2.3.3 Information by species

Aphanopus Lowe, 1839 **TRICH Apha**

Aphanopus Lowe, 1839:79. Type species, ***Aphanopus carbo*** Lowe, 1839, by monotypy.

Synonyms: None.

Diagnostic Features: Body elongate and compressed. Head profile smooth, gently rising from tip of snout to dorsal-fin origin; frontal ridges not elevated, interorbital space and nape flattened, without sagittal crest; lower hind margin of gill cover convex; lower jaw extends anterior to upper jaw; tip of both jaws with a short dermal process; jaw dentition includes anterior fangs and compressed triangular teeth; no vomerine teeth; few uniserial teeth present on palatines. Gill rakers on first arch spinescent. Dorsal fin long, with XXXVIII to XLV spines and 52 to 65 soft rays (total 90 to 109 fin elements), partly divided by a deep notch, base of spinous part only slightly shorter than the soft part; anal fin with II close-set spines, well detached from the rest of fin, but the first diminutive, completely concealed in adults, the second very strong, dagger-like, and 43 to 54 soft rays, external rays developed throughout, but connected with membranes only in posterior portion of fin base; pectoral fins with 12 rays; pelvic fins absent in adults but present in juveniles as a single spine inserted before base of pectoral fins; a small forked caudal fin present. **Colour:** Body coppery black with iridescent tint. Inside of mouth and gill cavities black.

Biology, Habitat and Distribution: Benthopelagic on continental slope, mostly from 400 to 1 600 m, juveniles mesopelagic. Feeds on cephalopods, crustaceans and a variety of fish. Distributed throughout temperate and tropical oceans.

Interest to Fisheries: Of the four species in this genus, commercial catches are only reported for ***Aphanopus carbo.***

Species: Four species recognized (Parin, 1983) but the systematic status of the Pacific form is uncertain.

Key to Species of *Aphanopus:*

1a. Total dorsal-fin elements 104 to 109; vertebrae total 111 to 115 ..... ***A. mikhailini***

2b. Total dorsal-fin elements 90 to102; vertebrae total 97 to 108 .....→ ***2***

2a. Total dorsal-fin elements 95 to102; vertebrae total 102 to 108 ..... ***A. intermedius***

2b. Total dorsal-fin elements 90 to97; vertebrae total 97 to 102 ..... → ***3***

3a. Dorsal-fin spines 38 to 41; precaudal vertebrae 40 to 44 ..... ***A. carbo***

3b. Dorsal-fin spines 41 to 43; precaudal vertebrae 44 to 47 .....***A. microphthalmus***

Aphanopus carbo Lowe, 1839 | Fig. 114 | **TRICH Apha 1**

Aphanopus carbo Lowe, 1839:79 (Madeira).

Synonyms: ***Aphanopus minor*** Collett, 1887. ***Aphanopus schmidti*** Saemundsson, 1907. ***Aphanopus acus*** Maul, 1948.

FAO Names: En - Black scabbardfish**; Fr -** Sabre noir**; Sp -** Sable negro.

