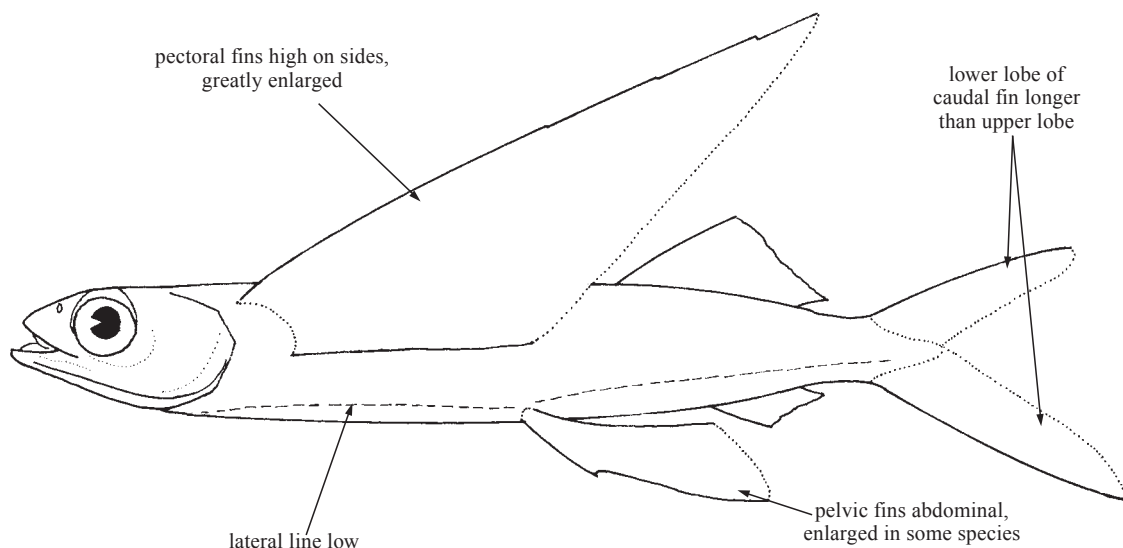


## EXOCOETIDAE

## Flyingfishes

by N.V. Parin, Shirshov Institute of Oceanology, Russia (after Gibbs, 1978)

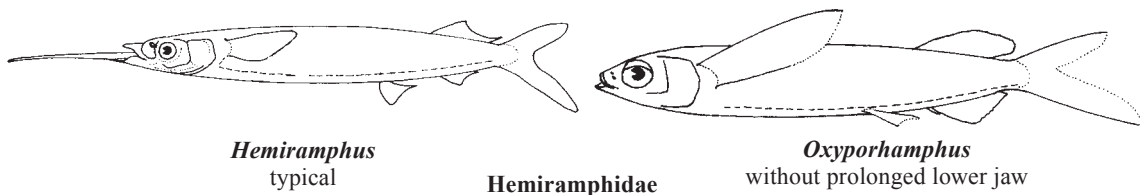
**Diagnostic characters:** Small to medium-sized (to 45 cm total length) with elongate, broadly cylindrical (round or elliptical in cross-section) bodies, flattened ventrally in some species. Head short; snout usually blunt (produced in *Fodiator* only), shorter than eye in all western Atlantic species. Mouth small; jaw teeth absent or very small. Gill rakers well developed. Upper pharyngeal bones of third gill arches close together, but not fused into a single plate. **No spines in fins.** Dorsal and anal fins set equally far back on body; their bases short and opposed. Caudal fin deeply forked; its lower lobe longer than the upper. **Pectoral fins high on sides, strikingly long, always extending beyond dorsal-fin origin.** Pelvic fins abdominal in position, and greatly enlarged in many, but not all, species. **Lateral line low on body.** Scales large, cycloid (smooth to touch), easily shed. Swimbladder large, extending posteriorly beyond body cavity. Young stages (to about 10 cm) quite different in appearance from adults, with pectoral fins shorter; dorsal fin often higher than in adults; single or paired chin barbels conspicuous in many species. **Colour:** dark above, pale below. Dark colours usually iridescent blue or green in life; dorsal fin in some species with black pigment; pectoral fins in some species with pale crossband and outer margin. Colour patterns of young stages variable, and spots and bars often developed.



**Habitat, biology, and fisheries:** Inhabit surface waters of open ocean as well as neritic and inshore areas. Well known for their habit of leaping out of the water and gliding over long distances. Schooling, do not undertake extensive migrations. Feed on zooplankton, larger species also feed on small fishes. Attracted by light at night. Very abundant in most tropical seas. Usually appreciated as food and some species are highly prized; however, few commercial fisheries have developed. Target fishery operates from Barbados, Tobago, etc., using mainly drift gill nets in localities of unusually heavy spawning concentrations, the catch from this fishery is mostly fresh-frozen. In other regions within the area, especially around the Antilles, flyingfishes are consumed fresh or used as bait. FAO statistics report landings ranging from 1 623 to 2 835 t from 1995 to 1999.

**Similar families occurring in the area**

Hemiramphidae: body more elongated, except *Oxyporhamphus*; pectoral fins short to medium length, never reaching dorsal-fin origin; lower jaw much longer than upper jaw, except in adult *Chriodorus* and *Oxyporhamphus*; upper pharyngeals of third gill arch usually fused, forming a single plate; swimbladder not extending posteriorly beyond body cavity.



**Key to the species of Exocoetidae in the area**

- 1a. Pectoral fins moderately long, not reaching beyond posterior part of anal-fin base; pectoral branch of lateral line present (Fig.1). . . . . → 2
- 1b. Pectoral fins very long, reaching beyond anal-fin base to or almost to caudal-fin base; pectoral branch of lateral line absent . . . . . → 3

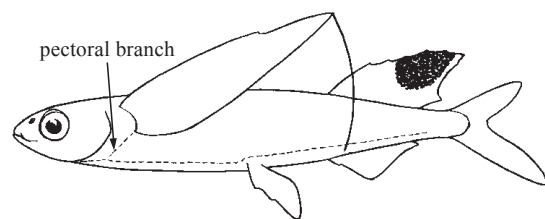


Fig. 1 *Parexocoetus*

- 2a. Snout long and pointed, much longer than eye diameter; upper jaw not protrusible; juveniles not barbelled, with lower jaw greatly elongated (recorded only twice from the area, off Suriname and in the Carribean Sea but both records seem to be erroneous . . . . . *Fodiator acutus*
- 2b. Snout short and blunt, shorter than eye diameter; upper jaw protrusible (Fig. 2); juveniles with paired chin barbels (easily lost) and lower jaw not elongated . . . . . *Parexocoetus hillianus*

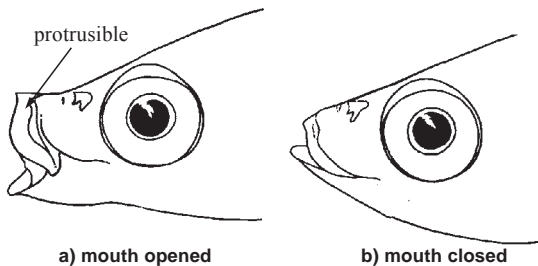


Fig. 2 *Parexocoetus*

- 3a. Pelvic fins short, not reaching anal-fin origin (barely reaching in juveniles), inserted nearer to pectoral-fin insertion than anal-fin origin (Fig. 3); juveniles not barbelled . . . . . → 4
- 3b. Pelvic fins long, reaching well beyond anal-fin origin, inserted nearer to anal-fin origin than pectoral-fin insertion (Fig.4); juveniles barbelled or not barbelled . . . . . → 5

