

EXOCOETIDAE**Flyingfishes**

- Eggs** — Pelagic and large.
 — Shell: note differences in species below.
 — Yolk: homogeneous.
 — Oil globules: none.
- Larvae** — Body deep anteriorly, tapers to narrow peduncle.
 — Persistent preanal finfold generally not present.
 — Caudal fin well developed at hatching; lower lobe longer and with more rays than upper lobe; fin unique with 7+8 principal rays.
 — Pectoral rays last to form.
 — Abundant in neuston samples.

Meristic features

Myomeres: 39–50*

* Range in 11 species.

***Exocoetus volitans* Linnaeus**

- Eggs** — Diameter: 2.8–3.0 mm.
 — Shell: smooth, with no spines or filaments.
- Larvae** — Pectoral fin long, pelvic short.
 — Pelvic fin origin under tip of pectoral fin (snout to pelvic fin base shorter than pelvic to caudal fin base).

Meristic features

Myomeres: 42–45

D : 13–15

A : 13–14

Piv : 6

P : 14–15

***Cypselurus furcatus* (Mitchill)**

- Eggs** — Shell: with filaments.
- Larvae** — Fins formed at 5.0 mm.
 — Pectoral and pelvic fins long in juveniles.
 — Dorsal fin base longer than anal.

Meristic features

Myomeres: 45–46

D : 13–14

A : 10

Piv : 6

***Oxyporhamphus micropterus* (Valenciennes)**

- Eggs** — Spherical (pinkish-brown).
 — Diameter: 1.95–2.10 mm.
 — Shell: with short spines.
- Larvae** — Pectoral and pelvic fins short.
 — Elongate lower jaw in juveniles only.
 — Note persistent preanal finfold in this species, as in scomberesocids, belonids and hemiramphids (p. 210); also late-forming pelvic fin rays.

Meristic features

Myomeres: 49–51 (high)

D : 13–15

A : 13–16

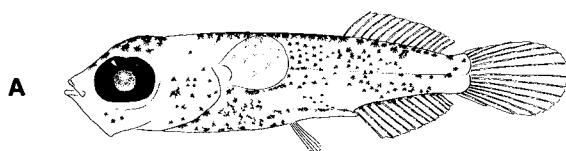
Piv : 6

P : 11–13

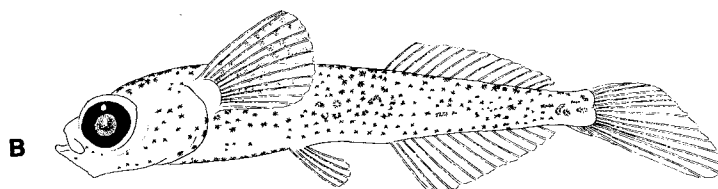
- Note:** (1) *O. micropterus* included within Hemiramphidae by Parin *et al.* (1980).
 (2) Several other genera and species possible in the western North Atlantic, but larvae are undescribed.

Fig. — **A–B**, Kovalevskaya 1964; **C–D**, Hildebrand and Cable 1930; **E–F**, Kovalevskaya 1963 (all redrawn).

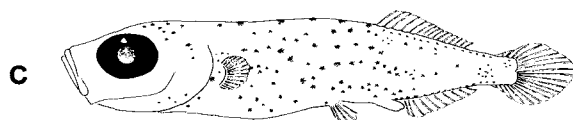
Ref. — Parin and Gorbunova 1966.