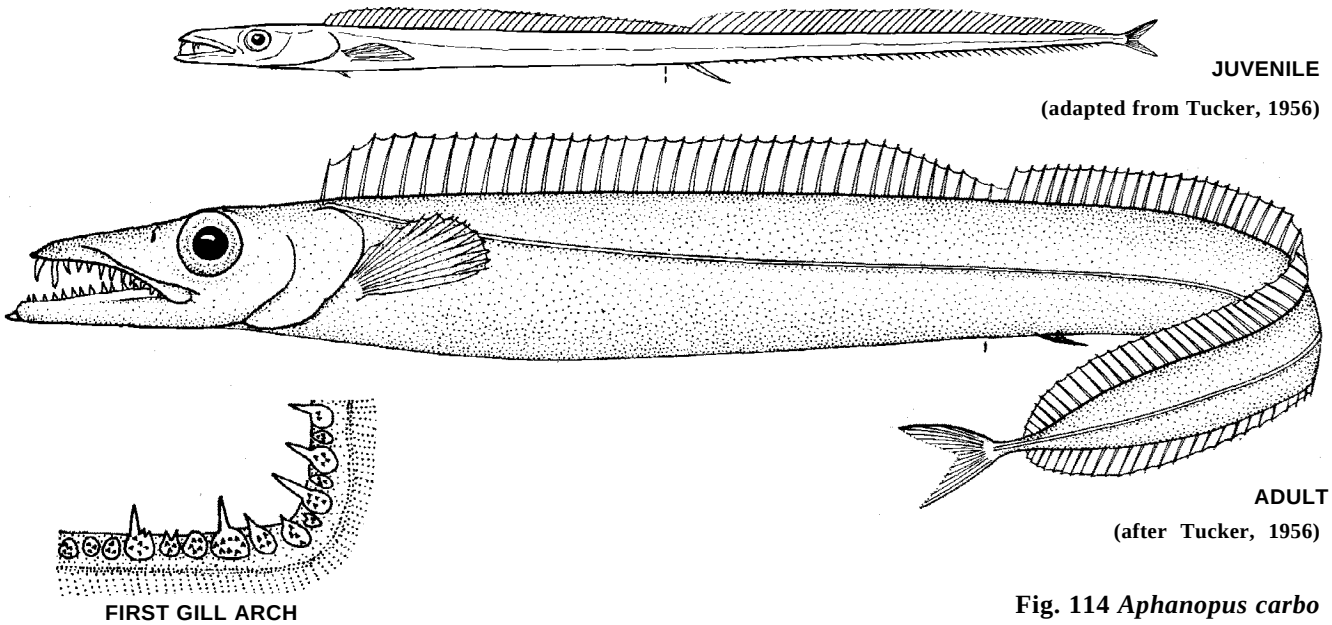

Fig. 114 ***Aphanopus carbo***

Diagnostic Features: Body depth 10.8 to 13.4 times in standard length; anus situated below the last 3 dorsal-fin spines; distance from snout to anus 1.7 to 1.8 times in standard length. Head length 4.7 to 5.2 times in standard length; snout length 2.3 to 2.5 times in head length; eye diameter 4.9 to 5.8 times in head length; interorbital width 1.1 to 1.4 times in eye diameter; maxillary length 2.1 to 2.2 times in head length. Dorsal fin with XXXVIII to XL (rarely XLI) spines, and 52 to 56 soft rays (total 90 to 96 fin elements); anal fin with II spines, situated below second to fifth dorsal-fin soft ray, and 44 to 48 (rarely 43) soft rays. Vertebrae total 97 to 100, including 40 to 44 precaudal and 55 to 60 caudal.

Geographical Distribution: On both sides and at underwater rises of North Atlantic from Denmark Strait to about 30°N (Fig. 115).

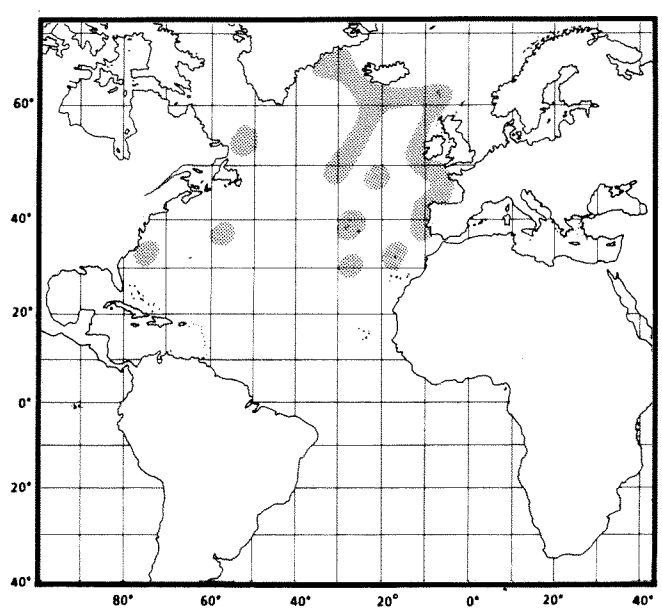

Fig. 115

Habitat and Biology: Benthopelagic from 200 to 1 600 m, juveniles mesopelagic. Migrates to midwater at night and feeds on crustaceans, cephalopods and fishes (mostly macrourids, morids and alepocephalids). Matures at 80 to 85 cm. Spawns west of the British Isles from November to April at depths from 700 to 900 m.

Size: Maximum 110 cm standard length.

Interest to Fisheries: Commercial catch reported entirely from Portugal with total annual landings (probably including ***A. intermedius*** off Madeira) from 4 613 to 6 865 t (1985 to 1990) (FAO, 1992), including up to 1 000 t which is caught off Madeira with a specialized commercial deep water longline (Maul, 1950). Appears as bycatch in the trawl fishery west of the British Isles, along the Middle-Atlantic Ridge and at Corner Rise.

