

A REVIEW OF THE AMERICAN CARANGINÆ.

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The purpose of the present paper is to furnish a catalogue of the species of *Caranginae* found in American waters, with an outline of the synonymy of each, and a key by which the species may be distinguished. The subfamily *Caranginae*, as understood by us, includes the *Seleninae*, *Caranginae*, and *Chloroscombrinae* of Dr. Gill (Proc. U. S. Nat. Mus., 1882, 492), or the genera *Trachurus*, *Carangichthys*, *Caranx*, *Argyreiosus*, and *Micropteryx* of Dr. Günther (Cat. Fish. Brit. Mus., ii, 418). In Dr. Lütken's classification (*Spolia Atlantica*, 196) this group would correspond to the genera *Trachurus*, *Megalaspis*, *Decapterus*, *Caranx*, *Gallichthys*, *Selene*, and *Micropteryx*.

The division of this group into genera offers numerous difficulties, inasmuch as the various characters of form, squamation, dentition, and armature are subject to almost complete intergradation. A division based on any of these characters would be imperfect from the presence of intermediate forms connecting one group with another.

A minute subdivision has been attempted by Dr. Bleeker and Dr. Gill, and numerous generic names have been proposed, which have not met with general acceptance because the distinctive characters disappear as our knowledge of the species increases, and the adoption of these genera would necessitate the making of still others for species more or less aberrant.

For the present we venture to divide the group into six genera, as follows:

1. *Megalaspis*;
2. *Decapterus*;
3. *Trachurus*;
4. *Caranx*;
5. *Selene*;
6. *Chloroscombrus*.

This division is not wholly natural, inasmuch as the differences between the extremes among the species of *Caranx* are greater than those separating some of these species from related genera, while, on the other hand, the characters separating *Trachurus* and *Selene* from *Caranx* are technical only, and have little real value. Under the head of *Caranx* we recognize a number of subgenera, which seem to intergrade too closely to permit us to consider any of them as of full generic rank.

ANALYSIS OF GENERA OF CARANGINÆ.

COMMON CHARACTERS.—Premaxillaries protractile; maxillary with a supplemental bone; anal fin similar to soft dorsal, its base longer than

abdomen; pseudobranchiæ persistent; pectoral fins elongate; scales small.

- a. Dorsal outline more strongly curved than ventral outline.
 - b. Dorsal and anal each followed by 8 or 9 finlets.... MEGALASPIS (Asiatic species).
 - bb. Dorsal and anal each with a single detached finlet; body slender.
 - DECAPTERUS, 1.
 - bbb. Dorsal and anal without finlets.
 - c. Lateral line armed posteriorly with bony shields, or scutes.
 - d. Scutes well developed along entire length of lateral line.... TRACHURUS, 2.
 - dd. Scutes well developed along straight posterior portion of lateral line only.
 - CARANX, 3.
 - cc. Lateral line without shields; body short and deep, strongly compressed.
 - SELENE, 4.
- aa. Dorsal outline less strongly curved than ventral outline; body greatly compressed, its edges everywhere trenchant; armature of lateral line obsolete, or nearly so CHLOROSCOMBRUS, 5.

GENUS 1.—DECAPTERUS Bleeker.

- DECAPTERUS Bleeker, *Natuurk. Tydskr.*, 1855, v, 417 (*kurra*).
- EUSTOMATODUS Gill, *Proc. Ac. Nat. Sci. Phila.*, 1862, 261 (*kurroides*).
- GYMNEPIGNATHUS Gill, *l. c.*, 261 (*macrosoma*).
- EVEPIGYMNUS Gill, *l. c.*, 261 (*hypodus*).

Type CARANX KURRA C. & V.

ANALYSIS OF SPECIES OF DECAPTERUS.

- a. Shields of lateral line numerous (40 to 50 in number); depth, 5 in length; teeth present on jaws, vomer, and palatines; none on tongue.
 - b. Dorsal with 30 soft rays; lateral line anteriorly, with about 12 distinct, small black points..... PUNCTATUS, 1.
 - bb. Dorsal with 27 soft rays..... SCOMBRINUS, 2.
- aa. Shields of lateral line few (25 to 35) in number.
 - c. Lateral line anteriorly with black points; teeth "almost insensible"; caudal keel of about 35 shields; depth, 5½ (in total); pectorals, 6 in total length..... SANCTE-HELENÆ, 3.
 - cc. Lateral line without dark points.
 - d. Teeth distinct on lower jaw and tongue; caudal keel of 30 distinct shields; depth, 5½ in length HYPODUS, 4.
 - dd. Teeth obsolete; caudal keel of 25 shields; depth, 5¾ in length.
 - MACARELLUS, 5.

- 1. *Decapterus punctatus* (Agassiz) Gill.—*Cigar-fish*; *Round Robin*; *Scad*.
 - Scomber hippos* Mitchell, *Trans. Lit. & Phil. Soc. N. Y.*, 1, 1815, pl. 5, f. 5 (New York; not of L.).
 - Caranx punctatus* Agassiz, *Pisc. Bras.*, p. 108, tab. 56a, f. 2 (Brazil).
 - Caranx punctatus* Cuv. & Val., ix, 33, 1833 (Martinique); Günther, ii, 426.
 - Decapterus punctatus* Poey, *Syn. Pisc. Cubens.*, 363; Poey, *Enum. Pisc. Cubens.*, 79; Jor. & Gilb., *Syn. Fish. N. A.*, 432.
 - ? *Caranx suareus* (Risso) C. & V., ix, 33 (Mediterranean).

Habitat.—Cape Cod to Brazil; occasional northward; common on the coasts of Florida and in the West Indies.

2. *Decapterus scombrinus* (Valenciennes) Jordan & Gilbert.

Caranx scombrinus Valenciennes, Voyage de la Vénus, 1846, 332, pl. 7, f. 1,
(Galapagos Islands); Günther, ii, 426.

Habitat.—Galapagos Islands.

We have not seen the original description of this species. There is nothing in the short account given by Dr. Günther to indicate that it is distinct from *D. punctatus*.

3. *Decapterus sanctæ-helenæ* (Cuvier & Valenciennes) Poey.

Caranx sanctæ-helenæ Cuvier & Valenciennes, ix, 37, 1833 (St. Helena).
Decapterus sanctæ-helenæ Poey, Syn. Pisc. Cubens., 1868, 368 (Cuba); Poey,
Enum. Pisc. Cubens., 79.

Habitat.—Tropical parts of the Atlantic; St. Helena; Cuba.

This species is unknown to us. According to Poey it differs from *D. punctatus* in having its scutes subdenticulate, less narrow, and beginning much behind the origin of the anal.

4. *Decapterus hypodus* Gill.

Decapterus hypodus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 261 (Cape San Lucas); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 358.

Habitat.—Cape San Lucas.

Four specimens of this species are known, all obtained by Mr. Xantus at Cape San Lucas. It is probably a subspecies of *D. macarellus*, as already noted by us, the differences being of minor importance and of doubtful permanence.

5. *Decapterus macarellus* (Cuvier & Valenciennes) Gill.—*Antonino*.

Caranx macarellus Cuv. & Val., ix, 40, 1833 (Martinique); Günther, ii, 426.
Decapterus macarellus Poey, Enum. Pisc. Cubens., 79; Jordan & Gilbert, Syn.
Fish. N. A., 1883, 433.

Habitat.—West Indies, occasionally northward to Cape Cod; rare on the coasts of the United States.

GENUS 2.—TRACHURUS Rafinesque.

TRACHURUS Rafinesque, Indice d' Ittiol. Siciliana, 1810, 20 (*trachurus*, etc.).
TRACHURUS Cuv. & Val., ix, 6, 1833 (*trachurus*).

Type SCOMBER TRACHURUS L. = TRACHURUS SAURUS Raf.

ANALYSIS OF AMERICAN SPECIES OF TRACHURUS.