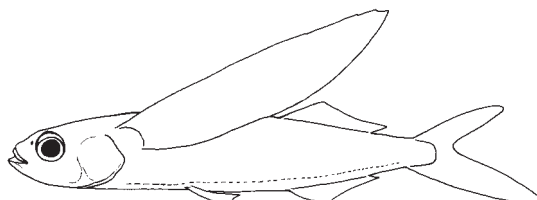


Fig. 3 *Exocoetus*

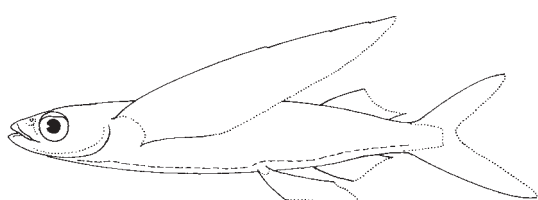
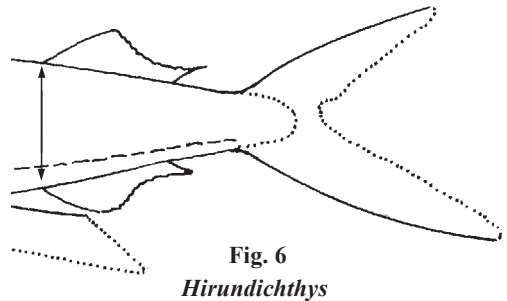
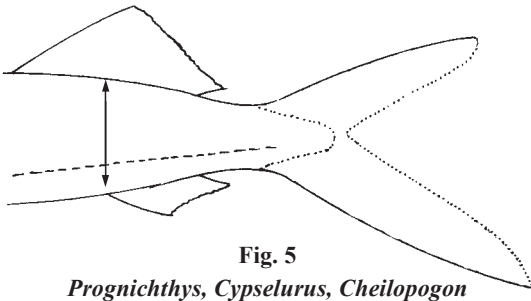


Fig. 4 *Hirundichthys*

- 4a. Gill rakers on first gill arch 22 to 29 (usually 25 to 27); 7 to 8 (usually 7.5) scales in transverse row between dorsal-fin origin and lateral line; juveniles hump-backed . . . . . *Exocoetus obtusirostris*
- 4b. Gill rakers on the first gill arch 29 to 37 (usually 32 to 34); 6 or 7 (usually 6.5) scales in transverse row between dorsal-fin origin and lateral line; juveniles elongated . . . . . *Exocoetus volitans*
- 5a. Origin of anal fin 3 soft rays or more behind origin of dorsal fin (Fig. 5); dorsal fin 2 to 5 soft rays more than anal fin; juveniles barbelled or not barbelled . . . . . → 6
- 5b. Origin of anal fin slightly before, under or, rarely, not more than 2 soft rays behind origin of dorsal fin (Fig. 6); dorsal fin usually with less or equal number of rays than anal fin; juveniles not barbelled . . . . . → 13



- 6a. First 2 pectoral-fin rays unbranched (Fig. 7); juveniles not barbelled . . . . . → 7
- 6b. Only the first pectoral-fin ray unbranched (Fig. 8); juveniles barbelled . . . . . → 8

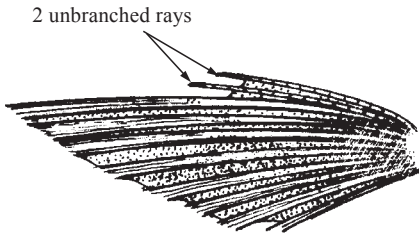


Fig. 7  
*Prognichthys*

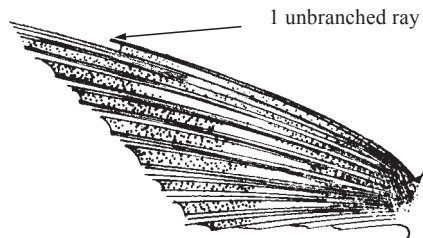
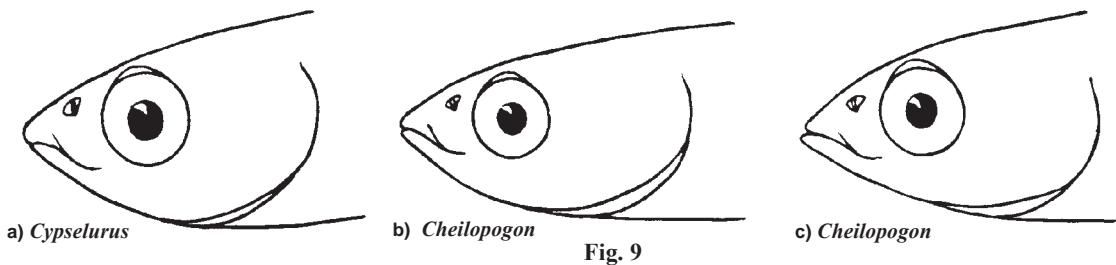


Fig. 8  
*Cypselurus, Cheilopogon*

- 7a. Pectoral fins chiefly pale with central part greyish; eye diameter 1.2 to 1.5 in postorbital part of head; anal-fin soft rays 9 to 11 (usually 10); juveniles with pectoral fins pale with 2 large black blotches, 1 at base and the other in outer portion . . . . . *Prognichthys glaphyrae*
- 7b. Pectoral fins chiefly blackish with central part greyish; eye diameter 1.4 to 1.8 in postorbital part of head; anal-fin soft rays 8 to 10 (usually 9); juveniles with pectoral fins almost uniformly pigmented . . . . . *Prognichthys occidentalis*

- 8a. Pelvic fins inserted about midway between posterior head margin and origin of lower caudal-fin lobe; lower jaw slightly shorter than upper jaw and included beneath the latter when mouth closed (Fig. 9a); pectoral fins lightly and almost uniformly pigmented; juveniles with a single chin barbel . . . . . *Cypselurus comatus*
- 8b. Pelvic fins inserted much nearer to posterior head margin than origin of lower caudal-fin lobe (except in *Ch. cyanopterus*); both jaws of equal length, or lower jaw a little longer than upper jaw (Fig. 9b, c); pectoral fins more densely pigmented, usually (except in *Ch. cyanopterus*) with paler transverse strip or basal triangle; juveniles with paired chin barbels . . . . . → 9



- 9a. Dorsal fin moderately high (longest soft ray usually less than 10 times in standard length), bearing a prominent black spot (Fig. 10a); palatine teeth present; jaw teeth noticeable (conspicuous to the touch). . . . . → 10
- 9b. Dorsal fin moderately low (longest soft ray usually more than 10 times in standard length), without black spot (Fig. 10b); palatine teeth absent; jaw teeth minute (not conspicuous to the touch). . . . . → 11

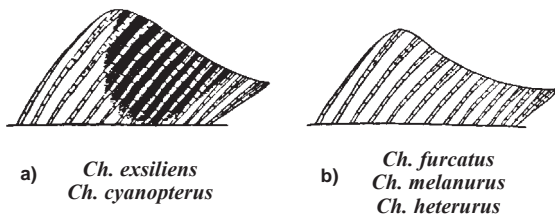


Fig. 10 dorsal fin

- 10a. Predorsal scales 24 to 29; pectoral fins black with a definite pale crossband (Fig. 12a); lower caudal-fin lobe obviously darker than upper lobe; juveniles with moderately long flat barbels, their length more than 2.5 times in standard length . . . . . *Cheilopogon exsiliens*
- 10b. Predorsal scales 33 to 41; pectoral fins uniformly bluish black except for outer margin and lowermost soft rays (Fig. 12b); both caudal-fin lobes equally pigmented; juveniles with very long barbels with fleshy axis, their length less than 1.7 times in standard length . . . . . *Cheilopogon cyanopterus*

