

## FAO SPECIES IDENTIFICATION SHEETS

FISHING AREA 51  
(W, Indian Ocean)

## EXOCOETIDAE

Elongate fishes, their bodies broadly cylindrical (round in cross-section), flattened ventrally in some species. Snout blunt, shorter than eye in all Indian Ocean species; mouth small; jaw teeth absent or very small; gillrakers 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; 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; caudal fin deeply forked, its lower lobe longer than the upper. Lateral line low on body; scales large, cycloid (smooth to touch), easily shed. Swimbladder large, extending posteriorly beyond body cavity.

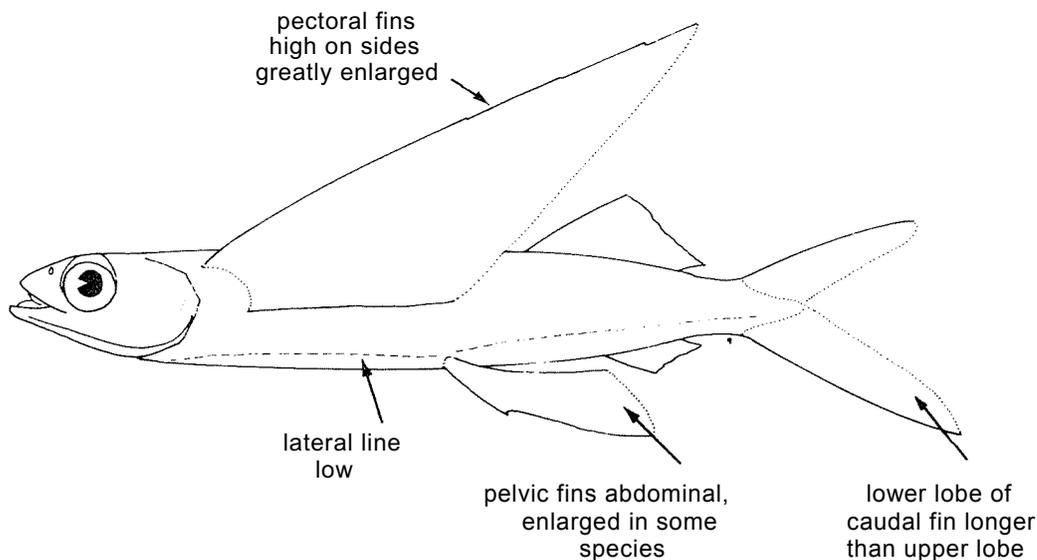
Colour: dark above, pale below; the dark colours usually iridescent blue or green in life. Pectoral fins in some species with dark spots or pale stripes. Dorsal fin in some species with black pigment.

Young stages (to about 10 cm); quite different in appearance from adults; dorsal fin often higher than in adults, pectoral fins shorter; colour patterns variable, spots and bars often developed; chin barbels conspicuous in many species.

Flyingfishes inhabit the surface waters of the open ocean and inshore areas. They are well known for their habit of leaping out of the water and gliding over long distances by means of their expanded pectoral fins (two-wing gliders) and sometimes also with their pelvic fins (four-wing gliders).

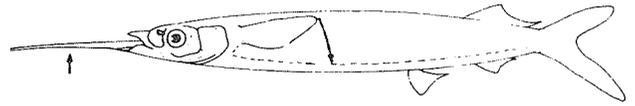
Even though flyingfishes are usually appreciated as food, there are only a few commercial fisheries for these resources. Within the Western Indian Ocean, such fisheries have developed only in India, with annual landings up to 10 900 tons (1963) and 9 200 tons (1971) (CMFRI Annual Reports 1969 to 1977). However, most of the fisheries for this group of resources are operating along the east coast of the country. Statistics are usually not broken down by species, and hence, it is difficult to assess the relative importance of the individual components of flyingfish catches.

Flyingfishes are attracted by light and this is sometimes used to aid in their capture. Almost the entire catch is salted and sun dried.

