

A REVIEW OF THE SPECIES OF STOLEPHORUS FOUND ON THE ATLANTIC COAST OF THE UNITED STATES.

By JOSEPH SWAIN.

Our knowledge of the Anchovies of the Atlantic coast of the United States has been confused and imperfect. Among them I recognize three species, the synonymy and diagnostic characters of which I give in the present paper.

I am indebted to Professor Jordan for the use of his collections and library, and for valuable suggestions.

ANALYSIS OF SPECIES.

- a. Body elongate, little compressed, the depth less than one-fifth the length; snout pointed; insertion of dorsal about midway between root of caudal and end of snout; caudal peduncle long and slender; depth 6 in length; silvery lateral band broad, diffuse, broader than eye. D. 14; A. 19.....PERFASCIATUS, 1.
- aa. Body compressed, little elongate; the depth more than one-fifth the length; insertion of dorsal nearer root of caudal than tip of snout.
 - b. Anal basis moderate, its rays about 20; snout pointed, projecting much beyond lower jaw; depth $4\frac{1}{2}$ in length; silvery lateral band very sharply defined, almost as broad as eye.....BROWNI, 2.
 - bb. Anal basis elongate, its rays about 26; snout rather blunt, not projecting much beyond lower jaw; depth about four in length; silvery lateral band diffuse, narrow, not much broader than pupil.....MITCHILLI, 3.

1. *Stolephorus per fasciatus* (Poey) Jor. & Gilb.

? *Engraulis argyrophanus* C. & V. Hist. Nat. Poiss. xxi, 49, 1848 (equatorial Atlantic).

Engraulis per fasciatus Poey, Memorias Cuba, ii, 313, 1860 (Havana); Poey, Syn. Pisc. Cub. 421, 1868 (Havana); Günther, Cat. Fishes Brit. Mus. vii, 391, 1868 (San Domingo; Cuba).

Stolephorus per fasciatus J. & G. Syn. Fishes North America, 273, 1882 (Wood's Holl, Mass.).

Habitat.—Cape Cod to Cuba; Wood's Holl, Massachusetts; Havana; San Domingo.

Head $3\frac{3}{4}$ ($4\frac{1}{4}$ in total); depth 6 ($6\frac{2}{3}$). D. 14; A. 19.

Body elongate, less compressed than in *S. browni*; belly slightly compressed, not serrated. Depth of head $1\frac{2}{3}$ in its length. Snout pointed, projecting beyond lower jaw, about 5 in head, its profile below not concave. Eye 4 in head. Mouth somewhat oblique; maxillary truncate, not reaching quite to base of mandible. Teeth on mandible and maxillary weaker than in *S. browni*. Opercle short, oblique. Gill-rakers as long as snout. Insertion of dorsal about midway between root of caudal and end of snout. Caudal peduncle long and slender. Caudal fin forked. Anal rather short, without basal sheath, its base $5\frac{1}{2}$ in length of fish. Pectoral short, $2\frac{1}{2}$ in head. Ventrals 3 in head.

Silvery lateral band broad, one-half wider than eye, bordered above by a dusky stripe. Tip of snout and upper part of head rather dusky, color otherwise as in *S. browni*. Described from a single specimen from Wood's Holl, Mass.

Engraulis argyrophanus, taken by Kuhl and Van Hasselt in the equatorial Atlantic, during their passage from Europe to Batavia, as described by C. & V., does not materially differ from *Engraulis perfuscatus* Poey, but, owing to the inadequate description and the locality, I have queried their identity.

2. *Stolephorus browni* (Gmel.) J. & G.

"*Piquitinga*, Maregr. Pisc. Bras. 159."

"*Menidia*, Brown, Jam. 441, tab. 45, fig. 3."

"*Argentina*, sp., Gronov, Zoophyl. 112, No. 350."

Atherina browni Gmel. Syst. Nat. 1397, 1788 (Atlantic Ocean; Pacific. After Brown).

Engraulis browni C. & V. Hist. Nat. Poiss. xxi, 41, 1848 (New York; Havana; Jamaica; Martinique; Vera Cruz; Brazil); Poey, Memorias Cuba, ii, 312, 1860 (Havana); Poey, Sys. Pisc. Cub. 419, 1868 (Havana); Günther, Cat. Fishes Brit. Mus. vii, 389, 1868 (Atlantic; Pacific Coast of Central America*); Jor. & Gilb. Proc. U. S. Nat. Mus. 1878 (Beaufort, N. C.).

Stolephorus browni J. & G. Syn. Fishes North America, 273, 1882 (Cape Cod to Brazil).

Clupea vittata Mitchill, Trans. Lit. & Phil. Soc. N. Y. i, 456, 1815 (New York); DeKay, New York Fauna, 254, 1842 (copied from Mitchill); Storer, Syn. Fishes North America, 457, 1845 (New York).