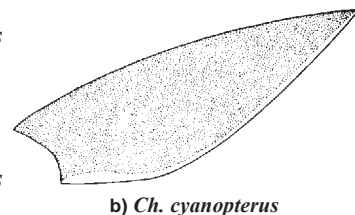
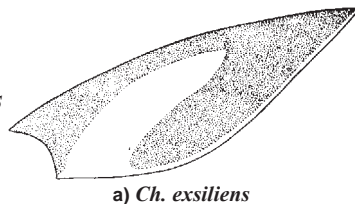


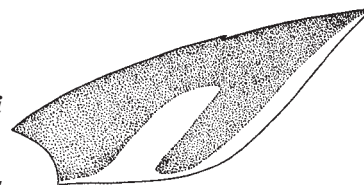
Fig. 12 pectoral fin

- 11a. Pectoral fin usually blackish, with definite pale crossband and broad outer margin; juveniles with moderately long barbels, their length less than 2.7 times in standard length . . . . . *Cheilopogon furcatus*
- 11b. Pectoral fins greyish, with indefinite pale triangular crossband and narrow outer margin; juveniles with short barbels, their length more than 7 times in standard length . . . . . → 12

- 12a. Head length 3.9 to 4.6, usually less than 4.3 in standard length; predorsal scales 25 to 33, usually 27 to 30; vertebrae 45 to 47, usually 46 . . . . . *Cheilopogon melanurus*
- 12b. Head length 4.3 to 4.9, usually more than 4.5 in standard length; predorsal scales 29 to 38, usually 30 to 35; vertebrae 47 to 50, usually 48 . . . . . *Cheilopogon heterurus*

**13a.** First 2 pectoral-fin soft rays unbranched; pectoral fin uniformly black without pale crossband; head length 4.5 to 5.0 in standard length; pectoral-fin length 1.25 to 1.35 in standard length . . . . . *Hirundichthys rondeletii*

**13b.** Only the first pectoral-fin ray unbranched; pectoral fins grey, with pale triangular crossband; head length 3.9 to 4.4; pectoral-fin length 1.35 to 1.6 in standard length . . . . → 14




**14a.** Palatine teeth present; pectoral fins with broad pale outer margin (Fig. 13) . *Hirundichthys speculiger*


**14b.** No palatine teeth; pectoral teeth with narrow pale outer margin . . . . . *Hirundichthys affinis*


### List of species occurring in the area

Note: Species accounts are included for all species excepting *Fodiator acutus* which occurrence in the area is highly doubtful.

The symbol  is given when species accounts are included.

 *Cheilopogon cyanopterus* (Valenciennes, 1847).

 *Cheilopogon exsiliens* (Linnaeus, 1771).

 *Cheilopogon furcatus* (Mitchill, 1815).

 *Cheilopogon heterurus* (Rafinesque, 1810).

 *Cheilopogon melanurus* (Valenciennes, 1847).

 *Cypselurus comatus* (Mitchill, 1815).

 *Exocoetus obtusirostris* Günther, 1866.

 *Exocoetus volitans* Linnaeus, 1758.

*Fodiator acutus* (Valenciennes, 1847). 15 cm sl. E Atlantic.


 *Hirundichthys affinis* (Günther, 1866).

 *Hirundichthys rondeletii* (Valenciennes, 1847).

 *Hirundichthys speculiger* (Valenciennes, 1847).

 *Parexocoetus hillianus* (Gosse, 1851).

 *Prognichthys glaphyrae* Parin, 1999.

 *Prognichthys occidentalis* Parin, 1999.

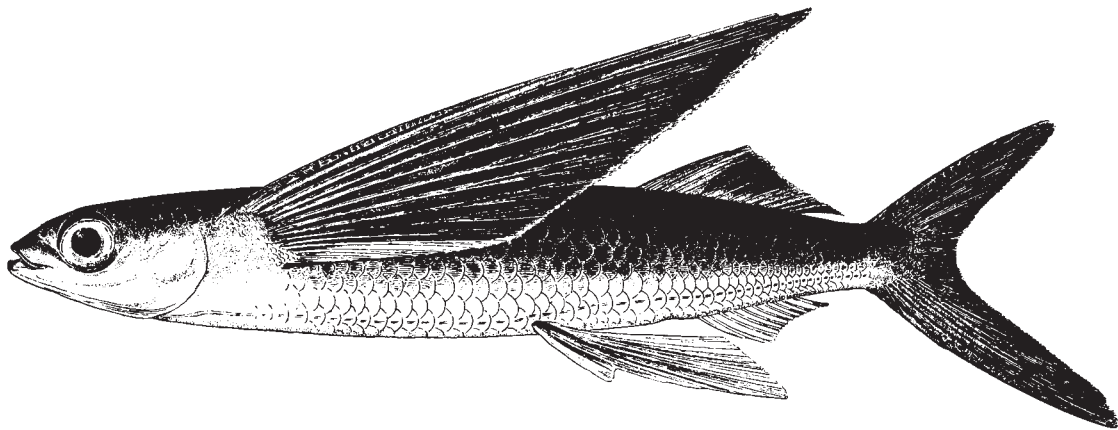
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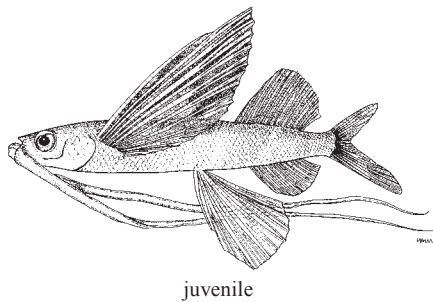
***Cheilopogon cyanopterus* (Valenciennes, 1847)**

**Frequent synonyms / misidentifications:** *Cypselurus cyanopterus* / None.

**FAO names:** En - Marginated flyingfish; Fr - Exocet codene; Sp - Volador bordiblanco.



**Diagnostic characters:** Body elongate, nearly rectangular in cross-section, almost flat ventrally. Depth 5.4 to 5.7 in standard length. Eye 3.3 to 3.6 in head length. Head length 5.4 to 5.7 in standard length. Jaws subequal. Jaw teeth conspicuous, mostly conical and slightly curved. **Palatine teeth present.** Gill rakers on first arch 21 to 28. **Dorsal fin** moderately high, **with 12 to 14 soft rays.** **Anal fin with 9 to 11 soft rays, originating under fifth to seventh dorsal fin ray.** **Pectoral fins** 1.4 to 1.5 in standard length, **with 13 to 15 soft rays, first ray unbranched.** **Pelvic fins** 3.3 to 3.8 in standard length, **inserted nearer to posterior margin of opercle than origin of caudal-fin base.** **Juveniles with enlarged dorsal fin** (its height 3.9 to 5.1 in standard length at 30 to 150 mm standard length) and **very long paired chin barbels** exceeding standard length at 20 to 80 mm standard length (barbels lost at 190 to 200 mm standard length). Predorsal scales 33 to 41. Scales in transverse row 7.5 to 9. Vertebrae 43 to 46. **Color:** body dark above, pale below. Dorsal fin greyish with a large black blotch in central part; anal fin transparent; caudal fin dark grey to almost black; pectoral fins bluish black except outer margin and lowermost soft rays; pelvic fins unpigmented. Juveniles with black dorsal fin, other fins strongly but partially pigmented; stems of barbels light, their lateral folds black.