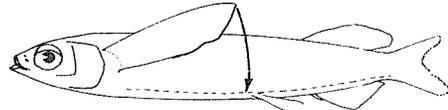


**SIMILAR FAMILIES OCCURRING IN THE AREA:**

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

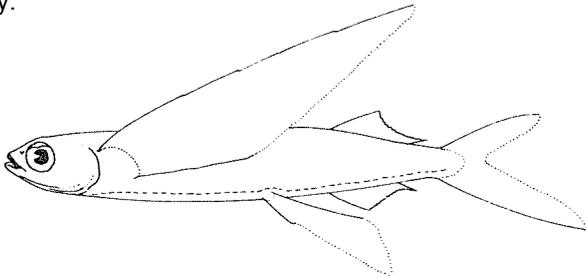


**a) Hemiramphus**  
(a typical representative)



**b) Oxyporhamphus**  
(a representative without prolonged lower jaw)

Hemiramphidae



**Exocoetidae**

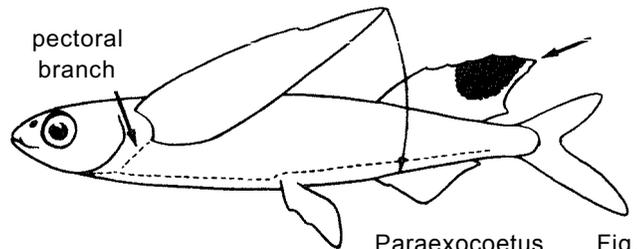
**KEY TO GENERA OCCURRING IN THE AREA:**

1a. Pectoral fins not reaching beyond posterior part of anal fin base; pectoral branch of lateral line present (Fig.1); upper jaw protrusible (Fig.2) ..... Parexocoetus

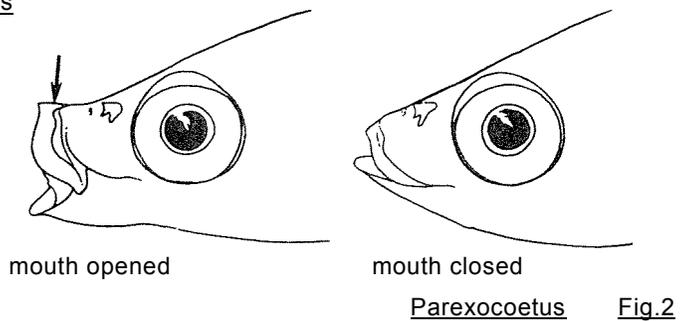
1b. Pectoral fins reaching beyond anal fin base to, or almost to, caudal fin base; pectoral branch of lateral line absent (Figs 3,4 and 7); upper jaw not protrusible

2a. Pelvic fins short, not reaching anal fin origin (barely reaching in juveniles); pelvic fin insertion closer to pectoral fin insertion than to anal fin origin (Fig.3) ..... Exocoetus

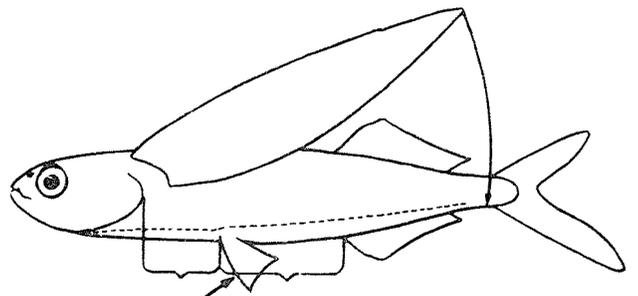
2b. Pelvic fins long, reaching beyond anal fin origin; pelvic fin insertion closer to anal fin origin than to pectoral fin insertion (Figs 4 and 7)



Parexocoetus Fig.1



Parexocoetus Fig.2



Exocoetus Fig.3

\*The taxonomy of the family in the Indian and Pacific Oceans is still confused and needs to be thoroughly revised. Hence, the above key to genera as well as the list of species must be regarded as provisional

3a. Origin of anal fin 3 rays or more behind origin of dorsal fin (Fig.4); dorsal fin usually with 2 to 4 (rarely with one) rays more than anal fin