- a. Body elongate, little compressed, the depth 5 in length; scutes about 96 (50 + 46 to 48) in number, the height of the anterior scutes one-third that of the posterior and about $2\frac{1}{2}$ in diameter of eye; curved part of lateral line scarcely shorter than straight part; maxillary $2\frac{2}{3}$ in head, reaching just beyond vertical from front of eye; lining of opercle scarcely blackish.....PICTURATUS, 6.
- aa. Body comparatively deep and compressed, the depth 4 to $4\frac{1}{2}$ in length; scutes about 72 (34 to 36 + 36 to 38) in number, the anterior scutes scarcely lower than the posterior, their height about $1\frac{1}{2}$ in diameter of eye; length of curved part of lateral line $1\frac{2}{3}$ to $1\frac{3}{4}$ in straight part; maxillary reaching past front of pupil, $2\frac{1}{4}$ to $2\frac{1}{2}$ in head; lining of opercle blackish.....SAURUS, 7.

6. *Trachurus picturatus* (Bowdich) Jordan & Gilbert.

Caranx amia Risso, Ichth. Nice, 1810, 174 (Nice; not *Scomber amia* L. = *Lichia amia*).

Seriola picturata Bowdich, Excursion to Madeira, 1825, 123, f. 27 (Madeira).

Caranx picturatus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 269 (Monterey; Santa Barbara; San Pedro; Cape San Lucas).

Trachurus picturatus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 358, and in Syn. Fish. N. A., 911.

Caranx trachurus "deuxième subdivision," Cuv. & Val., iii, 17, 1833 (Mediterranean; Valparaiso).

? *Trachurus trachurus* Hutton, Fishes New Zealand, 1872, 16.

Caranx curvieri Lowe, Trans. Zool. Soc. Lond., ii, 183, 1837 (Madeira); Steindachner, Ichthyol. Berichte, v, 34, 1868 (Portugal; Teneriffe; Madeiras; Canaries).

Caranx (*Trachurus*) *curvieri*, Steindachner, Ichthyol. Beitr., ii, 16, 1875 (Tahahuano; Callao; Juan Fernandez; Galapagos Islands).

Trachurus curvieri Lütken, Spolia Atlantica, 1880, 126 (Azores; West Indies).

Caranx symmetricus Ayres, Proc. Calif. Acad. Nat. Sci., i, 62, 1855 (San Francisco).

Trachurus symmetricus Gill, Proc. Ac. Nat. Sci. Phila. 1862, 261 (Cape San Lucas).

Trachurus fallax Capello, Catal. Peix. Portugal, 1867, 310-318 (Lisbon).

Trachurus rissoi Giglioli, Catalogo degli Anfibi e Pesci Italiani 1880, 27 (on *Caranx amia* Risso).

Habitat—Warm seas; Mediterranean, Portugal, Madeiras, Canaries, Azores, West Indies, Pacific coast of Southern California, Mexico, Peru and Chili, San Francisco to Valparaiso.

7. *Trachurus saurus* Rafinesque.

Scomber linca laterali curva omnino loricate, etc., Artedi, Genus 31, No. 3 (in part, includes also *T. mediterraneus* and *T. picturatus*).

Scomber trachurus Linnæus, Syst. Nat., ed. x and xii (after Artedi and others; "habitat in Mediterraneo").

Scomber trachurus Bloch, Naturgesch. Fische Deutschlands, ii, 138, taf. 36, 1784 (excellent figure and description of the northern species; other species involved in the synonymy).

Caranx trachurus Cuv. & Val., ix, 11, 1833 (description: La Manche); Steindachner, Ichthyol. Berichte, v, 32, 1868; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 269 (Pensacola, Newport).

Trachurus trachurus Günther, ii, 419, 1860 (includes all species of the genus).

? *Caranzomorus plumierianus* La Cépède, Hist. Nat. Poiss., iii, 84, pl. 11, 1802 (unidentifiable; from a figure by Plumier, supposed to have been made in the West Indies).

Trachurus saurus Rafinesque, Indice d' Ittiol. Siciliana, 1810, 20 (no description; based on *Scomber trachurus* L.; hence, includes all species; the name *trachurus*—and constructively *saurus* also—restricted to the present species by Bloch and by Cuvier); Jor. & Gilb., Syn. Fish. N. A., 911, 1882.

Caranx semispinosus Nilson, Prodr. Ichth. Scand., 1832, 84.

? *Trachurus europæus* Gronow, Syst. Ichthy., 2 ed. Gray, 1854, 125 (not diagnostic).

Trachurus linnaei Malin, Bohusläns Fauna, 421 (Sweden); Lütken, Spolia Atlantica, 1880, 125 (Denmark; Faroë Islands; Naples).

Trachurus declivis Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 358 (Cape San Lucas;—not *Caranx declivis* Jenyns).

Habitat.—Coasts of Northern Europe, south to Spain, Naples; Newport, R. I.; Pensacola; Cape San Lucas; chiefly of the Northeastern Atlantic; but four American specimens being known.

GENUS 3.—CARANX La Cépède.

CARANX (Gomerson) La Cépède, Hist. Nat. Poiss., iii, 72, 1802 (*carangus*, etc.).

GALLUS La Cépède, Hist. Nat. Poiss., iv, 583, 1803 (*virescens* = *gallus*; name preoccupied in ornithology).

CITULA Cuvier, Règne Animal, ii, 1817 (*armata*).

BLEPHARIS Cuvier, Règne Animal, ii, 1817 (*indicus* = *ciliaris*; name used in botany).

VOMER Cuvier, Règne Animal, ii, 1817 (*browni* = *setipinnis*).

OLISTUS Cuvier, Règne Animal, ed. 2d, 1829 (*atropus*).

SCYRIS Cuvier, Règne Animal, ed. 2d, 1829 (*indica* = *gallus*).

GALLICHTHYS Cuvier & Valenciennes, Hist. Nat. Poiss., ix, 168 (*major* = *gallus*; name a substitute for *Gallus*).

HYNNIS Cuvier & Valenciennes, Hist. Nat. Poiss., ix, 195 (*gorensis*).

PLATYSOMUS Swainson, Nat. Hist. Classn. Fish. ii, 1839, 250 (*browni* = *setipinnis*).

SELAR Bleeker, Verhandl. Batav. Genootsch, xxiv, Makreele, 1851 (*boops*, etc.).

CARANGOIDES Bleeker, l. c. (*plagiotaenia*).

LEIOGLOSSUS Bleeker, l. c. (*LeioGLOSSUS carangoides*).

URASPIS Bleeker, l. c. (*Uraspis carangoides*).

CARANX Bleeker, l. c. (*carangus*, etc.; earliest restriction).

GNATHANODON Bleeker, l. c. (*speciosus*).

LEPTASPIS Bleeker, l. c. (*leptolepis*).

SELAROIDES Bleeker, l. c. (*leptolepis*).

CARANGICHTHYS Bleeker, Bijdragen Ichthyol. Faun. Celebes, iii, 760, about 1852, (*typus*).

CARANX Girard, Proc. Ac. Nat. Sci. Phila., 1858, 168 (*speciosus*, etc.).

CARANGUS Girard, l. c. (*esculentus* = *carangus* = *hippos*).

HEMICARANX Bleeker, Versl. Kon. Ak. Wet., xiv, 134, 1862 (*marginatus*).

ALECTIS (Rafinesque, Analyse de la Nature, 1815, *nomen nudum*?) Gill, Proc. Ac. Nat. Sci. Phila., 1862, 239 (*gallus*, etc.).

TRACHUROPS Gill, Proc. Ac. Nat. Sci. Phila., 1862, 431 (*crumenophthalmus*).

PARATRACTUS Gill, l. c. (*pisquctus*).

CARANGOPS Gill, l. c. (*falcatus* = *amblyrhynchus*).

BLEPHARICHTHYS Gill, l. c. (*crinitus*; substitute for *Blepharis*).

Type SCOMBER CARANGUS Bloch = SCOMBER HIPPOS L.

We see no sufficient reason for setting aside the earliest restriction of the genus *Caranx*, and therefore, with Bleeker, consider *Caranx hippos* (*carangus*) as the type. The reasons which have led Professor Gill to regard *Caranx speciosus* as the type are given in full in the Proc. Ac. Nat. Sci. Phila., 1862, 433, to which the reader is referred.