Exocoetus volitans**EXOCOETIDAE**

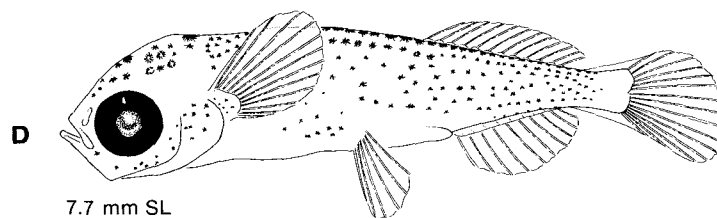
3.7 m SL



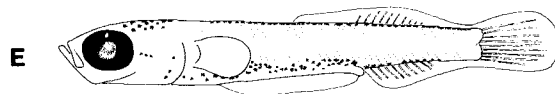
9.8 mm SL

Cypselurus furcatus

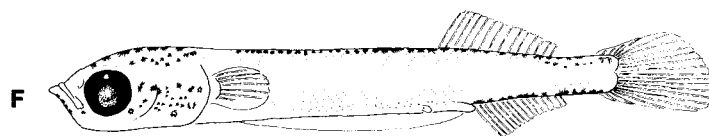
5.0 mm SL



7.7 mm SL

Oxyporhamphus micropterus

4.0 mm SL



6.9 mm SL

A-B (Pacific material).

EXOCOETIDAE**Generic Characters**

(Hemiramphidae)

- Eggs** — Demersal, with filaments on shell.
— Oil globules: none.
- Larvae** — Body long, slender, not tapered, with vent at about 66% TL.
— Dorsal and anal fins small and posterior.
— Persistent preanal finfold.
— Dorsal and ventral rows of pigment.

***Hemiramphus brasiliensis* (Linnaeus)**

- Larvae** — Preanal finfold ends anterior to pelvic fin.
— Pigment light up to size of 13.5 mm SL.
— Posterior dorsal rays elongated and pigmented.
— Posterior anal rays pigmented.

Meristic features

Myomeres: 52-55
D : 12-15
A : 11-15
P : 10-12

***Hyporamphus unifasciatus* (Ranzani)**

- Larvae** — Preanal finfold ends posterior to pelvic fin.
— Pigment heavy at 7.0 mm SL.
— Posterior dorsal rays not elongated.
— Posterior anal rays not pigmented.

Meristic features

Myomeres: 49-53
D : 12-16
A : 14-18
P : (10)11-12

Note: *Hemiramphus balao* Lesueur (54-56 myomeres) and *Euleptorhamphus velox* Poey (71-73 myomeres) occur in western North Atlantic north to Cape Cod, but larvae are undescribed.

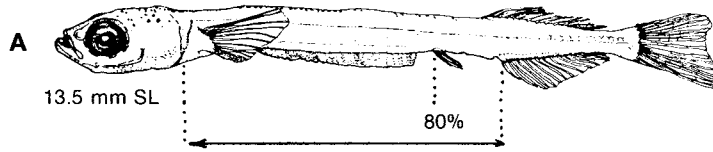
Fig. — A-C, Hardy and Johnson 1974.

Ref. — Collette and Parin 1970; Collette 1974.

Hemiramphus brasiliensis

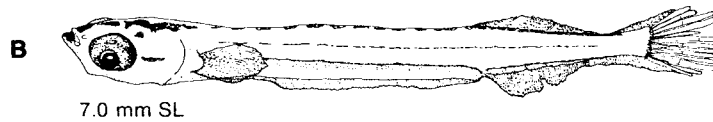
EXOCOETIDAE
(Hemiramphidae)