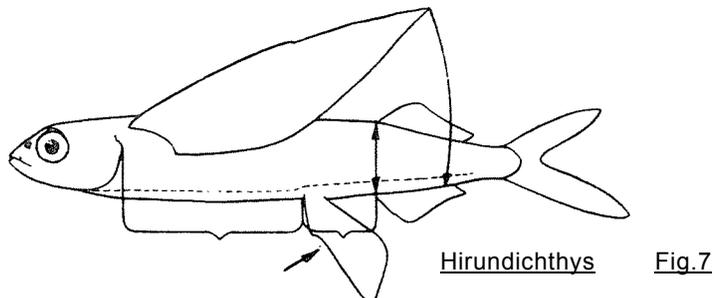
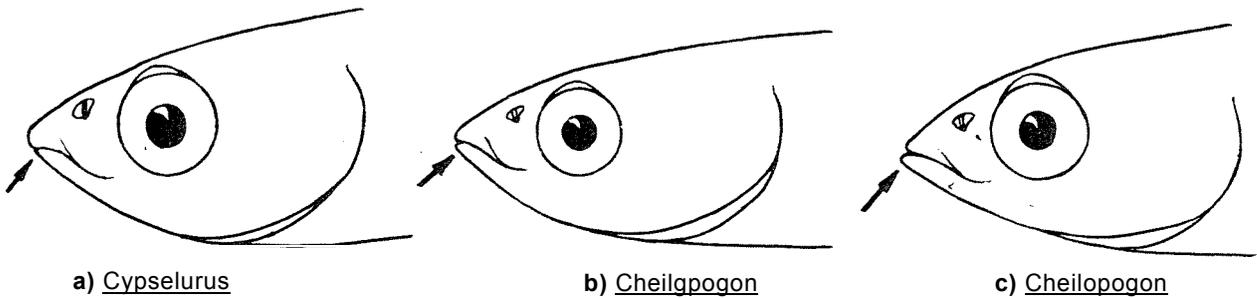
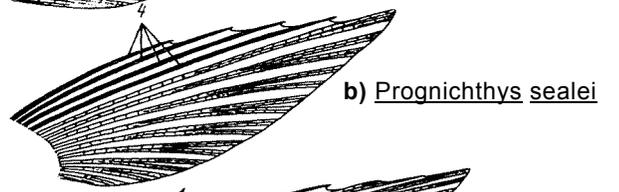
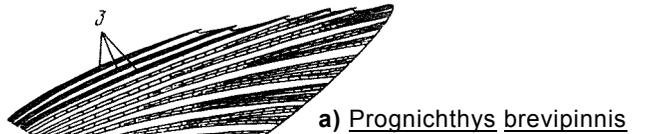
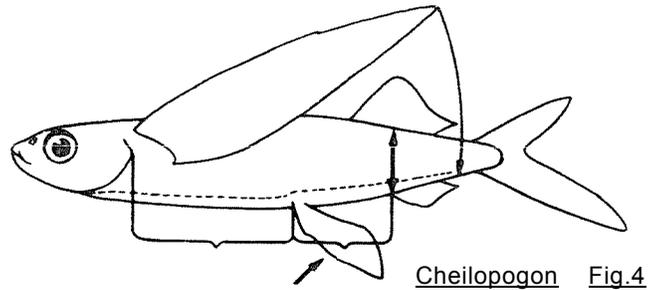
4a. First 3 or 4 pectoral fin rays unbranched (Figs 5a,b) ..... Prognichthys

4b. Only the first pectoral fin ray unbranched (Fig.5c)

5a. Lower jaw a little shorter than the upper and included beneath the upper jaw (Fig.6a) ..... Cypselurus

5b. Both jaws of equal length (Fig. 6b), or lower jaw a little longer than the upper (Fig.6c) ..... Cheilopogon\*

3b. Origin of anal fin slightly before, under, or not more than 3 rays behind origin of dorsal fin (Fig.7); dorsal fin usually with less, or equal number of rays than anal fin (rarely with 1 or 2 more) ..... Hirundichthys



\* Cheilopogon species are placed in the genus Cypselurus in FAO Species Identification Sheets for Atlantic areas

**LIST OF SPECIES OCCURRING IN THE AREA:**

Code numbers are given for those species for which Identification Sheets are included