The species here associated in the genus *Caranx* differ widely in form, *C. crumenophthalmus* standing at one extreme, and *C. setipinnis* at the other. The gradation from one type to the other is unusually perfect, and we find it quite impossible to introduce any satisfactory lines of generic division. We may, however, recognize a number of subgenera of unequal, and for the most part of low, value, as follows:

1. TRACHUROPS (*crumenophthalmus*).

2. HEMICARANX (= *Carangops* Gill;) (*amblyrhynchus*; *atrimanus*).

3. URASPIS (*vinctus*; *leucurus*; *dentex*; *platessa*; *ruber*).

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4. CARANX (*Carangus* Grd. = *Carangichthys* Bleeker = *Paratractus* Gill;) (*caballus*; *chrysus*; *latus*; *hippos*; *lugubris*; *melampygus*).
5. GNATHANODON (= *Caraux* Gill;) (*spcciosus*).
6. CARANGOIDES (*orthogrammus*).
7. CITULA (*otrynter*).
8. BLEPHARIS (= *Gallus*, *Scyris*, *Gallichthys*, *Hynnus*, *Alcetis*, and *Blepharichthys*;) (*crinitus*).
9. VOMER (= *Platysomus*;) (*scitipinnis*).

Our arrangement of the Carangoid genera agrees with that given by Lütken (*Spolia Atlantica*, 1880, 124), with the following exceptions:

We do not regard *Gallichthys* (*Blepharis*) as a genus distinct from *Caranx*, as neither of the two characters assigned by Lütken to the former genus (partial or total absence of scales and disappearance of the spinous dorsal) is diagnostic. Neither can be used to draw a line between *Caranx otrynter* and *Caranx crinitus*. We refer the subgenus *Vomer* to *Caranx* rather than to *Selene*, as it really possesses the lateral shields of the former.

ANALYSIS OF AMERICAN SPECIES OF CARANX.*

- a. Shoulder-girdle with a deep cross-furrow at its junction with the isthmus, above which is a fleshy projection; body elongate, the depth about $3\frac{1}{2}$ in length (*Trachurops* Gill).
- b. Teeth, feeble, in a narrow band above, the outer slightly enlarged; eye very large, with large adipose eyelid, its diameter about 3 in head; interopercle and branchiostegals truncate behind; breast scaly; lateral line scarcely arched, its plates small, about 40 in number; soft dorsal and anal slightly falcate, with conspicuous basal sheath; pectoral shorter than head; 2d D. 1, 25; A. 1, 21.
CRUMENOPHTHALMUS, 8.
- aa. Shoulder-girdle normal, its surface even.
- c. Teeth of jaws in few series, unequal or at least not forming villiform bands, the outer series above usually enlarged, the lower teeth usually uniserial.

* We are unable to place the following species in the key, on account of imperfections in the description:

Caranx peruanus Tschudi.

Caranx peruanus Tschudi, Fauna Peruana, Ichthyologie, 1845, 19 (Pern).

This species remains thus far unidentified. The following is an outline of the description, which seems to be erroneous in some respects:

D. IX, 1, 23. Depth $6\frac{1}{2}$ in length (with caudal); head 4 (without caudal). Mouth not extending to eye. Teeth all fine and villiform. Teeth on tongue, vomer, and palatines. Eye large. Lateral line sharply bent. Second dorsal highest in front. Pectoral extending to first ray of soft dorsal. Color, dark bluish above; belly not very pale.

- d.* Dorsal and anal fins not falcate, their bases with a conspicuous sheath of scales; teeth small; breast scaly.
- e.* Maxillary very narrow, its greatest width scarcely one-fourth eye; head small; lateral line strongly arched in front; teeth uniserial, those on vomer and palatines minute or obsolete (*Hemicaranx* Bleeker).
- f.* Arch of lateral line very strong, its height more than one-third its length, which is much less than half the length of the straight part; upper lobe of caudal falcate, much longer than lower; mouth small, reaching little past front of eye; head $4\frac{1}{3}$ in length; depth $2\frac{1}{2}$; 2d D. 1, 28; A. 1, 25; shields 50; pectoral little longer than head, its base dusky.
AMBLYRHYNCHUS, 9.
- ff.* Arch of lateral line strong, its height less than one-third its length, which is about half the straight part; caudal lobes subequal; mouth small, reaching scarcely past front of eye; head 4; depth $2\frac{2}{3}$; 2d D. 1, 29; A. 1, 25; shields 60; pectoral half longer than head, its basal part and axil jet-black.
ATRIMANUS, 10.
- ee.* Maxillary broad; head rather large (*Uraspis* Bleeker).
- g.* Lateral line strongly arched, its arch much shorter than its straight portion.
- h.* Teeth on vomer, palatines, and tongue; arch of lateral line not half as long as straight portion; breast scaly; lateral scutes strong, about 48 in number; head $3\frac{1}{2}$; depth 3; 2d D. 1, 24; A. 1, 19; sides with dark bars; a black opercular spot. VINCTUS, 11.
- hh.* Teeth on vomer, palatines, and tongue obsolete; arch of lateral line a little more than half length of straight part; head $3\frac{1}{2}$; depth 2; 2d D. 1, 28, A. 1, 24; scutes 57; sides with dark bars; a black opercular spot.....LEUCURUS, 12.
- gg.* Lateral line little arched, its curved part not shorter than its straight part; maxillaries scarcely reaching front of eye.
- i.* Opercular spot distinct; body deep, compressed, the depth about 3 in length; small teeth on vomer and palatines, disappearing with age.
- j.* Snout $2\frac{1}{2}$ in head; head $3\frac{3}{8}$ in length; depth $3\frac{3}{8}$; 2d D. 1, 26; A. 1, 21; shields 24 to 29.....DENTEX, 13.
- jj.* Snout $2\frac{1}{8}$ in head; head $3\frac{1}{2}$ in length; depth 3; 2d D. 1, 27; A. 1, 22; shields 25 to 29.....PLATESSA, 14?
- ii.* Opercular spot obsolete; body rather elongate, the depth 3 to $3\frac{1}{2}$ in length; teeth on vomer and palatines persistent; snout 3 in head; head $3\frac{1}{8}$ in body; 2d D. 1, 26; A. 1, 22; shields 25 to 29.....RUBER, 15.
- dd.* Soft dorsal and anal elevated in front and more or less falcate; upper teeth in a band, the outer enlarged; lower teeth in one series; teeth on vomer, palatines, and tongue; maxillary broad; dorsal sheath of scales not greatly developed (*Caranx*).

- k. Body subfusiform, the depth less than one-third the length; breast scaly; teeth of outer series small, not canine-like; a black opercular spot; no spot on pectoral; arch of lateral line about half straight part.
- l. Pectoral fin very long, considerably longer than head; head $3\frac{3}{4}$ in length; depth $3\frac{1}{2}$; 2d D. 1, 22; A. 1, 20; scutes 40.....CABALLUS, 16.
- ll. Pectoral moderate, about as long as head; head $3\frac{3}{4}$ in length; depth $3\frac{1}{4}$; D. 1, 24; A. 1, 19; scutes 50.
CURYSUS, 17.
- kk. Body oblong-ovate, the depth more than $\frac{1}{3}$ the length; outer teeth rather strong.
- m. Vertical fins pale; general color silvery.
 - n. Breast scaly; lower teeth scarcely canine-like; opercular spot very small or obsolete; no pectoral spot; pectoral 3 in length; head $3\frac{2}{5}$; depth $2\frac{3}{4}$; 2d D. 1, 20; A. 1, 17; scutes 30...LATUS, 18.
 - nn. Breast naked, except a small rhombic area before ventrals; two small canines in front of lower jaw; opercular spot large; adult with a black spot on pectoral; pectoral 3 in length; head $3\frac{1}{4}$; depth about 3; 2d D. 1, 20; A. 1, 16; scutes (developed) about 25.....HIPPOS, 19.
- mm. Vertical fins chiefly black; general color brassy or blackish; lower teeth not canine-like; breast scaly.
 - o. Anterior profile gibbous; head very large; curve of lateral line less than $\frac{2}{3}$ straight part; second dorsal and anal strongly falcate; anterior lobe of dorsal about $\frac{2}{3}$ head; pectoral very long, $2\frac{3}{4}$ in length; color nearly uniform black; head $3\frac{1}{2}$; depth $2\frac{3}{5}$; 2d D. 1, 21; A. 1, 18; scutes 28.....LUGUBRIS, 20.
 - oo. Anterior profile scarcely gibbous; curve of lateral line a little more than $\frac{2}{3}$ straight part; soft dorsal and anal strongly falcate; anterior rays of dorsal $\frac{2}{3}$ head; pectoral a little more than $\frac{1}{2}$ body; color dark olivaceous or brassy; sides with many small dark brown spots; head $3\frac{1}{2}$; depth $2\frac{3}{4}$; 2d D. 1, 22; A. 1, 19; scutes about 35.....MELAMPYGUS, 21.
- cc. Teeth of jaws equally small; if present, forming viliform bands; maxillary broad; body compressed.
 - p. Teeth very minute, disappearing early, none on vomer or palatines (*Gnathanadon* Bleeker); breast scaly; body broadly ovate, strongly compressed; vertical fins somewhat falcate; the lobe of dorsal about half head; color silvery, with dusky cross-bands; opercular spot obsolete; head 3; depth 2; 2d D. 1, 20; A. 1, 16; scutes weak, about 15.....SPECIOSUS, 22.
 - pp. Teeth persistent; minute teeth on vomer and palatines; breast naked.

