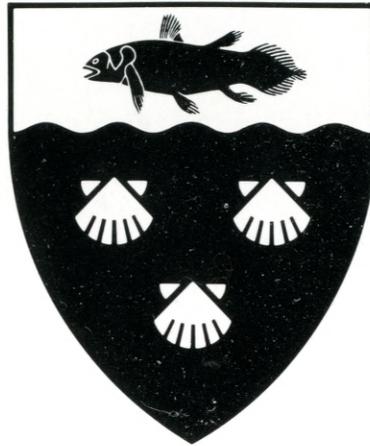


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**FISHES OF THE TRISTAN DA CUNHA GROUP AND GOUGH ISLAND,
SOUTH ATLANTIC OCEAN**

by

T.G. Andrew, T. Hecht, P.C. Heemstra and J.R.E. Lutjeharms

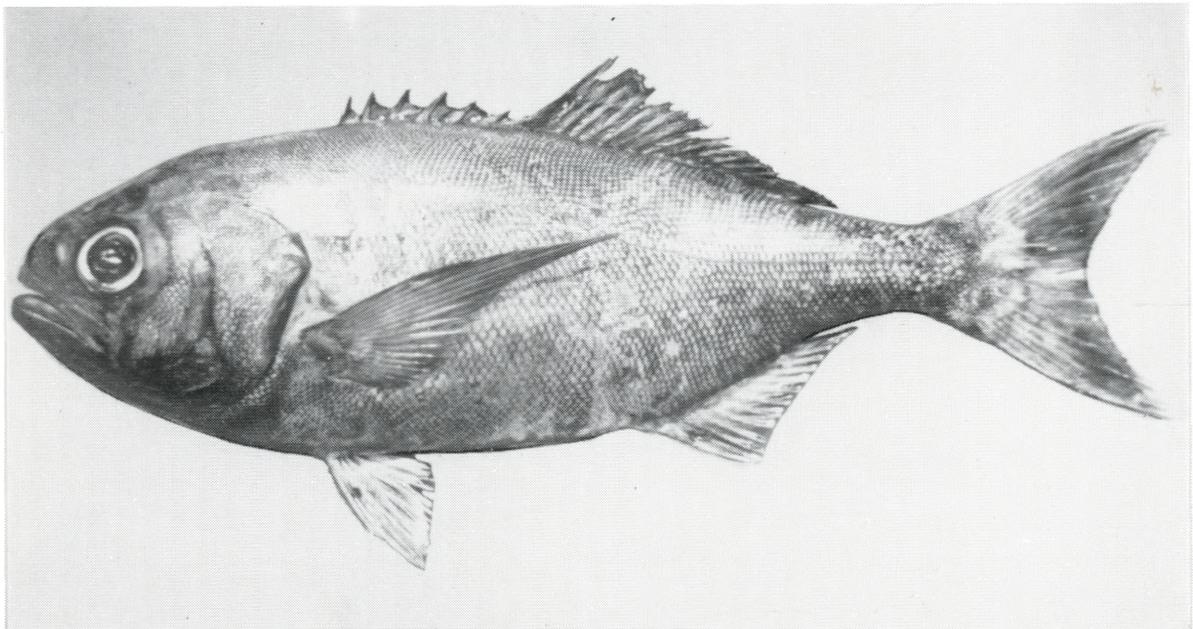
ABSTRACT

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Recent collections of fishes from the South Atlantic islands of the Tristan da Cunha Group (Tristan, Inaccessible and Nightingale) and Gough Island have produced 25 new records. Fifty one species are known to occur in the near-shore waters of the islands (46 of these are documented by specimens and another 5 species are probable). A diagnosis, synonymy and in most cases, an illustration, are provided for each species. For certain species, brief notes on biology, relative abundance and seasonal distribution are included. The neritic ichthyofauna of the Subtropical Convergence (STC) region is characterized, and the importance of this frontal zone as a barrier to dispersal of species in the Southern Ocean is evaluated. Analysis of the zoogeographic affinities of the Tristan/Gough fish fauna resulted in a redefinition of the West Wind Drift Islands Province (WWDI), comprising the Tristan Group and Gough in the South Atlantic and St. Paul and Amsterdam Islands in the southern Indian Ocean. Vema Seamount (west of Cape Town) and Walters Shoal (south of Madagascar) are excluded from the WWDI Province, as the affinities of their poorly-known fish faunas appear to be more with South Africa and the tropical Indian Ocean respectively.

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TRISTAN BLUEFISH

FISHES OF THE TRISTAN DA CUNHA GROUP AND GOUGH ISLAND, SOUTH ATLANTIC OCEAN

by

T.G. Andrew¹, T. Hecht¹, P.C. Heemstra² and J.R.E. Lutjeharms³

INTRODUCTION

The south Atlantic islands known as the Tristan Group and Gough Island were formed by volcanic activity that resulted in massive cones thrusting up from the outer slopes of the Mid-Atlantic Ridge (Heydorn and Lutjeharms, 1980). The Tristan Group comprises Tristan da Cunha, which is the largest island (about 13 km in diameter) and the two much smaller islands, Inaccessible and Nightingale. Tristan is about midway between South Africa and South America, at 37° 05' S, 12° 17' W, 1660 nautical miles from Cape Town (Fig. 1). The two smaller islands are about 20 miles southwest of Tristan. Gough Island lies 200 miles SSE of Tristan at 40° 19' S, 9° 56' W.

Little has been reported on the diversity and distribution of the neritic fishes of the Tristan da Cunha Group and Gough. Publications concerning the fishes of these islands have generally been descriptive in nature or have dealt with broad zoogeographical concepts. In the first published report on the fauna and flora of Tristan, Carmichael (1819)

described four species of fish and mentioned another five that occur there. Barnard (1923; 1925) listed five more species. Norman (1935a) described an additional species, and Sivertsen (1945) added seven species that were collected by the Norwegian expedition to the islands. Rowan and Rowan (1955) added three oceanic species to the fish fauna of Tristan. Penrith (1967) reviewed the fishes of Tristan, Gough Island and the Vema Seamount northwest of Cape Town; he listed 23 species from Tristan, 8 from Gough and 13 from Vema, and compared the ichthyofauna of these localities with those from other areas of similar latitude. Miller (1982) collected three additional pelagic species from the waters around Gough Island, and Gon and Heemstra (1987) added another species.

Several species of midwater fishes are known from near the islands. Krefft (1974, 1978) reported 16 species from the Tristan/Gough region, and Hulley (1981) listed another 24 species collected by the FRV WALTER HERWIG during March 1971. Including midwater fishes, 68 species

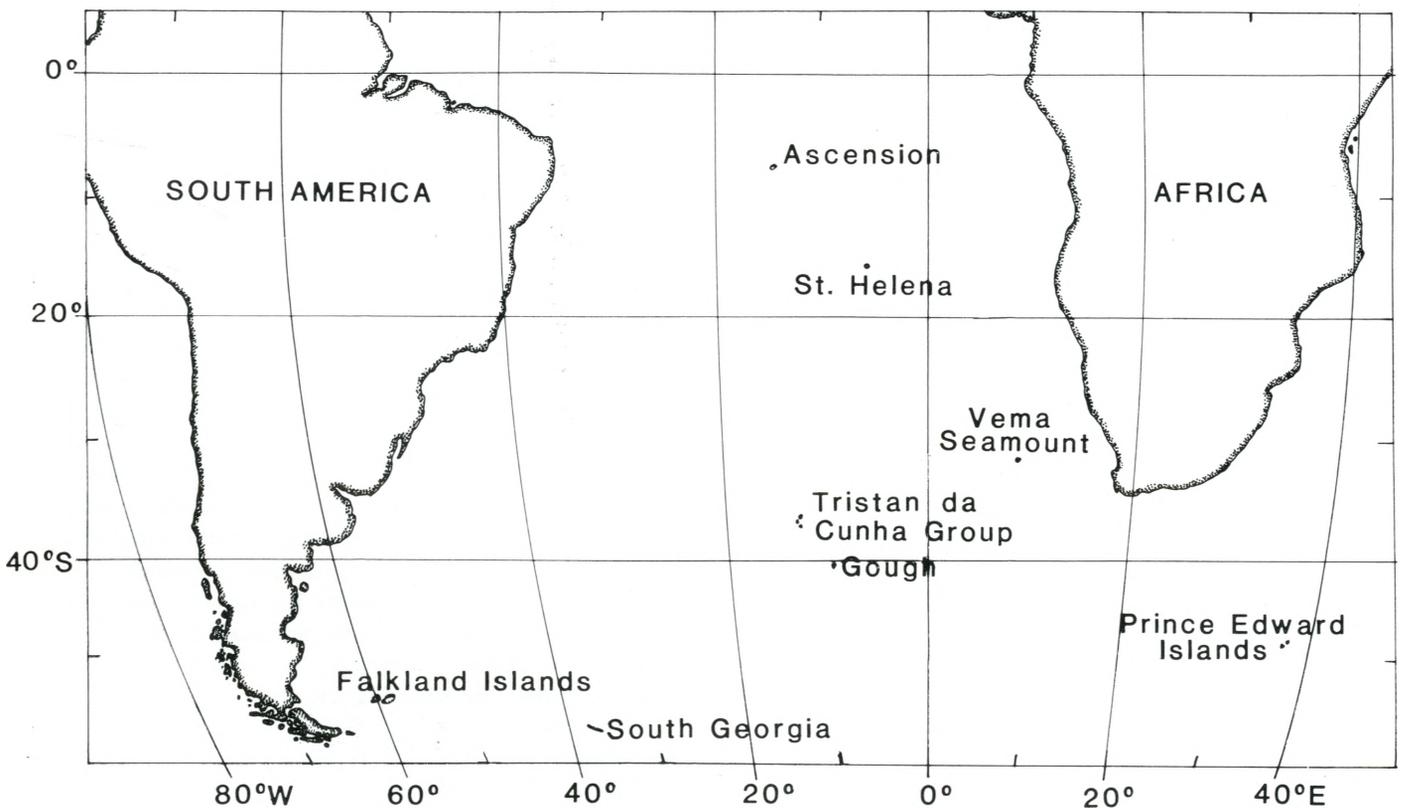


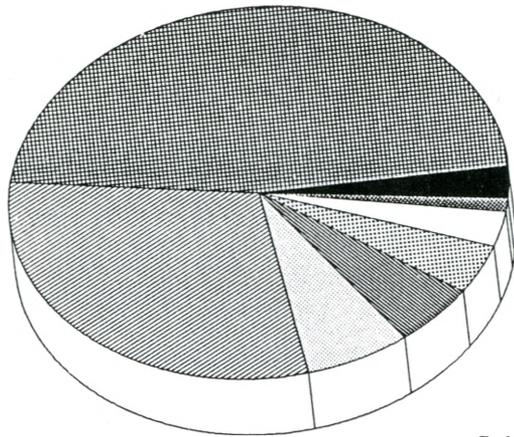
Figure 1. The position of Tristan da Cunha and Gough Island in the South Atlantic Ocean.

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Hyperoglyphe antarctica (47%)



Polyprion oxygeneios (3%)

Helicolenus mouchezi (1%)

Trachurus longimanus (3%)

Thyrsites atun (4%)

Sebastes capensis (5%)

Schedophilus velaini (7%)

Acantholatris monodactylus (30%)

Figure 2. Percentage composition by mass of the eight most common species caught in the Tristan da Cunha fishery from October 1988 to March 1990.

were previously known from these southern mid-Atlantic islands. We here report new records of 25 additional species.

The islanders depend on the fish resource to a large extent for food and for bait for the local rocklobster industry. Approximately 61.5 tons of linefish are harvested each year for these purposes. Figure 2 indicates the percentage composition by mass of the eight main species caught in the fishery from October 1989 to March 1990 (figures from present study).

The insular nature of the island ecosystem renders it vulnerable to over-exploitation from commercial fishing operations. Most of the fish species are bound to the islands

for the completion of their life cycles; hence, the populations are more or less isolated and not supplemented by recruits from outside of the system. At present, only the palinurid lobster *Jasus tristani* is commercially exploited. The catch per unit effort for this species has decreased considerably since 1965 (Roscoe, 1979). If this industry were to collapse, there would be a strong incentive to exploit the fish stocks commercially. A great danger of over-exploitation of the fish resource exists in the future, if early management is not implemented. For this reason it is essential to obtain a thorough knowledge of the composition and dynamics of the fish fauna of the islands.

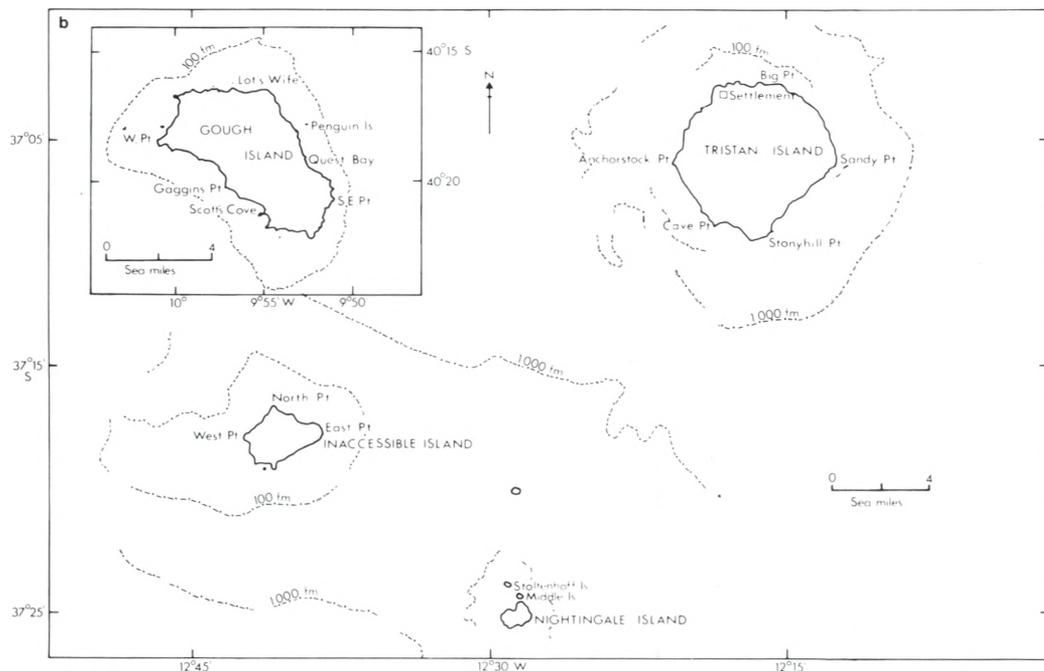


Figure 3. The Tristan da Cunha Group with Gough Island inset showing the 183m isobath around the islands (after Roscoe, 1979).

THE MARINE ENVIRONMENT OF THE ISLANDS

Being volcanic and situated on the Mid-Atlantic ridge, all of the islands have relatively narrow shelf areas (mostly about 1 nautical mile wide) which drop off into abyssal depths. Depths of up to 3000 m have been recorded between the northern islands. Roscoe (1979) estimated the planar areas around the islands down to the 183 m isobath (Fig. 3), which is about the maximum depth sampled for neritic fishes in the present study. The waters around the islands can be considered oceanic, because they are virtually unaffected by processes derived from the islands, such as silt deposition and fresh water run-off.

The inshore areas of the four islands differ considerably, although all are characterized by a rugged sea floor topography. Tristan has many boulder and sandy beaches that are not as common at the other islands, and there are many shallow reef areas with deeply incised rockpools. The slope of the littoral bottom at Tristan is more gentle than at the other islands. At Gough and Nightingale the drop-off is almost vertical from the shore down to about 10 m. Gough has few large rockpools. Gough and especially Nightingale have deeply incised coastlines, with many bays and offshore pinnacles. All of the islands are surrounded by a kelp (*Macrocystis pyrifera*) fringe occurring in depths of 10-40 m. The coastline of Inaccessible is more similar to that at Tristan than to the other islands, and it has few deeply incised features.

Knox (1960) stated that the Subtropical Convergence (STC) lies just north of Gough in summer and north of Tristan in winter. Relatively few physical and chemical measurements of this front have been undertaken in the central South Atlantic. In order to obtain a better understanding of the marine environment at the islands various oceanographic measurements in the inshore areas around the islands were undertaken during an 18-month period in the field.

Daily sea surface temperatures and salinities were measured from October 1988 to March 1990. Surface temperatures were measured using a Crawford bucket (Crawford, 1972) on the seaward side of the harbour breakwater at Tristan Island. Surface water samples were collected at the same locality. These samples were sent to Cape Town every three months where salinities were determined in parts per thousand (ppt) to an accuracy of 0.003 ppt, using a Beckman Model SR 9 salinometer.

Offshore temperature profiles were measured, on average, once a month off Tristan Island during the 18 month study period. Sampling periodicity was entirely dependent on sea conditions. A portable expendable bathythermograph (XBT) recorder and launcher were operated from an 8 m diesel powerboat or from the 35 m rock lobster vessel **MFV TRISTANIA II**. Care was taken to ensure that launching occurred in depths greater than 300 m as the XBT was capable of measuring a profile to this depth. The position, surface water temperature, salinity and weather conditions at each launch were recorded. These depths were usually obtained at a distance greater than 1km from the shore.

Quality controls of the temperature profile recordings were carried out in the manner described in Lutjeharms

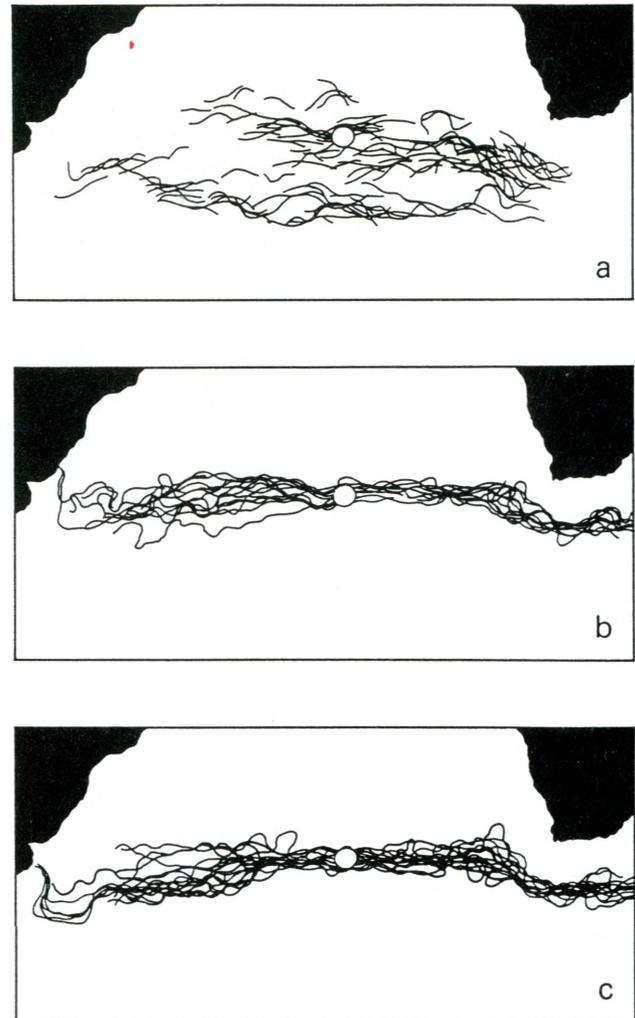


Figure 4. The location of the STC in the South Atlantic Ocean in 1988, according to satellite thermal infrared imagery. Panel (a) shows a compilation of all frontal expressions from January to June 1988. Panel (b) gives the locations of the 15°C surface isotherm from June to August. Panel (c) gives the same for the 18°C surface isotherm for the summer months December, January and February. The Tristan da Cunha Group is indicated by the open circle.

(1985). In some cases traces were discarded due to spikes in the record, and in others only the trace above the spikes was used.

The STC forms the northern border of the Southern Ocean and the geographic limit to the influence of Subantarctic Surface Water. At and near the sea surface it consists of a strong horizontal gradient in temperature, salinity and a number of nutrients such as nitrate, nitrite and phosphate. These gradients are particularly well developed along the east coast of South America (Guretskiy, 1986) and south of the Brazil and the Agulhas Currents respectively (Peterson and Stramma, 1991).

According to Deacon (1933) the STC in the South Atlantic is marked by a surface temperature change of at least 4°C and a salinity change of at least 0.50 psu. Lutjeharms and Valentine (1984) have carried out a detailed analysis of the surface expression of the STC based on 70

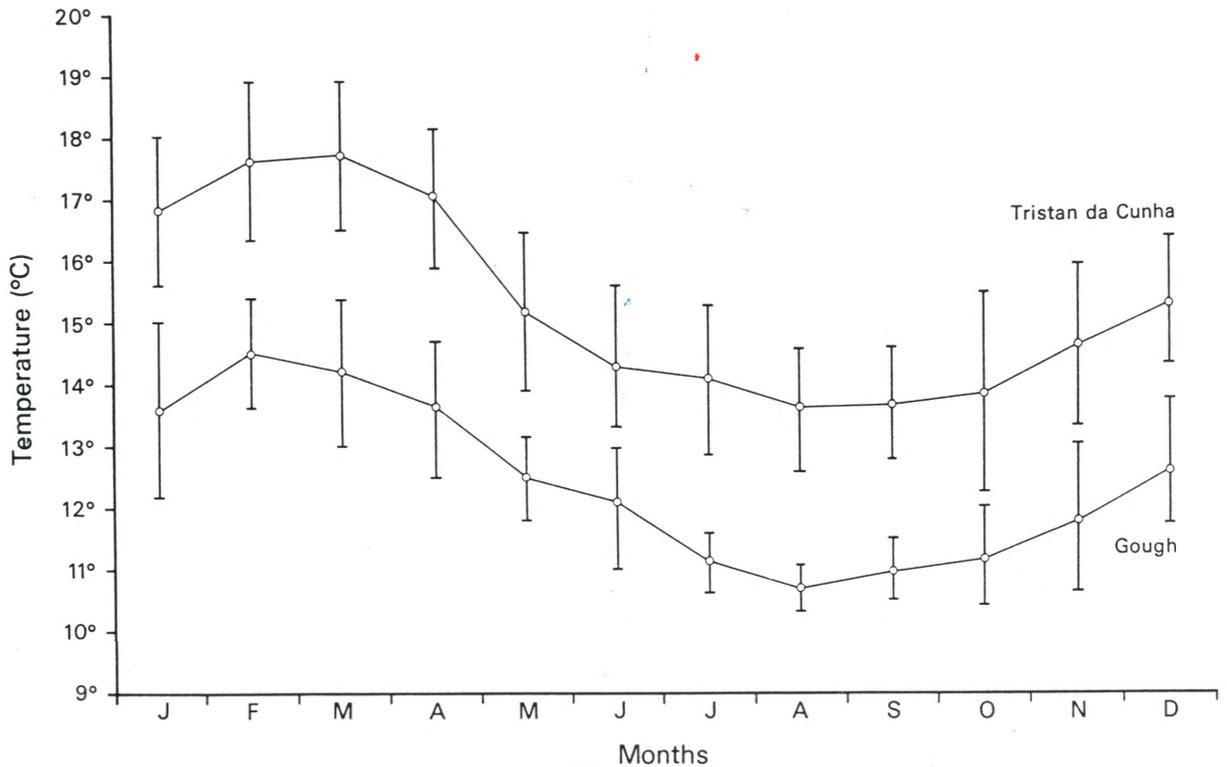


Figure 5. Mean monthly water temperatures at Tristan and Gough Island.

crossings of the front, mostly south of Africa. They have established that the average width of the front here exceeds 200 km, that its temperatures span 11°C to 18°C on average at any one time and that it has a mean temperature, in the core of the front, of 14.2°C.

Evidence that the islands fall within the meridional range of the STC can be seen in Figure 4. These data are derived from weekly products based on thermal infrared measurements made by satellite (Meeuwis, 1991). The locations of all distinct fronts for the period January to June 1988 are shown in Figure 4a. Figure 4b shows the locations of the 15°C surface isotherm which, according to Deacon (1966), represents the northern border of the STC in winter. Figure 4c shows the location of the 18°C isotherm in summer. All three diagrams indicate that Tristan da Cunha lies in the centre of the general meridional band in which the STC occurs.

Monthly average temperatures calculated for all the available sea surface temperature data from Tristan da Cunha and Gough Island also suggest that these islands lie within the STC (Fig. 5). Temperatures at Tristan in the warmer six months lie between 15°C and 19°C, and in the colder six months between 13°C and 15°C. Temperatures at Gough Island are on average 3°C lower than at Tristan during all months. If Deacon's (1966) definition of the STC is used, this would place the Tristan da Cunha group at the northern edge of the temperature range that the STC occupies and Gough Island at the southern border or entirely south of an STC influence. Monthly standard deviations are large, usually about 2°C (Fig. 5) from which it can be concluded that the seasonal temperature cycles at both

Tristan da Cunha and Gough Island may be considerably different from year to year.

According to the range of salinities reported for the STC by Lutjeharms (1985) all the measurements taken during the present study indicate that the Tristan da Cunha group lies within the STC. Figure 6 shows salinity values from this study as compared to salinities at the STC given by Whitworth and Nowlin (1987). The mean salinity proposed by these authors at the northern edge of the STC is indicated by the broken line. Therefore, according to their definition all the samples taken at Tristan Island during this period

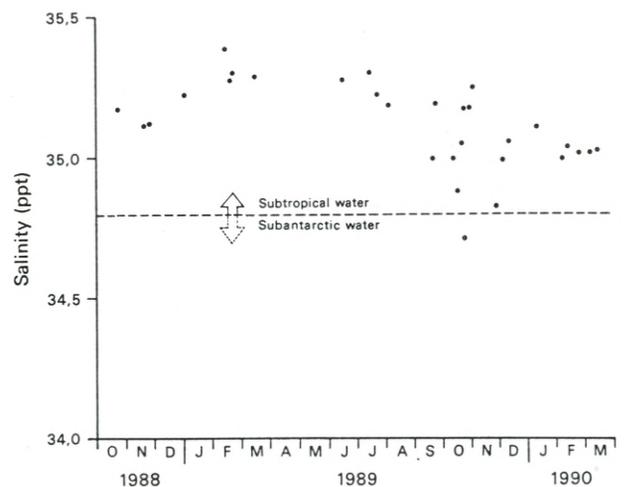


Figure 6. Offshore sea surface salinities measured in the vicinity of the Tristan da Cunha group from 1988 to 1990. The broken line denotes the saline limit of Subtropical Surface Water according to Whitworth & Nowlin (1987).