<u>Cheilopogon atrisignis</u> (Jenkins, 1904)	EXOC Cheil 1	
<u>Cheilopogon cyanopterus</u> (Valenciennes, 1846)	EXOC Cheil 2	(= <u>Cypselurus cyanopterus</u> EXOC Cyp 2, Fishing Areas 34/47 in part))
<u>Cheilopogon furcatus</u> (Mitchill, 1815)	EXOC Cheil 3	(= <u>Cypselurus furcatus</u> EXOC Cyp 4, Fishing Areas 31 a4/47 (in part))
<u>Cheilopogon hexazona</u> (Bleeker, 1852)		
<u>Cheilopogon intermedius</u> Parin, 1961		
<u>Cheilopogon nigricans</u> (Bennett, 1840)	EXOC Cheil 4	(= <u>Cypselurus nigricans</u> EXOC Cyp 8, Fishing Areas 34 47 in part))
* <u>Cheilopogon pinnatibarbatus</u> (Lowe)		
<u>Cheilopogon suttoni</u> (Whitley & Colefax, 1938)	EXOC Cheil 5	
<u>Cypselurus angusticeps</u> Nichols & Breder, 1930		
<u>Cypselurus naresii</u> (Günther, 1889)	EXOC Cyp 10	
<u>Cypselurus oligolepis</u> (Bleeker, 1866)	EXOC Cyp 11	
<u>Cypselurus poecilopterus</u> (Valenciennes, 1846)	EXOC Cyp 12	
<u>Exocoetus monocirrhus</u> Richardson, 1846	EXOC Exoc 3	
<u>Exocoetus volitans</u> (Linnaeus, 1758)	EXOC Exoc 2	
<u>Hirundichthys coromandelensis</u> (Hornell, 1923)	EXOC Hir 4	
<u>Hirundichthys oxycephalus</u> Bleeker, 1852)	EXOC Hir 5	
<u>Hirundichthys rondeletii</u> (Valenciennes, 1846)	EXOC Hir 2	
<u>Hirundichthys speculiger</u> (Valenciennes, 1846)	EXOC Hi 3	
<u>Parexocoetus brachypterus</u> (Richardson, 1846)	EXOC Par 1	
<u>Parexocoetus mento</u> Valenciennes, 1846)	EXOC Par 2	
<u>Prognichthys brevipinnis</u> (Valenciennes, 1846)	EXOC Progn 2	
<u>Prognichthys sealei</u> Abe, 1955	EXOC Progn 3	

Prepared by N.V. Parin, P.P. Shirshov Institute of Oceanology of the Academy of Sciences USSR, Moscow, USSR. Illustrations redrawn or copied from literature. Draft material revised by R.H. Gibbs, Division of Fishes, Natural Museum of Natural History, Smithsonian Institution, Washington D.C. 20560, USA

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\*Occurrence in area doubtful

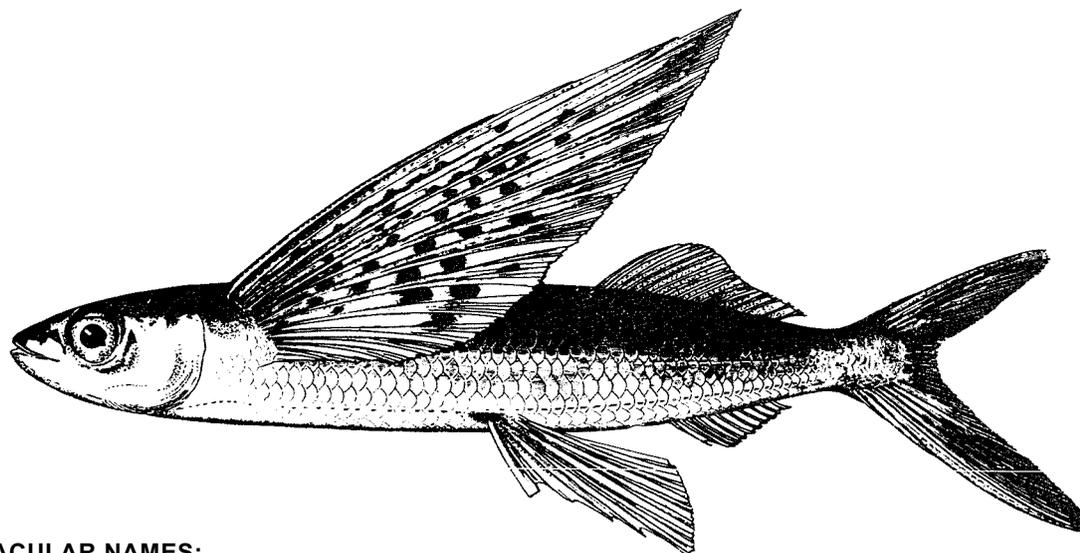
FAO SPECIES IDENTIFICATION SHEETS

FAMILY: EXOCOETIDAE

FISHING AREA 51  
(W. Indian Ocean)