- q. Second dorsal and anal more or less elevated in front or falcate; spinous dorsal disappearing with age.
- r. Soft dorsal with none of its rays produced in filaments (*Carangoides*), the longest ray about one-third head; dorsal and anal very long; no naked area above lateral line; lateral line nearly straight, its scutes small; body oblong; head $2\frac{3}{4}$; depth $3\frac{3}{8}$; 2d D. 1, 32; A. 1, 26; scutes 17; color dusky olivaceous: vertical fins blackish.....ORTHOGRAMMUS, 23.
- rr. Soft dorsal with one or more rays produced in long filaments; dorsal and anal rather short; a partly naked area above lateral line.
- s. Soft dorsal with the first ray only produced in a filament (*Citula*); lateral line not strongly arched, its scutes weak; body broad-ovate, its edges but little trenchant; head 3; depth $2\frac{1}{4}$; 2d D. 1, 18; A. 1, 16; scutes about 25; color pale, without markings.....OTRYNTER, 24.
- ss. Soft dorsal with 3 to 6 of its anterior rays produced in long filaments (*Blepharis*); dorsal and anal rather short; lateral line moderately arched, its shields very feeble; body very broadly ovate, its edges more or less trenchant; head 3; depth 2 (1 in young); 2d D. 1, 19; A. 16; scutes 17; color silvery, nearly plain.....CRINITUS, 25.
- qq. Soft dorsal and anal extremely low, not at all falcate; body broad-ovate, very strongly compressed, its outlines everywhere sharply trenchant; head extremely gibbous above the eyes; its anterior profile nearly vertical; lateral line strongly arched anteriorly; its shields small and weak; scales very small, non-imbricate (*Iomer*); 2d D. 1, 22 to 1, 25; A. 19 or 20; scutes about 20; depth, about half length in adult, much more in young..SETIPINNIS, 26.

8. *Caranx crumenophthalmus* (Bloch) La Cépède.—Goggler; Goggle-eye Jack; Chicharro.

Scomber crumenophthalmus Bloch, Ichthyol., taf. 343 (Guinea).

Caranx crumenophthalmus La Cépède, iv, 107, 1803; Cuv. & Val., ix, 62; Günther, ii, 429; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 358 (Cape San Lucas), and of recent writers generally.

Trachurops crumenophthalmus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 261.

Scomber plumieri Bloch, taf. 344 (Antilles).

Caranx plumieri C. & V., ix, 65.

Scomber balantophthalmus Bloch & Schneider, Syst. Ichthyol., 1801, 29 (Guinea).

Caranx daubentoni La Cépède, Hist. Nat. Poiss., iv, 107, 1803 (Antilles).

Caranx macropthalmus Agassiz, Spix, Pisc. Bras., 107, 1829 (Brazil).

Trachurops brachycheirus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 261 (Cape San Lucas).

Trachurops plumieri Poey, Enum. Pisc. Cubens., 78.

Habitat.—Atlantic coasts of United States, Central America, South America, Africa, West Indies, Cape San Lucas, Panama.

According to Streets, the East Indian representative of the type of *Trachurops* (*Caranx mauritanus* Quoy & Gaim.), is a different species from the American form. It is, perhaps, doubtful to which species the name *erumenophthalmus* was originally applied, as we find no definite record of the occurrence of our species on the coast of Guinea, the locality assigned by Bloch. This species is common in the West Indies, and ranges occasionally northward to Cape Cod. Numerous specimens have been taken at Cape San Lucas and at Panama. We do not see that these differ from the Atlantic type.

9. *Caranx amblyrhynchus* Cuvier & Valenciennes.—*Segundo*.

Caranx amblyrhynchus Cuv. & Val., Hist. Nat. Poiss., ix, 100, pl. 248, 1833;

Günther, ii, 411, and of authors (West Indies, &c.).

Caranx fuleatus Holbrook, Ichth. S. Car., 1860, 94 (Charleston).

Carangops fuleatus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 431.

? *Caranx secundus* Poey, Memorias Cuba, ii, 223, 1860.

Carangops secundus Poey, Syn. Pisc. Cub., 1867 (Cuba); Poey, Enum. Pisc. Cubens., 78

Caranx heteropygus Poey, Memorias Cuba, ii, 344, 1860 (Cuba).

Carangops heteropygus Poey, Enum. Pisc. Cubens., 77.

Habitat.—Cape Hatteras to Brazil. Common in the West Indies.

There is nothing in the description of *C. secundus* to show that it differs from *C. amblyrhynchus*. As Poey considered them different, we place it in the synonymy of the latter with doubt.

10. *Caranx atrimanus* Jordan & Gilbert.

Caranx atrimanus Jordan & Gilbert, Bull. U. S. Fish Com., 1882, 309 (Panama).

Habitat.—Pacific coast of tropical America; Panama.

This rare species is as yet known only from Panama.

11. *Caranx vinctus* Jordan & Gilbert.—*Cocinera*.

Caranx vinctus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 349 (Mazatlan).

Caranx sp. Lay & Bennett, Beechey's Voyage, 1849, 55 (San Blas, Mazatlan).

Habitat.—Pacific coast of Mexico, Mazatlan, San Blas, Punta Arenas.

This well-marked species is abundant about the entrance to the Gulf of California, its range extending thence to the coast of Central America, specimens having been taken by Professor Gilbert at Punta Arenas.

12. *Caranx leucurus* Günther.

Caranx leucurus Günther, Proc. Zool. Soc. Lond., 1864, 24, and Fish. Centr.

Amer., 1869, 430 (Panama).

Caranx fürthi Steindachner, Ichth. Beitr., iv, 12, 1875 (Panama).

Habitat.—Pacific coast of tropical America; Panama.

This species we have not examined. The five known specimens are from Panama, and all are immature. There can, we think, be no doubt of the identity of *fürthi* with *leucurus*.

13. *Caranx dentex* (Bloch & Schneider) Cuvier & Valenciennes.

? *Scomber ascensionis* Osbeck, Reise in China, 1760 (Ascension Island).

Scomber dentex Bloch & Schneider, Syst. Ichthyol., 30, 1801 (Brazil).

Caranx dentex Cuv. & Val., ix, 1833, 87 (Rio Janeiro); Günther, ii, 441 (Madeira; (?) New Orleans); Steindachner, Ichthol. Bericht, v, 36, pl. 1 (Cadiz, Gibraltar, Malaga, Canary Islands).

Caranx luna Geoffroy St. Hilaire, Deser. Egypt. Poiss., 1809, pl. 23 (Egypt); Cuv. & Val., ix, 80.

? *Trachurus imperialis* Rafinesque, Caratteri di Alcuni Nuovi Generi, 42, 1810 (Sicily).