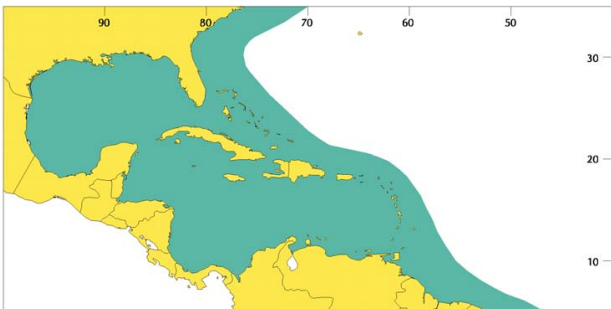


juvenile

**Size:** Maximum 33 cm standard length (about 41 cm total length).

**Habitat, biology, and fisheries:** Predominantly neritic species. Feeds on zooplankton and small fishes. Mature at about 27 cm standard length. Eggs demersal. Not important to fisheries.

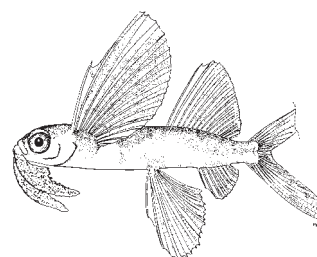
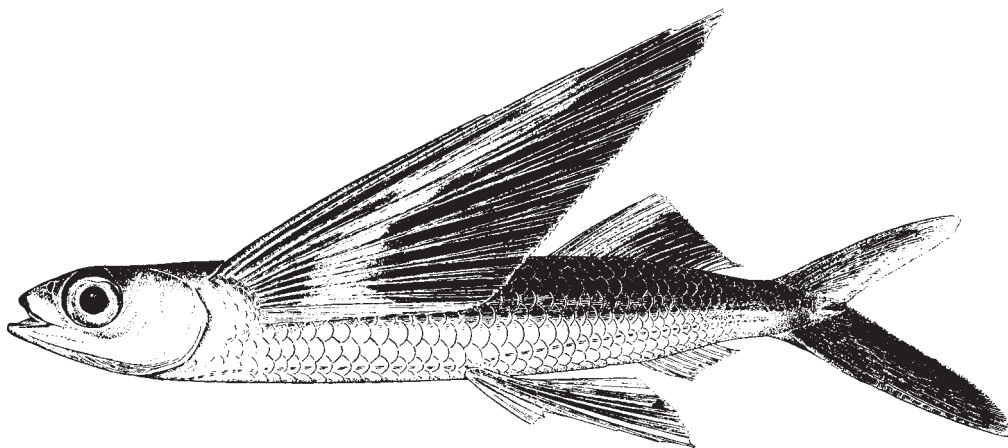
**Distribution:** Tropical Atlantic and Indo-West Pacific. In the western Atlantic from 40° N (juveniles in the Gulf Stream) to 20° S including both the Gulf of Mexico and the Caribbean Sea.



***Cheilopogon exsiliens* (Linnaeus, 1771)**

**Frequent synonyms / misidentifications:** *Cypselurus exsiliens* / None.

**FAO names:** En - Bandwing flyingfish; Fr - Exocet rayé; Sp - Volador bandiblanco.



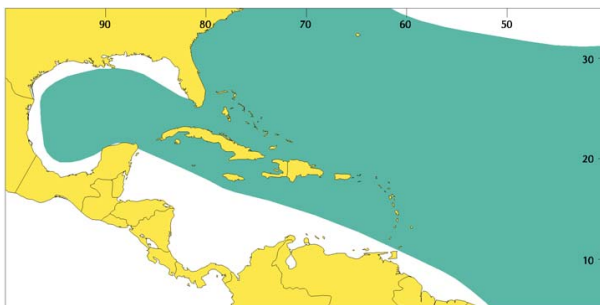
juvenile

**Diagnostic characters:** Body elongate, nearly rectangular in cross-section, almost flat ventrally. Depth 5.6 to 6.6 in standard length. Head length 3.8 to 4.2 in standard length. Eye 3.1 to 3.5 in head length. Jaws subequal. Jaw teeth conspicuous, unicuspid. **Palatine teeth present.** Gill rakers on first arch 23 to 28. **Dorsal fin moderately high, with 13 to 15 soft rays.** **Anal fin with 9 to 11 soft rays, originating under sixth to ninth dorsal fin ray.** **Pectoral fin 1.3 to 1.5 in standard length, with 14 to 15 soft rays, first ray unbranched.** **Pelvic fins 2.8 to 3.8 in standard length, inserted nearer to posterior margin of opercle than origin of caudal-fin base.** **Juveniles with enlarged dorsal fin** (its height 2.9 to 4.5 times in standard length at 30 to 100 mm standard length), and with **paired flap-like chin barbels**, their length 2.9 to 4.5 in standard length at 30 to 100 mm standard length (barbels lost at 105 to 115 mm standard length). **Predorsal scales 24 to 29.** Scales in transverse row 6 to 7.5. Vertebrae 43 to 45. **Colour:** body dark above, pale below. Dorsal fin greyish, with a large black blotch in central part; anal fin transparent; caudal fin with lower lobe almost entirely black and upper lobe almost entirely unpigmented, pectoral fins bluish black with pale oblique band crossing the fin; pelvic fins greyish, often with remains of black pigment in distal half. Juveniles with faint transverse bars on body; dorsal and paired fins partially pigmented; caudal fin clean, barbels grey with dark margins.

**Size:** Maximum 24 cm standard length (about 30 cm total length).

**Habitat, biology, and fisheries:** Oceanic species. Feeds on zooplankton. Eggs pelagic. Of no importance to fisheries.

**Distribution:** In the western North Atlantic to about 40° N in the Gulf Stream, including the Gulf of Mexico, apparently absent or rare in the Caribbean Sea. Also found in the eastern North Atlantic off Europe and North Africa, and in the southern Atlantic between 10° and 25° S.

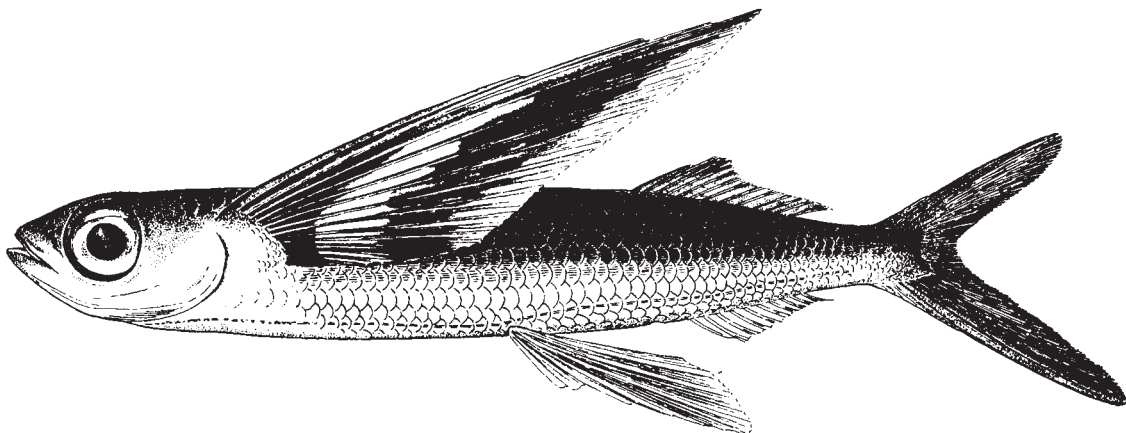


***Cheilopogon furcatus* (Mitchill, 1815)**

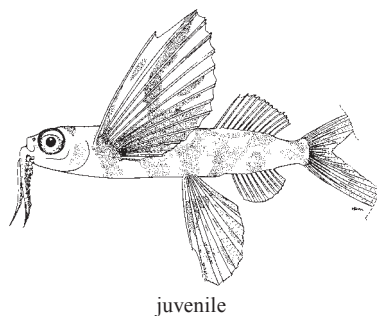
ECF

**Frequent synonyms / misidentifications:** *Cypselurus furcatus* / None.

**FAO names:** En - Spotfin flyingfish; Fr - Exocet tacheté; Sp - Volador manchado.



**Diagnostic characters:** Body elongate, nearly rectangular in cross-section, almost flat ventrally. Depth 4.8 to 6.1 in standard length. Head length 2.8 to 3.1 in standard length. Eye 2.8 to 3.1 in head length. Lower jaw slightly projected before the upper when mouth closed. Jaw teeth diminutive, mostly conical. **Palatine teeth absent.** Gill rakers on first arch 18 to 25. **Dorsal fin low, with 12 to 14 soft rays. Anal fin with 8 to 11 soft rays, originating under fifth to seventh dorsal-fin ray. Pectoral fins 1.3 to 1.5 in standard length, with 14 to 17 soft rays, first ray unbranched. Pelvic fins 2.7 to 3.3 in standard length, inserted nearer to posterior margin of opercle than**