Local Names: FRANCE: Ophanope carbon, Sabre noir; GERMANY: Schwarzer Degenfisch; JAPAN: Kurotachi-modoki; PORTUGAL: Espada preta (incl. Madeira); RUSSIA: Ugolnaya ryba-sablya; SPAIN: Sable negro; UK, USA: Black scabbard fish.

Literature: Tucker and Palmer (1949); Tucker (1950); Templeman and Squires (1963, in part); Wheeler (1969); Zilanov and Shepel (1975); Kukuev (1982, in part); Parin (1983, 1986); Nakamura (1984b).

Aphanopus intermedius Parin, 1983 | Fig. 116 | **TRICH Apha 2**

Aphanopus intermedius Parin, 1983:358 (off Congo and Angola, eastern Atlantic Ocean).

Synonyms: None.

FAO Names: En - Intermediate scabbardfish**; Fr -** Poisson sabre tachuo**; Sp -** Sable intermedio.

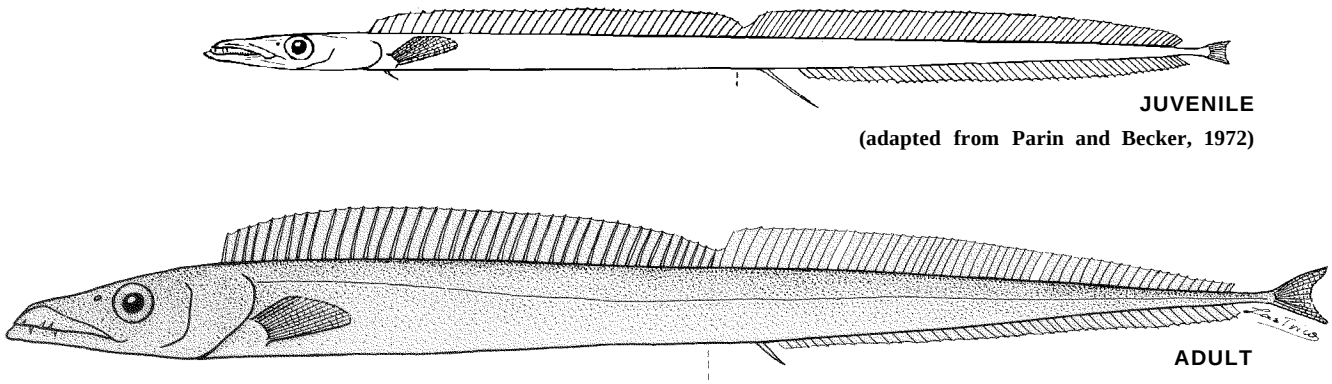

Fig. 116 ***Aphanopus intermedius***

Diagnostic Features: Body depth 12.0 to 16.4 times in standard length; anus situated below the third from the last dorsal-fin spine, to the first dorsal-fin soft ray; distance from snout to anus 1.8 to 1.9 times in standard length. Head length 4.9 to 5.5 times in standard length; snout length 2.3 to 2.6 times in head length; eye diameter 5.0 to 6.0 times in head length; interorbital width 1.2 to 1.4 times in eye diameter; maxillary length 2.0 to 2.2 times in head length. Dorsal fin with XL to XLIV (rarely XXXIX) spines and with 54 to 59 soft rays (total 96 to 102 (rarely 95) fin elements); anal fin with II spines situated below the third to sixth dorsal-fin soft rays, and 46 to 50 soft rays. Vertebrae total 102 to 108, including 43 to 47 precaudal and 57 to 61 caudal.

Geographical Distribution: Tropical and subtropical Atlantic Ocean; in the North Pacific off Japan, Kuril Islands, Hawaii, and British Columbia to California; and in the South Pacific off Australia and Peru (Fig. 117).

