth is closed [figs. 28 and 29]. Dorsal and anal fins with or without scales, but with no scaly sheaths at their bases. Dorsal spines ten or more (nine spines in less than 1 percent of specimens examined). . . . . Lutjanidae (sensu stricto).

Symphysanodon Bleeker 1878. Two species in western North Atlantic.

Symphysanodon typus Bleeker 1878, the only described species of this genus, has been reported from Kei Islands, New Guinea, and Hawaii (Weber and de Beaufort, 1936: 309), the Philippines (Herre, 1950: 151), and Japan (Kamohara and Katayama, 1959: 2-3).

Specimens of two undescribed species of Symphysanodon were collected recently in the western Atlantic by personnel aboard exploratory fishing vessels Silver Bay and Oregon of the Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, and research vessel Gerda of the Institute of Marine Science, University of Miami.

Key to the Species

1A. Depth of body (vertical at first dorsal spine) 3.5 to 4.5 times in SL (22.3 to 28.2% SL). Anal soft rays 7. Pectoral fin rays (16)17(18) . . . . . Symphysanodon sp. A.

1B. Depth of body 2.8 to 3.0 times in SL (33.4 to 35.5% SL). Anal soft rays 8. Pectoral fin rays 16. . . . . Symphysanodon sp. B.

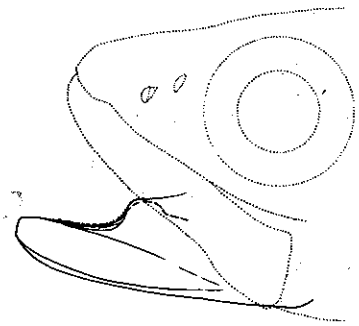

Figure 24.--Pronounced angular bony elevation on dorsal surface of dentary (Symphysanodon).

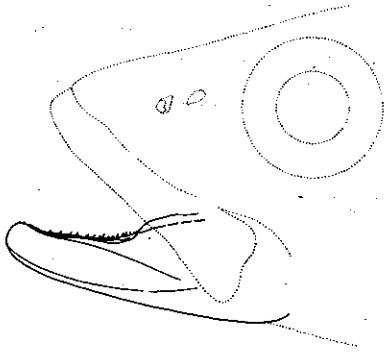

Figure 25.--No pronounced angular bony elevation on dorsal surface of dentary (Lutjanus mahogoni).

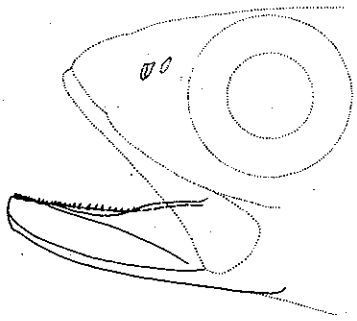

Figure 26.--No pronounced angular bony elevation on dorsal surface of dentary (Etelis oculatus).

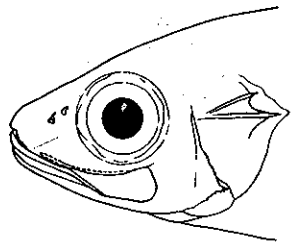

Figure 27.--Only dorsalmost border of maxillary covered by narrow suborbital when mouth is closed (Symphysanodon).

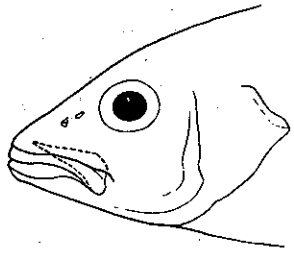

Figure 28.--Great part of maxillary covered by relatively wide suborbital when mouth is closed (Lutjanus griseus).

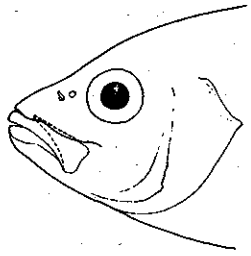

Figure 29.--Most of the dorsal part of maxillary covered by relatively wide suborbital when mouth is closed (Apsilus dentatus).

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Grady W. Reinert did the illustrations.

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