Cheilopogon atrisignis (Jenkins, 1904)

OTHER SCIENTIFIC NAMES STILL IN USE: None. Placed in genus Cypselurus by some authors



VERNACULAR NAMES:

- FAO : En - Glider flyingfish
- Fr - Exocet planeur
- Sp - Volador planeador



NATIONAL:

DISTINCTIVE CHARACTERS:

Body elongate, thick, somewhat flattened ventrally. Head shorter than distance between dorsal fin origin and origin of upper caudal fin lobe; jaws of equal length; upper jaw not protrusible; lower jaw not included beneath the upper; palatine teeth on root of mouth) present. Dorsal fin with 14 to 16 rays, anal fin with 9 to 11; anal fin origin 4 to 6 rays behind origin of dorsal fin; dorsal fin low, rays at anterior end the longest; pectoral fins strikingly long, 65 to 70% of standard length, only the first ray unbranched; pelvic fins abdominal, large, reaching well beyond anal fin origin, their insertion closer to anal fin origin than to pectoral fin insertion and much nearer to hind margin of head than to origin of lower caudal fin lobe. Pectoral branch of lateral line absent. Scale rows across back in front of dorsal fin (predorsal scales) 33 to 40. Juveniles with 2 flattened chin barbels reaching to over 30% of standard length.

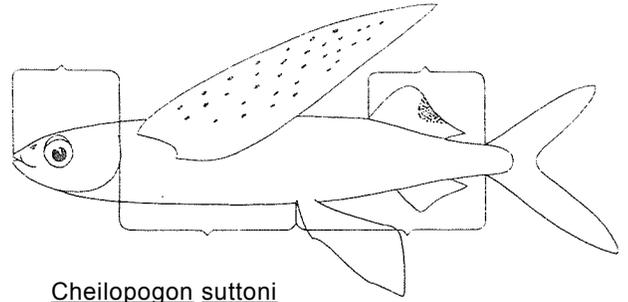
Colour: dark above, pale below, the dark colour usually iridescent blue or greenish-blue in life; dorsal fin usually with a black spot; pectoral fins brownish with numerous scattered dark spots; pelvic fins without spots (spotted in juveniles).

**DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:**

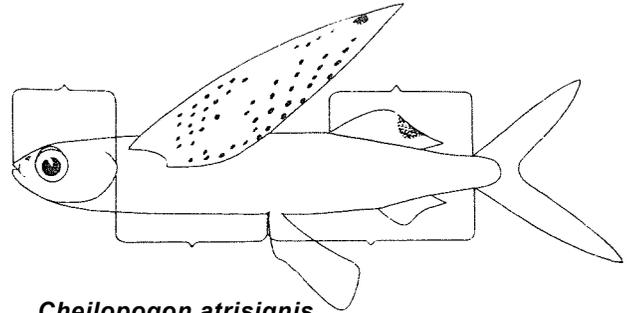
Cheilopogon suttoni: dorsal fin with 12 to 14 rays (14 to 16 in Ch. atrisignis); head approximately equal to distance between dorsal fin origin and origin of upper caudal lobe; pelvic fin insertion approximately at mid-point of distance between hind margin of head and origin of lower caudal fin lobe; juveniles with two flattened chin barbels connected by their bases, their length to about 25% of standard length.

Cypselurus poecilopterus: predorsal scales 24 to 28; dorsal fin with 11 to 13 rays; without black spots; lower jaw included beneath the upper; juveniles without chin barbels.

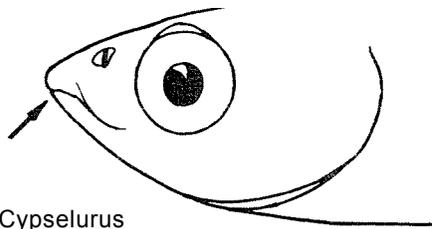
Other flyingfishes occurring in the area: none have the pectoral fins covered with numerous scattered dark spots.