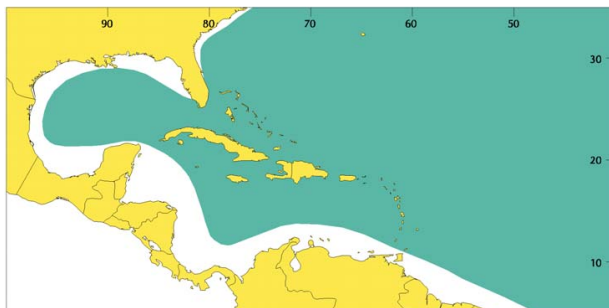
juvenile

**origin of caudal-fin base. Juveniles with paired chin barbels** consisting of firm pointed stem and skin fold along the outer margin, barbel length 1.2 to 3.1 times in standard length at 50 to 150 mm standard length, (barbels disappear at 112 to 175 mm standard length). Scales in transverse row 7 to 9. **Predorsal scales 26 to 33,** usually 27 to 30. Vertebrae 43 to 46. **Colour:** body dark above; pale below. Dorsal and caudal fins greyish; anal fin transparent; pectoral fins almost black to grey (deep blue in life) with unpigmented oblique crossband reaching or nearly reaching upper margin of the fin and very broad unpigmented margin along rear edge of the fin. Juveniles 50 to 100 mm standard length with 6 transverse vertical bars on body; dorsal and anal fins with black spots; pectoral fins with dark lower part and 2 oblique dark bands; pelvic fins also with dark spots and bands.

**Size:** Maximum to 27 cm standard length (about 33 cm total length).

**Habitat, biology, and fisheries:** True oceanic species not connected with inshore waters during any period of life. Feeds on zooplankton. Matures at 19 cm standard length. Eggs demersal, laid on drifting algae or other floating objects. Of no importance to fisheries.

**Distribution:** Worldwide in the tropical oceans. In the western Atlantic from 44° N in the Gulf Stream to 18° S.

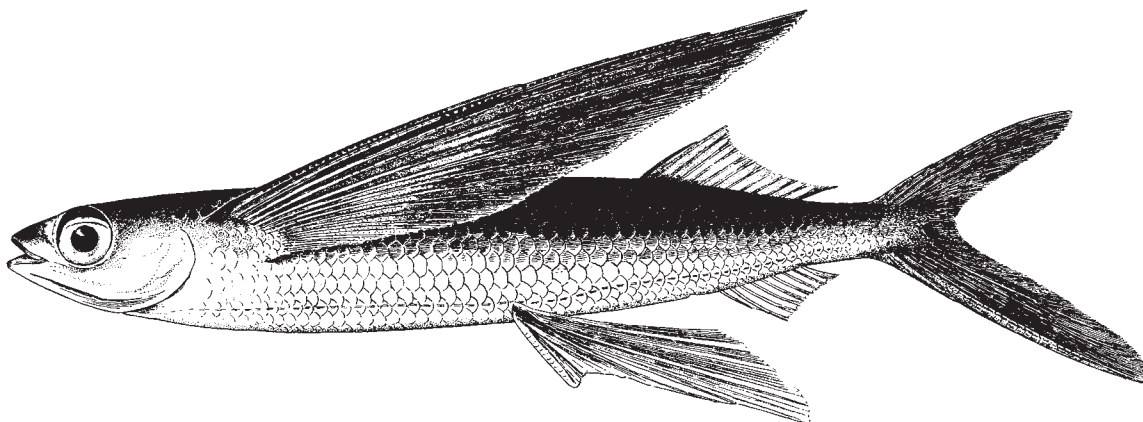


*Cheilopogon heterurus* (Rafinesque, 1810)

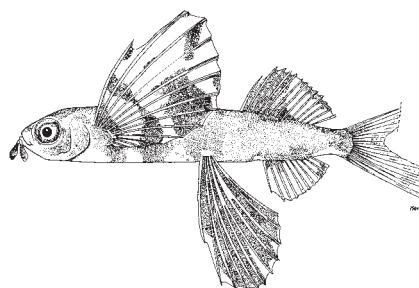
ECE

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Mediterranean flyingfish (AFS: Blotchwing flyingfish); Fr - Exocet méditerranéen; Sp - Volador mediterraneo.



**Diagnostic characters:** Body elongate, nearly rectangular in cross-section, almost flat ventrally. Depth 5.3 to 6.6 in standard length. Head length 4.3 to 4.9 in standard length. Lower jaw slightly projecting beyond the upper with mouth closed. Jaw teeth diminutive, mostly conical. **Palatine teeth absent.** Gill rakers on first arch 19 to 26. **Dorsal fin low, with 12 to 15 soft rays. Anal fin with 8 to 10 soft rays, originating under fifth to seventh dorsal fin ray. Pectoral fins 1.3 to 1.5 in standard length, with 16 to 18 soft rays, first ray unbranched. Pelvic fins 2.7 to 3.3 in standard length, inserted nearer to posterior margin of opercle than origin of caudal-fin base.**



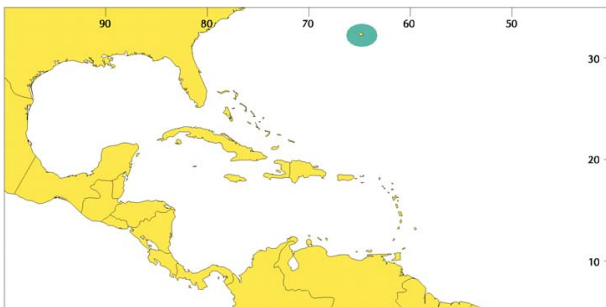
juvenile

**Juveniles with paired chin barbels** consisting of firm pointed stem and skin fold along the outer margin, barbel length more than 8, usually 10 to 25 times in standard length (barbels lost at about 80 to 90 mm standard length). Scales in transverse row 7 to 9. Predorsal scales 29 to 38. Vertebrae 46 to 50, usually 47 to 49. **Colour:** body dark above, pale below. Dorsal and caudal fins greyish; anal fin transparent; pectoral fins light to dark greyish, with indefinite pale triangular crossband and narrow outer margin, pelvic fins unpigmented. Juveniles less than 100 to 150 mm standard length with 3 transverse vertical bands on anterior part of body; dorsal and anal fins with dark markings; pectoral fins pale with dark blotches and curved bands; pelvic fins also with dark blotches and bands.