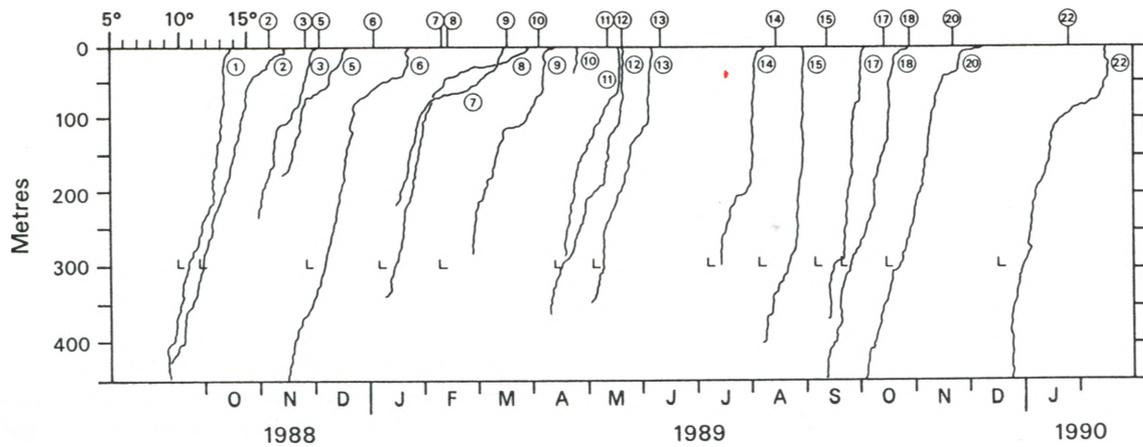


Figure 7. Profiles for ocean temperature to 400 m in the vicinity of the Tristan da Cunha group. The date when each profile was measured can be read off by comparing the numbered location above the top axis with the months on the bottom axis. Each numbered location corresponds to the 15°C isotherm on the temperature scale. The location of the 10°C isotherm at 300 m depth is shown as a step for each temperature trace that extended that deep.

were of Subtropical Surface Water, that is from north of the STC. The salinity measurements from this study do not clearly indicate any meridional movement of the STC on a seasonal basis. This is in contradiction of the view held by Knox (1960).

Figure 7 shows the results of the measurement of off-shore temperature profiles over the 18 month period. Two distinctive processes may be inferred from this figure. Firstly, a seasonal warming of the upper 50 m is evident. This was particularly clear for Station 8, taken on 13 February 1989 when the surface temperature was 21.0°C and the temperature at 50 m was 14.5°C. In winter the surface layer had cooled down to a uniform 13.3°C (Station 15). The second process is the event-controlled, vertical mixing of heat into the water column. This is evident from the step-like structure of a number of temperature traces (eg. Stations 5, 9, 13, 14). All the heat absorbed in the upper 50 m in February is mixed to 100 m by March (Station 9), to 200 m by August (Station 14) and to 300 m by September (Station 15). Whereas the temperature at 300 m had stayed more or less constant at 11°C, in August it suddenly increased to 12°C while the surface temperature had decreased to 13.2°C. By 17 October (Station 17) the top 80 m was again 0.5°C warmer with a distinct step at that depth showing the vertical penetration of the mixing process. By 23 November (Station 20) the top 40 m had again become warmer than 15°C.

Considered in conjunction with the findings of Lutjeharms and McQuaid (1986) who investigated changes in the thermal structure of Southern Ocean fronts with the onset of summer, the results presented here are quite significant. As summer progresses, surface water becomes increasingly warmer. This is due to insolation and not due to the overflow of warmer water from the north, in which case the salinity would also have risen. An increase in salinity was not evident from the present study (Fig. 6). Since the water masses below 100 m are not directly involved in this heating, they remain unchanged and a strong stratification between the upper 100 m and the water below is established. This

has been observed previously (Lutjeharms and McQuaid, 1986). With the onset of winter storms this upper, warmer layer is mixed out. Another possible mixing mechanism would be convective overturning as the sea surface cools.

The effect at the sea surface of this seasonal process might be an apparent southward shift of the STC during the summer months. In fact, the strongest horizontal thermal gradient might be found further south during the summer. The saline front will most probably not follow this thermal front, nor will the nutrient expression, or the major subsurface thermal expression of the front. For biological activity in the frontal zone this relative immobility of the major part of the STC itself is probably not as important as an increase in stratification at the front during the summer. Fournier et al. (1979) found that changes in the inclination of the Shelf-Break Front off Nova Scotia associated with varying degrees of mixing and stratification of the water column resulted in different phytoplankton standing stocks. They suggested that the steepness of the front influenced the depth to which phytoplankton were mixed which in turn controlled the amount of illumination received by a given cell. Therefore at times when the water column was well stratified (decreased frontal inclination) illumination available to phytoplankton would be at a maximum resulting in the highest production. Similarly, Marra et al. (1990) proposed that enhanced phytoplankton growth at the thermohaline Shelf-Break Front in the Middle Atlantic Bight could be explained by nutrient enrichment from turbid underlying water to organisms in clear well-lighted surface water. Allanson et al. (1981) hypothesised that increased primary productivity at the STC during the summer was mainly a result of an increase in stratification of the water column at this time. The layer of warm surface water resulting from this stratification in the summer probably extends south of the nutrient expression of the STC in the Tristan da Cunha region, and would therefore substantially increase the potential primary production of the frontal zone during summer by overlying an area of high nutrients which would otherwise be poorly accessible to organisms preferring warmer water.

This hypothetical mechanism would be in full agreement with all presently available data. It would also agree with the traditional perception of the fishermen of Tristan da Cunha that catches improve during the summer due to changes in the marine environment at this time. Increased primary production during this period may attract pelagic species into the vicinity of the islands during the summer months as suggested by an increase in catch per unit of effort in the local linefishery (data from present study). This hypothesis would not require the major subsurface expression of the STC to meander meridionally on a seasonal basis.

From a biogeographical perspective it may therefore be concluded that, although the STC is more diffuse in the mid-Atlantic than, for example south of Africa, the Tristan da Cunha group and Gough Island fall within its zone of influence. This may be through cast-off eddies (Lutjeharms and Valentine, 1988), filaments and other protrusions throughout the year. It is also likely that the surface expression of the STC retreats southward with the onset of summer and with increased vertical stratification in the water column at Tristan da Cunha. Such increased stratification may lead to increased primary productivity at this time of the year and therefore temporally affect the biology and distribution of fishes in the STC region.

METHODS OF FISH COLLECTION

Most of the species reported in this paper were collected by one of the authors (TGA) during the 18-month stay on Tristan da Cunha. Collections were made on each fishing day when the rock lobster fleet (usually 18-22 two-man powerboats) put to sea. Fish were obtained in lobster traps and with hook and line in depths of 50 - 200 m. Collecting was also done with hook and line from the shore and with rotenone ichthyocide in the intertidal and shallow sub-tidal region (max. depth 10 m). Stranded specimens were also collected, and one specimen was collected after being dropped by an Antarctic tern (*Sterna vittata*). Extensive underwater observations were carried out with SCUBA, especially at Tristan Island, to study fish behaviour and assess some of the collecting methods.

The fishes of Nightingale, Inaccessible and Gough Islands were sampled with hook and line and lobster traps from the MFV TRISTANIA II. Fishes were also collected from the shore at Nightingale by one of us (TGA) and at Gough by a member of the 1988/1989 South African Weather Team (R. Matthews).

During the 18-month period over 4000 specimens were examined in order to obtain biological information. Representative specimens of most species were preserved and are lodged in the collection of the J.L.B. Smith Institute of

Ichthyology. Ten species that were reported from Tristan by previous authors, that were not collected during the present study, are also listed below.

SPECIES ACCOUNTS

The neritic fishes and some mesopelagic species that were collected within one mile of the islands are listed below, with brief notes on the biology and ecology of some species. Many species have local common names that differ from those recognised elsewhere. In these cases, the species name is followed by the internationally recognised common name and the Tristan common name is given in parentheses. The synonymies given here comprise the original nominal species and other synonyms or references that are pertinent to the taxonomy of these species. Sizes of specimens examined are generally listed as total length (TL) although standard length (SL) and fork length (FL) are used in some cases. Detailed investigations on some of the more common species have been published elsewhere. RUSI catalogue numbers are given for voucher specimens housed in the J.L.B. Smith Institute of Ichthyology. SAM catalogue numbers are given for specimens examined at the South African Museum in Cape Town.

CHONDRICHTHYES

Family HEXANCHIDAE

Notorynchus cepedianus

broadnose sevengill shark (rock shark)

Fig. 8

Squalus cepedianus Peron, 1807: 337 (Tasmania).

Notorynchus cepedianus: Compagno, et al., 1989; Bass et al., 1986a.

DIAGNOSIS: One dorsal fin; 7 pairs of gill slits; 6 rows of large teeth on each side of lower jaw; horizontal diameter of eye much less than distance between nostrils and 1.6-3.0 times in least depth of caudal peduncle; no inner (nictitating) lower eyelid; snout length 1.1-1.3 times internostril distance and less than distance between lower ends of first gill slits.

Colour: Body pale grey dorsally, white below; dorsal surface of body and fins speckled with black spots.

MATERIAL: Tristan: RUSI 35991, 139 cm TL (jaws); RUSI 35992, 145 cm TL (jaws); RUSI 35995, 167 cm TL (jaws); RUSI 35997, 188 cm TL (jaws). In addition, numerous specimens (120 to 225 cm) were examined at the islands.

REMARKS: Although it has not been reported from these waters before, the sevengill shark is the most common shark

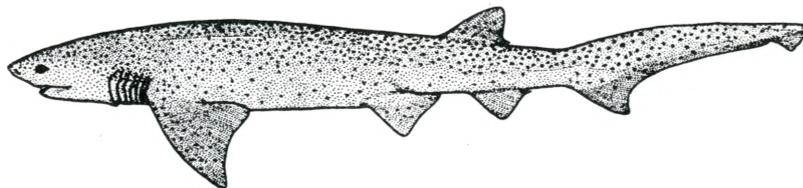


Figure 8. *Notorynchus cepedianus*, 209 cm mature female, South Africa (from Bass et al., 1986).

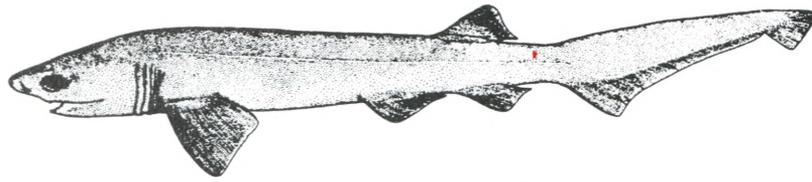


Figure 9. *Hexanchus griseus*, 115 cm immature male, South Africa (from Bass et al., 1986a).

on the shelf areas of Gough and the Tristan Group islands. *Notorynchus cepedianus* was almost certainly mistaken as "*Hexanchus* sp." in Roscoe's (1979) record, as the sixgill shark is extremely rare in the depths fished by the local fishermen; however, the sevengill shark is commonly caught and used for bait. The local *Notorynchus* population is probably self sustaining, as all size ranges are found in the region (D. Ebert pers. comm.). The species feeds predominantly on fish and cephalopods.

DISTRIBUTION: The sevengill shark is found worldwide in temperate waters, except in the North Atlantic, and is restricted to relatively shallow coastal waters (Bass et al., 1986a).

Hexanchus griseus
sixgill shark
Fig. 9

Squalus griseus Bonnaterre, 1788: 9 (Mediterranean).

Hexanchus griseus: Compagno, 1984; Bass et al., 1986a.

DIAGNOSIS: One dorsal fin; 6 gill slits on each side of head; lower jaw with a row of 6 large teeth on each side; mouth length contained 1.6-2.7 times in its width; snout length 4-7% TL, 2.0-2.8 times in mouth width; length of dorsal fin base contained 1.1-1.4 times in distance from dorsal base to origin of upper caudal fin lobe. The species attains a length of 5+ m and a weight of 730+ kg.

Colour: grey.

MATERIAL: Gough: 182 cm TL, 26 kg immature male, caught in 25-35 m, 6 October 1989.

REMARKS: This specimen was examined by Dr D.A. Ebert at the South African Museum in 1990.

DISTRIBUTION: *H. griseus* is a benthic species that is found at depths of 35-1500 m in all oceans.

Family SQUALIDAE

Etmopterus cf. princeps

great lanternshark

Fig. 10

Etmopterus princeps Collett, 1904: 3 (Eastern North Atlantic, Faeroe Bank, south of Faeroe Islands; depth 750-1200 m); Bigelow et al., 1953; Compagno, 1984.

DIAGNOSIS: Two dorsal fins, both with distinct spines, the origin of first dorsal fin behind tips of pectoral fins by about spiracle length; no anal fin; distance from pelvic fin base to origin of lower caudal fin lobe slightly greater than distance from tip of snout to spiracle and about 1.9 times in distance from pectoral to pelvic fin bases; snout length about 1.5 times in width of head; 5 pairs of gill slits, length of the first 3 subequal to maximum diameter of spiracle and about 1/2 length of eye; upper jaw teeth mostly with 5 cusps, the median cusp much the largest but slender, the outermost cusps minute; lower jaw teeth with cusps directed laterally; lateral trunk denticles thorn-like, with moderately high, nearly erect, slender and slightly curved, conical tips; denticles fairly widely-spaced but most not arranged in longitudinal rows (weakly formed rows on sides of caudal peduncle); head with conspicuous lines of pores (openings for ampullae of Lorenzini?) and a transverse row across the chest joining the pectoral fin origins. Vertebrae: monospondylous 47, precaudal diplospondylous 17, caudal 26, total 90.

Colour: Uniformly dark blackish-brown; no apparent dark markings on the flanks or ventral surface of the body except for a faint black horizontal bar on the lower caudal peduncle just anterior to lower caudal origin; no pale spot between the eyes.



Figure 10. *Etmopterus princeps*, 780 mm female, Inaccessible Island.

MATERIAL: Inaccessible: SAM 33071, 780 mm TL; caught in a crayfish trap set in 220 m, 3 Dec. 1993 by Capt. E. Stoffberg, of the M/V *HEKLA*.

REMARKS: We are grateful to Dr L.J.V. Compagno of the South African Museum for bringing this specimen to our attention and providing vertebral counts, photographs and a provisional identification for this shark. This specimen is provisionally identified as *Etmopterus princeps*, a species previously known from the North Atlantic and recently reported (Nakaya, 1982) from the Kyushu-Palau Ridge in the western Pacific. Dr Compagno has informed us that two specimens of *E. princeps* from Iceland that he x-rayed have 83 and 86 total vertebrae, fewer teeth in lower jaw, and teeth with higher side cusplets.

Family CARCHARHINIDAE

Prionace glauca

blue shark (bottlenose shark)

Fig. 11

Squalus glaucus Linnaeus, 1758: 235 ("European Ocean").

Glyphis glaucus: Sivertsen, 1945.

Prionace glauca: Compagno et al., 1989; Bass et al., 1986b.

DIAGNOSIS: Two dorsal fins, the first dorsal just in front of pelvic fins; 5 pairs of gill slits; pectoral fins long and falcate; no spiracles or ridge between dorsal fins; inner (nictitating) lower eyelid present; lip folds minute; teeth unicuspid, strongly serrated and broadly curved in upper jaw; lower jaw teeth narrower.

Colour: Brilliant dark blue above, white below; fades to grey after death.

MATERIAL: Tristan: RUSI 33584, 120 cm TL. Inaccessible: RUSI 35996, 250 cm TL (jaws).

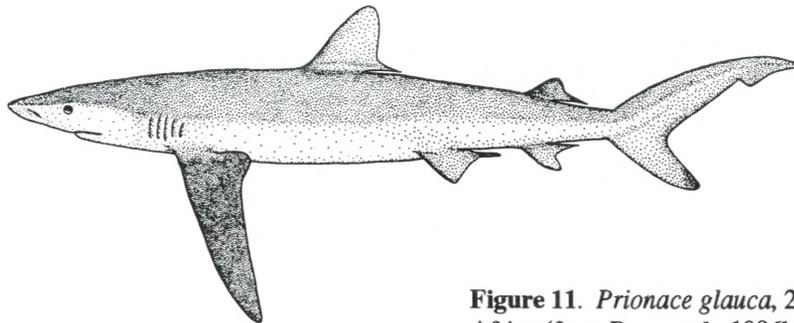


Figure 11. *Prionace glauca*, 279 cm mature male, South Africa (from Bass et al., 1986b)

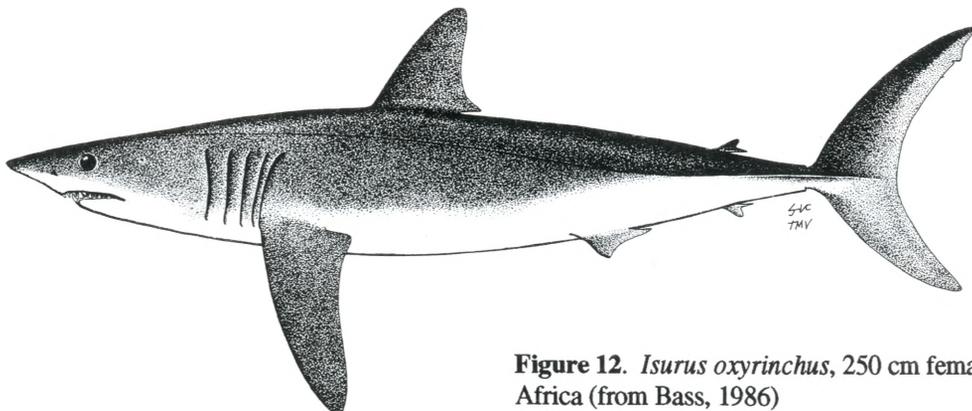


Figure 12. *Isurus oxyrinchus*, 250 cm female, South Africa (from Bass, 1986)

REMARKS: Sivertsen (1945) first reported the presence of this shark in Tristan waters. Blue sharks are caught all the year round at all the islands, from the surface down to at least 150 meters. Our two specimens were caught on the surface at Inaccessible and at 150 m at Tristan Island. These sharks of 2.5 m and 1.2 m suggest that all size ranges are found in these waters. This species is commonly caught, but only smaller specimens are landed and used as bait. The temperature regime at Gough would suggest that the shark reported by fishermen to be common there is the blue shark.

DISTRIBUTION: The blue shark is found around the world in tropical and temperate waters, but is most common in waters of 12° - 16° C (Bass et al, 1986b).

Family LAMNIDAE

Isurus oxyrinchus

shortfin mako (bottlenose shark)

Fig. 12

Isurus oxyrinchus Rafinesque, 1810: 12, Pl. 13 (Sicily). Compagno et al., 1989.

DIAGNOSIS: Two dorsal fins; caudal fin lunate, the lower lobe almost as big as the upper lobe; 5 pairs of large gill slits; origin of first dorsal fin over or behind inner corner of pectoral fin; pectoral fins markedly shorter than distance from snout to pectoral fin origin; teeth lanceolate, without small basal denticles.

Colour: Dark blue above, white below.

MATERIAL: Tristan: RUSI 35994, 267 cm TL (jaws).

REMARKS: A 267 cm TL mako caught on a longline set in over 100 m is the first record for Tristan. Makos are said to be common in Tristan waters, although seldom landed; they are occasionally seen leaping from the water, and are known to display aggressive behaviour towards boats.

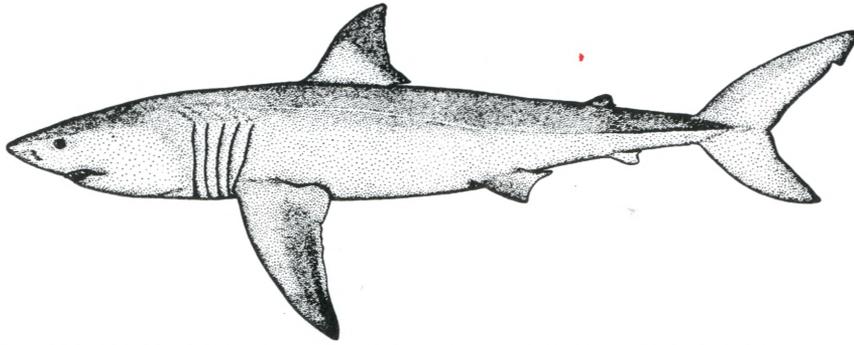


Figure 13. *Carcharodon carcharias*, 177 cm immature female, South Africa (from Bass, 1986)

DISTRIBUTION: Worldwide in tropical and temperate waters, both inshore and in the open ocean (Bass, 1986). Reported by Blanc and Paulian (1957: 326 as "*Isurus glaucus*") from St. Paul and Amsterdam Islands.

Carcharodon carcharias
great white shark
Fig. 13

Squalus carcharias Linnaeus, 1758: 235 (Europe).

Carcharodon carcharias: Bass, 1986: 98, Compagno, 1984.

DIAGNOSIS: Two dorsal fins, the first much bigger than the second; origin of first dorsal fin in front of inner corner of pectoral fin; caudal fin lunate; tail with a single, large keel along each side of peduncle (no secondary keels on caudal fin); anal fin origin under or behind axil of second dorsal fin; teeth triangular, flattened, with broad, coarsely serrate cusp (in sharks less than 150 cm, most teeth are lanceolate, smooth-edged, with small basal cusplets).

Colour: Dark grey to brown or black above and white below.

MATERIAL: A 4.3 m FL, 4.9 m TL great white shark was caught at Gough Island in a depth of 51 m on July 1, 1993 by Captain Ben Herwig and Mike Saunders of the MFV *TRISTANIA II*. The jaws and dorsal fin of this specimen were examined by Dr Leonard J.V. Compagno of the South African Museum.

REMARKS: Dr Compagno informed us of this capture of a great white shark at Gough Island. This is the first documented occurrence of the species at Gough or the Tristan islands. According to Captain Herwig, the stomach of this shark contained seals and 7 "bluefish" [*Hyperoglyphe antarctica*].

DISTRIBUTION: *Carcharodon carcharias* occurs worldwide in tropical and temperate seas.

Family TORPEDINIDAE

Torpedo nobiliana
Atlantic electric ray
Pl. 1, Fig. A

Torpedo nobiliana Bonaparte, 1835: Fig. (pages not numbered; Italy); Compagno, 1986; Compagno et al., 1989.

DIAGNOSIS: Head, body and pectoral fins forming a round soft flabby disc which is wider than long; tail short, with two moderate-sized dorsal fins (first distinctly larger

than second and placed anterior to rear edge of pelvic fins) and a large triangular caudal fin (caudal fin height about equal to distance from upper origin of caudal to origin of first dorsal fin); no papillae on edge of spiracles.

Colour: Dorsal surface brown, with small irregular blackish spots and specks; underside white. In South African waters, *T. nobiliana* is described as "uniform shiny black or dark grey above, underside white" (Compagno et al., 1989). Stehmann and Bürkel (1984) described north-eastern Atlantic specimens as "usually plain dark violet/brown above, sometimes with indistinct darker dots and white spots; underside white to cream, often with dusky margins to disc and pelvic fins".

MATERIAL: Tristan: RUSI 35993, 89 cm TL.

REMARKS: Another *Torpedo* (SAM 25245) was collected at Tristan in May 1969 and donated by the Division of Sea Fisheries to the South African Museum. Unfortunately, this specimen cannot now be located at the Museum. Our specimen, collected by a Tristan fisherman with hook and line in about 150 m of water, was sent to us by Mr Jimmy Glass. It looks very similar to the *Torpedo macneilli* (Whitley, 1932) from St Paul Island that was illustrated by Duhamel (1989). It would not surprise us to learn that *T. macneilli* (described originally from Australia) and *T. fairchildi* Hutton, 1872 (from New Zealand) are synonyms of *T. nobiliana*.

DISTRIBUTION: *T. nobiliana* is known from the Mediterranean and Eastern Atlantic Ocean (from Scotland to South Africa), the western North Atlantic (from Cuba to Nova Scotia) and along the south coast of South Africa to Algoa Bay. A specimen identified as *T. nobiliana* by B. Sêret was reported from the "banc Austral" (34°54'S, 53°14'E) by Duhamel (1989).

OSTEICHTHYES

Family CONGRIDAE

Bassanago nielseni
hairy conger (eel)
Fig. 14

Pseudoxenomystax nielseni Karmovskaya, 1990: 8, Figs. 1c and 2d (Southeastern Pacific: Nazca Ridge, 22°05'S, 81°15'W).