Citula banksi Risso, Eur. Mérid., 1826, 422 (Nice).

Caranx solea Cuv. & Val., ix, 1833, 86 (Brazil).

Caranx analis Cuv. & Val., ix, 1833, 88 (St. Helena).

Habitat.—Both coasts of Atlantic Ocean, Brazil, Mediterranean Sea, Madeiras, and Canaries.

We have made no study of this species; but follow authors in identifying the *Caranx luna* of the Mediterranean with the Brazilian species (*dentex*). The *Scomber ascensionis* of Osbeck, wrongly identified by Forster with *Caranx lugubris*, is probably this species, but the meager description does not authorize a change of name. *Caranx solea*, although not hitherto identified, seems to be certainly the present species.

14. *Caranx platessa* Cuvier & Valenciennes.

Caranx platessa Cuv. & Val., ix, 84, 1833 (East Indies).

Caranx georgianus Cuv. & Val., ix, 85, 1833 (Australia); Günther, ii, 440 (Australia, New Zealand, Raoul Island, Norfolk Island); Günther, Voyage Challenger, Shore Fishes, 24, 1880 (Juan Fernandez, identified with *Caranx chilensis*).

Caranx chilensis Gay, Hist. Chili Zool., 1850, ii, 235 (Juan Fernandez); Steindachner, Ichth. Beitr., ii, 17, 1875 (Juan Fernandez).

Habitat.—South Pacific, New Zealand, Australia, coast of Chili.

We follow Dr. Günther in identifying the Chilean *C. chilensis* with the Australian species, there being no discrepancies in the description. We have compared the detailed descriptions of this species and of *C. dentex* given by Steindachner, and can find no difference likely to be permanent. The sole difference indicated by Dr. Günther ("This species is closely allied to *C. dentex*, from which it differs by the presence of teeth on the palate") has been shown by Steindachner and Vinciguerra to be fallacious, being dependent on age. It is therefore probable that *C. platessa* is identical with *C. dentex*, as well as with *C. chilensis*, but we hesitate to formally unite them here in the absence of specimens.

15. *Caranx ruber* (Bloch) Jordan & Gilbert.—*Cibi amarillo*; *Cibi carbonero*.

Scomber ruber Bloch, Ichth., taf. 342; Bloch & Schneider, Syst. Ichth., 1801, 29 (Ste. Croix).

Caranx blochii Cuv. & Val., ix, 69, 1833 (Ste. Croix: same type); Günther, ii, 430 (West Indies).

? *Caranx bartholomaei* Cuv. & Val., ix, 100, 1833 (St. Bartholomew).

Caranx cibi Poey, Memorias Cuba, ii, 224, 1860 (Cuba); Jordan, Proc. U. S. Nat. Mus., 1880, 486 (Cuba); Jordan & Gilbert, Syn. Fish. N. A., 436.

Carangoides cibi Poey, Syn. Pisc. Cub., 1867, 366; Enum. Pisc. Cubens., 77.

? *Caranx iridinus* Poey, Memorias Cuba, ii, 226, 1860 (Cuba).

? *Carangoides iridinus* Poey, Syn. Pisc. Cub., 1867, 366; Enum. Pisc. Cubens., 77.

Caranx beani Jordan, Proc. U. S. Nat. Mus., 1880, 486 (Beaufort, N. C.); Jordan & Gilbert, Syn. Fish. N. A., 436.

Habitat.—West Indies; North Carolina to Brazil.

We have united under the above head a number of nominal species from the West Indies, which from the published descriptions we are unable to distinguish.

Since the description by Professor Jordan of *Caranx beani*, we have examined the young of various species, and have now little doubt that the much greater depth of the body in *beani*, as distinguished from *cibi*, is due to the immaturity of the types of the former. There is nothing in Poey's description of *C. iridinus* to distinguish it from *C. cibi* (color plumbeous instead of yellow, &c.), and our notes on types of the two preserved in the National Museum likewise fail to indicate any difference. *C. bartholomewi* is said to have 33 to 35 lateral shields, and is moreover compared with *C. chrysus*. The description otherwise agrees fully with *C. cibi*, and it is possible that 5 or 6 of the smaller scales were included in the enumeration of the scutes. So far as we can see, *C. blochii*, as described by Günther and Cuvier & Valenciennes, agrees with *C. cibi*. The earlier name *ruber*, although inappropriate, the original redness of the type coming from spoiled alcohol, and having been intensified into carmine by the artist, can hardly be set aside.

16. *Caranx caballus* Günther.—*Jurel*.

Trachurus boops Girard, U. S. Pac. R. R. Expl., Fish, 1859, 108 (San Diego; not *Caranx boops* C. & V.).

Caranx boops Gill, Proc. Ac. Nat. Sci. Phila., 1862, 261.

Caranx caballus Günther, Fish. Centr. Amer., 1869, 431 (Panama); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1880, 456; 1881, 46, 232; 1882, 359 (Porto Escondido; Cape San Lucas; Mazatlan; Panama). Jordan & Gilbert, Syn. Fish. N. A., 435.

? *Caranx caballus* Günther, Voyage Challenger, Shore Fishes, 1880, 10 (Bermuda, probably an error).

Caranx girardi Steindachner, Ichthyol. Notizen, ix, 25, 1869 (based on *Trachurus boops* Grd.).

Habitat.—Pacific coast of tropical America, San Diego to Panama. ?? Bermuda Islands.

This species is closely related to *C. chrysus*, of which it is a representative on the Pacific coast.

17 *Caranx chrysus* (Mitchill) De Kay.—*Hard Tail*; *Jurel*; *Yellow Mackerel*; *Cojinera*.

Scomber crysos Mitchill, Trans. Lit. and Phil. Soc. N. Y., 1, 424, 1815 (New York).

Caranx chrysos De Kay, N. Y. Fauna, Fishes, 1842, 121; Günther, ii, 445; Jordan & Gilbert, Syn. Fish. N. A., 1883, 970; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883.

Caranx pisquetus Cuv. & Val., ix, 97, 1833; Jordan & Gilbert, Syn. Fish. N. A., 435.

Paratractus pisquetus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 432; Poey, Syn. Pisc. Cub., 1862, 366.

Trachurus squamosus, Gronow, Syst. ed. Gray, 1856, 125.

Caranx hippos Holbr., Ichth. S. Car., 1860, 90.

Habitat.—Cape Cod to Brazil; generally abundant.

This species is abundant farther north than any of the others. It has not been reported from the Pacific, being there replaced by *C. caballus*.

18. *Caranx latus* Agassiz.—*Jurel*.

? *Scomber kleinii* Bloch, Ichthyol. 1787, taf. 347; Bloch & Schneider, Syst. Ichthyol. 1801, 30 (description insufficient; may be *C. hippos*).

? *Caranx sexfasciatus* Quoy & Gaimard, Zool. Voy. Freycinet, Poiss., 358, pl. 65, f. 4, 1824 (young; perhaps of some other species); C. & V., ix, 110, 1833 (Vanicolo; Waglow; Batavia).

Caranx latus Agassiz, Pisc. Bras. 1829, 105 (Brazil).

? *Caranx lepturus* Agassiz, Pisc. Bras. 1829, 106; Günther, ii, 447.

? *Scomber heberi* Bennett, Fishes Ceylon, 1830, pl. 26.

Caranx fallax Cuv. & Val., ix, 95, 1-33 (Antilles; Brazil); Poey, Rep. Fis. Nat. Cuba, 1, 328; ii, 14 (Cuba); Jordan & Gilbert, Syn. Fish. N. A., 1882, 437; Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 110 (Mazatlan; Panama) and of most recent writers.

Caranx fallax Gill, Proc. Ac. Nat. Sci. Phila., 1862, 433, and elsewhere; Poey, Syn. Pisc. Cub., 364, 1863; Poey, Enum. Pisc. Cubens., 1875, 75.

Caranx sem C. & V., ix, 105 (Pondicherry).

Caranx forsteri C. & V., ix, 107 (East Indies); Bleeker, Natuurk. Tydskr. Nederl. Ind., 1852, iii, 164 (East Indies).

? *Caranx xanthopygus* C. & V., ix, 109 (East Indies).