**Size:** Maximum to 35 cm standard length (about 45 cm total length).

**Habitat, biology, and fisheries:** neritic species, rarely found offshore. Feeds on zooplankton. Mature at 280 to 300 mm standard length. Spawns near shore. Eggs demersal. Not known to be a commercial fish.

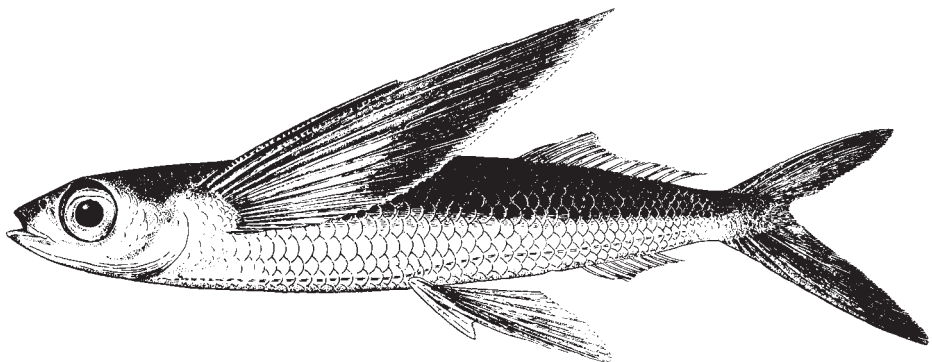
**Distribution:** In the western Atlantic known only from off Bermuda. Disjunct population occurs in the western Mediterranean Sea, along the shores of southwestern Europe (occasional specimens as far north as Denmark and southern Norway) and northwestern Africa, and off the Azores.



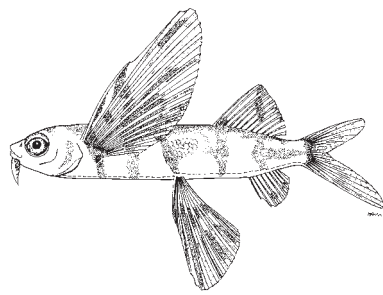
***Cheilopogon melanurus* (Valenciennes, 1847)**

**Frequent synonyms / misidentifications:** *Cypselurus melanurus*; *Cypselurus lutkeni* (Jordan and Evermann, 1896) / *Cypselurus heterurus* (Rafinesque, 1810).

**FAO names:** En - Atlantic flyingfish; Fr - Exocet atlantique; Sp - Volador atlántico.



**Diagnostic characters:** Body elongate, nearly rectangular in cross-section, almost flat ventrally. Depth 4.9 to 6.2 in standard length. Head length 3.9 to 4.6 in standard length. Lower jaw slightly projecting beyond the upper with mouth closed. Jaw teeth diminutive, mostly conical. **Palatine teeth absent.** Gill rakers on first arch 17 to 24. **Dorsal fin low, with 11 to 14 soft rays. Anal fin with 7 to 11 soft rays, originated under fifth to seventh dorsal-fin ray. Pectoral fins 1.4 to 1.6 in standard length, with 14 to 18 soft rays, first ray unbranched. Pelvic fins 2.5 to 3.3 in standard length, inserted nearer to**



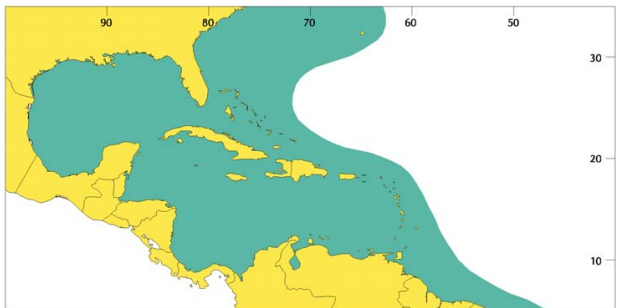
juvenile

**posterior margin of opercle than origin of caudal-fin base. Juveniles with paired chin barbels** consisting of firm pointed stem and skin fold along the outer margin; barbel length more than 7, usually 8 to 20 times in standard length (barbels lost at 80 to 100 mm standard length). Scales in transverse row 6 to 8. **Predorsal scales 25 to 33, usually 27 to 30.** Vertebrae 45 to 47, usually 46. **Colour:** body dark above, pale below. Dorsal and caudal fins greyish; anal fin transparent; pectoral fins greyish, with indefinite pale triangular crossband and narrow outer margin; pelvic fins unpigmented. Juveniles less than 100 to 120 mm standard length with 6 transverse vertical bands on body; dorsal and anal fins with dark markings; pectoral fins pale, with dark blotches and curved bands; pelvic fins also with dark blotches and bands.

**Size:** Maximum to 26.5 cm standard length (about 33 cm total length).

**Habitat, biology, and fisheries:** Neritic species. Feeds on zooplankton. Eggs dimersal. Of no importance to fisheries.

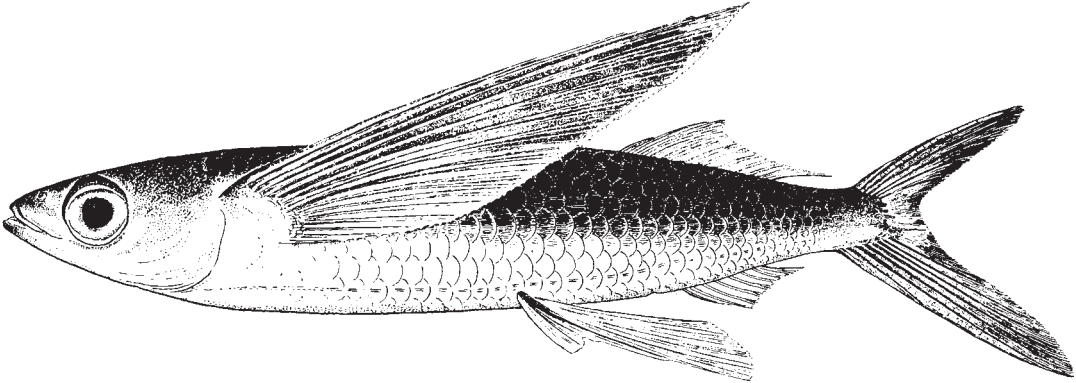
**Distribution:** In the western Atlantic mostly along coasts from about 40° N to Trinidad, including the Gulf of Mexico and the Caribbean Sea, found offshore only in the area between the Gulf Stream and Bermuda. Also known from the coast of Brazil from the Equator to about 30° S.



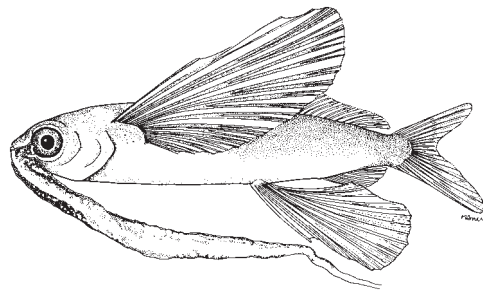
***Cypselurus comatus* (Mitchill, 1815)**

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Clearwing flyingfish; Fr - Exocet hollandais; Sp - Volador holandés.