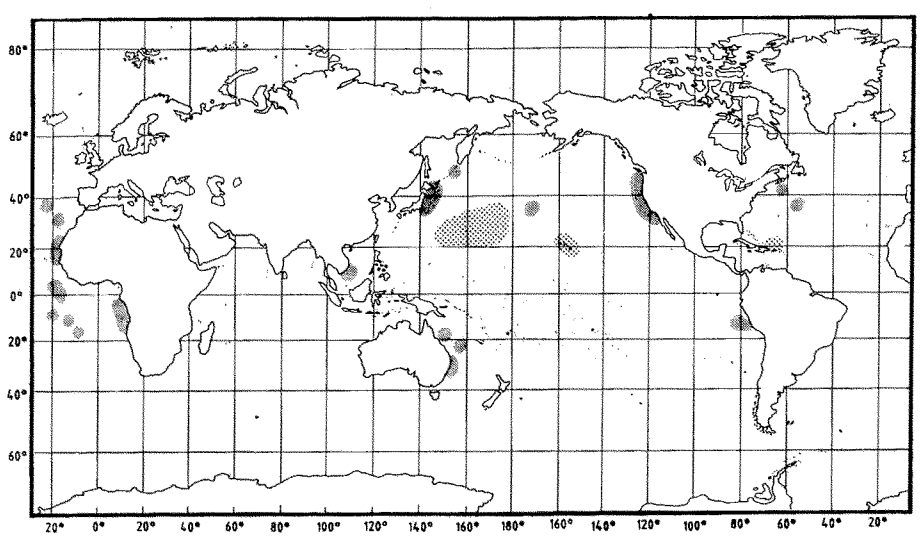

Fig. 117

Habitat and Biology: Benthopelagic from 800 to 1 350 m juveniles mesopelagic from 300 to 500 m (1000 m).

Size: Maximum 100 cm standard length.

Interest to Fisheries: No special fishery for this species.

Local Names: JAPAN: Kurotachi-modoki; USA: Black scabbard fish.

Literature: (as ***A. carbo*** or ***Aphanopus*** sp.) Templeman and Squires (1963, in part); Parin and Becker (1972); Fitch and Gotshall (1972); Peden (1974); Clarke and Wagner (1976); Parin and Golovan (1976); Parin et al. (1978); Howe et al. (1980); Mikhailin (1982); Parin and Sazonov (1982); Kukuev (1982, in part); Parin (1983, 1990b,c); Nakamura (1984b); Borets (1986).

Aphanopus microphthalmus Norman, 1939 Fig. 118 **TRICH Apha 3**

Aphanopus microphthalmus Norman, 1939:71, fig. 25 (Gulf of Aden).

Synonyms: None.

FAO Names: En - Smalleye scabbardfish**; Fr -** Poisson sabre petits yeux**; Sp -** Sable ojito.

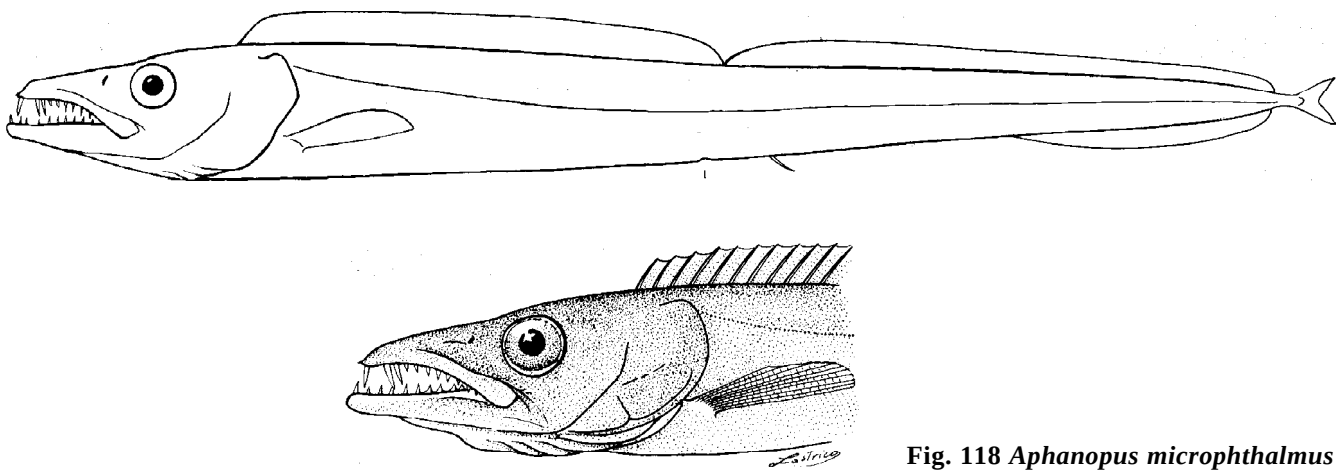

Fig. 118 ***Aphanopus microphthalmus*** **(adapted from Norman, 1939)**

Diagnostic Features: Body depth 9.5 to 12.2 times in standard length; anus situated below penultimate dorsal-fin spine to first dorsal-fin soft ray; distance from snout to anus 1.8 times in standard length. Head length 4.3 to 5.0 times in standard length; snout length 2.2 to 2.5 times in head length; eye-diameter 5.4 to 6.2 times in head length; interorbital width 1 .1 to 1.4 times in eye diameter; maxillary length 2.0 to 2.1 times in head length. Dorsal fin with XLI to XLIII spines and 53 to 55 soft rays (total 94 to 97 fin elements); anal fin with II spines, its origin situated below third to sixth dorsal-fin soft rays, and 43 to 46 soft rays. Vertebrae total 99 to 102, including 44 to 47 precaudal and 54 to 56 caudal.