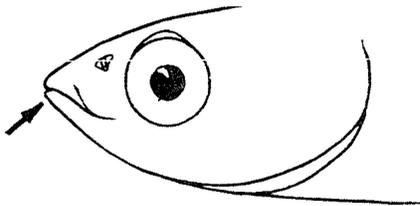
Cheilopogon suttoni



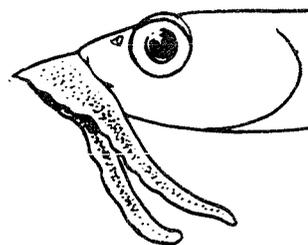
**Cheilopogon atrisignis**



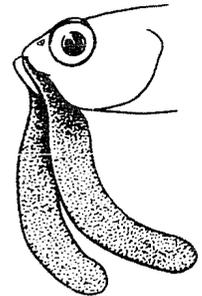
Cypselurus



**Cheilopogon atrisignis**



Cheilopogon suttoni



juvenile

**Cheilopogon atrisignis**

**SIZE:**

Maximum: about 30 cm standard length.

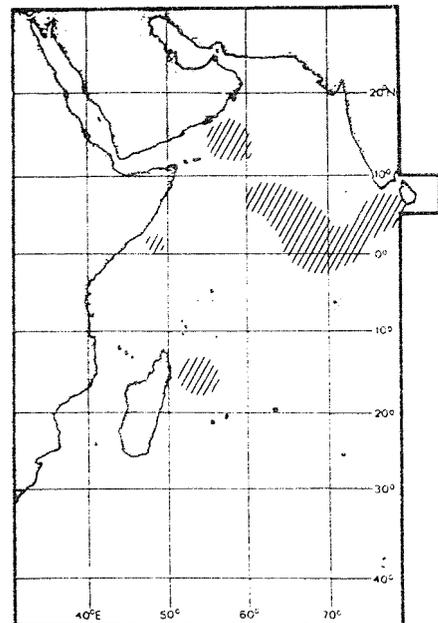
**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Widely distributed in the tropical Indian Ocean but absent from the Red Sea and the "Gulf". Also occurs in the tropical Pacific Ocean.

Pelagic in surface waters of both neritic and oceanic areas; capable of leaping out of the water and gliding for long distances above the surface.

**PRESENT FISHING GROUNDS:**

Not known to be a commercial species, but included in this publication to facilitate future field identification and data collection.

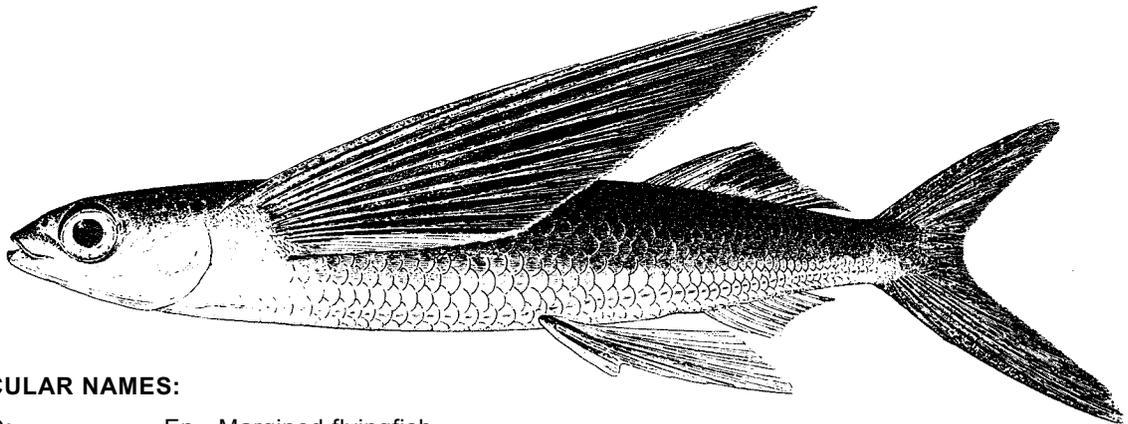


## FAO SPECIES IDENTIFICATION SHEETS

FAMILY: EXOCOETIDAE

 FISHING AREA 51  
(W. Indian Ocean)