**Diagnostic characters:** Body elongate, nearly rectangular in cross-section, almost flat ventrally. Depth 5.0 to 6.0 in standard length. Head length 3.8 to 4.1 in standard length. Eye 2.8 to 3.1 in head length. Lower jaw a little shorter than the upper and included beneath upper jaw with mouth closed. Jaw teeth noticeable, partly tricuspid. **Palatine teeth usually present.** Gill rakers on first arch 19 to 24. **Dorsal fin low, with 11 to 14 soft rays. Anal fin with 8 or 9 soft rays, originating under fourth to sixth dorsal-fin ray. Pectoral fin 1.5 to 1.6 in standard length, with 13 to 15 soft rays, first ray unbranched. Pelvic fins 3.3 to 3.7 in standard length, inserted middle of distance between hind margin of opercle to origin of caudal-fin base. Juveniles with a single chin barbel,** its length 0.9 to 2.3 times in standard length at 50 to 80 mm standard length, barbel disappearing at 150 to 160 mm standard length. Scales in transverse row 7 to 8.5. Predorsal scales 23 to 30. Vertebrae 40 to 43. **Colour:** body dark above, pale below. Dorsal and caudal fins greyish; anal fin transparent; pectoral fins uniformly light greyish to grey; pelvic fins greyish basally, transparent elsewhere, rarely with a black spot. In juveniles body uniformly blackish; pelvic fins heavily pigmented; stem of barbel light; its lateral folds blackish.

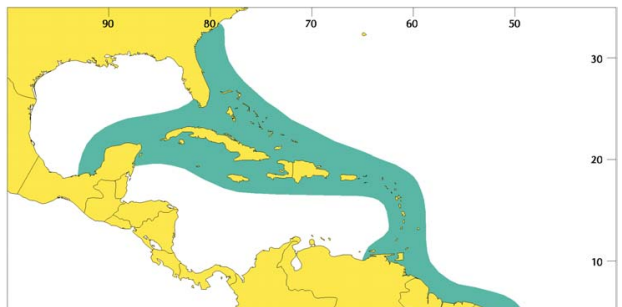


juvenile

**Size:** Maximum to 24 cm standard length in the Gulf of Mexico, to 21 cm standard length (about 26 cm total length) elsewhere.

**Habitat, biology, and fisheries:** Neritic species. Feeds on zooplankton. Smallest ripe female is 18 cm standard length. Eggs demersal. Breeding season in West Indies from February to April. Of no importance to fisheries.

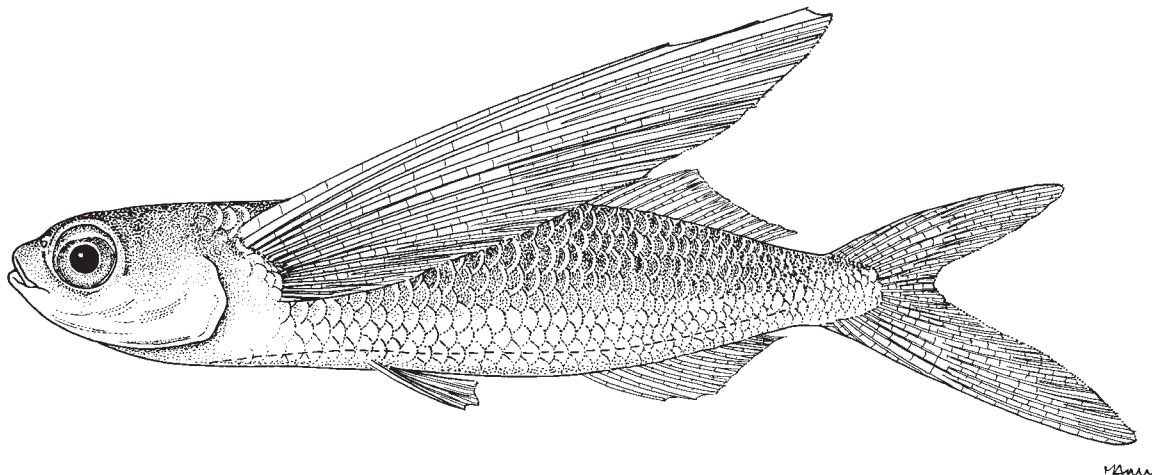
**Distribution:** Endemic to the tropical western Atlantic. Abundant off Florida, the Bahamas, Antilles, and in the Caribbean Sea; very rare (known from a single record) in the Gulf of Mexico. Also recorded from off Brazil between 1° and 20° S.



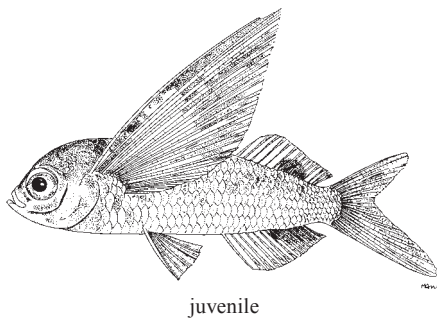
*Exocoetus obtusirostris* Gøntner, 1866

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** **En** - Oceanic two-wing flyingfish; **Fr** - Exocet bouledogue; **Sp** - Volador ñato.



**Diagnostic characters:** Body elongate, roundish in cross-section, slightly flattened ventrally. **Depth 4.6 to 5.4 in standard length.** Head length 3.6 to 4.1 in standard length. Eye 3.2 to 3.6 in head length. Jaws subequal, without teeth. **Gill rakers on first arch 22 to 29.** Dorsal fin low, with 12 to 14 soft rays. Anal fin with 12 to 14 soft rays, originating just before dorsal-fin origin. **Pectoral fins 1.3 to 1.4 in standard length,** with 15 to 17 soft rays. **Pelvic fins 6.5 to 7.5 in standard length, inserted much nearer to posterior margin of opercle than caudal-fin base.** Juveniles not barbelled, hump-backed, upper profile of head steeply sloping, body depth 3.4 to 3.7 in standard length at less than 40 mm standard length. Predorsal scales 18 to 23. **Scales in transverse row 7 to 8, usually 7.5.** Vertebrae 42 to 45. **Colour:** body dark above, pale below. Dorsal and caudal fins greyish; anal and pelvic fins transparent; pectoral fins brownish grey with a broad pale margin. In juveniles body evenly pigmented, dorsal and anal fins blackish posteriorly; pectoral fins usually transparent; pelvic fins mostly blackish.



**Size:** Maximum to 19.5 cm standard length (about 24.5 cm total length).

**Habitat, biology, and fisheries:** Oceanic species. Feeds on small zooplankton, predominantly copepods. Consumed by predatory fishes (dolphin fish, tunas, snake-mackerels, etc.), squids, seabirds, and dolphin fish. Longevity about 1 year. Spawning intermittent, each batch consist of 420 to 890 eggs. Eggs pelagic. No importance to fisheries.

**Distribution:** Tropical Atlantic Ocean. In the western Atlantic between 40° N and 40° S, including the Gulf of Mexico and the Caribbean Sea.

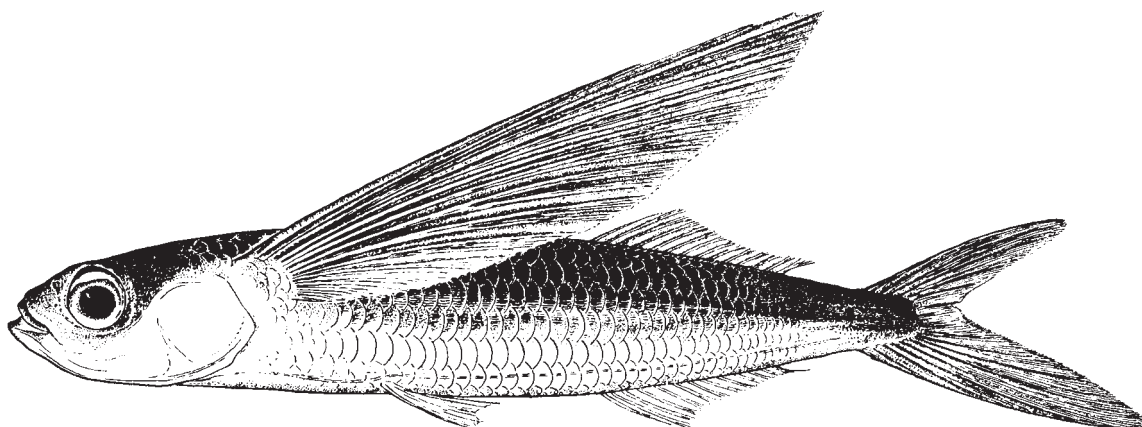


*Exocoetus volitans* Linnaeus, 1758

EXV

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Tropical two-wing flyingfish; Fr - Exocet volant; Sp - Volador.