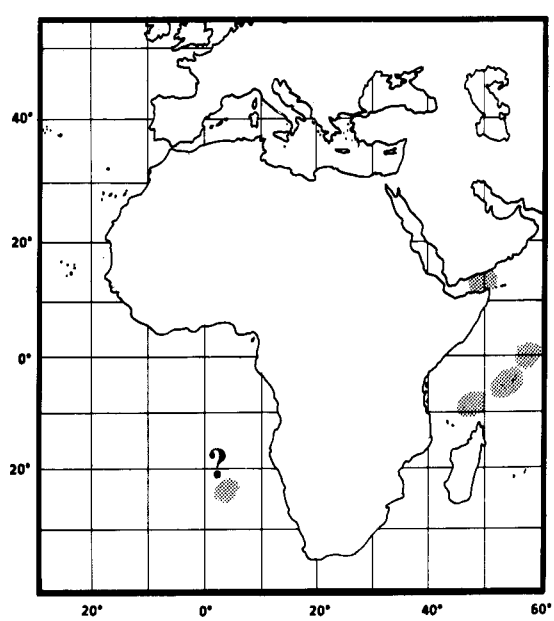

Fig. 119

Geographical Distribution: Western Indian Ocean; one specimen collected at Walvis Ridge in the eastern South Atlantic (Fig. 119).

Habitat and Biology: Benthopelagic from 810 to 1 020 m.

Size: Maximum 94 cm.

Interest to Fisheries: None.

Local Names:

Literature: Forster et al. (1970, as A. carbo); Piotrovsky (1979, as ***A. carbo,*** in part); Pakhorukov (1981, as ***A. carbo,*** in part); Parin (1983); Nakamura (1986c); Shcherbachev et al. (1986).

Aphanopus mikhailini Parin, 1983 | Fig. 120 | **TRICH Apha 4**

Aphanopus mikhailini Parin, 1983:356 (Walters Shoals, western South Indian Ocean).

Synonyms: None.

FAO Names: En - Mikhailin's scabbardfish**; Fr -** Poisson sabre jarretière**; Sp -** Sable de Mikhailin.