Cheilopogon cyanopterus (Valenciennes, 1846)

 OTHER SCIENTIFIC NAMES STILL IN USE: None. Placed in genus *Cypselurus* by some authors


## VERNACULAR NAMES:

 FAO: En - Margined flyingfish  
 Fr - Exocet codène  
 Sp - Volador bordiblanco


NATIONAL:

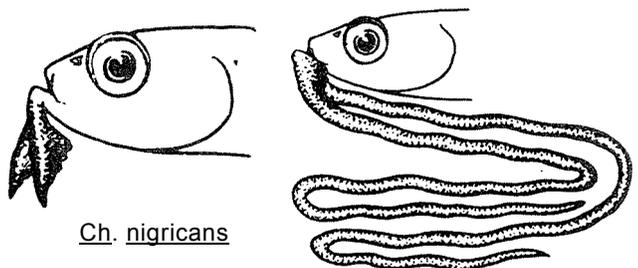
## DISTINCTIVE CHARACTERS:

Body elongate, thick, somewhat flattened ventrally. Head approximately equal to distance between dorsal fin origin and origin of upper caudal fin lobe; jaws of equal length; upper jaw not protrusible; lower jaw not included beneath the upper; palatine teeth (on roof of mouth) usually present. Dorsal fin with 12 to 14 rays, anal fin with 9 to 11; anal fin origin 5 to 7 rays behind origin of dorsal fin; dorsal fin low, rays at anterior end the longest; pectoral fins strikingly long, 65 to 70% of standard length, only the first ray unbranched; pelvic fins abdominal, large, reaching well beyond anal fin origin, their insertion closer to anal fin origin than to pectoral fin insertion and much nearer to hind margin of head than to origin of lower caudal fin lobe. Pectoral branch of lateral line absent. Scale rows across back in front of dorsal fin (redorsal scales) 33 to 41. Juveniles with a pair of long chin barbels (about equal to standard length in some individuals and without lateral flaps).

Colour: dark above, pale below, the dark colours usually iridescent blue in life; dorsal fin with a prominent black spot; pectoral fins dark, blue in life, without a pale transverse stripe or dark spots; pelvic fins without spots (with a dark spot in juveniles).

## DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

*Cheilopogon nigricans*: pectoral fins with a pale transverse stripe which is yellow or greyish-yellow in life; predorsal scales 24 to 28 (33 to 41 in *Ch. cyanopterus*); head shorter than distance between dorsal fin origin and origin of upper caudal fin lobe; pelvic fins usually with a black spot; juveniles with a pair of shorter (not more than 35% of standard length) chin barbels, each bearing a smaller lateral flap.


*Ch. nigricans*
*Ch. cyanopterus*

juvenile

Ch. atrisignis and Ch. suttoni: pectoral fins with numerous scattered dark spots. Furthermore, in Ch. atrisignis, dorsal fin with 14 to 16 rays (12 to 14 in Ch. cyanopterus). and juveniles with a pair of flattened chin barbels, their length about 30% of standard length; and in Ch. suttoni, pelvic fin insertion approximately at mid-point of distance between hind margin of head and origin of lower caudal fin lobe-, juveniles with a pair of flattened shorter chin barbels, about 25% of standard length.

Ch. pinnatibarbatus: predorsal scales 39 to 47; head less than 22% of standard length (longer in Ch. cyanopterus); greatest width of body less than 13.5% of standard length (more in Ch. cyanopterus); juveniles with an unpair, fringed chin barbel.

Other Cheilopogon species: predorsal scales less than 35; pectoral fins with a paler transverse strip or basal triangle; palatine teeth present or absent; chin barbels in juveniles shorter (less than 35% of standard length) or absent.