DIAGNOSIS: A congrid eel with the tail longer than head and trunk combined; skin covered with minute, slender,

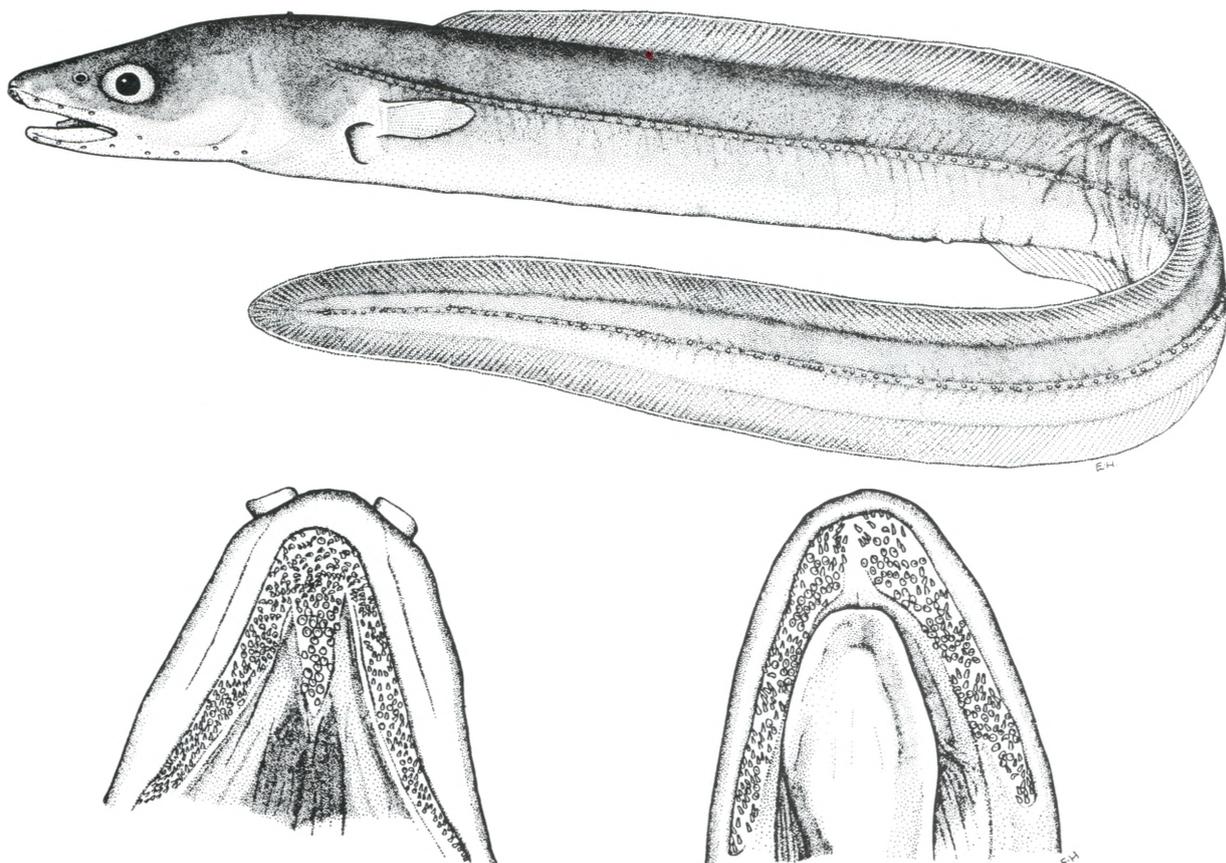


Figure 14. *Bassanago nielseni*, 664 mm TL (Nightingale Island); left — upper jaw, right — lower jaw.

darkly-pigmented villi, which are scattered and difficult to see in juveniles, but profuse in adults and give a distinctive "hairy" appearance to the body. Head length 15-19% TL; distance from tip of snout to anus 39-42% TL; predorsal distance 16-19% TL. Eye diameter 13-17% head length; snout fleshy, longer than eye and projecting in front of lower jaw; rear nostrils in front of middle of eye; front nostrils are short tubes directed forward at front of snout; gape extends to below pupil; a fleshy labial flange or lip on each side of lower jaw, but not continued across tip of jaw; no labial flange on upper jaw; cardiform teeth in several rows on jaws; intermaxillary tooth patch about as broad as long and not separated from maxillary or ethmovomerine teeth; vomer with a band of short conical teeth, the band extending posteriorly about to middle of maxillary tooth band. Lateral line a raised ridge running midlaterally along body, the pores opening via short, white, fleshy tubes along ventral edge of the ridge; 39-43 pores from head to vertical at front of anus; top and sides of head with numerous, short fleshy papillae (superficial neuromasts). Median fins continuous around tip of tail; pectoral fin rays 13-16. Preanal vertebrae (anterior to anus) 42-45 (n = 8); total vertebrae 150-159 (4 specimens with intact tail).

Colour: Brownish dorsally, pale ventrally; median fins dark with pale margin; some specimens distinctly darker than others.

MATERIAL: Tristan: RUSI 33577: 2, 58-60 cm TL; RUSI 33579, 84 cm; RUSI 33580 2, 57-63 cm. Nightingale:

RUSI 33578 2, 58-60 cm; RUSI 33581, 66 cm. Inaccessible: RUSI 33604, 61 cm.

REMARKS: Although the hairy conger is the most common eel at Tristan, it has not previously been reported from Tristan or Gough (Contrary to Duhamel, 1989, the species was not reported from Tristan by Penrith, 1967.). All our eels were collected in traps set deeper than 70 m. *B. nielseni* are often captured in traps overnight, suggesting that they are nocturnal feeders. An adult male captured off Tristan Island in June 1989 was in a ripe running condition, indicating a winter spawning season for the species.

According to David Smith (1989), "The species treated as *Pseudoxenomystax* by Castle ... — *Congermuraena albescens* Barnard, 1923, *Bassanago bulbiceps* Whitley, 1948, and *Pseudomystax hirsutus* Castle, 1960 — seem quite different from *P. dubius* Breder [the type of the genus *Pseudoxenomystax*] and probably should be placed in *Bassanago* Whitley." Castle (1986) intimated that *P. hirsutus* (from New Zealand) may be a synonym of *B. albescens*; and, having examined two specimens of *B. bulbiceps* from Australia, we believe that this species should also be considered a synonym of *albescens*. The supposed differences between *B. bulbiceps* and *hirsutus* in the numbers of dorsal and anal fin-rays and lateral-line pores (as given by Castle, 1960) are subsumed in the counts given by Castle (1968) for *B. albescens* from South Africa.

Specimens of *Bassanago* from the Tristan Group have fewer vertebrae than *B. albescens* from South Africa (with 45-48 preanal vertebrae [n = 10] and 169-174 total vertebrae

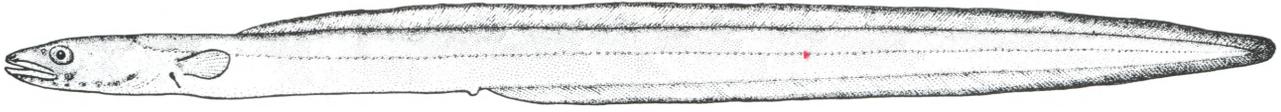


Figure 15. *Conger wilsoni*, 490 mm TL (Gough Id)

[7 specimens with intact tails]). We tentatively assign the Tristan species to *B. nielseni*, which was recently described from the Nazca Ridge in the southeastern Pacific Ocean. According to Karmovskaya (1990), *B. nielseni* has a total vertebral count of 152-153, which falls within our range for Tristan specimens. The counts of 34-39 vertebrae before the anal fin reported by Karmovskaya (1990) in *B. nielseni* are lower than our preanal counts of 42-45 for Tristan specimens. The taxonomic significance of this apparent difference in preanal vertebrae cannot be assessed with the limited material presently available to us.

B. albescens is common off Cape Point, South Africa, and has also been reported from southern Argentina and southern Chile (Nakamura et al., 1986 [as "*Pseudoxenomystax albescens*"]; Pequeño, 1989). If *B. bulbiceps* and *B. hirsutus* are synonyms of *B. albescens*, the species also occurs at Australia and New Zealand. *B. hirsutus* and *B. bulbiceps* were both listed from the Chatham Islands east of New Zealand by Roberts (1991), but he gave no vertebral counts for his specimens, so his identifications are dubious.

DISTRIBUTION: *B. nielseni* is, at present, known only from the Tristan Group and the Nazca Ridge in the southeastern Pacific Ocean. Duhamel (1989) reported *Bassanago albescens* from Amsterdam Island, but the vertebral count for this specimen (148) indicates that it is probably *B. nielseni*, (which was described after Duhamel's paper was published).

Conger wilsoni

conger eel

Fig. 15

Gymnothorax wilsoni Bloch & Schneider, 1801: 529 (Australia).

Conger wilsoni: Castle, 1986.

DIAGNOSIS (data from SAM specimen in parentheses): Tail longer than head and trunk combined; snout longer than eye; rear nostril in front of middle of eye; lips with well developed flange; teeth in 1 or 2 rows on jaws, the outer teeth longer, compressed, forming a continuous cutting edge; dorsal fin origin over or behind pectoral fin tip; a sensory pore behind and in line with corner of mouth; head 7.0-8.2 (8.0) times in SL; lateral-line with 37-40 (37) pores before anus; pectoral fin rays 13-17 (15); vertebrae 140-142 (144).

Colour: Dorsal two-thirds of head and body dark olive brown, ventral parts creamish white; dorsal and anal fins with black margin.

MATERIAL: Gough Island: SAM 29632, 488 mm TL.

REMARKS: This South African Museum specimen (collected in Tranvaal Bay with hook and line by T. Gosliner

and W. Liltved) represents the first record of *Conger wilsoni* from any of the West Wind Drift islands.

DISTRIBUTION: *C. wilsoni* is known from South Africa, Australasia, New Zealand and possibly (if *C. jordani* Kanazawa, 1958 is a synonym) Japan. Castle (1986) estimated the larval life of *Conger* species as "about a year", and this would account for the wide distribution of *C. wilsoni*.

Gnathophis capensis

southern conger (eel)

Fig. 16

Leptocephalus capensis Kaup, 1856: 153 (Cape of Good Hope; larva). *Congermuraena australis* Barnard, 1923: 442 (Namibia, Cape Peninsula, False Bay, Tristan da Cunha). *Ariosoma australis*: Penrith, 1967.

Gnathophis capensis: Castle, 1968; 1986; Duhamel, 1989.

DIAGNOSIS: A congrid eel with the tail considerably longer than head and trunk combined; pectoral fins present; snout slightly longer than eye and projecting in front of lower jaw; lips not well developed; several rows of small teeth on jaws and roof of mouth, those on vomer blunt; no hair-like epidermal papillae on body; lateral-line pores and vertebrae 128-135.

Colour: Body olive brown above, paler below; head silvery; dorsal and anal fins with dusky margin.

MATERIAL: Tristan: RUSI 33627: 372 mm; SAM 12782: 186 mm; SAM 24551: 374 mm.

REMARKS: *G. capensis* appears to be rare in Tristan waters compared to *Bassanago nielseni*. Perhaps the southern conger prefers deeper waters and is therefore more difficult to collect. Our single specimen was collected in a trap set overnight in 150 m.

DISTRIBUTION: *G. capensis* is known from False Bay to Plettenberg Bay, South Africa (Castle, 1986) and from St. Paul and Amsterdam islands (Duhamel, 1989). According to Castle (1968), the duration of larval life is 10-12 months; during this period, the larvae could easily drift from Tristan to South Africa or from South Africa to St. Paul Island.

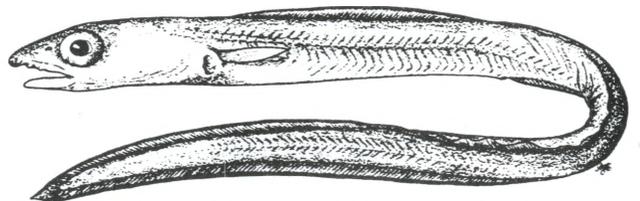


Figure 16. *Gnathophis capensis*, 290 mm TL, South Africa (from Castle, 1986).

Family PHOTICHTHYIDAE

Vinciguerria poweriae

Gonostoma poweriae Cocco, 1838: 167, Pl. 5, Fig. 2 (Messina).

Vinciguerria poweriae: Schaefer et al., 1986.

DIAGNOSIS: Small, compressed silvery fishes with light organs (photophores) along ventral surface of head and body; total gill-rakers 14-16; dorsal fin rays 13-15, the last ray above or behind anal fin origin; anal fin base not longer than dorsal fin base; anal fin rays 12-14; adipose fin over anal fin; pectoral rays 9-11; branchiostegal rays 8; 12-15 photophores from anal fin origin to caudal fin base; no photophore at tip of lower jaw; one photophore in front, and another behind, lower edge of eye; premaxillary teeth uniserial, with 3 or 4 long teeth and a few smaller ones; lower jaw teeth biserial in front; vomer and palatines toothed; pterygoids and tongue toothless; maxilla with 2 supramaxillae; vertebrae 38-39.

Colour: Head and body dark dorsally, the flanks silvery; dark streak at tip of lower jaw and over premaxilla; fins colourless.

MATERIAL: Tristan: RUSI 33467: 49 mm TL.

REMARKS: Our only specimen was found floating dead on the surface near Tristan Island in December 1989. During the day, this mesopelagic species is found at depths of 300-600 m, and at night it rises to 50-350 m.

DISTRIBUTION: *V. poweriae* has a circumglobal, subtropical distribution (Schaefer et al, 1986).

Family STERNOPTYCHIDAE

Maurolicus inventionis

Maurolicus pennanti (non Walbaum, 1792): Barnard, 1925: 151.

Maurolicus muelleri (non Gmelin, 1789): Klages et al., 1988.

Maurolicus inventionis Parin & Kobylansky, 1993: 83, Fig. 3b (42°18'S, 00°08'W [seamount southeast of Gough Island]).

DIAGNOSIS: Small silvery fishes with light organs (photophores) along ventral surface of head and body; head and body compressed; long low adipose fin above rear end of anal fin; eyes large and round; teeth in jaws minute, uniserial or with a short outer row at front of lower jaw; dorsal fin base mostly in front of anal fin; dorsal rays 10-11; anal rays 22-26; pectoral rays 17-19; gill-rakers (7-9) + 1 + (21-25) total 30-35; vertebrae 33-35; 2 long groups of photophores along ventral edge of tail preceded by a single elevated light organ; a large light organ just behind symphysis of lower jaw.

Colour: Brilliant silvery, the dorsal surface dark greenish blue.

MATERIAL: SAM 23950: 12 specimens; locality, "Tristan or Gough Island". None collected by us.

REMARKS: Parin and Kobylansky (1993) revised the genus *Maurolicus* and described four new species from the

South Atlantic. Barnard (1925) recorded "*Maurolicus pennanti* (Walbaum)" from Tristan and Parin and Kobylansky (1993) listed *M. pennanti* in the synonymy of *Maurolicus muelleri* (Gmelin, 1789) an eastern North Atlantic species. Klages, et al. (1988) recorded "*M. muelleri*" from the stomach contents of rockhopper penguins (*Eudyptes chrysocome moseleyi*) at Gough Island.

DISTRIBUTION: *M. inventionis* is known only from the Tristan Group, Gough Island and the seamount type-locality southeast of Gough.

Family MYCTOPHIDAE

Electrona paucirastra

Electrona paucirastra Bolin, in Andriashev, 1962: 280 (west of Amsterdam Islands; 39°30'S, 71°16'E); Miller, 1982; Hulley, 1986.

DIAGNOSIS (from Hulley, 1986): Mouth terminal; maxilla distinctly expanded posteriorly and reaching to vertical at rear edge of eye; anal fin base longer than dorsal fin base; posterodorsal margin of operculum rounded and without serrations; caudal peduncle depth less than 2.5 times in its length; dorsal fin rays 13-15; anal fin rays 20-21; pectoral fin rays 14-16; gill-rakers (5-6)+(15-18) = 21-24.

MATERIAL: None.

REMARKS: Miller (1982) collected this species close to Gough Island in midwater trawls from less than 50 m during October 1980. *E. paucirastra* is a high-oceanic and mesopelagic species, occurring from the surface to 100 m at night.

DISTRIBUTION: Circumglobal between the STC and the Antarctic Polar Front (Hulley, 1986).

Electrona subaspera

Scopelus subaspera Günther, 1864: 411 (43°00'S, 123°00'E off SW Australia).

Electrona subaspera: Miller, 1982; Hulley, 1986.

DIAGNOSIS (from Hulley, 1986): Mouth terminal; maxilla distinctly expanded posteriorly and reaching to vertical at rear edge of eye; anal fin base longer than dorsal fin base; posterodorsal margin of operculum rounded and smooth; caudal peduncle depth less than 2.5 times in its length; dorsal fin rays 13-15; anal fin rays 20-22; pectoral fin rays 13-16; gill-rakers (7-9)+(18-22) = 27-31.

MATERIAL: None.

REMARKS: Miller (1982) collected *E. subaspera* near Gough Island in October 1980. It is a high-oceanic and mesopelagic species, occurring from the surface down to 200 m at night.

DISTRIBUTION: Circumglobal between STC and the Antarctic Polar Front (Hulley, 1986).

Lampadena dea

Lampadena dea Fraser-Brunner, 1949: 1097, Fig. 1101, Pl. 1A (48°27'S, 22°7-10'W [about 1400 km SW of Gough Island]); Hulley, 1981.

DIAGNOSIS: A charcoal black lantern fish with large mouth; maxilla extending well behind eye, not expanded posteriorly; anal fin base slightly shorter than dorsal fin base; dorsal fin origin above or slightly anterior to pelvic fin origin; large, black-edged light organ on dorsal surface of caudal peduncle and another one on ventral surface; smaller photophores arranged on body below lateral line. Dorsal fin rays 13-15; anal fin rays 13-15; pectoral fin rays 13-16; gill-rakers (5-6)+(3-6).

MATERIAL: Inaccessible Id: RUSI 34036: 52 mm TL.

REMARKS: One specimen was collected with a net between 80 m and the surface. *L. dea* is a mesopelagic species of the open ocean; it is found at depths of 350-2390 m during the day and 150 m at night.

DISTRIBUTION: Circumglobal in the vicinity of the STC (25° to 49° S latitude; Hulley, 1986).

Family GADIDAE

Gaidropsarus novaehollandiae

comb rockling

Fig. 17

Motella nova-zealandiae Hector, 1874: 107, Pl. 18, Fig. 76b (Cape Campbell, New Zealand); Svetovidov, 1986.

Gaidropsarus insularum Sivertsen, 1945: 8, Fig. 6 (Tristan da Cunha); Penrith, 1967; Cohen, 1986; Svetovidov, 1986; Duhamel, 1989.

Gaidropsarus parini Svetovidov, 1986: 122, Fig. 2 (Nazca Ridge).

DIAGNOSIS: Body elongate, with long low dorsal and anal fins that reach to the rounded caudal fin; the dorsal fin is preceded by a row of short filaments and a longer ray on the nape; pectoral fins with 20-21 rays; 2 barbels on snout (from anterior nostrils) and one on chin; pelvic fins with 7 rays; dorsal fin with 62-64 rays; anal fin with 50-54 rays; teeth in bands on jaws and vomer. Vertebrae 44-48.

Colour: Head, body and fins dark reddish brown, purplish grey ventrally.

MATERIAL: Tristan: RUSI 31484: 142 mm TL; RUSI 33473: 3, 145-160 mm; RUSI 33477: 3, 89-140 mm; RUSI 33482: 2, 130-180 mm; RUSI 33478: 6, 98-110 mm; SAM 24930: 147 mm SL. Gough: RUSI 31486: 193 mm; RUSI 13293: 300 mm, collected in 1978 by Gideon Rossouw;

RUSI 33601: 3, 270-335 mm. Plus 25 additional RUSI specimens and numerous specimens (31-343 mm) examined at the islands, but not preserved.

REMARKS: Juveniles and small adults (less than 20 cm TL) are common in rockpools and in shallow subtidal areas at all the islands; larger adults are found down to at least 50 m. Prejuveniles (less than 30 mm TL) are silvery and probably pelagic. This cryptic predator feeds on crustacea and small fishes.

The specific distinction of *G. insularum*, *G. novaehollandiae* and *G. parini* is dubious. According to Svetovidov's (1986) key to species of *Gaidropsarus*, these three species differ in number of dorsal fin-rays (*insularum* with 66-70 and *novaezealandiae* with 62-65), pectoral fin-rays (*novaezealandiae* with 20-21 and *parini* with 23-24), length of first dorsal fin base, and eye diameter. But these data are based on only 3 specimens of *insularum*, 10 *novaezealandiae*, and 2 *parini*. The dorsal fin-ray counts given in Svetovidov's text for *novaezealandiae* do not agree with those in his key and overlap the counts that he gives in the text for *insularum*. Furthermore, Duhamel (1989) has shown that the range in dorsal fin-ray numbers of specimens from St. Paul and Amsterdam (62-76) includes the ranges for all three of these supposedly allopatric species.

DISTRIBUTION: *G. novaehollandiae* is known from Tristan, Gough, the west coast of South Africa, St. Paul and Amsterdam Islands, Australia, New Zealand, Nazca Ridge, and the Bromley Plateau (31° S, 34° W).

Family MORIDAE

Physiculus karrerae

Fig. 18

Physiculus karrerae Paulin, 1989: 114, Fig. 10 (off Rio Grande, Brazil).

DIAGNOSIS (from Paulin, 1989; data from our specimens given in parentheses): Body elongate, cylindrical anteriorly, tapering to a narrow caudal peduncle and small separate caudal fin; snout rounded, mouth terminal; dorsal fin divided into a short anterior part of 7-8 (8) rays and a long posterior part of 68-76 (66-69) rays; anal fin with 73-78 (73-78) rays; pectoral fin rays 26-27 (25-27); about 150 vertical scale series from upper end of gill opening to caudal fin base; light organ on belly indicated by round black spot of naked (scaleless) skin in front of anus; diameter of light

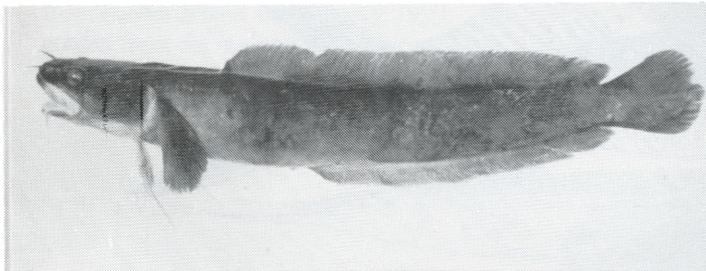


Figure 17. *Gaidropsarus novaehollandiae*, 210 mm TL, Tristan.

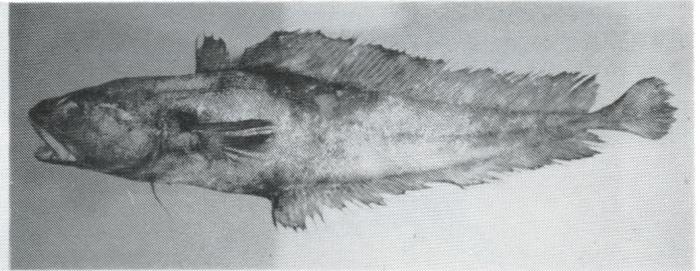


Figure 18. *Physiculus karrerae*, 237 mm TL, Nightingale Island.

organ 16-18% of distance from anal fin origin to an interventral-line joining origins of pelvic fins; light organ closer to interventral-line than to anus; chin barbel present; no teeth on vomer; gill-rakers long and slender, 1-2 + 7-9; vertebrae 56 (58-59).

Colour: head and body mostly uniform reddish brown; abdomen dark bluish black; fins and lips dark brown.

MATERIAL: Nightingale Id: RUSI 33611: 2, 235-237 mm TL. Inaccessible Id: RUSI 33585: 11, 215-255 mm TL.

REMARKS: *Physiculus karrerae* is common in the shelf waters from 50 m to at least 150 m at the northern islands, but it was not found at Gough. All specimens were collected in traps baited with fish.

DISTRIBUTION: *P. karrerae* has a wide anti-tropical distribution in the Atlantic Ocean. It was previously known from Bermuda, the Caribbean, southern Brazil and St. Helena; depth range 250-800 m (Paulin, 1989). Our specimens are the most southerly and the shallowest records for this species.

Family EXOCOETIDAE

Cheilopogon pinnatibarbatus smallhead flyingfish (flying fish)

Fig. 19

?*Exocoetus exiliens* (non Linnaeus): Carmichael, 1819: 494.

Exocoetus pinnatibarbatus Bennett, 1831: 146 (Atlantic coast of North Africa).

Exocoetus lineatus Valenciennes, in Cuvier & Valenciennes, 1846: 92 (Gorée [Dakar] Sénégal).

Cypselurus lineatus: Penrith, 1967.

Cypselurus pinnatibarbatus: Gibbs & Staiger, 1970.

DIAGNOSIS: (from Gibbs and Staiger, 1970; data from our material given in parentheses.) Pectoral fins greatly enlarged, reaching past base of anal fin; pelvic fins also enlarged, reaching past origin of anal fin; pelvic fin origins closer to anal fin than to base of pectoral fins; anal fin origin under or behind base of 3rd dorsal fin ray; jaws subequal; teeth microscopic, mostly unicuspid (conical); dorsal fin rays 11-14 (11-12); anal fin rays 9-12 (10); pectoral fin rays

i, 13-15 (i, 13-14), the first ray unbranched, the rest branched; vertebrae 49-51 (49); predorsal scales 39-47 (40, 45); head length contained 4.4-5.0 (4.4, 4.5) times in SL.

Colour: body dark iridescent blue dorsally, silvery white ventrally; pectoral fins dusky, with narrow pale transverse band and the rear margin pale.

MATERIAL: Tristan: RUSI 13015: 375 mm SL. Nightingale: RUSI 33597: 2; 46 cm TL.

REMARKS: Flying fish are common in the waters around the Tristan Group in the warmer summer months (November to April). Their presence coincides with sea surface temperatures of 15.5° to 20°C; according to Parin (1959), *C. pinnatibarbatus* comprises 6 subspecies, which are found circumglobally in waters of 15° to 25°C. At Tristan *C. pinnatibarbatus* are one of the major prey items for the hammerhead shark, *Sphyrna mokarran*, and the snoek, *Thyrsites atun*. Two specimens of 460 mm TL were found after landing aboard ship at night. Carmichael (1819: 494) mentioned a specimen of "*Exocoetus exiliens* that dropped on board a ship while at anchor, and which measured eighteen inches in length." He gave no descriptive details of the specimen, but judging from the length, it is likely that it was *C. pinnatibarbatus*.

DISTRIBUTION: According to Gibbs and Staiger (1970), this species appears to be associated with islands or proximity to land and generally avoids tropical latitudes. It is known from the eastern North Atlantic (from the Azores and Spain to Liberia, including Madeira, Canary Islands and Cape Verde Islands); in the South Atlantic it has been reported from Ascension, St Helena, South Africa and southern Brazil. Our specimens from the Tristan Group represent the most southerly record for the Atlantic Ocean. Angot (1951) reported *C. pinnatibarbatus* (as "*Exocoetus altipinnis*") from St Paul and Amsterdam Island. Gon and Klages (1988) recorded a specimen from the vicinity of Marion Island at 46°45'S in the Indian Ocean.

Hirundichthys rondeletii

subtropical flyingfish (flying fish)

Exocoetus rondeletii Valenciennes, in Cuvier & Valenciennes, 1846: 115 (Mediterranean).

Hirundichthys rondeletii: Parin, 1984.