? *Caranx peroni* C. & V., ix, 112 (East Indies).

? *Caranx lessoni* C. & V., ix, 113 (Malabar).

? *Caranx belengeri* C. & V., ix, 116 (Malabar).

? *Caranx ekala* C. & V., ix, 117 (Malabar).

Caranx flavocornutus Schlegel, Fanna Japonica, 1850, 110 (Japan).

Caranx parasistes Richardson, Voy. Erebus and Terror, 136 (Port Essington).

Caranx hippos Günther, ii, 449, 1860 (East and West Indies; China; Madagascar); Günther, Fische Centr. Amer. 1869, 431 (Panama); Günther, Fische der Südsee, 1876, 131, f. 84 (Pacific); Day, Fishes of Malabar, 1865, 86 (not *Scomber hippos* L.).

Caranx richardi Holbrook, Ichth. S. Car., 1860, 96, pl. xiii, f. 1 (South Carolina).

Caranx marginatus Gill, Proc. Ac. Nat. Sci. Phila., 1863, 166 (Panama).

? *Caranx aureus* Poey, Enum. Pisc. Cubens., 1875, 76.

Habitat.—All warm seas, north to Mazatlan and Virginia; very abundant in tropical America.

19. *Caranx hippos* (Linnaeus) Jordan & Gilbert.—*Cavally*; *Crevallé*; *Jack*; *Toro*; *Jiguagua*.

? *Scomber cordula* Linnaeus, Syst. Nat., ed. x, 1758. (In part; apparently confused with *Megalaspis rotleri*.)

Trachurus cordyla Gronow, Syst. Ichth., ed. Gray, 124, 1856.

Scomber hippos Linnaeus, Syst. Nat., ed. xii, 1, 494, 1766 (Charleston).

Caranx hippos Gill, Proc. Ac. Nat. Sci. Phila., 1862, 433, and elsewhere.

Caranx hippus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 269; Jordan & Gilbert, Syn. Fish. N. A., 1883, 437, and elsewhere.

Scomber caranx Bloch, Ichthyol., taf. 340, 1787 (on a drawing by Plumier).

Caranx carangus C. & V., ix, 91, 1833 (West Indies); Günther, ii, 448, and of authors.

Caranx erithrurus La Cépède, iii, 68, 1802 (based on *S. hippos* L.).

Caranx carangua La Cépède, iii, 74, 1802 (on a drawing by Plumier).

Caranx defensor De Kay, N. Y. Fauna Fishes, 1842, 120 (New York); Holbrook, Ichth. S. Car., 87, 1860 (Charleston).

Carangus cseulentus Girard, U. S. Mex. Bound. Surv. 1859, 23 (Texas).

Carangus chrysos Gill, Proc. Ac. Nat. Sci. Phila., 1862, 434 (young).

Carangus hippos Poey, Enum. Pisc. Cubens., 1875, 75.

Caranx caninus Günther, Fish. Centr. Amer., 1869, 432 (Panama).

Habitat.—Both coasts of tropical America, north to Cape Cod and Mazatlan. East Indies. More abundant northward than any other species except *C. chrysos*.

20. *Caranx lugubris* Poey.—*Tiñosa*.

Scomber ascensionis Forster MSS; Bloch & Schneider, Syst. Ichthyol., 1801, 33; Forster, Deser. Anim. ed. Lichtenstein, 412, 1844 (Ascension Island; not of Osbeck).

Caranx ascensionis C. & V., xi, 102 (Ascension); Günther, ii, 1860, 432; Günther, Fische Südsee, xi, 132, 1876, taf. 85 (St. Helena; Society Islands; Kingsmill); Günther, Voy. Challenger, Shore Fishes, 1880, 4, 5 (St. Paul's Rocks; Ascension).

Carangus ascensionis Streets, Bull. U. S. Nat. Mus., vii, 88, 1877 (Fanning Islands).

Caranx lugubris Poey, Memorias Cuba, ii, 222, 1860 (Cuba); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 227 (Clarion Island).

Carangus lugubris Poey, Syn. Pisc. Cub., 1868, 365.

Caranx frontalis Poey, Memorias Cuba, ii, 222, 1860 (Cuba).

Habitat.—Rocky islands in the tropics; Clarion Island (Revillagigedos); West Indies; Mid-Atlantic; Mid-Pacific.

We have compared our specimen from Clarion Island with one of Poey's types and with the specimens obtained by Dr. Streets. These differ somewhat in form and in the height of the fins, but we have no doubt that all belong to the same species. The name *ascensionis* should not be retained for this species, having evidently been first given to some other, probably to *C. dentex*.

21. *Caranx melampygnus* Cuvier & Valenciennes.

Caranx melampygnus C. & V., ix, 1833, 116 (East Indies); Günther, ii, 440, 1860; Günther, ii, 440, 1860; Günther, Fische der Südsee, 133, 1876, pl. 86 (Polynesia, &c.); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 230 (Socorro Island; Revillagigedos).

Carangus melampygnus Streets, Bull. U. S. Nat. Mus., vii, 1877, 69 (Honolulu).

Caranx stellatus Eydonx & Souleyet, Voy. Bonite. Poiss., 167, 1840 (Sandwich Islands).

Caranx bixanthopterus Rüppell, Neue Wirbelthiere, 1837, 49.

Habitat.—Pacific Ocean generally, about islands in mid-ocean. Revillagigedo Islands.

22. *Caranx speciosus* (Forskål) La Cépède.—*Mojarra*; *Dorada*.

Scomber speciosus Forskål, Deser. Anim., 1775, 54 (Red Sea).

? *Caranx speciosus* La Cépède, Hist. Nat. Poiss., iii, 72, 1802.

Caranx speciosus C. & V., ix, 130, 1833 (East Indies); Günther, ii, 44; Günther, Fish. Centr. Amer., 1869, 431 (Panama); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 375.

Gnathanodon speciosus Bleeker, Verh. Bat. Gen., xxiv, Makreele, 72, 1852.

Caranx panamensis Gill, Proc. Ac. Nat. Sci. Phila., 1863, 166 (Panama).

Habitat.—Tropical parts of the Pacific Ocean, East Indies, Mazatlan, Panama.

This species is generally common on the Pacific coast of tropical America. Our specimens agree fully with the descriptions of the East Indian form.

23. *Caranx orthogrammus* Jordan & Gilbert.

?? *Scomber ferdau* Forkål, Descr. Anim., 1775, 55 (Red Sea).

? *Caranx ferdau* Günther, Fische der Südsee, 1876, 134 (Red Sea; Polynesia).

Caranx orthogrammus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 226 (Clarion Island, Revillagigedos).

Habitat.—Islands off the Pacific coast of tropical America. ?Polynesia.

It is possible that this species may prove to be identical with *Caranx ferdau*, or some related species. The single large specimen known, however, differs materially from all the published descriptions of species of this type.

24. *Caranx otrynter** nom. sp. nov.

Carangoides dorsalis Gill, Proc. Ac. Nat. Sci. Phila., 1863, 166 (Panama; not *Fomer dorsalis* Gill).

Caranx dorsalis Günther, Fish. Centr. Amer., 1869, 432 (Panama); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 375 (Panama).

Habitat.—Pacific coast of tropical America; Mazatlan; Panama.

This species marks the transition from "*Caranx*" to "*Blepharis*." The adult would be referred to the latter genus, while the young might find place in *Carangoides* if these petty subdivisions should be retained. The relations of *C. otrynter* with *C. armatus* (Forskål) are rather close, but the two seem to be satisfactorily separated.

Compared with typical species of *Caranx* (as *C. hippos*), *C. otrynter* differs strikingly in many respects, among others the following: The greater compression and elevation of the body, the greater length and sharpness of the breast, the much greater depth of the preorbital region, the greater prominence and sharpness of the frontal and occipital keel, the more oblique position of the bones of the head, the feebleness and uniformity of the teeth, the approximation below of the mandibular rami, the reduction in size of the scales and scutes, and the increase of the naked areas, the reduction or loss (in the adult) of the dorsal and anal spines, the increase in length of the lobes of the dorsal, anal, and caudal, and, finally, the increase in the difference between the old and the

* *Οτρυντηρ*, a driver, in allusion to the whip-like ray of the second dorsal.

young. Not one of these features can, however, be used for generic distinction, as they increase by easy transitions from species to species.