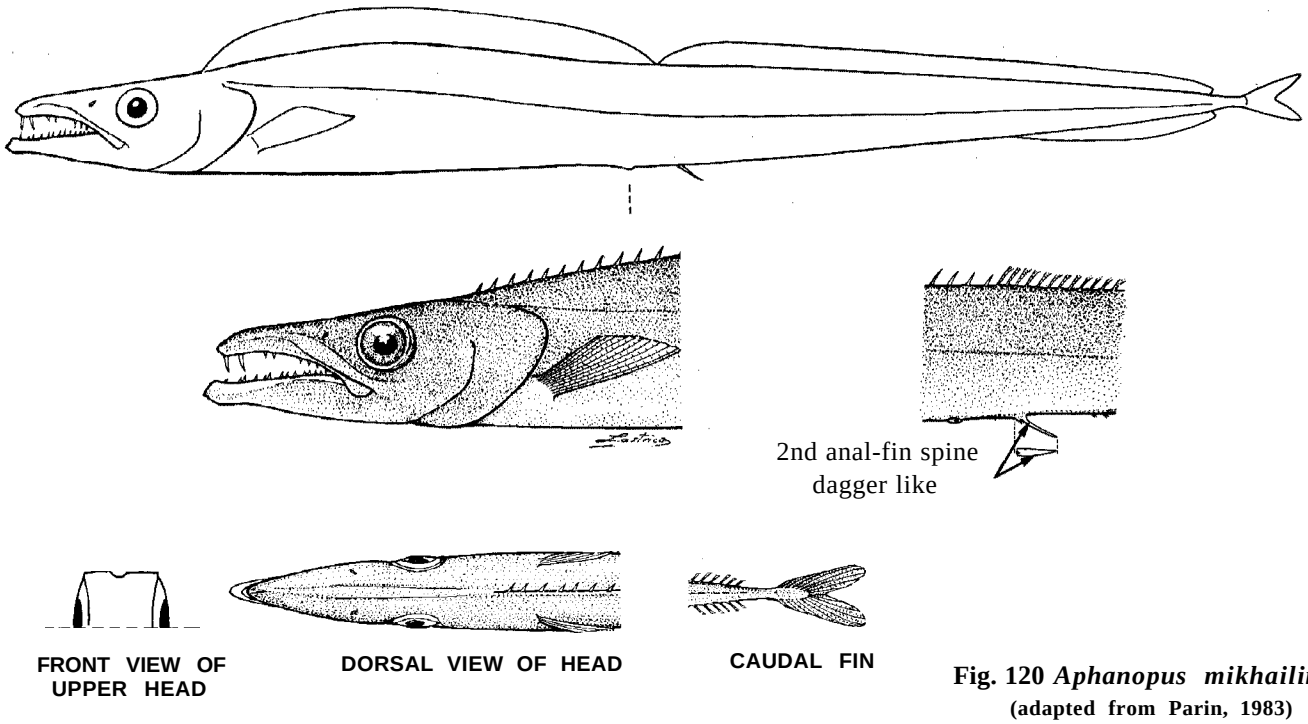

Fig. 120 ***Aphanopus mikhailini*** **(adapted from Parin, 1983)**

Diagnostic Features: Body depth 11.4 to 15.1 times in standard length; anus situated below penultimate or last dorsal-fin spine; distance from snout to anus 1.8 to 1.9 times in standard length. Head length 5.1 to 6.0 times in standard length; snout length 2.2 to 2.4 times in head length; eye diameter 4.8 to 5.6 times in head length; interorbital width 1.3 to 1.7 times in eye diameter; maxillary length 2.0 to 2.2 times in head length. Dorsal fin with XLIII to XLV spines and 61 to 65 soft rays (total 104 to 109 fin elements); anal fin with II spines, its origin situated below third to fourth dorsal-fin soft ray, and 51 to 54 soft rays. Vertebrae total 111 to 115, including 48 to 51 precaudal and 63 to 65 caudal.

Geographical Distribution: In the South Atlantic Ocean off Argentina, Namibia and at Walvis Ridge, and in the South Indian Ocean on seamounts off Mozambique and the West Australian Ridges (Fig. 121).

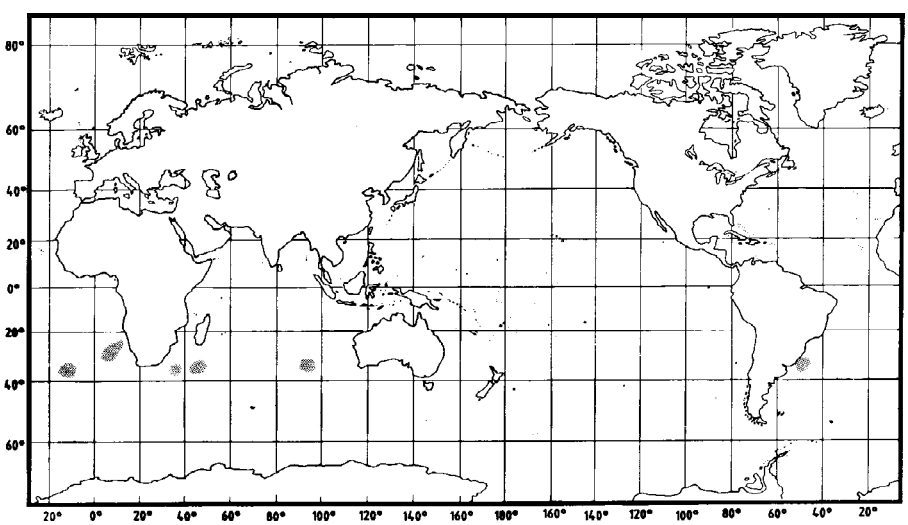

Fig. 121

Habitat and Biology: Benthopelagic from 1 035 to 2000 m.

Size: Maximum 82 cm.

Interest to Fisheries: None.

Local Names:

Literature: Piotrovsky (1979, as ***A. carbo,*** in part); Mikhailin (1982, as ***Aphanopus*** sp.); Nakamura (1986c); Parin (1990c).

Assurger Whitley, 1933

TRICH Assur

Assurger Whitley, 1933:84. Type species, ***Evoxymetopon anzac*** Alexander, 1916, by original designation (also monotypic).

Synonyms: None.