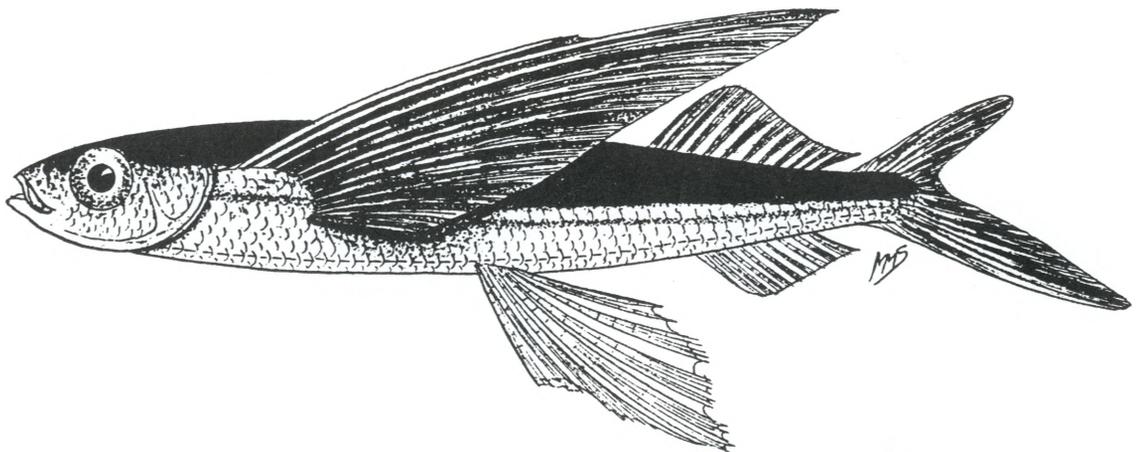


Figure 19. *Cheilopogon pinnatibarbatus*, 300 mm SL, Mozambique (from Heemstra & Parin, 1986).

DIAGNOSIS: (Data from our material given in parentheses.) Pectoral fins reaching past base of anal fin; pelvic fins reaching past origin of anal fin; pelvic fin origins closer to anal fin than to base of pectoral fins; anal fin origin under origin of dorsal fin; jaws subequal; dorsal fin rays 10-12 (10); anal rays 11-12 (11); pectoral fin rays ii,15-18 (ii,16), the first 2 rays unbranched, the rest branched; predorsal scales 27-32 (29).

Colour: body dark iridescent blue dorsally, silvery white ventrally; dorsal and caudal fins greyish; pectoral fins dark, with narrow pale margin along rear (ventral) edge of fin, other fins hyaline.

MATERIAL: Gough Id: RUSI 17709: 235 mm SL.

REMARKS: Our single specimen was collected in 1972 by G. Basson.

DISTRIBUTION: *H. rondeletii* is a subtropical species of the upper epipelagic ecosystem (Parin, 1968). Gough Island is on the southern limit of the range for this species.

Family SCOMBERESOCIDAE

Scomberesox saurus scomberoides

saury
Fig. 20

Esox saurus Bloch & Schneider, 1801: 399 (part referring to J.R. Forster's ms. pertaining to New Zealand).

Sauris scomberoides Richardson, 1842: 26 (on *Esox saurus* above and G. Forster's illustration of New Zealand specimen).

Scomberesox saurus: Sivertsen, 1945.

Scomberesox saurus scomberoides: Hubbs & Wisner, 1980.

DIAGNOSIS: Body elongate, compressed, covered with small thin scales; dorsal and anal fins set on rear half of body with 5-7 finlets behind; jaw produced to form long slender beaks, with the lower jaw longest; dorsal fin rays (9-12) + 5 or 6 finlets; anal fin rays (11-14) + 6 or 7 finlets; pectoral fin rays 12-15; gill-rakers 39-51; vertebrae 64-70.

Colour: greenish brown to dark blue dorsally, separated by a silvery lateral stripe from the silvery-white ventral parts; fins hyaline.

MATERIAL: Tristan: SAM 28236: 186 mm BL. Inaccessible: RUSI 33473: 5, 23-25 cm TL

REMARKS: Five specimens of approximately 24 cm TL were removed from the gut of a snoek, *Thyrsites atun* off Inaccessible Island in February 1990. The saury was recorded from the region by Sivertsen (1945). It is likely that *S. saurus* are present in the surface waters of the region during the warmer summer months as none were observed

at sea during the winter. Hagan (1952) reported this species from the stomach contents of the rockhopper penguin, the yellow-nosed albatross (*Diomedea chlororhynchus*) and the brown noddy (*Anous stolidus stolidus*), which were collected in the summer of 1937/1938.

DISTRIBUTION: Tristan Group; the saury has a circumglobal distribution in the southern hemisphere (Hubbs and Wisner, 1980).

Family LOPHOTIDAE

Lophotus lacepede

crestfish

Pl. 1, Fig. B

Lophotus lacepede Giorna, 1809: 179, Pl. II, Fig. 1 (type locality, probably Mediterranean Sea); Heemstra, 1986a.

DIAGNOSIS: Body elongate, markedly compressed, tapering evenly to a minute caudal fin; dorsal fin origin in front of eyes, the anterior head profile vertical or inclined forward; dorsal fin-rays 220-263, the first ray produced; anal fin with 12-20 short rays placed near the caudal fin; pectoral fin-rays 14-17; pelvic fins rudimentary, situated below and behind pectoral fin base; no scales; swimbladder present; ink sack posterior to swimbladder, empties into cloaca.

Colour: Head and body silvery; fins red.

MATERIAL: Tristan: SAM 28234: 136 cm TL.

REMARKS: The specimen was caught on a line in December 1977 by Mr E. Viljoen and Capt. E. Stoffberg of the MFV HEKLA.

DISTRIBUTION: The crestfish inhabits the lower epipelagic zone in tropical and subtropical waters of all oceans.

Family BERYCIDAE

Beryx decadactylus

beryx

Fig. 21

Beryx decadactylus Cuvier, in Cuvier & Valenciennes, 1829: 222 (Lisbon?); Penrith, 1967; Heemstra, 1986b.

DIAGNOSIS: Body compressed and deep, the depth 44-50% SL; scales ctenoid; cheeks and operculum scaly; preopercle serrate, but no single large spine; mouth large, the maxilla expanded posteriorly, with 2 supramaxillae; dorsal fin with 4 spines and 16-20 rays; anal fin with 4 spines and 25-29 rays; pelvic fins with 1 spine and 10 rays; pectoral fin rays 15-17; lateral-line scales 56-61; gill-rakers (6-7) + (17-19).

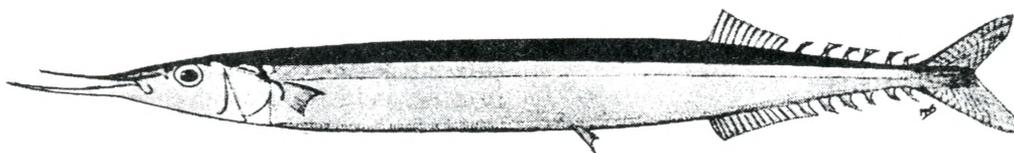


Figure 20. *Scomberesox saurus*, 350 mm SL, South Africa (from Smith, 1986).

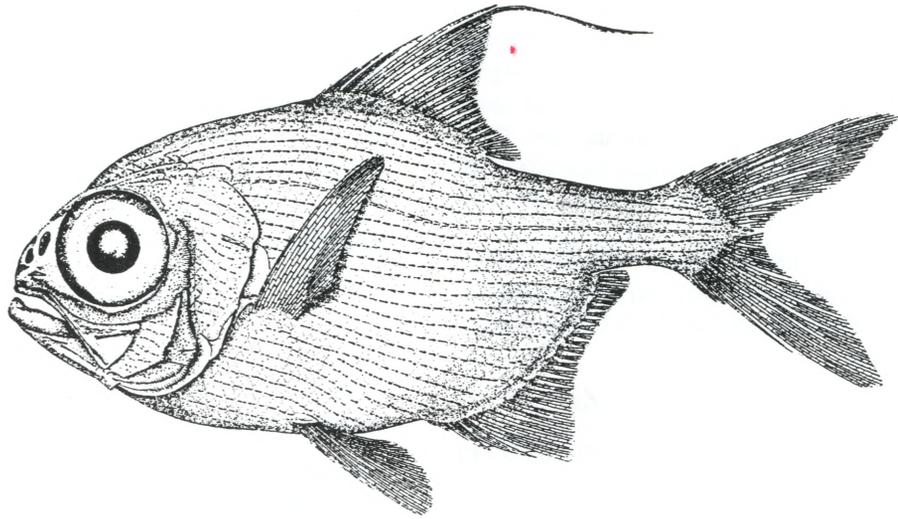


Figure 21. *Beryx decadactylus*, 260 mm SL, Madeira, drawn by Mary Ann Holloway (from Woods & Sonoda, 1973).

Colour: Head and body scarlet dorsally, silvery white below; fins red.

MATERIAL: Tristan: SAM 21809: 362 mm SL.

REMARKS: Penrith (1967) received one specimen from Tristan.

DISTRIBUTION: *B. decadactylus* is found in subtropical and temperate waters of all oceans; records include the North Atlantic, South Africa, Australia, New Zealand, Japan and Hawaii (Heemstra, 1986b).

Family MACRORHAMPHOSIDAE

Centriscops obliquus
banded snipefish (piper)
Pl. 1, Fig. C

Centriscops humerosus obliquus Waite, 1911: 170, Pl. 26 (New Zealand?).

Centriscops obliquus: Menni & Miquelarena, 1979; Heemstra, 1986c; Duhamel, 1989.

DIAGNOSIS: Body very compressed; snout produced into a long tube at the end of which is the small toothless mouth; scales minute but visible to the naked eye, like shark denticles with sharp ridges and spines; orbit rim spiny; bony plates on body above pectoral fins and along ventral midline; pelvic fins small, with a spine-like ray and 4 branched rays; dorsal fin with 7 spines (2nd spine greatly enlarged and somewhat movable, the other spines fixed) and 16-18 segmented rays; anal fin with 17-21 rays; pectoral fin rays 15-17; snout length contained twice in body length; orbit diameter contained 3.0-3.2 times in snout length.

Colour: Males white or pale orange, with 6 oblique dark red bands on body; females with several horizontal, wavy dark stripes.

MATERIAL: Tristan: RUSI 33608: 145 mm TL. Gough: RUSI 33496: 2, 138-153 mm TL.

REMARKS: Our specimens represent the first record of *C. obliquus* from the region. Although it is found at all the

islands, *C. obliquus* is seldom encountered because it is caught only in lobster traps set at 50 m and deeper. One specimen was picked up on the beach after a storm. Males and females differ considerably in colour pattern (Menni and Miquelarena, 1979). Dr G. Duhamel has informed us that *C. obliquus* is pelagic until it reaches 15 cm TL. However, the size of our specimens which were collected near the bottom in deeper than 50 m indicates that the pelagic phase can be terminated at a smaller size than this. This range in the size at settlement could be expected, as it is probable that juveniles will remain drifting in the pelagia until a suitable substrate on which to settle is reached. This is a phenomenon observed in other fish families and is especially common in the pleuronectiformes (Ahlstrom et al., 1984).

DISTRIBUTION: *C. obliquus* is known from Tristan, Gough Island, South Africa, St Paul/Amsterdam, Australia, New Zealand, Chile and Argentina (Heemstra, 1986c).

Notopogon lilliei
round bellowsfish (piper)
Pl.1, Fig. D

Notopogon lilliei Regan, 1914: 14 (New Zealand); Sivertsen, 1945; Heemstra, 1986c; Pequeño et al., 1992.

DIAGNOSIS: Body strongly compressed; snout produced into a long tube at the end of which is the small toothless mouth; scales microscopic, lanceolate and erect, giving the body a velvety feel; orbit rim not spiny; body depth (vertical at origin of pelvic) more than snout length and contained 1.6-1.9 times in distance from eye to end of caudal fin; distance from eye to origin of second dorsal spine distinctly less than distance from eye to caudal fin base; distance from base of second dorsal spine to first dorsal ray not more than length of soft dorsal fin base; eye diameter contained 2.7-4.0 times in snout length; snout length 1.6-1.9 times in body length (from rear edge of gill cavity to caudal fin base); dorsal fin with 7 spines (2nd spine greatly enlarged and somewhat movable, the other spines fixed) and 14 or 15

segmented rays; anal fin rays 17-19; pectoral fin rays 16-17; pre-dorsal profile of body evenly convex; adults with a patch of short bristles above operculum.

Colour: Body orange, with silvery white patches anterior and posterior to pectoral fins; soft dorsal, caudal and anal fins with white bands.

MATERIAL: Tristan: RUSI 33490: 163 mm TL; SAM 26697: 86 mm BL; SAM 27479: 122 mm BL. Inaccessible: RUSI 33616: 2, 167-167 mm TL. Nightingale: RUSI 33492: 226 mm TL; RUSI 33623: 222 mm TL. Gough: RUSI 33617: 200 mm TL.

REMARKS: *N. lilliei* is common in depths greater than 50 m at all the islands, and is eaten by *Polyprion oxygeneios*. All the specimens were collected in lobster traps set at depths of 40-200 m. *N. lilliei* is sometimes found washed up on beaches after storms, and it is presumed that the specimens Hagan (1952) found in the stomachs of black-browed albatross (*Diomedea melanophris*) were scavenged from beaches.

Penrith (1967) suggested that the species originally recorded by Sivertsen (1945) as *N. lilliei* was in fact *N. macrosolen* Barnard, 1925. However, the relatively large collection of specimens that we now have available indicates that the species is *N. lilliei*. According to Heemstra (1986c), *N. macrosolen* has a smaller eye (4.2-5.2 times in snout length), longer snout (1.3-1.5 times in body length), body depth 1.9-2.2 times in distance from eye to end of caudal fin, and the predorsal profile is straight (or nearly so) from the eye to the first dorsal spine.

DISTRIBUTION: Tristan Group and Gough Island; *N. lilliei* is also known from South Africa, New Zealand and South Australia (Heemstra, 1986c).

Family SCORPAENIDAE

Helicolenus mouchezi

(soldier)

Pl. 1, Fig. E

Sebastes mouchezi Sauvage, 1875: 988 (St Paul Island).

Helicolenus tristanensis Sivertsen, 1945: 17-19, Pl.1, Fig. 12 and Pl. 6, Figs. 3-4 (Tristan da Cunha); Eschmeyer, 1969.

Helicolenus mouchezi: Eschmeyer & Hureau, 1971.

Helicolenus dactylopterus goughensis Barsukov, 1979: 12, Fig. 2 (Gough Island).

Helicolenus dactylopterus mouchezi: Duhamel, 1989.

DIAGNOSIS: Dorsal fin with 12 spines and 12-13 rays; anal fin with 3 strong spines and 5 or 6 rays; head spiny, but the suborbital ridge with or without a small spine below front edge of eye; pectoral fin rays 18-20, the upper part of fin truncate, the lower 8 rays unbranched and thickened with the tips free; lateral-line scales 27-30; vertical scale rows (counted above lateral line from cleithral spine to base of caudal fin) 75-84; gill-rakers 7-8 + 17-19, total 25-27; vertebrae 25 or 26. Head length (measured from front of

upper jaw to tip of upper opercular spine) 37-39% SL; body depth 31-35% SL; orbit diameter 9.9-13.1% SL. Attains 42 cm total length.

Colour: Ground colour variable, from brown to pale red; head, body and dorsal fin covered with conspicuous, small, dark brown spots; dark spots also on other fins; belly white; peritoneum and inside of operculum black; tongue and posterior part of buccal cavity dark grey.

MATERIAL: Tristan: RUSI 33619: 230 mm TL. Inaccessible: RUSI 33500: 3, 138-165 mm TL. Nightingale: RUSI 33590: 8, 159-253 mm TL. Gough: RUSI 7682: 293 mm SL; RUSI 18244: 2, 370-410 mm SL; RUSI 18248: 2, 310-340 mm SL. Plus 14 RUSI specimens and numerous fish 128-420 mm TL examined at the islands.

REMARKS: At Tristan, the soldier inhabits deeper water (40 to at least 200 m) than the other scorpaenid (*Sebastes capensis*), and smaller size classes are not found close to shore. Because of its preference for deeper water, *H. mouchezi* is less common than *S. capensis* in the catch of local fishermen. *H. mouchezi* is a fecund live bearer (approximately 300 000 embryos counted in the ovary of a 400 mm TL specimen) spawning during the summer months from October through to April. The larvae are born at a size of 3.5-4.0 mm TL. Moser (1967) reports that *Sebastes paucispinis* in Southern California is ovoviviparous with large females producing up to two million larvae in one brood. *H. mouchezi* feeds almost exclusively on fishes.

This species was thought to be endemic to the Tristan islands by Sivertsen (1945). Eschmeyer and Hureau (1971) suggested that *H. mouchezi* from Amsterdam and St Paul Islands is conspecific with *H. tristanensis*, and we accept their suggestion. *H. mouchezi* differs from *H. dactylopterus* of South Africa in having a wider interorbital (13.8-15.6% HL, [n = 9, 179 - 278 mm SL] versus 11.2-13.9% HL [n = 8, 203 - 226 mm SL] in *dactylopterus*), shorter dorsal fin spines (3rd dorsal spine 13-16% SL, versus 16-18% SL in *dactylopterus*), fewer gill-rakers (lower-limb rakers 17-19 versus 20-22), more numerous scales (75-84 vertical scale rows, versus 60-67 rows) and in colour pattern (head and body covered with conspicuous, small, close-set dark brown spots, versus dorsolateral parts of body with a few small, faint, irregular dark spots).

Barsukov (1979) described a new subspecies (*Helicolenus dactylopterus goughensis*) from Gough Island based on 5 specimens. Three of the four characters that Barsukov used to differentiate *goughensis* from other species or subspecies of *Helicolenus*, namely body depth (28.7-30.8% SL), the number of anal fin rays (5 or 6) and the colour pattern do not differ significantly from the condition in *H. mouchezi* from Tristan and St Paul/Amsterdam islands. The fourth character, 26 vertebrae is also not useful to distinguish specimens from Gough Island; of 4 specimens from Tristan that we x-rayed, 1 has 26 vertebrae and the other 3 fish have 25 vertebrae.

DISTRIBUTION: This species is endemic to the Westwind Drift Islands Province: Tristan Group, Gough, St Paul and Amsterdam, and the Austral and Sapmer seamounts of the southwestern Indian Ocean (Duhamel, 1989).

Sebastes capensis
false jacobever (soldier)

Pl. 1, Fig. F

Scorpaena capensis Gmelin, 1789: 1219 (Cape of Good Hope); Carmichael, 1819.

Sebastichthys capensis: Sivertsen, 1945.

Sebastes capensis: Eschmeyer, 1969; Eschmeyer & Hureau, 1971; Eschmeyer, 1986.

DIAGNOSIS: Dorsal fin with 13 spines and 13-14 rays; anal fin with 3 strong spines and 6 rays; head spiny, but the suborbital ridge without a small spine below front edge of eye; pectoral fin rays 18-19, the lower 9-10 unbranched, the fin wedge-shaped; lateral-line scales 34-41; gill-rakers, including rudiments, 8-9 + 19-21; vertebrae 25 or 26. Head length 37-39% SL; body depth 33-36% SL.

Colour: Variable, ranging from gold, through red, to orange with 5 or 6 pale spots on body at base of dorsal fin.

MATERIAL: Tristan: RUSI 33473: 148 mm TL; RUSI 33582: 318 mm TL; RUSI 33621: 255 mm TL; SAM 26696: 153 mm SL. Inaccessible Id: RUSI 33489: 165 mm TL; RUSI 33589: 121 mm TL; RUSI 33592: 3, 125-233 mm TL. Nightingale Id: RUSI 33497: 3, 225-247 mm TL; RUSI 33589: 7, 153-264 mm TL. Gough: RUSI 33563: 330 mm TL; RUSI 33564: 435 mm TL. SAM 27489: 259 mm SL; SAM 29626-29631: 29, 117-398 mm SL; SAM 30444: 3, 150-258 mm SL; SAM 30445: 3, 195-266 mm SL. Plus 30 additional RUSI specimens and numerous fish of 107-455 mm TL examined at the islands.

REMARKS: *S. capensis* occurs at all the islands from 2 to about 150 m, but is rare at depths greater than 100 m. Small individuals (less than 20 cm TL) are found in rockpools and shallow sub-tidal habitats to about 10 m. Adults are found in deeper water. This species is the second most abundant fish (after the five-finger) in the catch of the Tristan fishermen. It is used only as bait for lobster traps. *S. capensis* is highly territorial, even as juveniles, with individuals occupying caves and clefts. It is ovoviviparous and highly fecund (215 000 embryos counted in a 405 mm TL, 1070 g fish). The embryos hatch inside the ovary and are released at a length of 3.0 - 4.0 mm TL) as free-swimming larvae. This ambush predator feeds mainly on fishes, but will also take benthic invertebrates. (Andrew and Hecht, in press)

DISTRIBUTION: Chen (1971) considered the 11 nominal species that have been described from South America, Tristan da Cunha, Gough Island and South Africa as conspecific. According to Eschmeyer and Hureau (1971), who apparently were not aware of Chen's (1971) work, *S. capensis* may prove to be synonymous with *S. oculatus* Cuvier, 1833 of Chile and Argentina. Kong U (1985) synonymized '*S. capensis*' with 7 nominal species from the coasts of Chile and Argentina. The colour photo of the specimen from South America that was published by Nakamura (1986a) is very similar to *S. capensis*, but the count of 55-66 lateral-line scales given by Nakamura is much higher than in *S. capensis* or in the South American specimens examined by Chen (1971). Perhaps Nakamura was counting scale series above the lateral line, rather than pored lateral-line scales. Nakamura's count of "D XII, 12-14;" for the dorsal fin spines of

Sebastes oculatus is also a mistake; this should have been written D XIII, 12-14 (i.e., 13 dorsal fin spines). *Sebastes capensis* was reported from St Paul/Amsterdam Islands by Blanc (1961), but Eschmeyer and Hureau (1971) re-identified these specimens as *Helicolenus mouchezi*.

Family POLYPRIONIDAE

Polyprion oxygeneios
wreckfish (steambras)

Pl. 1, Fig. G

Epinephelus oxygeneios Bloch & Schneider, 1801: 301 (New Zealand).

? *Polyprion americanus* (non Bloch and Schneider): Rowan and Rowan, 1955.

Polyprion oxygeneios: Roberts, 1989.

DIAGNOSIS: Body oblong, somewhat compressed, covered with small strongly ctenoid scales; body depth contained 3.3-3.8 times in SL (for fish larger than 25 cm SL); dorsal fin with 11 or 12 strong spines and 11 or 12 soft rays; anal fin with 3 spines and 8-10 rays; pectoral fins shorter than pelvics; caudal fin truncate; head, except for snout scaly; maxilla exposed, scaly, with well-developed supramaxilla; rear edge of opercle with 2 spines, the lower one at the end of a distinct horizontal ridge; preopercle with large spines in juveniles, serrate in adults; teeth villiform, in bands on jaws, vomer and palatines and in a small oval patch on tongue. Vertebrae 13+14.

Colour: Body distinctly bicoloured, the dorsal half dark bluish grey and the ventral half abruptly pale.

MATERIAL: Tristan: SAM 28235, 100 cm SL; 19, 57-145 cm TL examined at Tristan, but none preserved by us. Gough: SAM 30450, 460 mm SL.

REMARKS: According to Roberts (1989) the genus *Polyprion* comprises two species, *P. oxygeneios* and *P. americanus* (Bloch and Schneider, 1801); both species are widely distributed in the Southern Hemisphere. *P. americanus* also occurs in the North Atlantic; it differs from *oxygeneios* in having a deeper body (body depth 2.3-3.0 times in SL for fish larger than 25 cm SL) and a mottled or uniformly dark colour pattern (body not distinctly bicoloured).

Rowan and Rowan (1955) examined a "23 inch, 6 lb" steambras from Tristan, which they identified as "*Polyprion americanus*". All of the *Polyprion* that we have seen from Tristan (some 50 specimens) were *P. oxygeneios*, but *P. americanus* might also occur there, as it is known from Vema Seamount (Penrith, 1967; SAM 24300, 457 and 581 mm SL; SAM 31701, 530 mm SL) and is common off South Africa and the coast of Argentina.

P. oxygeneios occurs at all of the Tristan Group islands and at Gough on high relief, rocky bottom at depths of 80 to at least 200 m. It is not often caught by the local fishermen (about 100 individuals a year), and no juveniles smaller than 50 cm TL were seen. Juveniles are pelagic until at least 30 cm TL and often associate with floating objects (Roberts, 1989). An increase in gonad weight towards the end of summer indicates that the species spawns at this time

(February - April). *P. oxygeneios* feeds mainly on fish and lobsters.

DISTRIBUTION: The species has been reported from depths of 100 - 1000 m along continental coasts and off oceanic islands in most subtropical and temperate regions of the Southern Hemisphere (Roberts, 1989), including St Paul and Amsterdam Islands (Duhamel, 1989).

Family SERRANIDAE

Lepidoperca coatsii

Pl. 1, Fig H

Caesioperca coatsii Regan, 1913: 237, Pl. 6, Fig. 1 (Gough Island).

Lepidoperca coatsii: Duhamel, 1989.

DIAGNOSIS: Dorsal fin with 10 spines and 16-18 rays, the interspinous membranes deeply incised; anal fin with 3 spines and 7-8 rays; pectoral fins with 16-17 rays; caudal fin truncate, with 15 branched rays; lateral-line scales 43-48; 2 or 3 rows of scales between lateral line and 5th dorsal fin spine; gill-rakers 9-12 + 22-25. Body depth contained 2.7-3.0 times in SL; head length 2.6-2.9 times in SL; eye diameter 2.4-3.0 times in head length (HL); bony interorbital width 4.0-5.2 times in HL; pectoral fins extend to between anus and base of 2nd anal fin ray, their length contained 1.1-1.2 times in HL; pelvic fins extend to between anus and anal fin origin. Head, including snout, maxilla, lower jaw and gular area scaly; maxilla with or without a splint-like supramaxilla; jaws with a row of small slender teeth and a pair of widely-spaced, exerted, small canines at front; 2 or 3 small canines at middle of each dentary; chevron-shaped band of small sharp teeth on vomer and 4 or 5 series of similar teeth on palatines; no teeth on tongue. Vertebrae 10+16; supraneural bones 3.

Colour: Head and body pinkish orange fading to white ventrally; 4 or 5 distinct purple lines running longitudinally along the body below pronounced lateral line. Fins yellowish, except spinous part of dorsal which has dark blotches on interspinous membranes.

MATERIAL: Nightingale: RUSI 31523: 3, 110-113 mm SL; RUSI 33606, 111 mm. Gough: BMNH 1912.7.172-6: 4, 70-78 mm (syntypes of *Caesioperca coatsii* Regan); RUSI 13294: 82.5 mm; RUSI 33609: 138 mm.