Engraulis vittatus Baird, Ninth Smithsonian Rept. 1854, 347 (Beaseley's Point, New Jersey).

Engraulis piquitinga "Spix, Pisc. Bras. tab. 23, fig. 1 (not good)."

Engraulis tricolor Agass. Pisc. Bras. 51, 1850; Poey, Memorias Cuba, ii, 314, 1860 (Havana).

Argentina menidia "Gronov, Syst. ed. Gray, 141."

Engraulis mitchilli Günther, Cat. Fishes Brit. Mus. vii, 391, 1868 (Atlantic coast of America; Cayenne. Description confused with that of *E. mitchilli* C. & V.),

Engraulis hiuleus Goode & Bean, Proc. U. S. Nat. Mus. ii, 343, 1879 (Clear Water Harbor, Fla.).

Stolephorus hiuleus J. & G. Syn. Fishes North America, 237, 1882.

Habitat.—New York to Brazil; Hudson River; New York Harbor; Beaseley's Point, New Jersey; Beaufort, North Carolina; Clear Water Harbor, Florida; Havana; Jamaica; Martinique; Vera Cruz; Cayenne; Brazil.

Head $3\frac{3}{4}$ ($4\frac{1}{2}$); depth $4\frac{3}{4}$ ($5\frac{1}{2}$). D. 15; A. 20.

Body oblong, compressed; the belly compressed, somewhat serrated. Head moderate. Snout pointed, projecting much beyond lower jaw, its length less than diameter of eye, about 5 in head, its profile below slightly concave. Eye about $3\frac{1}{2}$ in head. Mouth oblique; maxillary pointed, reaching almost to gill-openings. Teeth evident on maxillary and mandible. Cheeks triangular, scarcely larger than eye. Opercle

* This and other references to *Stolephorus browni* from the Pacific Coast apparently refer to the related but distinct species, *Stolephorus ischanus* J. & G.

rather short, oblique. Length of gill-rakers equals two-thirds the diameter of eye. Insertion of dorsal about midway between root of caudal fin and anterior border of eye. Caudal peduncle robust. Caudal fin deeply forked. Anal moderate, with basal sheath, the length of its base $4\frac{3}{4}$ in head. Pectorals nearly 2 in head. Ventrals short, $3\frac{3}{4}$ in head.

Color in spirits slightly olivaceous; side with a sharply defined silvery band, about as wide as eye, more distinct than in our other species. Snout yellowish; top of head dusky; sides of head lustrous silvery; caudal light, with many dark points; dorsal little dotted; anal and pectoral scarcely specked. Described from numerous specimens from Beaufort, N. C., and a specimen from the coast of Brazil. The specimens obtained by Professor Baird at Beesley's Point, New Jersey, belong to this species.

Günther's description of *Engraulis mitchilli* does not conform to *S. browni* in depth of body and in the number of anal rays; these characters probably indicate a confusion with *E. mitchilli* C. & V. *Engraulis hiuleus* Goode and Bean differs from *S. browni* in a body less deep and in having two more rays in the anal—differences which scarcely sustain the validity of the species.

3. *Stolephorus mitchilli* (C. & V.) J. & G.

Engraulis mitchilli C. & V. Hist. Nat. Poiss. xxi, 50, 1848 (New York; Lake Pontchartrain); Poey, Syn. Pisc. Cub. pp. 421 and 422, 1868 (Havana).

Stolephorus mitchilli J. & G. Proc. U. S. Nat. Mus. 1882.

Engraulis vittata Storer, Fishes of Mass. 341, 1867, pl. xxvii, fig. 3. (Description incomplete and erroneous; the figure good, and evidently referring to *S. mitchilli*. Provincetown, Mass.)

Engraulis duodecim Cope, Trans. Amer. Philos. Soc. 1866 (Beesley's Point, N. J. Description erroneous* if intended for this species).

Habitat.—Cape Cod to Texas and Cuba; Provincetown; Wood's Holl; Pensacola; Lake Pontchartrain; Galveston; Havana.

For detailed description of *S. mitchilli*, see J. & G., Proc. U. S. Nat. Mus. 1882.

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ON A COLLECTION OF FISHES FROM THE LOWER MISSISSIPPI VALLEY.

By O. P. HAY.

The fishes described in the following paper were collected mostly by the author during the summer of 1881. The first point visited was Memphis, Tenn. My collections there were made during the latter part of June, on the Arkansas side of the river. The seining was done there, as I was obliged for the most part to do it elsewhere, in the shallow

*This species differs from *E. browni* in having the dorsal fin entirely anterior to the anterior ray of the long and deeply concave anal and in the serration of its belly. (Cope.)