Diagnostic Features: See species.

Biology, Habitat and Distribution: Rare benthopelagic fish, probably widely distributed in all warm oceans.

Interest to Fisheries: No special fishery.

Species: A single species.

Assurger anzac (Alexander, 1916)

Fig. 122

TRICH Assur 1

Evoxymetopon anzac Alexander, 1916:104, pl. 7 (Freemantle, Western Australia).

Synonyms: ***Assurger alexanderi*** Whitley, 1933 .

FAO Names: En - Razorback scabbardfish**; Fr -** Poisson sabre rasoir**; Sp -** Sable aserrado.

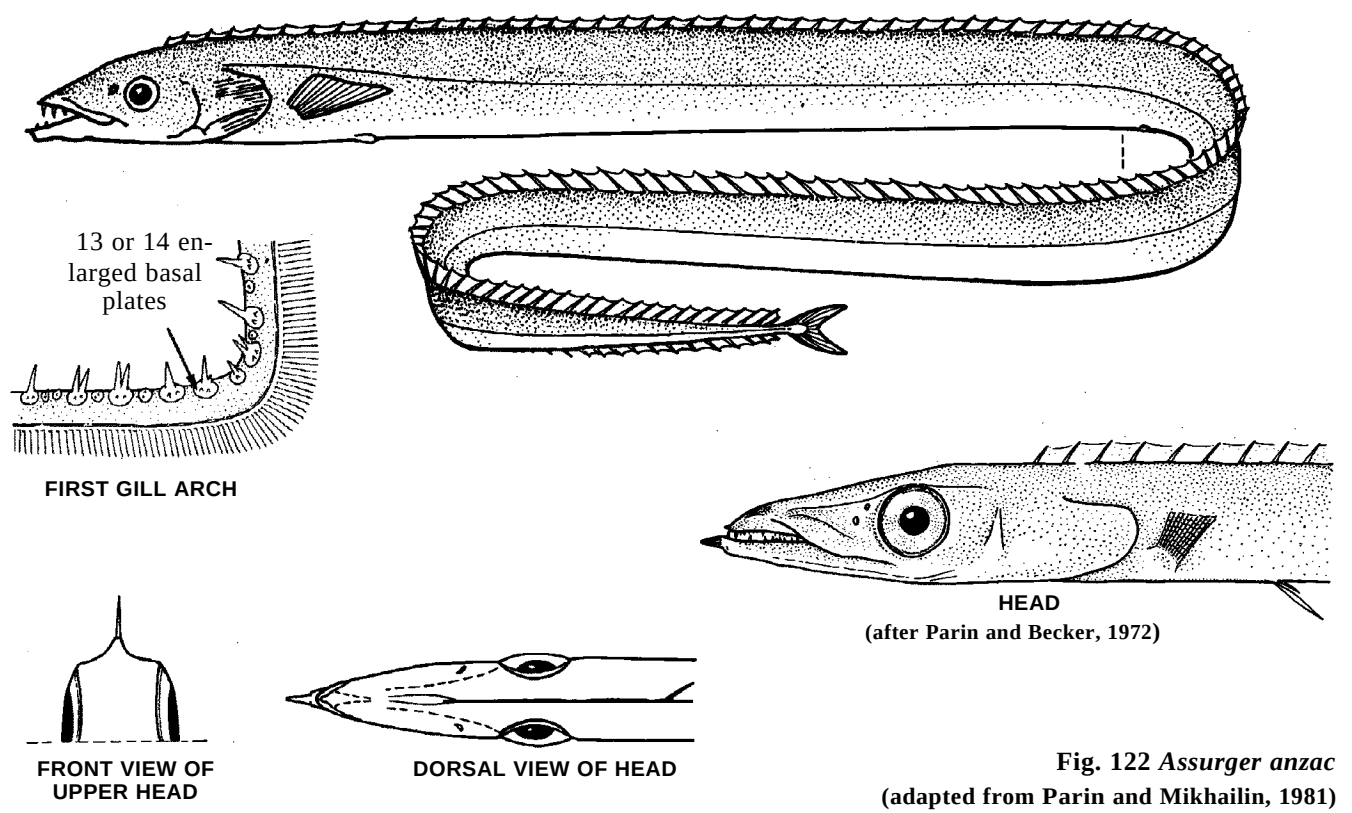

Fig. 122 ***Assurger anzac***
(adapted from Parin and Mikhailin, 1981)

Field Characters: Caudal fin present. Sagittal crest developed on interorbital space and nape. Upper head profile gentle. Body depth 25 to 28 times in standard length.