On the other hand, comparing *Caranx otrynter* with *Selene vomer*, we find that in almost every one of the differences above noted the latter species carries these characters to a still greater extreme, and differs from *Caranx otrynter* in just the respects in which the latter differs from *Caranx hippos*. *Caranx setipinnis* is, in some regards, a species still more extreme than *Selene vomer*, although it has not quite lost the lateral scutes.

25. *Caranx crinitus* (Mitchill) Jordan & Gilbert.

? *Zeus gallus* L., Syst. Nat., x (includes *Selene*, &c.).

? *Caranx gallus* Günther, ii, 455 (East Indies).

? *Zeus ciliaris* Bloch, Ichthyol., vi, 29, taf. 29, 1788 (East Indies; young of *C. gallus*?).

? *Caranx ciliaris* Günther, ii, 454, 1860 (East Indies); ? Günther Fische der Südsee, 1876, 135, taf. 89; ? Day, Fishes Malabar, 90, 1865.

Gallichthys ciliaris Lütken, Spolia Atlantica, 1880, 139, 197.

Scomber filamentosus Mungo Park, Trans. Linn. Soc., iii, 36, 1797 (Sumatra).

? *Gallus virescens* La Cépède, iv, 583, 1803 (after Linnæus).

Zeus crinitus Mitchill, Amer. Jour. Sci. Arts, xi, 144, 1826 (Shoreham).

Blepharis crinitus De Kay, N. Y. Fauna Fish, 1842, 123; Jordan & Gilbert Syn. Fish. N. A., 438.

Blepharichthys crinitus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 262 (Cape San Lucas).

Caranx crinitus Jor. & Gilb., Proc. U. S. Nat. Mus., 1882, 359.

Gallichthys crinitus Lütken, Spolia Atlantica, 1880, 131, 197.

? *Seyris indica* C. & V., ix, 145 (East Indies).

? *Blepharis indicus* C. & V., ix, 154.

Blepharis sutor C. & V., ix, 161 (Caribbean Sea).

Caranx sutor Günther, ii, 454.

Blepharis major C. & V., ix, 163 (West Indies).

? *Gallichthys major* C. & V., ix, 168 (East Indies).

? *Gallichthys chevola* C. & V., ix, 175 (East Indies).

? *Carangoides blepharis* Bleeker, Verhand. Batav. Genoots. xxiv, Makr., 67, 1852 (East Indies).

? *Carangoides gallichthys* Bleeker, l. c., 68 (East Indies).

? *Hynnus cubensis* Poey, Mem. Cuba, ii, 535, 1860 (Cuba); Enum. Pisc. Cubens., 79.

Seyris analis Poey, Syn. Pisc. Cub., 1868, 369 (Cuba); Enum. Pisc. Cubens., 79.

Habitat.—Tropical America on both coasts, north to Cape Cod and Mazatlan. ? East Indies.

The many nominal species of this type have been reduced by Lütken to three or four: *C. gallus* and *C. ciliaris* of the East Indies, *C. alexandrinus* of North Africa, and *C. crinitus* of America. We have not examined the East Indian forms, but see no reason for doubting that *ciliaris* is the young of *gallus*, as has been supposed by Dr. Day and others. Our young specimens of *C. crinitus*, moreover, agree fully with the figures of *C. ciliaris*. We think it, therefore, extremely probable that all the nominal species of this type (except *C. alexandrinus*) are

forms of *Caranx gallus*. We, however, follow Lütken in retaining the American name until specimens can be actually compared. As has been shown by Lütken (*Spolia Atlantica*, 197), the nominal genera *Scyris*, *Blepharis*, *Gallichthys*, and *Hynnys* are simply stages in the development of the individuals, their characters changing with age.

26. *Caranx setipinnis* (Mitchill) Jordan & Gilbert.—*Blunt-nosed Shiner*; *Jorobado*; *Moon-fish*; *Horse-fish*.

♂ (*Setipinnis*.)

Zeus setipinnis Mitchill, Trans. Lit. and Phil. Soc. N. Y., 1, 334, pl. 1, f. 9, 1815 (New York).

Argyreus setipinnis Günther, ii, 459, 1860.

Vomer setipinnis Gill, Proc. Ac. Nat. Sci. Phila., 1862, 436, and elsewhere.

Selene setipinnis, Lütken, *Spolia Atlantica*, 1880, 135; Steindachner, Beitr. Kenntniss. Fische Afrikas, ii, 10, 1882; Jordan & Gilbert, Syn. Fish. N. A., 440.

Caranx setipinnis Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882.

Vomer browni Cuv. & Val., ix, 189, pl. 256, 1833, and of various writers.

Platysomus browni, *spixi*, and *micropteryx* Swainson, Nat. Hist. Classn. Fishes, ii, 1839, 405.

Argyreus unimaculatus, Batchelder, Proc. Bost. Soc. Nat. Hist., ii, 78 (Maine: young); Storer, Hist. Fish. Mass., 78, pl. xiv, f. 2.

Vomer sanctæ-marthæ, *columbiensis*, *martinicensis*, *dominicensis*, *norcboracensis*, *sanctæ-petri*, *brasiliensis*, *cayennensis*, and *cubæ* Guichénot, Ann. Soc. Linn. Maine et Loire, 1865, 38 to 44.

Vomer curtus Cope, Proc. Am. Philos. Soc. Phila., 1870, 119 (Rhode Island).

♂♂ (? Var. *gabonensis*.)

Argyreus setipinnis, var. A, Günther, ii, 459.

Vomer gabonensis Guichénot, l. c., 42 (Gaboon).

Argyreus gabonensis Steindachner, Fisch-fauna des Senegals, 1869, 33.

♂♂♂ (? Var. *dorsalis*.)

Argyreus setipinnis, var. B, Günther, ii, 459.

Vomer dorsalis Gill, Proc. Ac. Nat. Sci. Phila., 1862, 436.

Vomer senegalensis and *goreensis* Guichénot, l. c., 35, 37.

Habitat.—Tropical America and Western Africa; Cape San Lucas to Peru; Maine to Brazil.

This species is generally abundant within its range. Some local variations occur, but most of the above nominal species are based on the changes due to age, or on individual peculiarities shown by single specimens. It is possible that *C. gabonensis* (having the depth more than half the total length) and *C. dorsalis* (slenderer, with the rays of the second dorsal, I, 25) are really distinct species. It seems, however, very unlikely. The remaining species of M. Guichénot, as well as his family *Vomeridæ*, seem to be wanton synonyms, without excuse.

GENUS 4.—SELENE La Cépède.

- SELENE, La Cépède, Hist. Nat. Poiss., iv, 560, 1803 (*argentea*).
 ARGYREIOSUS La Cépède, Hist. Nat. Poiss., iv, 566, 1803 (*vomer*).
 SELENE Lütken, Spolia Atlantica, 1880, 124.

Type SELENE ARGENTEA La Cépède = adult of ZEUS VOMER L.

We separate this genus from *Caranx* on the character, certainly of little value, of the entire absence of bony scutes. Two species are known. The variations depending on age are in this group extreme.

ANALYSIS OF SPECIES OF SELENE.

- a. Dorsal with about 18 soft rays; anal with about 15; anterior profile of head curved; bones of head lower and less oblique than in *S. vomer*.....OERSTEDI, 27.
 aa. Dorsal with about 23 soft rays; anal with about 18; anterior profile of head, from base of snout to occiput almost perfectly straight.....VOMER, 28.

27. *Selene oerstedii* Lütken.

Selene oerstedii Lütken, Spolia Atlantica, 1880, 144 (Punta Arenas).

Habitat.—Pacific coast of tropical America.

Lütken's type came from Punta Arenas. Specimens have been obtained by Professor Gilbert at Mazatlan and at Panama.

28. *Selene vomer* (Linnæus) Lütken.—*Moon-fish*; *Jorobado*; *Horse-fish*; *Look-down*; *Horse-head*.