REMARKS: *Lepidoperca coatsii* is a relatively rare species found at all the islands. The species was originally described from specimens collected at Gough Island in 100 fathoms by the SCOTIA (Regan 1913). The 6 specimens collected in the present study were captured at Gough and Nightingale islands in lobster traps set in about 50 m of water.

The two specimens that we examined from the Indian Ocean Austral Seamount (MNHN 1984-82 and 1984-83) are indistinguishable from the Gough Island material.

DISTRIBUTION: In addition to Gough and the Tristan Group, *L. coatsii* has also been reported from St Paul and Amsterdam Island (Duhamel, 1989) and the Austral Seamount (Duhamel, 1984).

Family PENTACEROTIDAE

* *Pseudopentaceros richardsoni*

pelagic armourhead

Fig. 22

Pentaceros richardsoni Smith, 1844: 51 (pages not numbered), Pl. 21 (Cape of Good Hope); Smith, 1964; Penrith, 1967.

Pseudopentaceros richardsoni: Hardy, 1983; Heemstra, 1986d.

DIAGNOSIS: Body oblong, compressed; dorsal fin continuous, the spinous part much longer than soft-rayed part; dorsal fin spines 14 or 15, rays 8-10; anal fin spines 4 or 5, rays 7 or 8; pectoral fin rays 17-18; caudal fin truncate or slightly concave. Bones of head mostly exposed, rugose; mouth small, the maxilla not reaching past front edge of eye; lateral-line scales 74-86; gill-rakers (5-7) + (14-17). Vertebrae 13+13.

Colour: Dark bluish dorsally, pale ventrally.

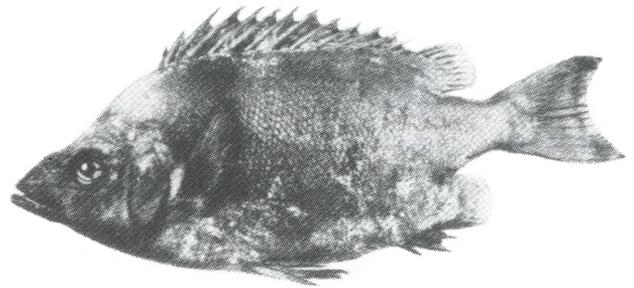


Figure 22. *Pseudopentaceros richardsoni*, 455 mm TL, Tristan.

MATERIAL: Tristan: RUSI 33566, 465 mm TL; RUSI 33599, 455 mm TL; SAM 21791, 80 mm SL.

REMARKS: *P. richardsoni* was recorded from Tristan by Penrith (1967) who obtained a juvenile specimen from the Islands. This species is likely to be a summer spawner, as a 455 mm TL female with active gonads and a 465 mm TL male with ripe testes were collected with hook and line in 100 m during September 1989 and February 1990 respectively. *P. richardsoni* is probably common on the shelf edges surrounding the islands. Hardy (1983) described ontogenetic changes in the serrated ridges and spines on the head of small juveniles.

DISTRIBUTION: *P. richardsoni* has been collected from depths of 50 - 600 m off South Africa, Walters Shoal and other seamounts of the Indian Ocean, Australia, New Zealand, Sala y Gomez Ridge, and South America (Heemstra, 1986d; Penrith, 1967, Parin, 1991). Previous records from the North Pacific (Smith, 1964; Penrith, 1967) were reidentified as two new species by Hardy (1983). The absence of this widely-distributed species at the Amsterdam Islands (Duhamel, 1989) is puzzling.

Family BRAMIDAE

Brama australis

pomfret

Fig. 23

Brama australis Valenciennes, 1840: Pl. 44, Fig. 1 and unnumbered text (Valparaiso, Chile); Pavlov, 1991: 6-9.

Brama sp. Mead, 1972: 81, Pl. 4; Duhamel, 1989.

DIAGNOSIS (modified from Pavlov, 1991; data from our specimen in parentheses): Body oblong, distinctly compressed; body depth 2.1-2.4 times in SL, the greatest body width 2.7-3.9 times in distance between snout and pelvic fin origin (The body depth cannot be measured on our specimen because of missing epaxial muscles.). Dorsal profile of head distinctly convex, the distance between eye and nearest point on dorsal midline more than half eye diameter. Dorsal and anal fins scaly, dorsal fin rays 31-36 (dorsal fin damaged); anal fin rays 26-29 (28; last ray split to its base, which is contiguous with base of 27th ray); pectoral fin rays 20-22 (21); caudal fin lunate; lateral scale series 78-85 (about 79); total developed gill-rakers on one side of first gill arch 18-24 (5 + 13 = 18). Vertebrae 14 + 25 = 39 (16 + 24 = 40).

Colour: Head and body mottled metallic silvery-black, darker dorsally; scaleless snout and tips of median fin rays also black; inside of mouth black.

MATERIAL: Tristan: RUSI 34593, 490 mm SL.

REMARKS: Only one specimen was collected; it was stranded on Halfway Beach on Tristan Island. This is a new distributional record for the species. According to the Islanders, this fish is washed up fairly regularly after storms. It is therefore probable that the species is common in waters not fished with hook and line (i.e., deeper than 200 m).

Our identification of this specimen is somewhat tentative. It was found damaged, and most of the dorsal fin and epaxial muscles are missing. Except for the vertebral count, all of the meristic data fit the diagnosis given by Pavlov (1991) for *Brama australis* and rule out other species that are known from the Atlantic Ocean. According to Mead (1972), *B. brama* has more vertebrae and more anal fin rays; *B. dussumieri* has more vertebrae and fewer gill-rakers; *B. caribbea* has fewer vertebrae, fewer gill-rakers and fewer lateral scale series; *B. orcini* has fewer lateral scale series and fewer gill-rakers; *B. myersi* has fewer pectoral fin rays and more vertebrae.

Mead (1972) described two specimens from South Africa (434 mm SL) and New Zealand (468 mm SL) which he assigned to an undescribed species (designated "*Brama* sp."). According to Mead (1972: 81), *Brama* sp. differs from *B. brama* and *B. japonica* in that "the gill filaments (not the rakers) appear to be much longer (longer than distance between anterior nostril and orbit, nearly as long as snout; while in *B. brama*, and in *B. japonica* of somewhat shorter length, these filaments are about equal to the distance from anterior nostril to orbit)." In our specimen, the length of the longest gill filaments on the first arch are 26 mm and the distance from anterior nostril to eye is 17 mm; Mead (1972) did not record these measurements for the two specimens that he examined.

B. australis is very similar to *B. japonica*, which is known only from the North Pacific. Pavlov (1991) mentioned that the dorsal head profile of *B. japonica* is more steeply convex than in *B. australis*, and this is also shown on Mead's (1972: Pls. 3 and 4) illustrations.

DISTRIBUTION: *Brama australis* (including *Brama* sp. Mead, 1972) is also known from the southeastern Pacific Ocean, Chile, New Zealand, South Africa and Amsterdam Island (Duhamel, 1989).

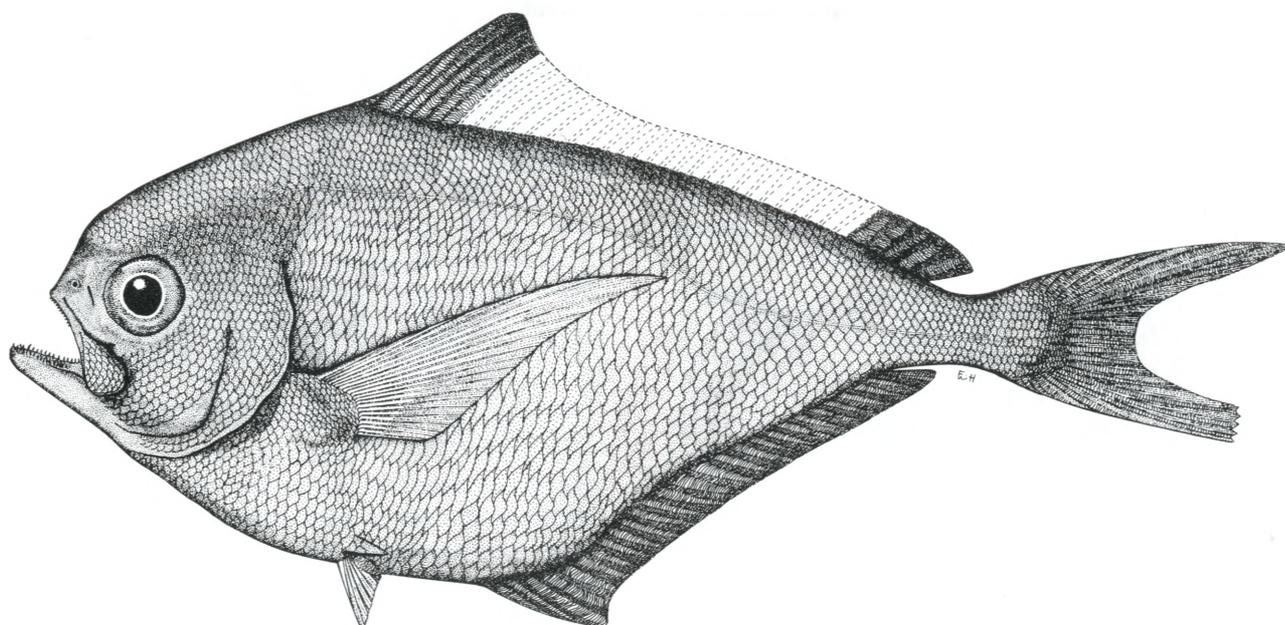


Figure 23. *Brama australis*, 490 mm TL, Tristan.

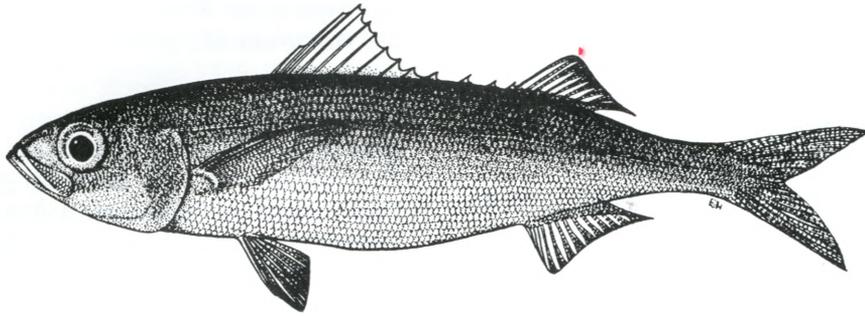


Figure 24. *Emmelichthys nitidus*, 300 mm SL, South Africa.

Family EMMELICHTHYIDAE

Emmelichthys nitidus

southern rover

Fig. 24

Emmelichthys nitidus Richardson, 1845: 47, Pl. 29, Figs. 7 and 8 (west coast of Australia); Heemstra and Randall, 1977; Heemstra, 1986e.

DIAGNOSIS: Body elongate, subcylindrical; body depth 4.1-5.2 times in SL, and less than head length; spinous dorsal fin separated from soft dorsal fin by a gap with 2-4 isolated spines; soft dorsal and anal fins with scaly basal sheath; dorsal fin with 13 spines and 9-11 soft-rays; anal fin with 3 spines and 10 rays; pectoral fin rays 20-23; caudal fin forked; upper jaw very protrusile; maxilla scaly, not covered by preorbital bone when mouth is closed; supramaxilla long and slender; lateral-line scales 87-98; gill-rakers (10-12) + (27-31). Vertebrae 10+14.

Colour: Dark bluish grey dorsally, silvery reddish on ventral parts.

MATERIAL: Tristan: RUSI 34592: 285 mm TL.

REMARKS: *E. nitidus* occurs near the bottom in waters deeper than 100 m. The only specimens collected by us came from the stomach of the deep water predator *Polyprius oxygeneios*. This is a new record for the region.

DISTRIBUTION: The southern rover is also recorded from South Africa, Australia, New Zealand, St Paul and Amsterdam Islands (Heemstra, 1986e).

Family CARANGIDAE

Naucrates ductor

pilotfish

Fig. 25

Gasterosteus ductor Linnaeus, 1758: 295 ("in Pelago").

Naucrates ductor: Smith-Vaniz, 1986.

DIAGNOSIS (modified from Smith-Vaniz, 1986): Body elongate, subcylindrical; caudal fin forked; first dorsal fin with 7 spines (first minute), second dorsal with 1 spine and 30-35 rays; anal fin with 2 small spines preceding fin, a slender spine closely bound to first ray, and 19-22 rays; pectoral fins shorter than pelvics; length of dorsal-fin lobe in adults not much longer than pectoral fin, 11-13% fork length; gill-rakers (7-10) + (15-20) = 22-29. Maxilla reaches about to vertical through anterior edge of pupil. Caudal peduncle with a low fleshy keel on each side.

Colour: Body silvery blue dorsally, with 6 broad dark bars, including one at base of caudal fin; caudal fin lobes with white tips.

MATERIAL: Tristan: SAM 28931: 2, 312-341 mm FL.

REMARKS: *N. ductor* is a member of the pelagic, open-ocean fauna, and juveniles are often associated with jelly-fishes or flotsam of terrestrial origin. The pilotfish got this name from its habit of riding the bow wave of ships or large fishes. This commensal relationship is adopted with several species of sharks, rays and other large fishes.

DISTRIBUTION: The pilotfish is known from tropical and temperate waters of all oceans.

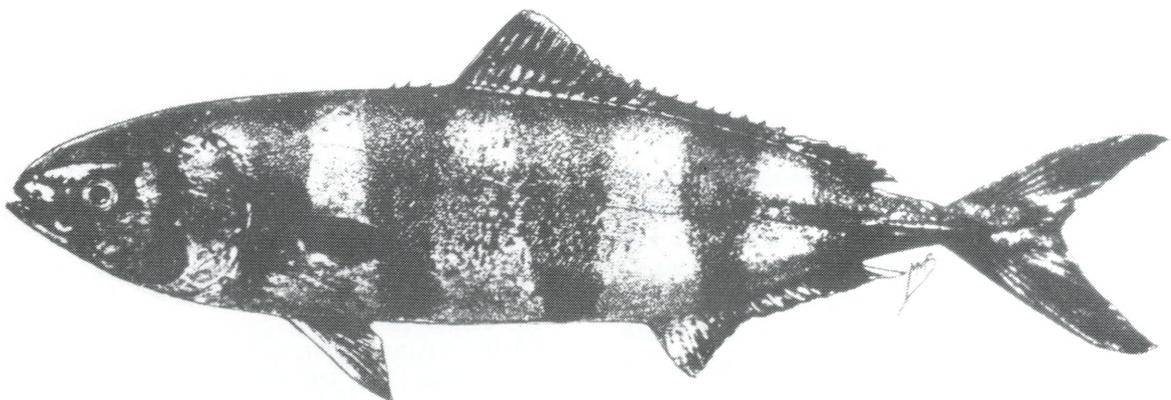


Figure 25. *Naucrates ductor*, 300 mm SL, South Africa.

Seriola lalandi

giant yellowtail (yellowtail)

Pl. 2, Fig. A

Seriola lalandi Valenciennes, in Cuvier & Valenciennes, 1833: 208 (Brazil); Smith-Vaniz, 1986.

DIAGNOSIS (modified from Smith-Vaniz, 1986): Caudal fin forked; first dorsal fin with 7 spines (first minute), second dorsal with 1 spine and 30-35 rays; anal fin with 2 small spines preceding fin, a slender spine closely bound to first ray, and 19-22 rays; pectoral fins shorter than pelvics; length of dorsal-fin lobe in adults not much longer than pectoral fin, 11-13% fork length; gill-rakers (7-10) + (15-20) = 22-29. Maxilla reaches about to vertical through anterior edge of pupil. Caudal peduncle with a low fleshy keel on each side.

Colour: Blue to olivaceous above, shading to silvery white below; sometimes with narrow bronze stripe along midside of body; caudal fin olivaceous yellow.

REMARKS: *Seriola lalandi* was first recorded by Rowan and Rowan (1955) from Tristan. It seems that this fish is extremely rare in Tristan waters. A specimen of 60 cm TL was caught with hook and line in February 1989; it was not kept. One other specimen was observed underwater at about 20 m during March 1989. This subtropical species probably enters Tristan waters (possibly a fringe area of the species' range) during the warmer summer months.

DISTRIBUTION: The yellowtail is considered to be circumglobal and restricted to subtropical waters (Smith-Vaniz, 1986).

Trachurus longimanus

southern horse mackerel (mackerel)

Pl. 2, Fig. B

Decapterus longimanus Norman, 1935b: 255 (Tristan da Cunha); Penrith, 1967.

Trachurus longimanus: Duhamel, 1989; Collette & Parin, 1991.

DIAGNOSIS (data from 6 specimens, 355-492 mm FL): Body depth 4.4-5.0 times in FL; head length 3.7-3.9 times in FL; greatest height of scales in curved part of lateral line 3.0-3.8% FL, the greatest height of scales in straight part 4.0-4.6% FL. Caudal fin forked; first dorsal fin with 8 spines, second dorsal with 1 spine and 31-34 rays; anal fin with 2 distinct spines preceding fin, a slender spine closely bound to first ray, and 26-29 rays; last ray of dorsal and anal fins enlarged, connected by membrane to penultimate ray but set about 50% farther apart than other rays; pectoral fins with 22-23 rays (2 dorsalmost rays unbranched); curved part of lateral line with 48-53 scales (these scales vertically elongate but mostly hidden by overlying skin and small accessory scales); straight part of lateral line with 44-50 scutes (including those on caudal fin); gill-rakers (15-17) + (40-42) = 56-59. Colour: Body silvery-grey, dark bluish green dorsally, silvery white ventrally; a small black spot on upper rear margin of operculum.

MATERIAL: Tristan: RUSI 34594: 395 mm FL; RUSI 34595: 492 mm FL. Inaccessible: RUSI 33567: 355 mm

FL. Nightingale: RUSI 33569: 460 mm FL. Gough: RUSI 11084: 448 mm FL; SAM 30443: 400 mm FL.

REMARKS: *T. longimanus* shoals from the surface down to about 50 m and is present at Gough as well as the northern islands. At Tristan, it spawns from October to March. As expected from the long numerous gill-rakers, planktonic organisms such as amphipods and small pelagic fishes are the major prey. Collette and Parin (1991) reported euphausiids (*Euphausia recurva*) as the primary food item in specimens from Walters Shoal.

DISTRIBUTION: Once thought to be endemic to Tristan (Sivertsen, 1945), *T. longimanus* has since been recorded from Vema Seamount (Penrith 1967), St Paul and Austral Seamount (Duhamel, 1989) and Walters Shoal (Collette and Parin, 1991).

Family ECHENEIDAE

Remora remora

shark remora

Fig. 26

Echeneis remora Linnaeus, 1758: 260 (Indian Ocean).

Remora remora: Heemstra, 1986f.

DIAGNOSIS: Body elongate; top of head covered by a long flat sucking disk; body depth contained 5-8 times in SL; dorsal and anal fin bases less than twice head length; disc with 14-20 ridges; dorsal fin rays 22-26; anal fin rays 22-24; pectoral fin rays 26-30; gill-rakers (5-6)+(26-28).

Colour: Dark brownish grey.

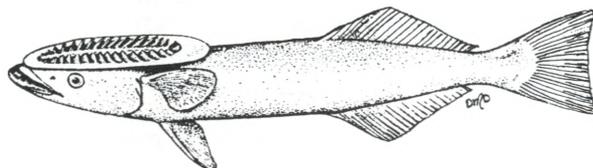


Figure 26. *Remora remora*, 230 mm SL, South Africa.

MATERIAL: Tristan: RUSI 7296: 2, 102-167 mm SL.

REMARKS: As the name implies, the shark remora is usually attached to sharks. Our 2 specimens were collected in June 1977 by Peter Warren, captain of a lobster-fishing vessel operating at the islands.

DISTRIBUTION: Worldwide except in polar seas.

Family CHEILODACTYLIDAE

Acantholatris monodactylus

(fivefinger)

Pl. 2, Figs C & D

Chaetodon monodactylus Carmichael, 1819: 500, PL. 24 (Tristan da Cunha).

Cheilodactylus Carmichaelis Cuvier, in Cuvier & Valenciennes 1830: 360 (based on *Chaetodon monodactylus* Carmichael).

?*Cheilodactylus aspersus* Richardson, 1850: 64 ("Port Arthur, Van Diemen's Land" [= Tasmania], erroneous).

Acantholatris monodactylus: Gill, 1863; Sivertsen, 1945; Penrith, 1967; Duhamel, 1989; Collette & Parin, 1991.
Chilodactylus monodactylus: Sauvage, 1879; Regan, 1913; Norman, 1935a.

DIAGNOSIS: Caudal fin forked; dorsal fin with 16-18 spines and 24-27 rays; anal fin with 3 spines and 11 or 12 rays; pectoral fins with 14-15 rays, the upper 2 rays and the lower 5-6 rays unbranched, the other rays branched; lateral-line scales 50-54; gill-rakers 5-7 + 16-18. Measurements from 18 specimens, 226-323 mm SL: Body depth at pelvic fin origin 38-46% SL, head length 28-34% SL, and snout to dorsal fin origin 28-34% SL; orbit diameter 4.9-9.5% SL, interorbital 5.6-9.5% SL, caudal peduncle depth 7.8-8.9% SL, longest pectoral ray 33-43% SL.

Colour: Body usually bronze (but the colour varies from silver through bronze to orange) with 5-6 dark brown or black vertical bars on dorsal part of body, the first at dorsal fin origin and the last at base of caudal fin; dorsolateral parts of head and body with numerous small black spots.

MATERIAL (all lengths are SL): Tristan: RUSI 33570: 253 mm; RUSI 33603: 284 mm. Nightingale Id: RUSI 33575: 2, 200-218 mm. Inaccessible Id: RUSI 33586: 2, 282-290 mm; RUSI 33587: 4, 214-252 mm. Gough Id: RUSI 26185: 260 mm; RUSI 33573: 250 mm; RUSI 33568: 323 mm; RUSI 33576: 281 mm; RUSI 33583: 226 mm; RUSI 33593: 241 mm; RUSI 33600: 274 mm; RUSI 33602: 280 mm.

REMARKS: The fivefinger is the dominant species in terms of biomass on the shelf areas of the Tristan islands, and it is also the most abundant species captured for food and bait. It occurs in all well-covered habitats (i.e., algal covered reefs and kelp stands) from 1.5 m to at least 150 m. The species is an opportunistic carnivore, feeding on benthic invertebrates, planktonic salps, amphipods, and fishes (Andrew and Hecht, 1992). It is normally restricted to within 10 m of the seabed. Larval and paperfish stages of this species are pelagic, while juveniles are usually seen swimming in shoals of up to 15 individuals within 2 metres of the bottom. Tagging studies done at Tristan show that larger individuals are territorial, and have a relatively small home range. Adults are often seen resting on the bottom in caves or crevices. The species attains 65 cm TL and is relatively slow growing. Our age and growth studies (using otoliths) show that large adults attain ages in excess of 25 years. The fivefinger spawns in summer from early February to late April.

Specimens from Gough Island appear to have a smaller head than those from the Tristan group: head length 28-29% SL (7 fish of 226-323 mm SL) versus head length 30-34% SL (10 fish of 200-290 mm SL). The colour patterns of specimens from Gough do not differ significantly from those at Tristan (or those that we have seen from St Paul and Amsterdam Islands). In view of the small sample of fish that we have from Gough and the absence of any other differences in the specimens that we have examined, we consider the Gough population of *A. monodactylus* to be conspecific with the population at Tristan.

DISTRIBUTION: In addition to the Tristan Group and Gough Island, *A. monodactylus* has been recorded from St

Paul and Amsterdam Islands (Sauvage, 1879; Kner, 1865; Hureau, 1969; Duhamel, 1989), Austral Seamount in the southwest Indian Ocean (Duhamel, 1984), Walters Shoal (400 miles south of Madagascar, Collette and Parin, 1991) and from Vema Seamount (Penrith, 1967).

Family LATRIDAE

Latris lineata

striped trumpeter (funnyfish)

Pl. 2, Fig. E

Cichla lineata Forster, in Bloch & Schneider, 1801: 342 (New Zealand).

Latris lineata: Penrith, 1967; Last et al., 1983; Duhamel, 1989.

DIAGNOSIS (data from our specimen given in parentheses): Body elongate, compressed, the depth contained 2.9-3.1 times in SL; caudal fin forked; dorsal fin with 18 spines and 34-36 rays, the fin divided almost to the base between spiny and soft-rayed parts; anal fin with 3 spines and 25-27 (28) rays; pectoral fins with 18 (17) rays, the lower 8 or 9 rays unbranched, the middle rays longest; gill-rakers 6 + 16.

Colour: Head and body dark olive green dorsally, with 3 silvery bands from head to tail; belly silvery yellow; fins greenish yellow.

MATERIAL: Tristan: RUSI 33595: 745 mm TL. Gough: SAM 22623: (skin) 90 cm SL: SAM 22891: 90 cm SL.

REMARKS: One specimen was collected at Tristan Island in 80 m. This species is seldom hooked, but it is known from all the islands including Gough (Jimmy Glass, Tristan da Cunha, pers. comm.).

DISTRIBUTION: *L. lineata* is also known from the Amsterdam Islands (Duhamel, 1989), Australia, New Zealand (Last et al., 1983; Ayling and Cox, 1982) and the sub-Antarctic Auckland Islands (Kingsford et al. 1989).

Mendosoma lineatum

Pl. 2, Figs F & G

Mendosoma lineatum Guichenot, 1848: 213 (Valparaiso, Chile); Gon & Heemstra, 1987; Duhamel, 1989.

DIAGNOSIS: Body elongate, moderately compressed, the depth contained 3.5-3.9 times in SL; caudal fin forked; dorsal fin with 22-24 spines and 24-27 rays, the fin divided between spinous and soft-rayed parts; anal fin with 3 spines and 17-21 rays; pectoral fin rays 16-18, the upper 2 and lower 6-8 rays unbranched, but not thicker or longer than other rays; mouth very protrusile, the upper jaw with 1 row of small conical teeth; no teeth on lower jaw, vomer or palatines; body covered with cycloid scales; lateral-line scales 69-77; lower-limb gill rakers 20-22. Vertebrae 42-46.

Colour: Bluish green dorsally, fading to silver-yellow below lateral line; fins pale yellow, the caudal fin darker yellow.

MATERIAL: Tristan: RUSI 33471: 2, 83-86 mm TL; RUSI 33625: 225 mm TL. Nightingale Id: RUSI 33613: 218 mm TL. Gough Id: RUSI 26047, 175 mm SL; RUSI 33626: 4, 210-235 mm TL.