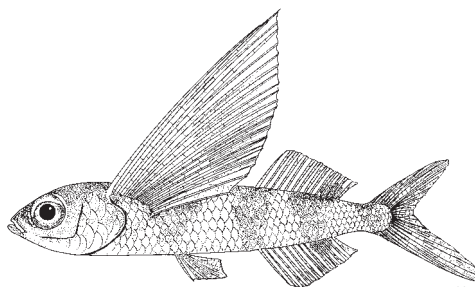
**Diagnostic characters:** Body elongate, roundish in cross-section, slightly flattened ventrally. Depth 5.6 to 6.0 in standard length. Head length 3.6 to 3.9 in standard length. Eye 3.5 to 3.9 in head length. Jaws subequal, without teeth. **Gill rakers on first arch 29 to 37, usually 32 to 34.** Dorsal fin low, with 13 to 15 soft rays. Anal fin with 12 to 14 soft rays, originating under first to third dorsal-fin ray. **Pectoral fins 1.3 to 1.4 in standard length,** with 14 to 16 soft rays. **Pelvic fins 6.5 to 7.6 in standard length, inserted much nearer to posterior margin of opercle than caudal-fin base.** Juveniles not barbelled, fusiform, upper profile of head gently sloping, body depth 4.8 to 5.3 in standard length at less than 40 mm standard length.

**Scales in transverse row 6 to 7, usually 6.5.** Predorsal scales 16 to 21. Vertebrae 43 to 45. **Colour:** body dark above, pale below. Dorsal and caudal fins greyish; anal and pelvic fins transparent; pectoral fins grey with a narrow colourless margin. In juveniles body pale with vertical dark bars; dorsal and anal fins blackish posteriorly; pectoral and pelvic fins transparent.

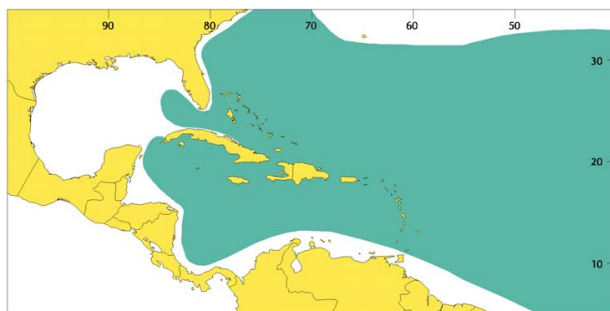
**Size:** Maximum to 19 cm standard length (about 24 cm total length).

**Habitat, biology, and fisheries:** Most abundant oceanic flyingfish. Feeds mainly on copepods. All specimens below 140 mm standard length are immature and all above 170 mm standard length are ripe. Maximum age 1+ year. Spawning intermittent, each portion numbering 330 to 420 eggs. Eggs pelagic. Of no importance to fisheries.

**Distribution:** Worldwide in offshore tropical waters. In the western Atlantic common between 30° N and 25° S but rare in the Gulf of Mexico.

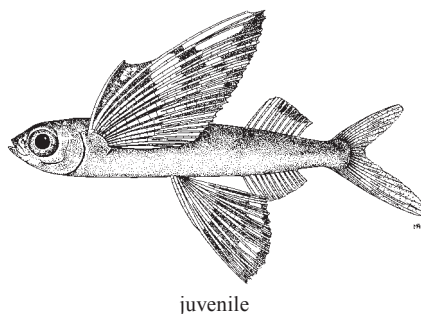
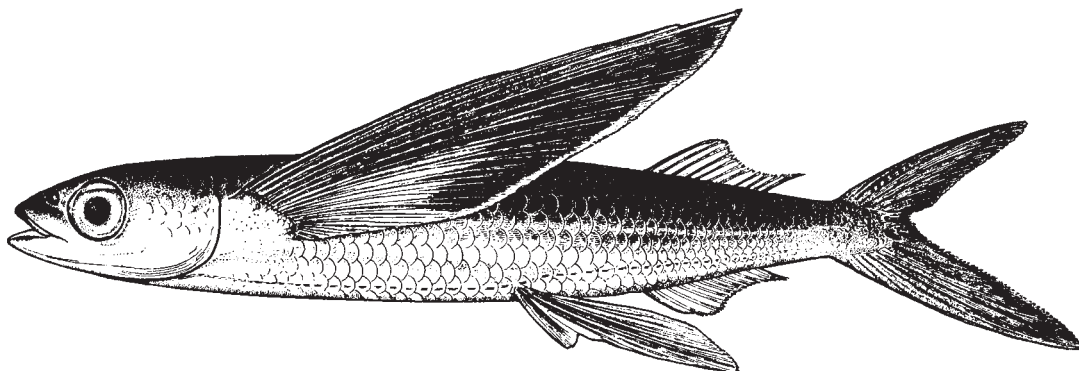


juvenile



***Hirundichthys affinis*** (Göther, 1866)

FFV

**Frequent synonyms / misidentifications:** None / None.**FAO names:** En - Fourwing flyingfish; Fr - Exocet hirondelle; Sp - Volador golondrina.

**Diagnostic characters:** Body elongate, nearly rectangular in cross-section, almost flat ventrally. Depth 5.5 to 5.7 in standard length. Head length 4.0 to 4.3 in standard length. Eye 3.3 to 3.6 in head length. Jaws subequal. Jaw teeth conspicuous, conical. **Palatine teeth absent.** Gill rakers on first arch 24 to 30. Dorsal fin very low, with 10 to 12 soft rays. **Anal fin** with 11 to 13 soft rays, **originating slightly before or 1 or 2 rays behind dorsal-fin origin.** **Pectoral fin 1.4 to 1.6 in standard length, with 16 to 18 soft rays, first ray unbranched.** **Pelvic fins 3.5 to 3.9 in standard length, inserted slightly nearer to posterior margin of opercle than origin of caudal-fin base.** Juveniles not barbelled. Scales in transverse row 5 to 7. Predorsal scales 26 to 33. Vertebrae 45 to 47. **Colour:** body dark above, pale below. Dorsal and caudal fins greyish; anal fin transparent; pectoral fins dark grey with unpigmented triangular crossband and narrow outer margin; pelvic fins light. Juveniles with pectoral and pelvic fins mottled with dark spots and bands.

**Size:** Maximum to 23 cm standard length (about 29 cm total length).

**Habitat, biology, and fisheries:** Neritic species. Feeds on zooplankton. Consumed by dolphinfish (*Coryphaena*) and other predatory fishes. Matures at about 19 cm. Maximum age 1.5 years. Spawning intermittent, total fecundity ranging between 4 100 and 9 200 eggs. Eggs demersal, laid on floating objects. Target species of artisanal fisheries on Barbados, Martinique, Domenica, Santa Lucia and Tobago as well as northeastern Brazil. Taken with gill nets, scooping by handhold dipnets and baited hooks near land. Fishery season from January to May in the eastern Caribbean, May to August off northeastern Brazil.

**Distribution:** In the western Atlantic abundant in the Caribbean Sea and adjacent areas (including the Gulf of Mexico), juveniles in the Gulf Stream northwards to 30° N. Also known from off Brazil and in the tropical eastern Atlantic.