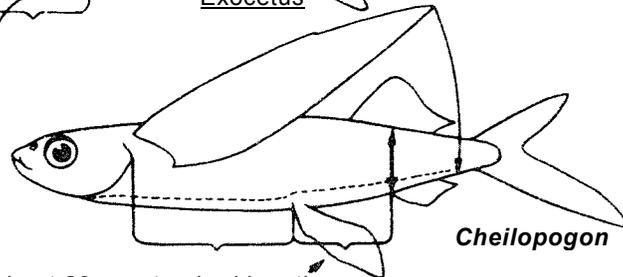
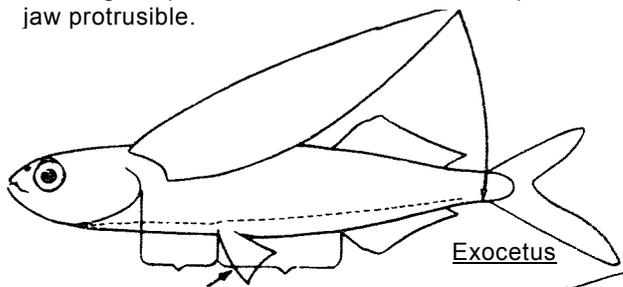
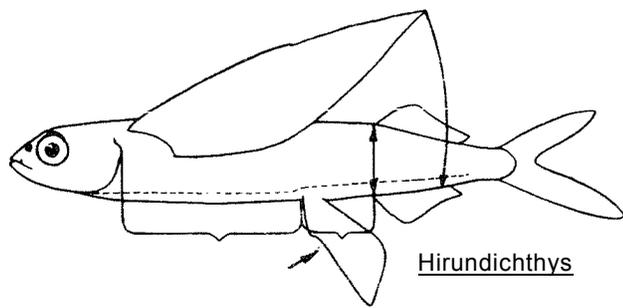
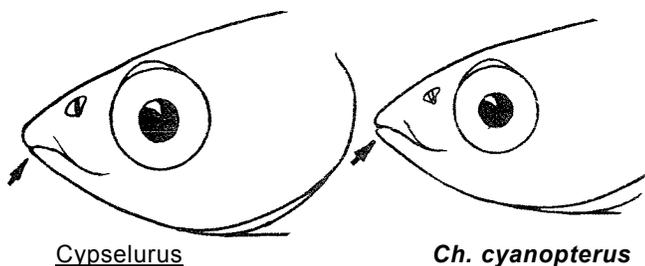
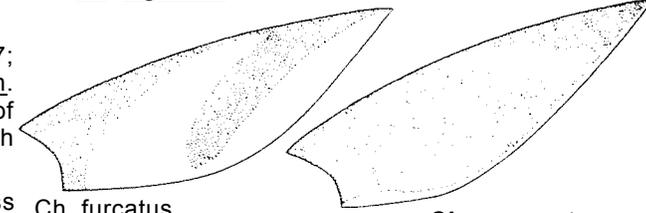
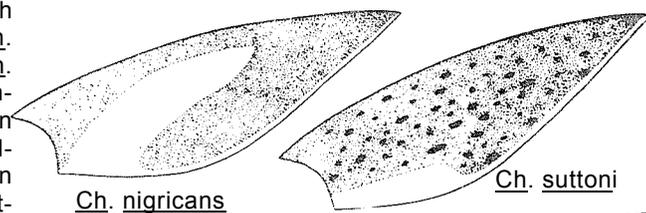
Cypselurus species: predorsal scales less than 32; lower jaw included beneath the upper. Furthermore, pectoral fins with numerous dark spots in C. poecilopterus.

Prognichthys species: pectoral fins with 3 or 4 unbranched rays; lower jaw included beneath the upper; predorsal scales 25 to 29.

Hirundichthys species: anal fin origin not more than 3 rays behind origin of dorsal fin.

Exocoetus species: pelvic fin insertion closer to pectoral fin insertion than to anal fin origin; pelvic fins short, not reaching anal fin origin.

Parexocoetus species: pectoral fins shorter, 55 to 60% of standard length; dorsal fin high, with middle rays the longest; pectoral branch of lateral line present; upper jaw protrusible.



**SIZE:**

Maximum: about 29 cm standard length.

**GEOGRAPHICAL DISTRIBUTION AND BEHAVIOUR:**

Widely distributed in the tropical Indian Ocean but apparently absent from the Red Sea, northern Arabian Sea and the "Gulf". Also occurs in the Atlantic and western Pacific Oceans.

Pelagic in surface waters of both neritic and oceanic areas; capable of leaping out of the water and gliding for long distances above the surface.

**PRESENT FISHING GROUNDS:**

Not known to be a commercial species, but included in this publication to facilitate future field identification and data collection.