REMARKS: *M. lineatum* is common at all the islands and shoals in groups of similar-sized individuals. Adults are epibenthic below about 20 m, but juveniles and small fish shoal close to the surface where they are easy prey for birds. Klages et al. (1988) reported this species from the stomachs of rockhopper penguins at Gough Island. Small shoals of juveniles occasionally become trapped in rockpools. These pelagic juveniles are compressed and silvery (Pl. 2, Fig. G) like the "paperfish" stage of cheilodactylids. *M. lineatum* is mainly planktivorous, but it will also feed on small pelagic fishes. The species forms an important prey item for the snoek, *Thyrssites atun*.

DISTRIBUTION: Gon and Heemstra (1987) reported the first Atlantic record of this species from Gough Island. *M. lineatum* is also known from Chile, New Zealand, Tasmania, St Paul and Amsterdam Islands (Gon and Heemstra, 1987; Duhamel, 1989) and the sub-Antarctic Auckland Islands (Kingsford et al., 1989).

Family LABRIDAE

Nelabrichthys ornatus

Tristan wrasse (concha)

Pl. 2, Figs H & I

Labrus ornatus Carmichael, 1819: 502, Pl. 27 (Tristan da Cunha).

Labrichtys Lantzii Sauvage, 1875: 988 (St Paul Island).

Labrichtys isleanus Sauvage, 1875: 988 (St Paul Island).

Platyglossus robinsoni Gilchrist & Thompson, 1914: 86 ("Natal" [specimen evidently mislabelled]).

Labrichthys ornatus: Sivertsen, 1945.

Nelabrichthys ornatus: Russell, 1983; Duhamel, 1989; Collette & Parin, 1991.

DIAGNOSIS: Body elongate, compressed; body depth contained 3.9-5.3 times in SL; head length 3.3-4.2 times in SL; snout 3.7-4.4, eye diameter 4.5-6.1, interorbital width 5.3-6.8 and suborbital depth 5.9-9.2 times in head. Caudal fin rounded; dorsal fin with 9 spines and 12-13 rays; anal fin with 3 slender spines and 11-12 rays; pectoral fin rays 12-14; lateral-line complete, with 26-27 scales; lateral line tubes branched; total gill-rakers 15-25; branchiostegal rays 6; cheeks scaly; preopercle entire. Vertebrae 9 + 17-18.

Colour: Sexually dichromatic; three colour phases are distinguished. Juveniles: predominantly yellow with indistinct markings of initial phase females. Initial (female) phase: head and body olive brownish with azure lateral stripes on body. Juveniles and females with 3 distinct black spots: one between first two dorsal fin spines, the second near base of dorsal fin between last 3 fin rays, and the third at middle of caudal fin base. Terminal (male) phase: Head and body brownish, the body scales marked with violet or red; lines on head and body violet or blue; dorsal fin purplish brown tinged with red, with 3 violet longitudinal stripes and a black spot between first and third spines (no black spot at rear end of dorsal fin or base of caudal fin; anal fin yellowish, violet edged; caudal fin reddish yellow, with concentric violet stripes; paired fins hyaline.

MATERIAL: Tristan: RUSI 33468: 2, 40-50 mm TL; RUSI 33483: 188 mm TL; RUSI 33607: 7, 90-175 mm TL;

RUSI 33615: 6, 90-180 mm TL; SAM 10503 (5, not measured); SAM 10504 (6, not measured); SAM 24070 (1, not measured); SAM 25284 (1, not measured); SAM 23764 (1, not measured). Nightingale: RUSI 33481: 155 mm TL. Gough: SAM 29920: 9, 91-165 mm SL; SAM 29922: 6, 155-172 mm SL; SAM 29923: 4, 84-168 mm SL.

REMARKS: *N. ornatus* is the most numerous species on the shelf areas of the three northern islands. It was not seen at Gough Island during visits by the senior author (T.G.A.), but there are three lots of specimens in the South African Museum (see above) that were collected at Gough Island with spearguns by W. Liltved and T. Gosliner in September 1981.

N. ornatus inhabits waters from 1.5 m to at least 50 m and is rarely seen more than 2 metres above the bottom. The species favours areas with plentiful cover, either in the form of reef or kelp beds. The diet comprises mainly epiphytic organisms.

N. ornatus is a protogynous hermaphrodite with a lek-like mating system. All fish begin life as females, and some change to males at a size of 16-17 cm TL. The mechanism inducing this change is not clearly understood, but is thought to be related to size, as adult males establish temporary territories. Open areas surrounded by adequate cover are favoured for establishing territories, and larger males occupy more desirable sites that are close to cover and more sheltered. Secondary males of 17 cm TL and larger will set up territories about 2 m in diameter each evening throughout the spawning season (November to March). Vigorous displays are directed at any females moving into the territory of a particular male. If a female accepts the advances, the pair swim rapidly upwards and spawn in midwater. A detailed description of the mating system is currently in press. (Andrew et al., in press)

DISTRIBUTION: *N. ornatus* is known from Tristan, Gough, Vema Seamount (Duhamel, 1989), St Paul and Amsterdam Islands (Duhamel, 1989). The colour pattern of the 38 mm SL juvenile from Walters Shoal that was illustrated by Collette and Parin (1991) shows a dark red spot on each body scale, but similar-sized juveniles from Tristan have a pale lilac-colored spot on each of the ventrolateral body scales. The sexually dimorphic colour patterns of fresh males and females from St Paul Island (as described by Sauvage, 1879) also differ considerably from adults at Tristan (photographed by T.G. Andrew). In view of the subtle colour differences between many wrasse species, we are dubious about the conspecific status of the wrasses at Tristan, St Paul and Walters Shoal that are currently identified as "*Nelabrichthys ornatus*". If these wrasses are not conspecific, they certainly represent a monophyletic group of species.

Family BOVICHTIDAE

Bovichtus diacanthus

klipfish

Pl. 2, Fig. J

Callionymus diacanthus Carmichael, 1819: 501, Pl. 26 (Tristan da Cunha).

Bovichthys diacanthus: Regan, 1913; Penrith, 1967.

DIAGNOSIS: Body elongate, subcylindrical, the depth contained about 5 times in SL; head length about 3 times in SL; two dorsal fins joined at the base; first dorsal fin with 8-9 spines; second dorsal fin with 20-21 rays; anal fin rays 15-16; dorsal and anal fin-rays unbranched; pectoral fin rays 14-15; pelvic fins with 1 spine and 5 rays, the fin origin distinctly anterior to pectoral fin base; caudal fin truncate or slightly convex; head and body naked; a large spine on opercle; a single nostril on each side of snout.

Colour: Generally olive or blackish green with white blotches; belly silver white; lower border of paired fins, also anal and caudal fins edged with white. *B. diacanthus* is able to adopt a reddish brown or blackish colour in order to match the colour of its habitat.

MATERIAL: Tristan: RUSI 33484: 3, 135-162 mm TL; RUSI 33487: 6, 120-185 mm TL; RUSI 33488: 9, 115-152 mm TL; SAM 10505 (14); SAM 26991 (4); SAM 23951 (1). Gough: RUSI 33614: 190 mm TL; SAM 27478 (1); SAM 27481 (1); SAM 29925 (1); SAM 29926 (3). Plus 20 additional RUSI specimens and numerous fish of 50-250 mm TL examined at the islands.

REMARKS: *B. diacanthus* is extremely common in rockpools 10-200 cm deep and in subtidal areas down to about 20 m. This species is able to withstand a wide temperature range. Sun-warmed rockpools where the species occurs reach summer midday temperatures of up to 27.4°C, and winter surface ocean temperatures can drop as low as 10°C at Gough Island.

The pelagic larva develops into a silvery postlarval stage, and at 5-6 cm TL, the postlarvae move into shallow water where they transform to the benthic olive-coloured juveniles. The pelagic postlarvae occur in large shoals and are important prey for predators such as *Thyrsites atun*. Adults become scarce or absent from the shallow subtidal region during February and March. Gonad development prior to this seaward movement suggests that it is a spawning related event. *B. diacanthus* feeds mainly on epiphytic fauna and amphipods.

DISTRIBUTION: *B. diacanthus* is endemic to the Tristan Group and Gough Island. Other species of *Bovichtus* are known from St Paul and Amsterdam Islands (Duhamel, 1989), the Antarctic Peninsula and the southern coasts of South America, Australia and New Zealand (Fischer and Hureau, 1985), and also the sub-Antarctic Auckland Islands (Kingsford et al, 1989).

Family GEMPYLIDAE

Thyrsites atun

snoek

Fig. 27

Scomber atun Euphrasen, 1791: 315 (Cape of Good Hope).

Thyrsites atun: Penrith, 1967; Nakamura, 1986b.

DIAGNOSIS: Body distinctly elongated and compressed, the greatest depth contained 7-9 times in SL; mouth large, with fearsome teeth; lateral line single, abruptly bent downwards below posterior dorsal fin spines; caudal fin forked; dorsal fin divided to the base before soft-rayed part, with 18-21 spines followed by a short fin of 10-12 rays and 5-7 separate finlets; anal fin of 2 or 3 minute spines, 8-11 rays and 5-7 finlets; pelvic fins small, with 1 spine and 5 rays; pectoral fin rays 14-15; no fleshy keels on caudal peduncle or belly; 2 nostrils on each side of snout.

Colour: Silvery with iridescent purplish hue when fresh; fins dark grey.

MATERIAL: Tristan: RUSI 33480: 43 mm TL; SAM 10502 (3); SAM 28233 (2). Gough: SAM 30439 (skull); SAM 30448 (1). Plus numerous specimens (maximum size 126 cm TL) examined at the islands.

REMARKS: This mesopelagic predator occurs year round in the waters of all the islands, including Gough. The population at the islands appears to be self sustaining with larvae, juveniles and breeding adults present. Spawning occurs in shallow water throughout the summer months (October to April). Adult snoek feed primarily on fish, mainly pelagic juveniles of *Bovichtus diacanthus* and *Mendosoma lineatum*; during the summer months, exocoetids are also a common prey item.

DISTRIBUTION: *T. atun* is found close to shore throughout temperate waters of the southern hemisphere (Grant et al., 1978). It was not previously recorded from Gough Island.

Family TRICHIURIDAE

Lepidopus caudatus

buttersnoek

Fig. 28

Trichiurus caudatus Euphrasen, 1788: 52, Pl. 9, Fig. 2 (Cape of Good Hope, South Africa).

Lepidopus caudatus: Nakamura, 1986c.

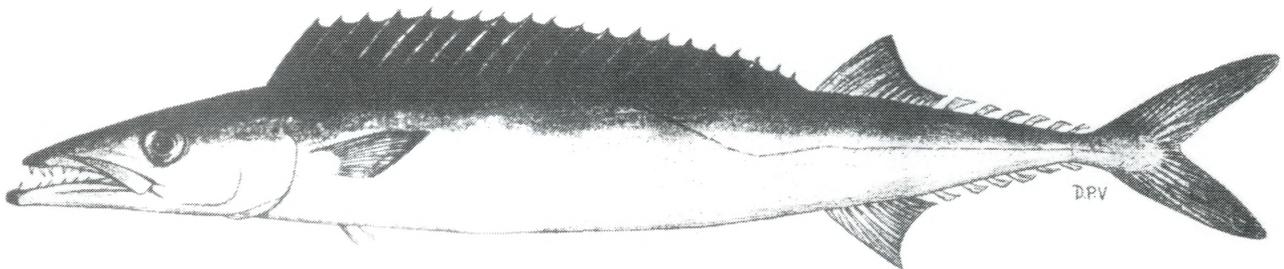


Figure 27. *Thyrsites atun*, 180 mm FL, South Africa.

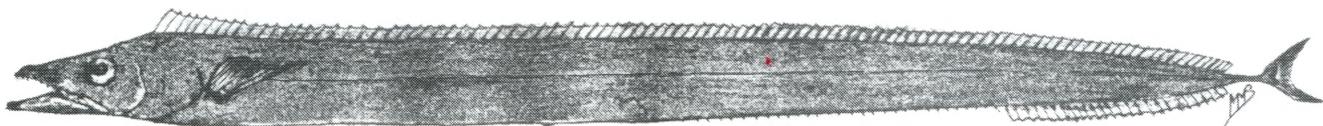


Figure 28. *Lepidopus caudatus*, 510 mm SL, South Africa.

DIAGNOSIS: Body greatly elongated and compressed, the depth contained 11-15 times in SL; dorsal fin base runs entire length of body; no notch between dorsal fin spines and rays; dorsal fin with 9 slender spines and 88-100 rays; anal fin with 2 small spines (the second, plate-like, much shorter than pupil diameter) and 61-64 rays, the first 40 or so rays embedded; pectoral fin rays 12; caudal fin small and forked; pelvic fins reduced to a scale-like spine inserted close behind pectoral fin base; a single nostril on each side of snout; interorbital area concave or flat, the dorsal head profile concave; lateral line single; scales absent; gill-rakers 17-20. Vertebrae 105-114.

Colour: Silvery; fins pale.

MATERIAL: Tristan: RUSI 33596: 127 cm TL. Nightingale: RUSI 18251: 150 cm TL.

REMARKS: Only two specimens of this benthopelagic species were collected at the Tristan Group. This is a new record for the region. One other specimen was reported to have been caught by an islander in the past.

DISTRIBUTION: The species has a wide anti-tropical distribution extending down the eastern Atlantic from Iceland and Norway to the Mediterranean, South Africa, St Paul and Amsterdam Islands, Australia and New Zealand (Duhamel, 1984; Nakamura, 1986c).

Family SCOMBRIDAE

Allothunnus fallai

slender tuna

Fig. 29

Allothunnus fallai Serventy, 1948: 132, Fig. 1 (South Island, New Zealand); Collette, 1986.

DIAGNOSIS: Body elongate, torpedo shaped, the depth contained 4.5-6.5 times in FL; head length 3.7-3.9 times in FL; first dorsal fin of 17-18 slender spines depressible into a groove; second dorsal fin with 12-13 rays followed by 6-8 little finlets; anal fin of 13-14 rays, followed by 6-7 finlets; caudal fin forked; pectoral fin rays 24-26; gill-rakers (21-25) + (49-53) = 71-78. Vertebrae 20+19.

Colour: Bluish dorsally, white ventrally.

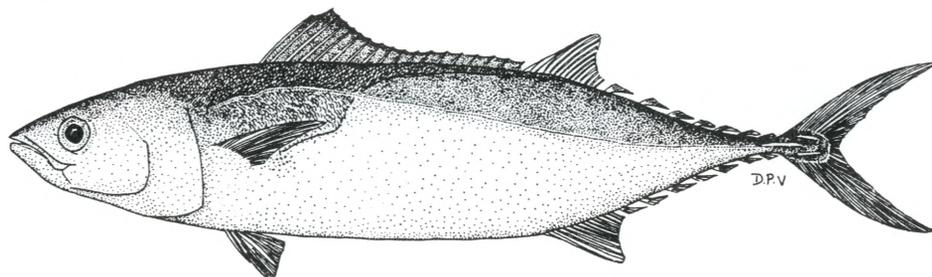


Figure 29. *Allothunnus fallai*, 265 mm TL, Namibia.

MATERIAL: Tristan: RUSI 31527, 265 mm TL.

REMARKS: One juvenile was collected on the surface at Tristan during 1989. The slender tuna was not previously recorded from the region, but it has a worldwide distribution between 20° and 50° S (Collette, 1986).

Family STROMATEIDAE

Hyperoglyphe antarctica

southern butterfish (bluefish)

Fig. 30

Perca antarctica Carmichael, 1819: 501, Pl. 25 (Tristan da Cunha).

Seriolella antarctica: Regan, 1913.

Seriolella antarctica: Sivertsen, 1945.

Palinurichthys porosus: Barnard, 1948, Smith, 1949.

Mupus perciformis: Smith, 1949.

Palinurichthys antarcticus: Penrith, 1967.

Hyperoglyphe antarctica: Haedrich, 1967, 1986; Duhamel, 1989.

DIAGNOSIS (based on 16 specimens, 390-884 mm SL): Body stout, little compressed, the depth 32-37% SL; head length 32-35% SL; least depth of caudal peduncle 47-61% of its length (from anal fin base to ventral end of caudal fin base); dorsal fin divided to the base, the front part low, with 7 or 8 short stout spines, not increasing in length posteriorly and less than half length of anterior soft-rays in second dorsal fin; dorsal fin origin on or slightly behind a vertical at upper end of pectoral fin base; second dorsal fin with 1 hidden spine and 17-20 rays; anal fin with 3 spines (hidden at front margin of fin) and 14-16 rays; pectoral fin long and falcate, reaching vertical at anal fin origin (pectoral length 27-32% SL), the rays 19-22; top of head naked except for a small patch of scales on each side above and behind eyes; lateral-line arched anteriorly, curving to mid-lateral position below middle dorsal fin rays, thence running straight to tail base; about 80-89 pored lateral-line scales; gill-rakers 6-7 + 16-18; vertebrae 25.

Colour: Body dark blue-grey fading to grey below; fins dusky.

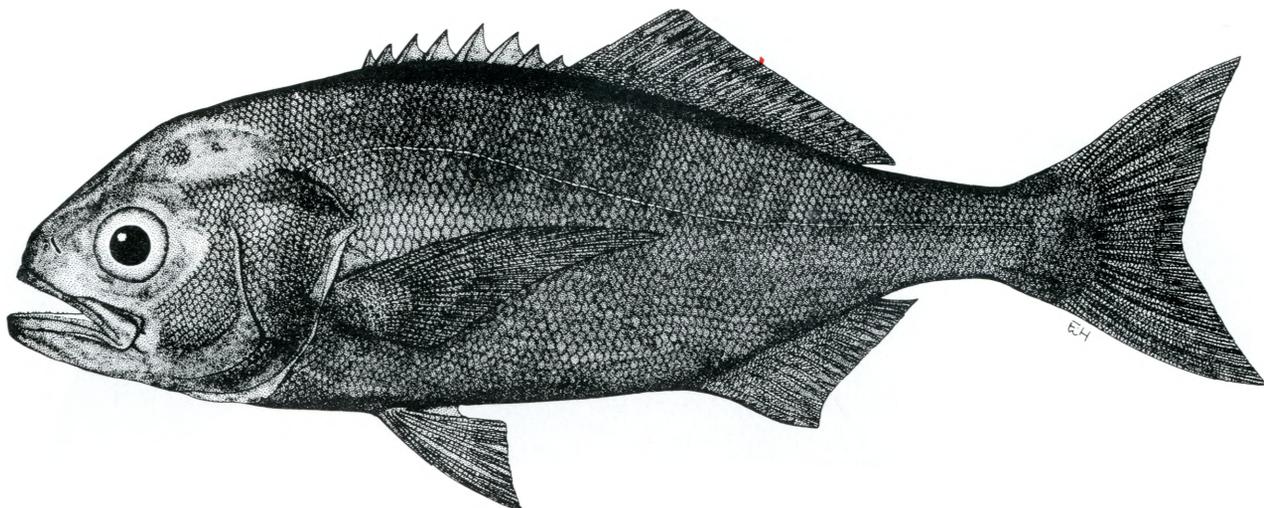


Figure 30. *Hyperoglyphe antarctica*, 500 mm SL, Tristan.

MATERIAL: Tristan: RUSI 33565: 495 mm SL; RUSI 34597: 425 mm SL; RUSI 34598: 528 mm SL; RUSI 34599: 440 mm SL. Gough: RUSI 18246: 2, 385-420 mm SL; SAM 23311: 432 mm SL; 30449 (1). Many specimens from the Tristan islands and Gough were examined in the field but not preserved.

REMARKS: *Hyperoglyphe antarctica* occurs year round at Tristan in depths of 40 to over 150 m. Fish more than about 45 cm TL are epibenthic in shoals; juveniles are pelagic and not captured by hook and line. They feed predominantly on cephalopods and colonial salps, but they will also take fish prey.

In New Zealand, *H. antarctica* reaches approximately 100 cm TL and 14 kg in 9 years (Horn, 1988) and attains a maximum size of at least 137 m FL and a weight of 36 kg (McDowall, 1982). At Tristan, specimens of 80 cm TL are sexually mature, and spawning occurs during January and February.

DISTRIBUTION: *H. antarctica* has a wide Southern Hemisphere distribution. In addition to the Tristan Group, this species is known from Gough Island and Vema Seamount (Penrith, 1967), South Africa (Haedrich, 1986), the Mozambique Plateau and Southwest Indian Ridge (Shcherbachev, 1987), St Paul/Amsterdam Islands (Duhamel, 1989), southern Australia, New Zealand, Kermadec Islands (McDowall, 1982), and the Chatham Islands east of New Zealand (Horn, 1988; Roberts, 1991).

Schedophilus velaini
oval driftfish (stumpnose).

Fig. 31

Seriollella velaini Sauvage, 1879: 32, Pl. 1, Fig. 2 (St Paul Island).

Leirus moselii Cunningham, 1910: 95, Pl. 5 (St Helena Island).

Seriollella christophersenii Sivertsen, 1945: 23, Fig. 16, Pl. 1 (Tristan da Cunha)

Mupus imperialis (non Cocco, 1840): Smith, 1949; Penrith, 1967.

Schedophilus ovalis (non Cuvier, 1833): Barnard, 1948; Haedrich, 1967; 1986; Stehmann & Lenz, 1973; Edwards & Glass, 1987; Duhamel, 1989.

Schedophilus labyrinthicus McAllister & Randall, 1975: 1, Fig. 1 (Easter Island)

Seriollella labyrinthica: McDowall, 1982: 117, Fig. 7.

DIAGNOSIS (compiled from Barnard, 1948; Stehmann and Lenz, 1973; McDowall, 1982; and Duhamel, 1989; data from our specimen in parentheses): Body firm, greatest depth 2.6-3.1 (2.9) times in SL; head length 3.2-3.8 (3.5) times in SL; a single dorsal fin with 6-8 (7) weak spines graduating in length to the soft-rays and 26-29 (28) rays; anal fin with 3 spines (hidden at front margin of fin) and 19-21 (19) rays; pectoral fin elongate and pointed in adults, with 21-22 (22) rays; lateral-line scales 90-110 (90); gill-rakers 6-7 + 17 (7+17). Vertebrae 10+15 (11+15); supraneural (predorsal) bone formula (of Ahlstrom et al., 1976) 0/0/2+1+1/1+1/.

Colour: Olive green dorsally, silvery on sides and below.

MATERIAL: Tristan: RUSI 34596, 430 mm SL. Numerous specimens of 45-73 cm TL examined at the islands but not preserved.

REMARKS: *Schedophilus velaini* is relatively common at the Tristan Group, and is often caught amongst bluefish. It is generally epibenthic, but occasionally feeds higher up in the water column; stomach contents include planktonic salps, cephalopods and small fish. *S. velaini* is seldom caught in waters shallower than about 40 m. Spawning occurs in late summer. According to Haedrich (1986), this species attains 100 cm TL, but the largest specimen caught at the islands is only 73 cm TL.

McAllister and Randall (1975) pointed out that specimens of *S. ovalis* (Cuvier, 1833) from the North Atlantic Ocean have more anal fin-rays (21-23) compared with those from the Southern Hemisphere (18-20). This difference is also supported by data supplied by Dr C. Karrer: 14 specimens from the North Atlantic with anal fin counts of 20(1), 21(5) and 22(8). McAllister and Randall's (1975) distinction of their new species (*S. labyrinthicus*) from *S. christophersenii* and *S. velaini* based on a supposed difference in

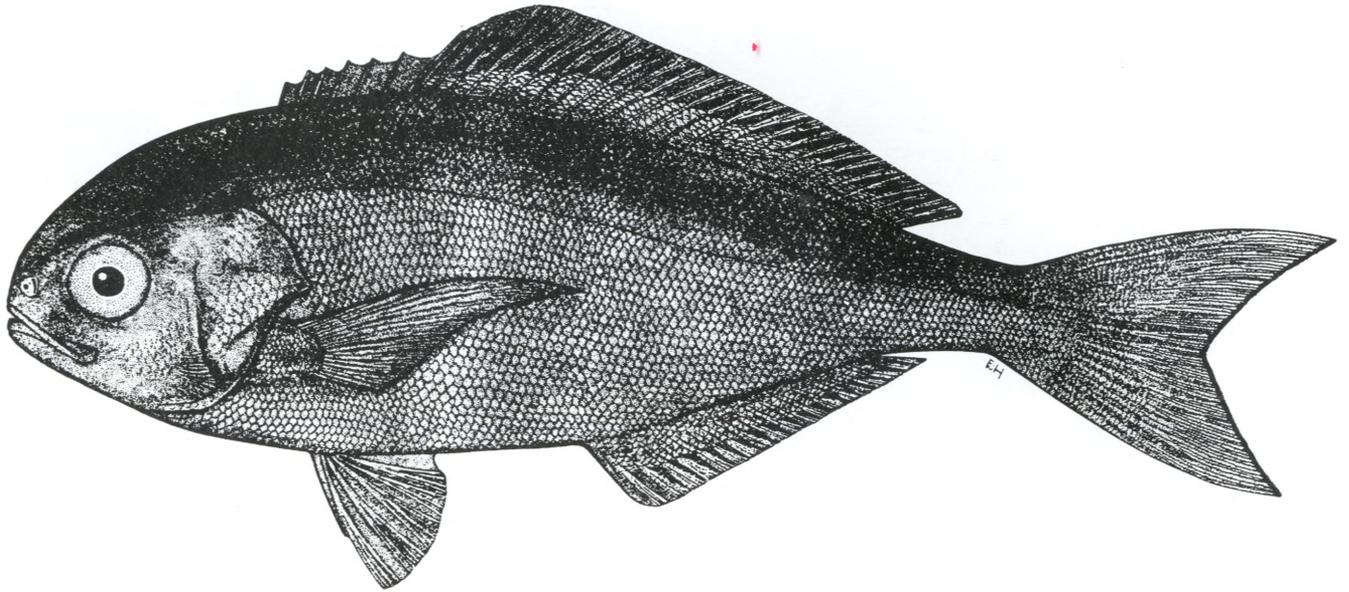


Figure 31. *Schedophilus velaini*, 430 mm SL, Tristan.

the number of anal fin-rays (18-19 in *labyrinthicus* [$n = 4$], vs 20 in the latter two species [$n = 2$]) does not hold up in the light of our data and those presented by Duhamel (1989) for additional specimens from St. Paul/Amersterdam Islands. We conclude therefore, that *S. labyrinthicus* and *S. christophersenii* are synonyms of *S. velaini* and agree with Dr Karrer (pers. comm.) that *S. velaini* is distinct from *S. ovalis*.