Zeus vomer Linnæus, Syst. Naturæ and elsewhere (young).

Argyreiosus vomer La Cépède, iv, 566, 1803; C. & V., ix, 177; Günther, ii, 458; Gill, Proc. Ac. Nat. Sci. Phila., 1862, 437, and elsewhere, and of most recent writers.

Selene vomer Lütken, Spolia Atlantica, 1880, 547 (with figures showing the changes undergone with age); Jordan & Gilbert, Syn. Fish. N. A., 439.

Zeus niger Bloch & Schneider, Syst. Ichth., 1801, 98 (confounded with *Pomacanthus arcuatus*).

Selene argentea La Cépède, iv, 560, 1803, pl. 9, f. 2 (adult); Brevoort, Ann. Lyc. Nat. Hist. N. Y., v, 68, pl. 4, 1853; Gill, Proc. Ac. Nat. Sci. Phila., 1862, 436; Poey, Enum. Pisc. Cubens., 80; and of various authors.

Zeus capillaris Mitchill, Trans. Lit. & Phil. Soc., 1, 383, 1815 (young).

Argyreiosus capillaris Gill, Proc. Ac. Nat. Sci. Phila., 1862, 437.

Zeus rostratus Mitchill, l. c., 384 (young).

Zeus geometricus Mitchill, Amer. Monthly Mag., 1818, ii, 245 (adult).

Argyreiosus triacanthus, filamentosus, and setifer Swainson, Nat. Hist. Classn. Fish., 1839, 250, 407, 409 (young).

Argyreiosus mauricci Swainson, l. c., 408 (adult).

Argyreiosus mitchilli De Kay, N. Y. Fauna Fish., 1842, 126 (young).

Argyreiosus spiri Castelnau, Anim. Nouv. Rares, 23 (adult).

Argyreiosus brevoorti Gill, Proc. Ac. Nat. Sci. Phila., 1863, 83 (Panama; young).

Argyreiosus pacificus Lockington, Proc. Ac. Nat. Sci., 1876, 84 (Lower California; adult).

Habitat.—Tropical America, on both coasts; Cape Cod to Brazil; Lower California to Peru.

Our observations of this species tend to confirm the correctness of

Dr. Lütken's views (*Spolia Atlantica*, 139) as to the transformations incident to its growth. We see no difference between Atlantic and Pacific coast specimens.

GENUS 5.—CHLOROSCOMBRUS Girard.

MICROPTERYX Agassiz, Spix, Pisc. Bras. 1829, 104 (*cosmopolita*; name a substitute for *Seriola* used in botany; *Micropteryx* is, however, preoccupied, according to Dr. Gill).

CHLOROSCOMBRUS Girard, Proc. Ac. Nat. Sci. Phila. 1858, 168.

Type MICROPTERYX COSMOPOLITA Agassiz = SCOMBER CHRYSURUS L.

ANALYSIS OF SPECIES OF CHLOROSCOMBRUS.

- a. Curved part of lateral line (chord) about as long as head (measured from tip of lower jaw), and $1\frac{3}{8}$ to $1\frac{1}{2}$ in length of straight part; lateral shields wholly obsolete; coloration rather pale CHRYSURUS, 29.
 aa. Curved part of lateral line considerably longer than head, $1\frac{1}{8}$ to $1\frac{3}{8}$ in straight part; lateral line armed posteriorly with small bony shields; coloration rather dusky, the fins largely tipped or edged with blackish STIRURUS, 30.

29. *Chloroscombrus chrysurus* (Linnæus) Gill.—*Bumper*; *Casabe*.

Scomber chrysurus L., Syst. Nat. (Charleston, S. C.).

Micropteryx chrysurus Günther, ii, 460.

Chloroscombrus chrysurus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 437; Jordan & Gilbert, Syn. Fish. N. A., 441.

Scomber chloris Bloch, Ichth., taf. 339.

Micropteryx cosmopolita Agass., Spix, Pisc. Bras., 104.

Seriola cosmopolita C. & V., ix, 219, pl. 256, and of authors.

Chloroscombrus cosmopolitus Girard, Proc. Ac. Nat. Sci. Phila., 1858, 168.

Scomber latus Gronov., Syst. ed. Gray, 1856, 127.

Chloroscombrus caribbeus Girard, l. c., 168.

Habitat.—Tropical parts of the Atlantic; Cape Cod to Brazil and Western Africa; abundant in the West Indies.

30. *Chloroscombrus stirurus* Jordan & Gilbert.

Chloroscombrus stirurus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883 (Panama).

Habitat.—Pacific coast of tropical America; Magdalena Bay to Panama.

This species represents *C. chrysurus* on the Pacific coast of tropical America. It is very similar to the latter, and will probably be considered as a geographical variety of it when these fishes are better known.

RECAPITULATION.

We have in this paper admitted 30 species of *Caranginae*. More or less doubt is attached to the nomenclature or systematic position of several of these. We therefore repeat the list here, with the nature of the doubts remaining to be solved in each case. The general distribution of the species is indicated by the letters W. (Western Atlantic), A. (Western Africa), P. (Eastern Pacific, Panama, &c.), E. (East Indies).

Genus 1.—DECAPTERUS.

1. *Decapterus punctatus* (W.).
2. *Decapterus scoubrinus* (P.). (Doubtful species; perhaps identical with *D. punctatus*.)
3. *Decapterus sanctæ helenæ* (W.). (Insufficiently described.)
4. *Decapterus hypodus* (P.). (Probably a variety of, or identical with, *D. macarellus*.)
5. *Decapterus macarellus* (W.).

Genus 2.—TRACHURUS. (Perhaps unworthy of retention.)

6. *Trachurus picturatus* (A. P.).
7. *Trachurus saurus* (A. W.). (Name to be retained somewhat questionable.)

Genus 3.—CARANX.

8. *Caranx crumenophthalmus* (A. W. P.). (Originally described from Africa; if American type should prove different it would stand as *C. plumieri*.)
9. *Caranx amblyrhynchus* (W.). (Possibly includes two species—*amblyrhynchus* and *secundus*.)
10. *Caranx atrimanus* (P.).
11. *Caranx rinctus* (P.).
12. *Caranx leucurus* (P.).
13. *Caranx dentex* (A. W.). (Should perhaps stand as *C. ascensionis*.)
14. *Caranx platessa* (P. E.). (Probably not different from *C. dentex*; possibly the Chilean form is distinct both from *dentex* and *platessa*, and should stand as *C. chilensis*.)
15. *Caranx ruber* (W.). (Name objectionable; possibly more than one species has been included by us. *Cibi*, *iridinus*, and *beani* are all possibly distinct from *ruber*, but not probably.)
16. *Caranx caballus* (P.). (The name *C. girardi* is of same year; we are not sure which is entitled to priority.)
17. *Caranx chrysus* (W.).
18. *Caranx latus* (W. P. E.). (Name to be adopted not definitely settled, some other names of more or less doubtful application being older.)
19. *Caranx hippos* (W. P. E. A.).
20. *Caranx lugubris* (W. P. E.).
21. *Caranx melampygus* (P. E.).
22. *Caranx speciosus* (P. E.).
23. *Caranx orthogrammus* (P.). (Possibly identical with *C. ferdau*.)
24. *Caranx otrynter* (P.). (The name *dorsalis* should be retained if the subgenus *Fomer* be recognized as a genus distinct from *Caranx*.)
25. *Caranx criinitus* (W. P.). (Probably identical with *C. ciliaris*, which in turn is probably the young of *C. gallus*.)
26. *Caranx setipinnis* (A. W. P.). (Possibly separable generically from *Caranx*; possibly includes three species, *setipinnis*, *gabonensis*, and *dorsalis*.)

Genus 4.—SELENE. (Possibly unworthy of retention.)

27. *Selen ærstedii* (P.).
28. *Selene romer* (W. P.).

Genus 5.—CHLOROSCOMBRUS.

29. *Chloroscombrus chrysurus* (A. W.).
30. *Chloroscombrus stirurus* (P.). (Perhaps to be considered a geographical variety of *C. chrysurus*.)