Halfbeaks

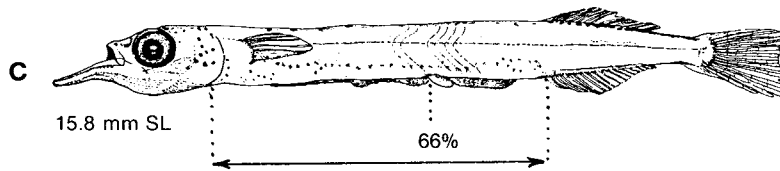


2 rows of small spots dorsally head to caudal fin base

Hyporamphus unifasciatus



2 rows of large dorsal spots join posteriorly



Note difference
in pelvic fin origin

SCOMBERESOCIDAE ***Scomberesox saurus* (Walbaum)**

- Eggs** — Pelagic, oval.
 — Diameter: 2.15–2.76 mm (long axis).
 — Yolk: homogeneous.
 — Shell: bristles and filaments.
 — Oil globules: none.
- Larvae** — Hatching occurs at 6–8 mm.
 — Body long and slender, with vent at 60–70% of TL.
 — Persistent preanal finfold.
 — Dorsal, anal and pelvic fins posterior on body, finlets form posterior to dorsal and anal.
 — Pelvic fin buds appear at 14–17 mm, and rays at about 20 mm.
- Meristic features**
 Myomeres: 64–68
 Vert : 39–42+26–27
 D : 9–12
 A : 12–13
 Plv : 6
 C : 7+8*
 * Principal rays

BELONIDAE **Four Western Atlantic Species**

- Eggs** — Demersal, with filaments on shell.
 — Oil globules: none.
- Larvae** — Body long, slender and tapered, with anus at 66% of TL.
 — Persistent preanal finfold.
 — Pectoral and pelvic fins small; large dorsal and anal fins posterior on body.
 — Flexion occurs at hatching.

Meristic features for material from western Atlantic:

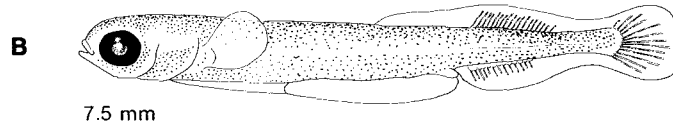
Species	Myomeres	D	A
<i>Tylosurus acus</i> (Lacépède)	90–95	22–26	20–24
<i>T. crocodilus</i> (Peron and Lesueur)	80–84	21–23	18–22
<i>Strongylura marina</i> (Walbaum)	69–77	14–17	16–20
<i>Ablennes hians</i> (Valenciennes)	93–97	23–26	24–28

Fig. — **A**, Nesterov and Shiganova 1976; **B**, Sanzo 1940; **C**, d'Ancona 1931; **D**, Mito 1958; **E**, Foster 1974 (A–D redrawn).

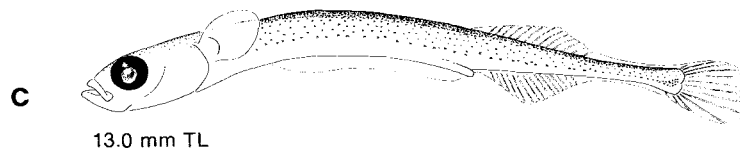
Ref. — Berry and Rivas 1962; Collette and Parin 1970; Collette 1974.

Scomberesox saurus

SCOMBERESOCIDAE

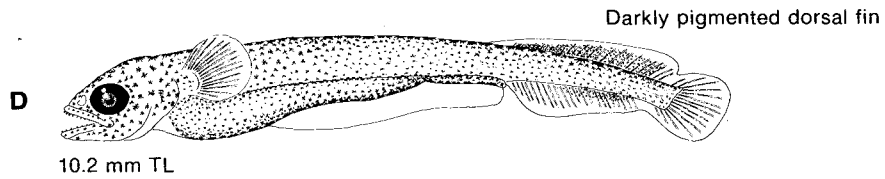


All have well-developed caudal fins at hatching

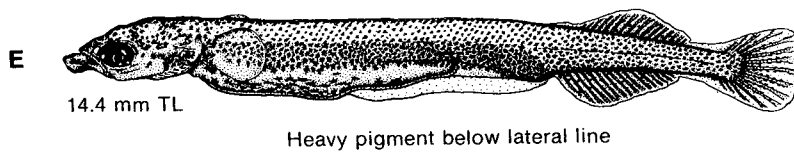


Tylosurus acus

BELONIDAE



Strongylura marina



Both belonid species heavily pigmented

B-C (eastern Atlantic material); **D** (Pacific specimen)