Like *Hyperoglyphe perciformis* (and most other stromateoid fishes), the postlarvae and small juveniles of *Schedophilus velaini* are associated with flotsam and pelagic jellyfishes in the open ocean (Ahlstrom et al., 1976). This habit accounts for the worldwide distribution of these species.

DISTRIBUTION: *S. velaini* is known from St Helena, Vema Seamount, South Africa, St. Paul/Amsterdam Islands, Australia, Lord Howe, New Zealand, Rapa Island, the Juan Fernandez Islands and Chile (Haedrich, 1986; Duhamel, 1989).

Family BOTHIDAE

Arnoglossus capensis

Cape flounder (sole)

Fig. 32

Arnoglossus capensis Boulenger, 1898: 1 (False Bay, South Africa); Hensley, 1986.

DIAGNOSIS (supplied by D.A. Hensley from our specimens): Dorsal fin rays 98-104; anal fin rays 76-82; pectoral fin rays (ocular side) 11; gill-rakers 0 + 10-12; lateral line ca. 61-63. Body depth 2.1-2.2, head length 3.9-4.2 times in SL. Scales of ocular side ctenoid; head profile without pronounced notch at level of upper border of lower eye; interorbital region concave; dorsal fin rays 2-5 slightly longer than adjacent rays; maxillar reaching slightly posterior to front edge of lower eye; upper jaw length 3.1-3.4 times in head length.

Colour: Head, body and fins with small indistinct dark spots.

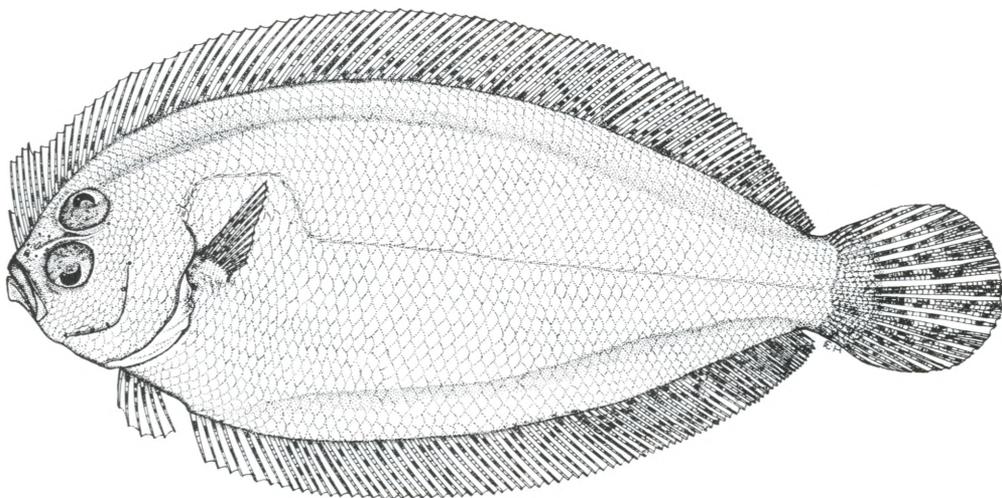


Figure 32. *Arnoglossus capensis*, 113 mm SL, Nightingale Island.

MATERIAL: Nightingale: RUSI 29061, female, 94 mm SL. Gough: RUSI 18238, males, 113 and 114 mm SL; RUSI 29062, female 129 mm SL.

REMARKS: The specimen from Nightingale was collected by Robert Tarr on a sand bottom. The two males from Gough were collected by Wynand Uys from the stomach of *Helicolenus mouchezi*, and the female was caught in 42 m with a dredge. Our specimens were identified by D.A. Hensley; they are the first record of a bothid from the Tristan Group and Gough Island.

DISTRIBUTION: *Arnoglossus capensis* is known from southern Africa (from Natal to Angola), St Helena and Ascension Island. According to Hensley (1986), it may also be conspecific with *A. entomorphynchus* Stauch, 1967 from the Gulf of Guinea.

SIGHT RECORDS

Family SPHYRNIDAE

Sphyrna mokarran

great hammerhead (hammerhead shark)

Fig. 33

Zygaena mokarran Rüppell, 1837: 66, Pl. 17 (Red Sea).

Sphyrna mokarran: Compagno, 1984.

DIAGNOSIS: Head flattened and greatly expanded laterally with the eyes on the ends of the lateral expansions; front edge of head with a median indentation; rear edge of pelvic fins markedly concave; second dorsal fin relatively large, its height greater than length of 3rd gill slit; teeth distinctly serrate.

REMARKS: This warm-water species occurs in Tristan waters only from November to April when water temperatures are at their highest (16° - 20°C). It has not been recorded from the islands before. During these months this shark is commonly seen feeding on the surface often in pursuit of exocoetids, which are also only present in the region during the warm water months. *S. mokarran* is wide ranging in tropical seas close inshore and in the open ocean (Compagno, 1984). No hammerhead was captured during our field work. Identification of this species is based on numerous observations at sea. This was possible because *S. mokarran* has a high second dorsal fin that is easily visible when the shark swims at the surface. The other two *Sphyrna* species that are known from the South Atlantic have a much

lower second dorsal fin that would not project much above the surface of the water (Compagno, 1984).

Family MOLIDAE

Mola sp.

Ocean sunfish have been sighted on three occasions around the Tristan islands. The specimens were too large to capture. Ocean sunfish are found in all oceans, but not in polar seas (Heemstra, 1986g).

PROBABLE RECORDS

Family ALEPISAUROIDAE

?*Alepisaurus ferox*

lancetfish

Fig. 34

?*Alepisaurus ferox* Lowe, 1833: 104 (seas off Madeira); Rowan & Rowan (1955); Heemstra & Smith, 1986.

DIAGNOSIS: Body greatly elongated, compressed, without scales; fleshy keel along each side of caudal peduncle; dorsal fin high and long, with about 40 rays; anal fin much shorter, with 13-18 rays; dorsal adipose fin above posterior anal fin rays; caudal fin forked; mouth large, with fearsome teeth.

MATERIAL: None collected by us.

REMARKS: Rowan and Rowan (1955) reported "*Alepisaurus ferox*" from Tristan, but they gave no diagnostic information on their specimen. This fish could be either *A. ferox* or *A. brevirostris* Gibbs, 1960. The latter species is common at the sub-Antarctic islands (Gon, 1990), and both species belong to the lower epipelagic fauna of tropical and temperate waters of all oceans (Heemstra and Smith, 1986).

Family MYCTOPHIDAE

?*Symbolophorus barnardi*

Myctophum humboldti: Brauer, 1906: 192 (in part); Barnard, 1925: 243 (in part); Sivertsen, 1945.

Myctophum humboldti barnardi Tåning, 1932: 128 (off Cape Point, South Africa).

Symbolophorus barnardi: Hulley, 1986.

DIAGNOSIS (from Hulley, 1986): Mouth subterminal, the maxilla moderately expanded posteriorly and reaching well past eye; anal fin base longer than dorsal fin base; pectoral

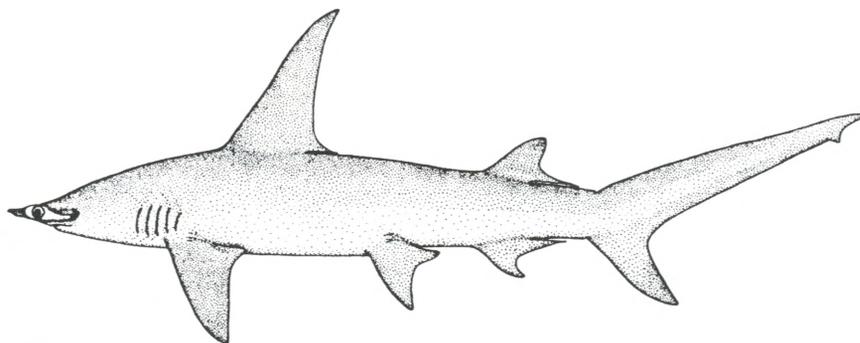


Figure 33. *Sphyrna mokarran*, 187 cm, immature male, South Africa (from Bass, 1986c).

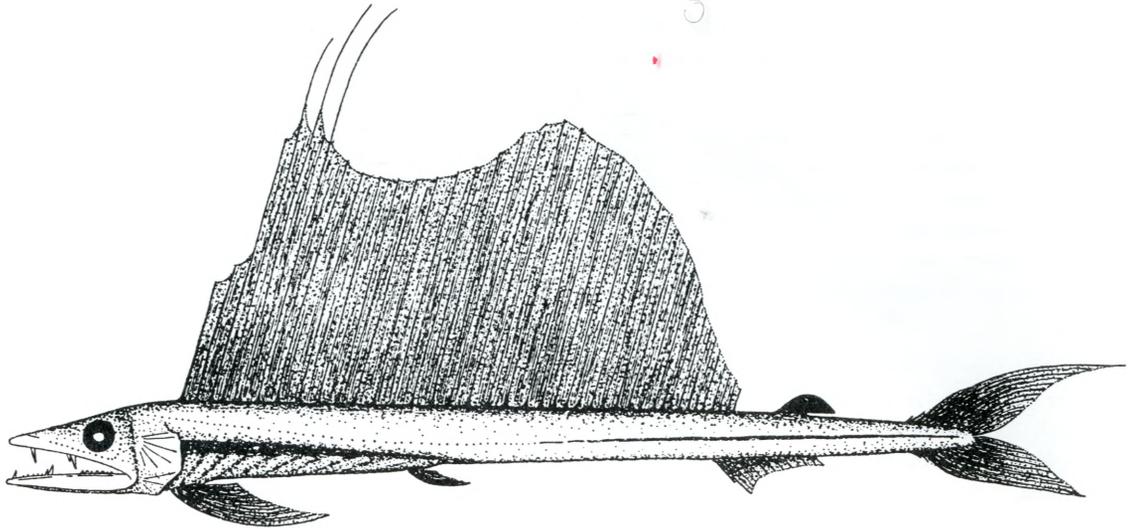


Figure 34. *Alepisaurus ferox*, 100 cm SL (after Gibbs, 1960).

fin unpigmented; dorsal fin rays 13-15; anal fin rays 21-23; pectoral fin rays 12-14; gill-rakers (4-6)+(12-14) = 17-20.

REMARKS: Sivertsen's (1945) record of "*Myctophum Humboldti*" was based on a specimen dropped by a tern (*Sterna vittata*), which had been feeding close to Tristan Island. His identification was taken from descriptions by Barnard (1925) and Brauer (1906), and according to Hulley (1986), these descriptions apply (at least in part) to *Symbolophorus barnardi*. It is a high-oceanic mesopelagic species that comes to the surface at night.

DISTRIBUTION: Circumglobal between 30° and 40° S.

Family TRACHIPTERIDAE

?*Trachipterus trachipterus*

peregrine ribbonfish

Cepola trachipterus Gmelin, 1789: 1187 (Adriatic Sea).

Trachipterus trachipterus: Heemstra & Kannemeyer, 1984, 1986.

DIAGNOSIS (from Heemstra and Kannemeyer, 1986): Body extremely elongate and compressed, tapering evenly to a minute caudal fin that projects dorsally from the slender tip of the tail; dorsal fin with 145-184 rays, the fin base extends from head to caudal fin; anal fin absent; scales absent, but ventral edge of body with enlarged pointed tubercles; no membranous flaps on dorsal and pelvic fin rays of juveniles; pelvic fins absent in adults; pectoral fin with 13-14 rays; eye diameter 8.4-10% of distance from snout to anus and contained 1.4-1.6 times in length of lower jaw.

Colour: Head and body silvery; front of head, orbital area, dorsal part of upper jaw and tip of lower jaw are black; young with 3-5 dark blotches on sides of body; dusky blotch usually visible on body at bases of 20-28th dorsal fin rays.

REMARKS: One specimen (length not given) was taken close to Gough Island in an RMT-2 midwater trawl in October 1980 (Miller, 1982). Our efforts to locate this specimen have been unsuccessful. This offshore pelagic

species is rare but widely distributed from the Mediterranean to South Africa, Japan and New Zealand (Heemstra and Kannemeyer, 1986).

DOUBTFUL RECORDS

Family NOTOTHENIIDAE

1) *Eleginops maclovinus* (Cuvier, 1830).

E. maclovinus is known from Southern Chile, Argentina and the Falkland Islands (Nakamura, 1986d). It attains 60 cm SL and is a popular food fish at the Falkland Islands. One specimen, 231 mm SL, SAM 22892, reported from Tristan by DeWitt et al. (1990: 285). There is no collector or date of collection listed in the museum register for this specimen, and it is the only one known from the island. Some of the Tristan fishermen who have been to the Falkland Islands are familiar with *E. maclovinus*, and they say that this species does not occur at Tristan. We suspect that the South African Museum specimen may have been mislabeled, and that it actually was caught at the Falkland Islands.

2) *Notothenia coriiceps* Richardson, 1844.

A similar case is the specimen of *Notothenia coriiceps* (SAM 22892), which is also listed in the Museum's register from Tristan, but without collector or date. *N. coriiceps* occurs at sub-Antarctic islands all round the Southern Ocean (DeWitt et al., 1990). It is a common shallow-water fish that is easy to see and to collect. We did not see any specimens of *N. coriiceps* at Tristan, and the fishermen there also have not seen this species.

DISCUSSION

Most of the 51 fish species reported from the Tristan Group and Gough Island are widely-distributed species that are known from several continental and insular localities in warm-temperate waters of the Southern Hemisphere. Situated within the Subtropical Convergence Zone, the Tristan Group represents the southern-most "way station" for many wide-ranging temperate and eurythermic subtropical species. A knowledge of the fish fauna from a frontal zone such

as the STC yields valuable information about the factors affecting general dispersal and distribution of fishes in the oceans. Comparison of the fish fauna from the Tristan da Cunha Group with that of Gough Island, which lie on the northern and southern limits of the STC respectively, is interesting, because the proximity of the islands and the different temperature regimes at the two localities enable us to determine how temperature affects the distribution of

Table 1. Fishes recorded from the Tristan Group (T) and Gough Island (G). New records for Tristan or Gough are indicated with an asterisk.

I) Shallow-water (neritic) species		T	G
1)	* <i>Notorynchus cepedianus</i>	+	+
2)	* <i>Carcharodon carcharias</i>		+
3)	* <i>Torpedo nobiliana</i>	+	
4)	* <i>Bassanago nielseni</i>	+	
5)	* <i>Conger wilsoni</i>		+
6)	<i>Gnathophis capensis</i>	+	
7)	<i>Gaidropsarus novaezelandiae</i>	+	+
8)	* <i>Physiculus karrerae</i>	+	
9)	<i>Beryx decadactylus</i>	+	
10)	* <i>Centriscops obliquus</i>	+	+
11)	<i>Notopogon lilliei</i>	+	+
12)	<i>Helicolenus mouchezi</i>	+	+
13)	<i>Sebastes capensis</i>	+	+
14)	* <i>Polyprion oxygeneios</i>	+	+
15)	* <i>Lepidoperca coatsii</i>	+	+
16)	<i>Pseudopentaceros richardsoni</i>	+	
17)	* <i>Emmelichthys nitidus</i>	+	
18)	<i>Seriola lalandi</i>	+	
19)	<i>Trachurus longimanus</i>	+	+
20)	<i>Acantholatris monodactylus</i>	+	+
21)	* <i>Latris lineata</i>	+	+
22)	* <i>Mendosoma lineatum</i>	+	+
23)	<i>Nelabrichthys ornatus</i>	+	+
24)	<i>Bovichtus diacanthus</i>	+	+
25)	<i>Thyrssites atun</i>	+	+
26)	<i>Hyperoglyphe antarctica</i>	+	+
27)	<i>Schedophilus velaini</i>	+	
28)	* <i>Arnoglossus capensis</i>	+	+
II) Oceanic and mesopelagic species			
29)	* <i>Hexanchus griseus</i>		+
30)	* <i>Etmopterus princeps</i>	+	
31)	<i>Prionace glauca</i>	+	+?
32)	* <i>Isurus oxyrinchus</i>	+	
33)	* ? <i>Sphyrna mokarran</i>	+	
34)	* <i>Vinciguerria poweriae</i>	+	
35)	<i>Maurolicus inventionis</i>	+	+
36)	<i>Electrona paucirastra</i>		+
37)	<i>Electrona subaspera</i>		+
38)	<i>Lampadena dea</i>	+	
39)	? <i>Symbolophorus barnardi</i>	+	
40)	? <i>Alepisaurus ferox</i>	+	
41)	<i>Cheilopogon pinnatibarbatu</i>	+	
42)	* <i>Hirundichthys rondeletti</i>		+
43)	<i>Scomberesox saurus</i>	+	
44)	<i>Lophotus lacepede</i>	+	
45)	<i>Trachipterus trachipterus</i>		+
46)	* <i>Brama australis</i>	+	
47)	* <i>Naukrates ductor</i>	+	
48)	* <i>Remora remora</i>	+	
49)	* <i>Lepidopus caudatus</i>	+	
50)	* <i>Allothunnus fallai</i>	+	
51)	* <i>Mola sp</i>	+	

fishes in this oceanic region. Twenty-six of the 28 neritic species known from the region were recorded from the Tristan Group, but only 19 occur at Gough (Table 1).

The STC has been noted to act as a substantive biogeographic barrier (Lutjeharms, 1987). In addition, it has been observed that the STC itself is an area of enhanced primary productivity and phytoplankton density (Allanson et al., 1981) which might influence organisms in higher trophic levels through the food chain. Recent research (Stramma and Peterson, 1990) has furthermore shown that a strong current, the South Atlantic Current, flows along the full longitudinal extent of the STC and it is proposed that this current enhances the dispersal of pelagic stages of fishes in the STC region beyond that of the general eastward drift.

The differences between the fauna at Gough and Tristan are also evident in the oceanic species that move into the Tristan area from the north during the warmer summer months. Of the 15 epipelagic species that have been reported from Gough and Tristan, only 3 or 4 have been found at Gough. Although sampling at Gough was less intense than at Tristan during the present study, it is apparent that several resident neritic species (eg. *Schedophilus velaini* and *Physiculus karrerae*) are only found at the northern islands. This indicates that there is a strong isolating factor preventing certain species from reaching Gough Island, only 200 miles to the south of Tristan. Mean monthly water temperatures at Gough are on average 3°C lower than Tristan during all months (Fig. 5). The subantarctic islands of the Prince Edward and Crozet groups, which are at 46° S latitude in the Indian Ocean and just south of the Antarctic Convergence, have no fishes in common with the areas close to the STC (Gon and Heemstra, 1990). The sea surface temperatures at these subantarctic islands range from 4° to 8°C. That 21 of the 51 species known from Tristan and Gough are found only within or north of the STC indicates that this subtropical frontal zone is an effective barrier to the north-south dispersal of animals in the Southern Ocean. As suggested by Sivertsen (1945) and Penrith (1967), water temperature appears to be the primary factor affecting the north-south distribution of fishes in the region.

For the purposes of zoogeographical analysis, the fishes of Tristan and Gough (T-G fishes) were divided into a neritic (coastal) and an oceanic category; the latter category includes mesopelagic and offshore epipelagic fishes that have been taken within a mile of these islands. Penrith (1967) used the same categories, although some of the fishes that he considered oceanic species are here included in the neritic group, due to biological information that is now available. Our neritic group comprises those species that appear to be restricted to the islands during their adult stage. The oceanic group includes species that are wide ranging and common, as adults, in the pelagic zone of the oceans. Once again it is stressed that, although some oceanic species are included in our list of T-G species (Table 1), only neritic species are used in the zoogeographic analysis that follows.

Distributional records of neritic species occurring at Gough and the Tristan Group were compiled in order to characterise a shallow-water Subtropical Convergence ichthyofauna (Table 2). These records were taken from the present study, as well as from published checklists of fishes

Table 2. Neritic fishes from the Tristan Group and Gough island, showing occurrence at other areas close to the Subtropical Convergence. T = Tristan Group, G = Gough, V = Vema Seamount, AF = southern Africa, P/A = St Paul and Amsterdam Islands, ANZ = Australia and New Zealand, SA = South America. * = new record for Tristan Group or Gough Island. + = species present; g = genus present.

NERITIC SPECIES	T	G	V	AF	P/A	ANZ	SA
* <i>Notorynchus cepedianus</i>	+	+		+		+	+
* <i>Carcharodon carcharias</i>		+		+	+	+	+
* <i>Torpedo nobiliana</i>	+			+	g	g	g
* <i>Bassanago nielsenii</i>	+			g	+	g	g
* <i>Conger wilsoni</i>		+		+		+	g
<i>Gnathophis capensis</i>	+			+	+	g	g
<i>Gaidropsarus novaezelandiae</i>	+	+		+	+	+	+
* <i>Physiculus karrerae</i>	+						+
<i>Beryx decadactylus</i>	+			+		+	+
* <i>Centriscops obliquus</i>	+	+		+	+	+	+
<i>Notopogon lilliei</i>	+	+		+	g	+	g
<i>Helicolenus mouchezi</i>	+	+		g	+	g	g
<i>Sebastes capensis</i>	+	+		+			g
* <i>Polyprion oxygeneios</i>	+	+	g	g	+	+	+
<i>Lepidoperca coatsii</i>	+	+			+	g	g
<i>Pseudopentaceros richardsoni</i>	+			+		+	+
* <i>Emmelichthys nitidus</i>	+			+	+	+	+
<i>Seriola lalandi</i>	+		+	+	+	+	+
<i>Trachurus longimanus</i>	+	+	+	g	+	g	g
<i>Acantholatris monodaactylus</i>	+	+	+		+		g
<i>Latris lineata</i>	+	+			+	+	
<i>Menosoma lineatum</i>	+	+			+	+	+
<i>Nelabrichthys ornatus</i>	+	+	+		+		
<i>Bovichtus diacanthus</i>	+	+			g	g	g
<i>Thyrsites atun</i>	+	+	+	+	+	+	
<i>Hyperoglyphe antarctica</i>	+	+	+	+	+	+	
<i>Schedophilus velaini</i>	+		+	+	+	+	+
* <i>Arnoglossus capensis</i>	+	+		+			

The zoogeographic affinities of the T-G fish fauna are indicated by the number of neritic species and genera that are shared with other areas (Table 3).

Table 3. The number of species, and the percentage species and genera of Tristan + Gough neritic fishes at other areas close to the STC. T-G = Tristan and Gough; V = Vema Seamount; AF = southern Africa; P-A = St Paul and Amsterdam Islands; ANZ = Australia and New Zealand; SA = South America.

	T-G	V	AF	P-A	ANZ	SA
T-G/Total	28	6/17	18/500+	18/29	16/600+	14/300+
%T-G species /% Total		21/35	64/4	64/62	57/3	50/5
% Genera		27	77	67	79	80

from other shallow-water areas in the Southern Ocean. These included Vema Seamount (Penrith, 1967; Heemstra, ms.), South Africa (Smith and Heemstra, 1986), St. Paul and Amsterdam Islands (Angot, 1951; Hureau, 1969; Beurois, 1976; Duhamel, 1989), Walters Shoal (Collette and Parin, 1991), Austral Seamount (Duhamel, 1984), South Australia (Maxwell, 1980; Last et al., 1983), New Zealand (Ayling and Cox, 1982) and the southern parts of South America (Menni et al., 1984; Nakamura et al., 1986).

Heemstra (ms.) has discussed the zoogeography of the fishes at Vema Seamount, a submerged volcano located at 31°38'S, 08°20'E, about 650 km off the west coast of South Africa. Although the fish fauna of Vema is poorly sampled, the zoogeographic affinities of the 17 neritic species that are presently known from Vema, like those of the crustaceans (Kensley, 1980) and other invertebrates (Berrisford, 1969), are primarily with Africa. Vema is well north of the Subtropical Convergence Zone, and the water temperatures on the plateau (18-21°C at depths of 26-73 m) are distinctly warmer and less variable than those of the Tristan Group. The fish fauna at Vema is a mixture of tropical and warm-temperate species. Although Vema has 6 (21%) of the neritic species recorded from Tristan and Gough, it has 13 species in common with southern Africa. Three of the 6 T-G species shared with Vema (*Seriola lalandi*, *Hyperoglyphe antarctica*, and *Schedophilus velaini*) are widespread species that also occur along the African coast and elsewhere in the Southern Hemisphere. The remaining three species (*Trachurus longimanus*, *Acantholatris monodactylus*, and *Nelabrichthys ornatus*) are known only from the Westwind Drift Islands, Walters Shoal and the Austral Seamount.

Collette and Parin (1991) reported 20 species of neritic fishes from Walters Shoal, a shallow seamount located 740 km south of Madagascar and 1111 km east of South Africa. Based on the presence of *Serranus novemcinctus*, *T. longimanus*, *A. monodactylus*, and *N. ornatus* (which also occur at St Paul and Amsterdam Islands) and their misinterpretation of the zoogeographic affinities of Walters Shoal and Vema Seamount, Collette and Parin (1991) concluded that "The fish fauna of Walters Shoals links the Tristan-Gough Province of Briggs's (1974) southern South America Cold Temperate Region with the Amsterdam-St Paul Province of his Southern African Warm Temperate Region into a single zoogeographic province, herein named the West Wind Drift Islands Province. There are no Antarctic or subantarctic species and there is little similarity to South African fishes."

The fish faunas of Vema Seamount and Walters Shoal are mixtures of tropical and warm-temperate species; 11 of the 20 species reported by Collette and Parin are tropical coral-reef species that are not known from the Westwind Drift Islands (*sensu stricto*). In fact, Walters Shoal shares more species with South Africa (9) than it does with the Westwind Drift Islands (5 or 6).

The "cladistic" or vicariance method of biogeographic analysis (Humphries and Parenti, 1986) assumes that disjunct distributions are the result of "vicariance events" (development of geological or climatological barriers) that fragment ancestral species ranges. This method also requires acceptable cladistic classifications of the relevant taxa. Since the Tristan Group and Gough are relatively

young (6-18 m.y., Baker, 1973) volcanic islands that originated at or near the mid-Atlantic Ridge, the zoogeographic affinities of the T-G fishes cannot be the result of some vicariance event occurring more than 20 m.y. ago. We assume, therefore, that the present neritic fish fauna is a product of transilient ("jump") dispersal of species from another (older) fauna and subsequent evolutionary divergence.