Diagnostic Features: Body very elongate and remarkably compressed; maximum depth 25.1 to 28.0 times in standard length; anus situated below the 40th to 42nd dorsal-fin soft ray. Head length 12.1 to 13.5 times in standard length; snout length 2.5 to 2.6 times in head length; upper head profile straight or scarcely convex, gently rising from tip of snout to dorsal-fin origin; frontal crests confluence at nares level; interorbital space and nape convex, with sagittal crest strongly elevated; lower hind margin of gill cover convex; eye diameter 7.4 to 8.0 times in head length; interorbital width 1.1 to 1.2 times in eye diameter; maxillary length 3.1 to 3.3 times in head length; lower jaw extends anterior to upper jaw; tip of both jaws with a short dermal process; anteriorly in lower jaw, 3 pairs of fangs; a single pair of smaller fangs at tip of lower jaw. Gill rakers spinescent, enlarged basal plates 13 or 14. Dorsal fin with a few weak anterior spines hardly differing from the soft rays, dorsal-fin elements 116 to 123; first anal-fin spine rudimentary, second spine scale-like, anal-fin spines inserted below 42nd to 44th soft dorsal-fin ray, total 74 to 87 anal-fin elements, with only 14 to 17 external soft rays, confined to posterior portion of the fin; pectoral fins with 12 soft rays, triangular, with anterior rays much shorter than posterior rays; pelvic fins of I scale-like spine and 1 tiny soft ray, inserted below eighth or ninth dorsal-fin soft ray and with a distance of 1.5 to 1.6 eye diameters behind the posterior part of pectoral-fin base; small forked caudal fin present. Lateral line fairly straight. Vertebrae total 125 to 129, including 42 to 43 precaudal and 83 to 86 caudal. **Colour:** Body silvery, dorsal-fin membrane black before third to fourth soft ray.

Geographical Distribution: Known from off Puerto Rico and Uruguay (specimens at Institut für Seefischerei, Universität Hamburg (ISH) were collected from 32º44'S, 48º43'W) and at Walvis Ridge in the Atlantic, off western Australia in the Indian Ocean, and in the Pacific off New Guinea, southern. Japan, Midway Island, California, Nazca and Sala y Gomez Ridges (Fig. 123).

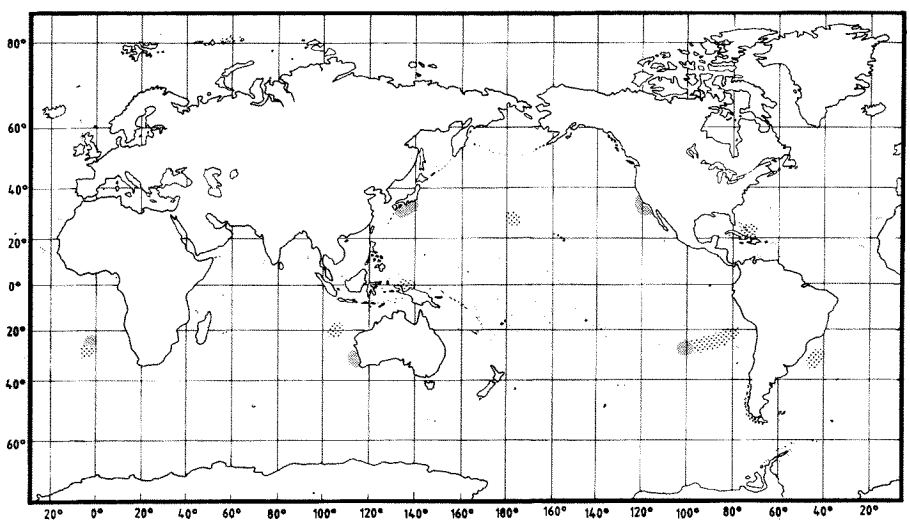

Fig. 123

Habitat and Biology: Probably benthopelagic from 150 to 400 m, juveniles epi- or mesopelagic. Feeds on fishes (including *Englauris mordax* and *Merluccius productus* off California) and squid

Size: Maximum 225 cm standard length.

Interest to Fisheries: No special fishery for this species.

Local Names: JAPAN: Nagayume-tachimodoki.

Literature: Kamohara (1952); Tucker (1956); Backus et al. (1969); Parin and Becker (1972); Fitch and Gotshall (1972); Abe et al. (1974); Parin and Mikhailin (1981); Nakamura (1984b); Parin (1990b).