The circumpolar distribution of many neritic T-G fishes is indicative of complex dispersal mechanisms. Species that are bound to shallow waters throughout their life cycle, or at least in the adult form, have evolved mechanisms to ensure dispersal to distant regions while maintaining a breeding population in the source region. It is hypothesised that dispersal via eggs, larvae, and (in some cases) pelagic juveniles, has resulted in the ichthyofaunal similarities at these widely-separated localities. In the case of the T-G species, this implies that their larvae and juveniles occur in the pelagic zone for long periods (from two months to a year) before metamorphosis into the benthic form occurs. At least 13 of the widely-distributed T-G species have prolonged pelagic stages (Table 4). The relatively large size that these species attain before adopting a benthic or epibenthic life-style allows time for dispersal over considerable distances.

The three congrid eels, *Bassanago nielseni*, *Conger wilsoni* and *Gnathophis capensis*, the first recorded from Tristan and the Nasca Ridge, the second from Gough, South Africa and Australasia, and the third from Tristan, South Africa and Amsterdam Island, have relatively long-lived leptocephalid larvae (Castle, 1986), which would facilitate dispersal within the Antarctic Circumpolar Current (ACC) between these distant points.

Mundy (1990) illustrated the larvae and pelagic juveniles of both species of *Beryx*. The pelagic juveniles of *B. decadactylus* attain at least 23 mm SL. Dr G. Duhamel (pers. comm.) suggests that *Centriscops obliquus* remains pelagic until a relatively large size.

Some species of *Sebastes* have a pelagic juvenile stage that lasts for up to a year (Moser and Boehlert, 1991), and the widespread scorpaenid species, *Helicolenus mouchezi* and *Sebastes capensis* are likely to have similarly long pelagic stages (Moser et al., 1977; Sanchez and Acha, 1988).

Polyprion oxygeneios, another suprabenthic species, has pelagic juveniles that occur near floating objects until they attain at least 30 cm TL (Roberts, 1989). This T-G species is also found off St Paul and Amsterdam, Southern Australia, New Zealand and South America. The two widely-distributed centrolophid species, *Hyperoglyphe antarctica* and *Schedophilus velaini*, are also pelagic until at least 30 cm TL (Haedrich, 1986; Horn, 1988).

Relatively large pelagic stages of *Acantholatris monodactylus* (6 cm TL), *Mendosoma lineatum* (9 cm TL), and *Gaidropsarus novaezelandiae* (3 cm TL), species which are also widely distributed, were encountered during the present study. *Bovichtus diacanthus* has a pelagic juvenile stage that is terminated at a size of approximately 6 cm TL. Adults of all these species and congeners of *B. diacanthus* occur at widely separated areas of shallow water in the Southern Ocean close to the STC.

Table 4. Reproductive characteristics of benthic or epibenthic shallow-water fishes at Tristan and Gough Island. BS = broadcast spawner. A "long" pelagic stage is of two months or longer duration.

Species	Reproductive mode	Fecundity	Egg size	Pelagic stages	References
<i>Bassanago nielseni</i>	BS	high	small	long	Thresher 1984
<i>Conger wilsoni</i>	BS	high	small	long	Castle 1986
<i>Gnathophis capensis</i>	BS	high	small	long	Castle 1986
<i>Gaidropsarus novaezlandiae</i>	?	?	?	long	present study
<i>Physiculus karrerae</i>	?	?	small	?	present study
<i>Beryx decadactylus</i>	?	high	small	long	Mundy 1990
<i>Centriscops obliquus</i>	?	high	small	long	Duhamel (pers. comm.)
<i>Notopogon lilliei</i>	?	high	small	?	present study
<i>Helicolenus mouchezi</i>	live bearer	high	small	long	Thresher 1984; present study
<i>Sebastes capensis</i>	live bearer	high	small	long	Moser et al. 1977; present study
<i>Polyprion oxygeneios</i>	BS	high	small	long	Roberts, 1989
<i>Lepodoperca coatsii</i>	?	?	?	?	
<i>Pseudopentaceros richardsoni</i>	?	high	small	?	present study
<i>Emmelichthys nitidus</i>	BS?	?	?	?	Thresher 1984
<i>Acantholatris monodactylus</i>	BS	high	small	long	present study
<i>Latris lineata</i>	?	high	small	?	present study
<i>Mendosoma lineatum</i>	?	high	small	long	present study
<i>Nelabrichthys ornatus</i>	protogynous, BS	high	small	?	present study
<i>Bovichthus diacanthus</i>	BS?	high	small	long	present study
<i>Hyperoglyphe antarctica</i>	BS	high	small	long	Haedrich 1986; present study

Table 4 lists the reproductive characteristics of neritic T-G species that have benthic or epibenthic adults. The reproductive biology of only a few species is known in detail; for the other species, common trends for the family or genus are taken from the literature. These species display a wide range of reproductive strategies including live-bearing, protogynous hermaphroditism, and pelagic broadcast spawning. Sinclair and Tremblay (1984) have shown that an increase in fecundity occurred with an increase in the duration of the larval stage in different populations of Atlantic herring. They suggested that an increase in fecundity is necessary to compensate for the greater losses of larvae from the spawning area that occur as a result of longer periods in the pelagia, especially in poor retention areas. Therefore, observations from the present study were used to broadly categorise fecundity and egg size of the various species as being high or low, and small or large, respectively. The presence or absence of an extended pelagic stage is listed in Table 4 from observations based on the present study or from the literature.

Sixty-five percent of the benthic or epibenthic species listed in Table 4 have an extended pelagic stage. This is a high percentage, given that the reproductive biology of most of the remaining 35% of these species is unknown. All of the species with extended pelagic stages have a high fecundity and small egg size, and 80% of all the species listed above display this characteristic. Because high fecundity

and small egg size are correlated with extended pelagic stages, we predict that many of the neritic T-G fishes whose early life-history is unknown will also be found to have similar prolonged pelagic stages. It is apparent that most of the benthic oriented T-G species have a long pelagic stage, and that this common trait is present in unrelated species displaying a wide range of reproductive modes. There is strong evidence, therefore, that an extended pelagic stage is important for the occurrence and survival of the majority of the benthic shallow-water species at the islands.

It is unlikely that the life cycles of T-G species include a complete circumpolar cycle. That is, for spawning to occur at one point and settlement to occur at the same place, after the pelagic stages have circled the southern ocean in the ACC. It is also improbable that the pelagic stages are retained in the enormous (and relatively slow-moving) oceanic gyres of the South Atlantic or Indian oceans, and that they return to the area where they were spawned via these circulations; this remote possibility is not considered viable for the maintenance of breeding populations.

The literature on early life history stages of oceanic island fish populations often places more emphasis on the *retention* (rather than the dispersal) of propagules in the vicinity of spawning areas. Authors such as Boden (1952), Boden and Kampa (1953) and Sale (1970) have concluded that physical oceanographic phenomena such as current eddies and upwellings often enhance retention rather than

dispersal from the source areas. Leis (1982) stressed that diverse mechanisms are utilised by the pelagic stages themselves, in conjunction with oceanographic phenomena, to ensure retention in the source area. At present, not enough information exists to define localised current patterns in the Tristan da Cunha and Gough Island region, or to determine the capacity that pelagic stages have to actively utilise these currents to ensure retention. It is suggested, however, that the majority of propagules remain in the source area, and that dispersal to other distant shallow-water areas has occurred through the occasional alteration of these local hydrographic conditions (or perhaps the regular escape of a small number of larvae and juveniles from the system).

Sinclair (1988) cautioned against the use of surface oceanographic phenomena as explanations for pelagic-stage dispersal and emphasised that movements of propagules within a current system may greatly affect the speed and hence distance of dispersal. Nevertheless, we believed that it would be useful to determine the distance that pelagic stages of T-G species could theoretically disperse passively in the eastward-moving surface current systems if they became separated from local retention areas. Trajectories of FGGE drifting-buoy experiments in the Southern Ocean have shown that surface current speeds of the ACC at the STC are about 26 cm/s (Hoffman, 1985). This current velocity would allow pelagic stages to be transported passively up to 4088 km in six months. If these drift rates are considered in relation to the relatively long-lived larval and juvenile stages of T-G fishes, it appears that dispersal over the great distances (e.g., from South America to Tristan, 4023 km, or Tristan to St Paul, 4680 km) between shallow-water areas in the Southern Ocean could be possible, if the species are tolerant of other physical oceanographic conditions, such as temperature. Localities such as St Paul and Amsterdam Islands have remarkably similar environmental conditions to Tristan da Cunha and Gough Island. Apart from the similarities in fish fauna, St Paul and Amsterdam also support dense beds of *Macrocystis pyrifera*, large populations of the lobster *Jasus paulensis* (Duhamel, 1989), and display sea temperatures very similar to Tristan and Gough (David and Guérin-Ancey, 1990).

We propose that the benthic T-G fish fauna was founded by means of pelagic larvae and/or juveniles that drifted via the Westwind Drift (ACC and South Atlantic Current) to Tristan from source populations along the Atlantic coast of South America. This hypothesis predicts that (1) pelagic larvae and/or juveniles of the species that occur at South America and Tristan will be found "upstream" (west) as well as "downstream" (east) of Tristan, (2) pelagic larvae and/or juveniles of T-G species that do not occur at South America will be found only downstream (east) of Tristan, (3) the fish fauna of St Paul and Amsterdam Islands (which are downstream of Tristan) are derived from the fauna at Tristan and South Africa, hence the sister taxa of T-G taxa will be found at St Paul and Amsterdam Islands, and the sister taxa of these two (T-G + P-A) taxa will be found at South America, Vema or South Africa.

Although there are no cladistic studies of T-G fishes, there are some indications of relationships in the currently accepted classifications of the genera *Helicolenus* and *Acantholatris*. According to Eschmeyer and Hureau (1971), *H.*

mouchezi, which is known only from T-G, P-A and the Austral Seamount west of P-A, is more closely related to *H. dactylopterus lahillei* from Uruguay than to *H. d. dactylopterus* of South Africa. The present generic classification of cheilodactylid fishes is confused (Allen and Heemstra, 1976; Smith, 1980), but based on superficial features (length of caudal peduncle and number of anal fin rays), it appears that *Cheilodactylus bergi* Norman, 1937 from the southern coast of South America may be the sister species of *Acantholatris monodactylus* and *A. vema*.

Pollock (1990) suggested that the South Atlantic may have been the source area from which the palinurid lobster *Jasus paulensis* at Amsterdam and St Paul Islands originated. This species and *J. tristani* from Tristan, Gough and Vema Seamount are closely related and could perhaps still be regarded as conspecific (Pollock, 1990). He suggested that a northward latitudinal shift of from 2° to 4° of the STC combined with an increase in velocity of the ACC during recent glacial periods, as proposed by McIntyre et al. (1976) and Kennett (1982), would increase the chance of dispersal of long-lived larvae in an easterly direction from the Atlantic into the Indian Ocean. This explanation might also be true for the wide distribution of STC fishes. A slight shift in the position of the STC to the north would effectively place fish propagules that are now virtually unaffected by the SAC and the ACC, in their path and facilitate a circumpolar dispersal in an easterly direction. St. Paul and Amsterdam islands have been estimated to be in the order of 700 000 years old (Gunn and Abranson, 1971) while the Tristan group and Gough Island are at least 18 million years old (Baker, 1973). For this reason it would seem probable that the Indian Ocean Islands were colonised from the South Atlantic Islands and Southern Africa. Also, as Pollock (*op cit.*) suggests, a number of glacial periods have occurred during the last 700 000 years with the last drawing to an end as recently as 15 000 years ago. Therefore, the last colonisation of St. Paul and Amsterdam by fish could have been relatively recent. It is probable that conspecific populations at the widely spread areas of shallow water in the STC region are now dependant mainly on the retention of local propagules rather than distant recruitment.

The original source areas of the widespread resident species at the oceanic islands must have been the three ancient continental land masses of Southern Africa, Australasia and South America to a greater or lesser degree. The volcanic islands of Tristan da Cunha, St Paul and Amsterdam and seamounts such as Vema and Walters Shoal were colonised from these areas, and are thought to have acted as stepping stones for dispersal, once breeding populations had established themselves there. The relatively high affinities that all the areas have with each other in terms of common genera could be explained by subsequent speciation after the initial dispersal, perhaps followed by further dispersal between them. The systematic relationship that the various genera have to one another needs to be addressed in order to define source areas with certainty.

The prolonged pelagic stages present in many of the species of the isolated Westwind Drift islands is probably responsible for the relatively low level of endemism at Tristan da Cunha, Gough Island and St Paul and Amsterdam

Islands in the Indian Ocean. Gough Island has no endemic fishes, and only *Bovichtus diacanthus* is endemic to Gough and the Tristan Group. St Paul and Amsterdam Islands have four endemic species (Duhamel, 1989).

It is impossible to be sure of the mechanisms responsible for the widespread distribution of certain species without further information on the distribution of the early life-history stages of the species involved. The ideas on dispersal outlined above will hopefully serve as a starting point to which further early life-history information on the species of the STC region can be added.

SUMMARY

In zoogeographical analyses, many historical zoogeographers focus on endemic species as the key to understanding animal distributions. Although endemism is an important aspect of zoogeography, it is not the complete picture. To understand the zoogeography of the fish fauna at Tristan and Gough, one should employ an holistic approach that considers not only endemism, but also the geological history of the islands, the geographic proximity of other neritic fish communities, the hydrography of the South Atlantic and southwestern Indian Ocean, the ecology of the marine community at these islands, the possibilities for dispersal, and the cladistic relationships of the T-G fishes with regard to their sister species at other localities.

As indicated in Table 3, the T-G fish fauna has most affinities with the fishes of St Paul and Amsterdam. These two localities (T-G and P-A) and the Austral Seamount comprise the Westwind Drift Islands Province. More than half of the neritic species at each of these three localities is shared with the other two localities. Two species (*Helicolenus mouchezi* and *Lepidoperca coatsii*) are endemic to this province. Three species (*Trachurus longimanus*, *Acantholatris monodactylus* and *Nelabrichthys ornatus*) are known only from the Province and the two subtropical seamounts, Vema and Walters Shoal. The large number of species in common between the Westwind Drift Islands is also a reflection of their similar temperate, rocky-bottom, kelp habitat.

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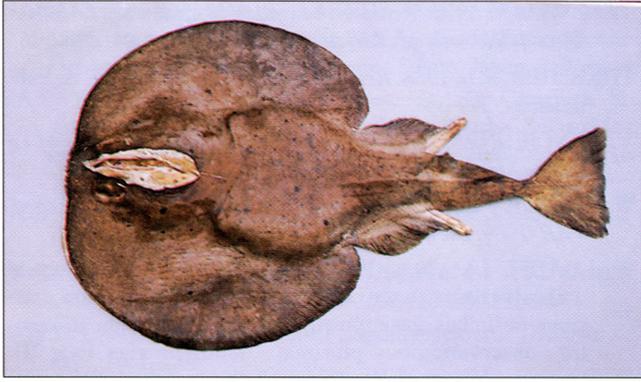
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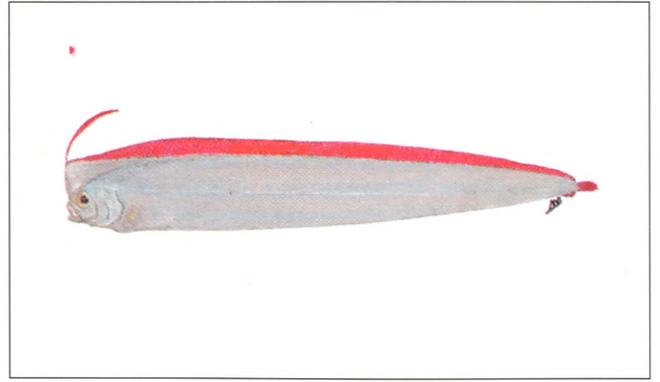
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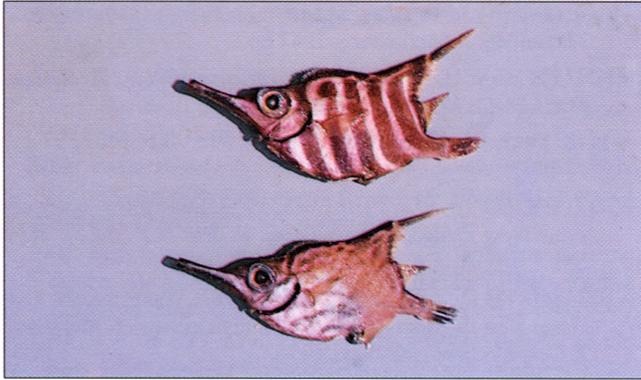
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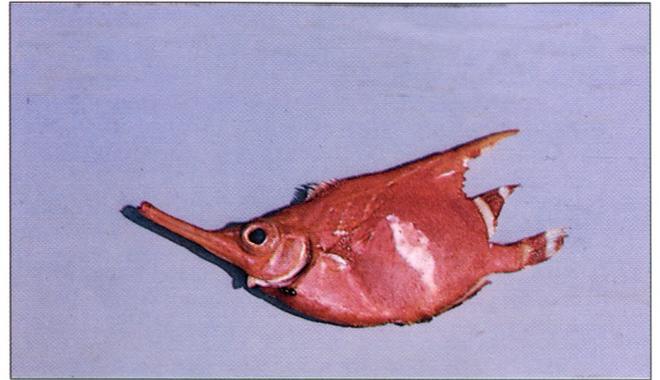
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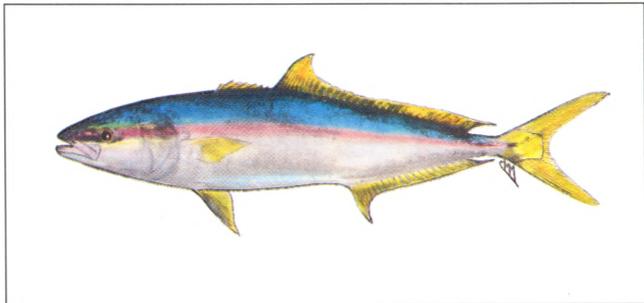


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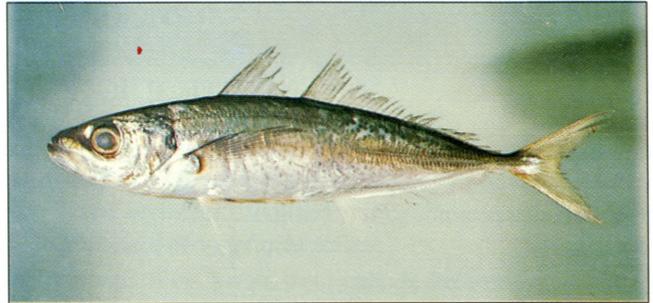


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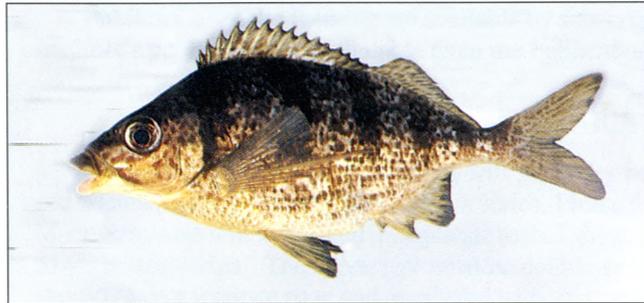
Plate 1. **A)** *Torpedo nobiliana*, 890 mm TL, Tristan. **B)** *Lophotus lacepede*, 120 cm SL (South Africa; from Heemstra, 1986). **C)** *Centriscops obliquus*, above, male, 153 mm TL; below, female, 138 mm TL; both from Gough. **D)** *Notopogon lilliei*, 200 mm TL, Gough. **E)** *Helicolenus mouchezi*, 210 mm TL, Tristan. **F)** *Sebastes capensis*, 320 mm TL, Tristan. **G)** *Polyprion oxygeneios*, 610 mm TL, Tristan. **H)** *Lepidoperca coatsii*, 110 mm TL, Nightingale Island.



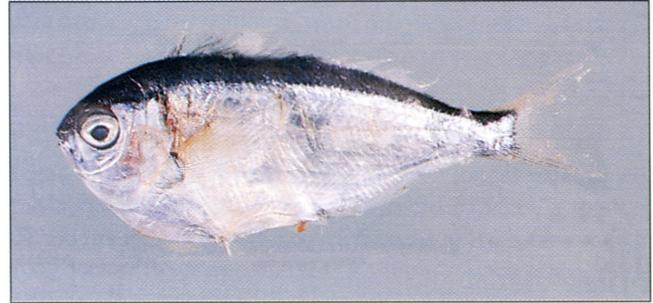
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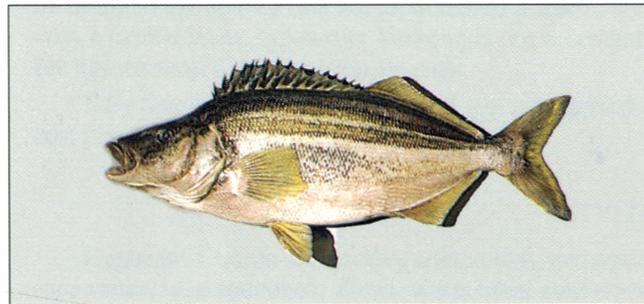
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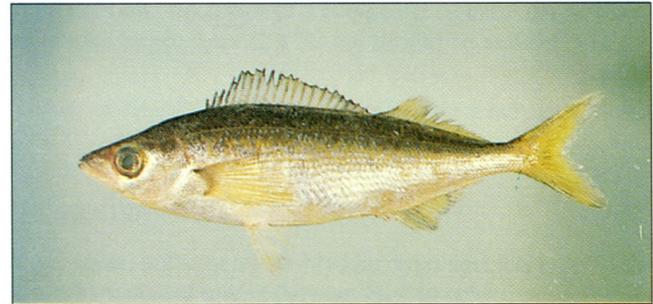
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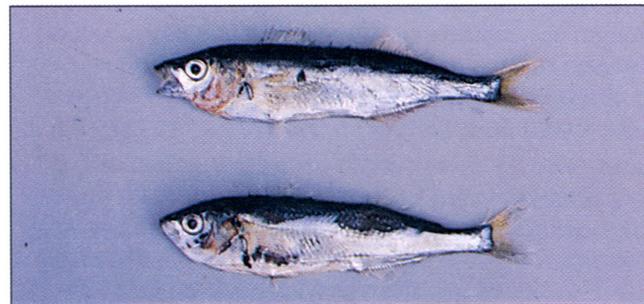
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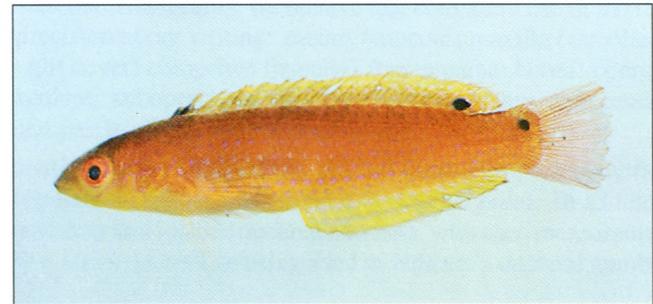
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Plate 2. A) *Seriola lalandi*, 960 mm SL, South Africa. B) *Trachurus longimanus*, 290 mm TL, Tristan. C) *Acantholatris monodactylus*, benthic adult, 200 mm TL, Tristan. D) *A. monodactylus*, pelagic juvenile, 57 mm TL, Tristan. E) *Latris lineata*, 745 mm TL, Tristan. F) *Mendosoma lineatum*, adult, 225 mm TL, Tristan. G) *M. lineatum*, juveniles, 83 & 86 mm TL, Tristan. H) *Nelabrichthys ornatus*, female, 110 mm TL, Tristan. I) *N. ornatus*, terminal male, 200 mm TL, Tristan. J) *Bovichtus diacanthus*, 120 mm TL, Tristan.

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STYLE OF THE HOUSE

Hyphens: Certain substantive compounds are hyphenated: gill-raker, soft-ray, swim-bladder, type-species, type-locality, type-series, type-specimen. Other words often used together are not hyphenated unless they are used in adjectival expressions before a noun: anal fin / anal-fin rays; lateral line / lateral-line scales; gill arch / gill-arch filaments, etc.

Word usage: Although the following word pairs are often used interchangeably, we believe that consistent use of the first word as a noun and the second as an adjective will improve the precision of our writing: mucus / mucous; maxilla / maxillary; opercle / opercular; operculum / opercular. The operculum (= gill cover) comprises (usually) four separate bones: opercle, subopercle, preopercle and interopercle. The words preoperculum, suboperculum and interoperculum are unnecessary substitutes and not to be used for preopercle, subopercle and interopercle. The plural of operculum is opercula.

Decimal comma versus decimal point: Contrary to most journals published in South Africa and some European countries, we will not use a comma in place of a decimal point. Most computers do not read a comma as a decimal point. In addition, it is common in ichthyological papers to give sequences of measurements that include decimal numbers, with each measurement separated by a comma. If the comma is used to separate items in a series, as well as being used to indicate a decimal number, it will cause considerable confusion.

Fin formulae: Fin formulae will be designated as follows: D XII, 10-12 indicates one continuous fin with 12 spines and 10-12 soft (segmented) rays; D X/I, 10-12 indicates a fin divided to the base in front of the last spine; and D X+I, 12 indicates two separate dorsal fins, the first with 10 spines and the second with 1 spine and 12 soft rays. If it is necessary to differentiate branched and unbranched soft-rays, lower-case Roman numerals will be used for unbranched rays and Arabic numerals for branched rays, e.g. D iii, 8. Principal caudal-fin rays are defined as those that touch the hypural bones. The number of principal caudal rays is usually the number of branched rays plus two. If the principal caudal rays are in two separate groups, the number of rays in the dorsal group is given first: thus, "principal caudal rays 8+7" means that there are 15 principal caudal rays, with 8 rays in the dorsal group and 7 in the ventral group.

Abbreviations: Abbreviations normally end with a full stop: et al., e.g., etc., n.b., (note: these commonly used abbreviations of Latin words are not italicized). Compass directions (north, west, northwest, etc.) are abbreviated using capital letters without the full stops: N, W, NW. Dr (Doctor) and Mr (Mister) will be used without a period. We recommend the following abbreviations for ichthyological terms: Standard length — SL, total length — TL, gill-rakers — GR, lateral line — LL.