

# A collection of marine fishes from Angola, with notes on new distribution records

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**ABSTRACT.** Collections of fishes from demersal trawl surveys to 800 m depth off the Angolan coast in 2001, 2002 and 2005 resulted in several range extensions tabulated here. Specimens of species poorly represented in previous collections allowed improved diagnoses of *Myxine ios*, *Torpedo bauchotae*, *Dysommima rugosa*, *Pisodonophis semicinctus*, *Xenomystax congroides*, *Lestidiops cadenati*, *Ophidion lozanoi*, *Cataetyx bruuni*, *Dibranchius atlanticus*, *Diceratias pileatus*, *Himantolophus paucifilosus*, *Neomerinthe folgori*, *Careproctus albescens*, *Paracaristius maderensis* and *Pachycara crossacanthum*. All specimens accessioned into the Fish Collection of the South African Institute for Aquatic Biodiversity are listed and colour plates show a selection of species from the trawl catches.

**KEY WORDS:** demersal trawl, Gulf of Guinea, Benguela Current, range extensions, species diagnoses

## INTRODUCTION

The Angolan coast is an area of high biodiversity interest as it forms the boundary between the fauna of the temperate Benguela current, arising from upwelling off the Namibian coast to the south, and the tropical waters of the Gulf of Guinea to the north. The sea off Angola therefore supports a rich and diverse fauna.

Few survey studies of fish off the Angolan coast have been made. Poll (1951, 1953, 1954, 1959) reported on work carried out by L'Expédition Océanographique Belge dans l'Atlantique Sud of 1948–49. Lloris (1984, 1986) reported on mainly deepwater fishes from Spanish government surveys run through the Instituto de Ciencias del Mar, Barcelona, along the adjacent Namibian coast. Surveys in the area by the former Soviet Union were conducted during the 1970s and 1980s (Trunov 1981), but many of these collections remain unreported. A few other summaries and guides have been published that are relevant to the Angolan marine fish fauna. The FAO Species Identification Sheets for the eastern central Atlantic (Fischer et al. 1981) provide identification material for mostly commercial species. The *Check-list of the fishes of the eastern tropical Atlantic* (or "Clofeta"), in three volumes, is a comprehensive guide to the relevant literature on fishes of the area (Quero et al. 1991). *Smiths' Sea Fishes* (Heemstra & Smith 1986) covers the southwestern African coast up to Namibia and thus is a partial guide to the Benguela system fishes, while the dated Blache et al. (1970) covers the eastern Atlantic coast to the north of Angola.

Extensive demersal trawl surveys off Angola in March 2001 and March 2002 in depths of 20 to 800 m by the RV *Dr Fridtjof Nansen* under a UNDP/NORAD programme provided South African Institute for

Aquatic Biodiversity (SAIAB) with an opportunity to make large representative collections of the fishes of the region. The collection had two purposes, (1) to enhance the Institute's existing fish collection, and (2) to provide the fisheries researchers on the vessel with an updated species list, the documentation of range extensions and descriptions of the rarer species encountered.

Because of space and transport limitations, preparations for the surveys included a review of the species likely to be encountered, using existing guides to the area (Bianchi 1986; Bianchi et al. 1993; Schneider 1990) to determine which species should be collected. Decisions were made on which of the known species to collect based on presence or absence from the existing fish collection at SAIAB and on taxonomic status. Those species that required further taxonomic study had higher priority than well-known species. For the lesser-known, deep-water species, efforts were made to obtain representative samples of as many as possible, but concentrating on specimens that were in good condition. Any specimens that were not identified on board were retained for later study. A complete list of all species collected is appended to this paper, together with a summary of trawl station data for cross reference. On the basis of the *Clofeta* synopsis and some more recent literature, we record range extensions (Table 1) of 34 fish species from more northerly waters, two (*Galeichthys feliceps* and *Careproctus albescens*) from more southerly waters and the first eastern Atlantic record of the apparently widespread eel *Dysommima rugosa*. A new morid species collected, *Physiculus cyanostrophus* Anderson & Tweddle 2002, was described earlier.

Colour plates in this paper illustrate a small selection of species caught during the surveys, including some of the species discussed in the text.

## MATERIALS AND METHODS

The trawl surveys were designed to obtain biomass estimates using the swept area method (Sparre & Venema 1998) and covered the entire length of the Angolan continental shelf from 20 to 800 m in depth. A total of 342 stations (summarised in Appendix A) were fished in the 2001 and 2002 surveys, with trawl bottom time usually of 30 minutes unless interrupted by hard ground.

Samples were taken from each trawl by the fisheries scientists on board for sorting, weighing and measurement. The fishes in this sample were checked and if there was any uncertainty over identification, the fishes were examined further in the vessel's laboratory, using available identification keys on board. In addition to the sample taken, each trawl haul was examined on deck for any unusual species that were present.

Using the target species list prepared in advance, up to ten good specimens were collected for each of the species and preserved in 10% formalin. Rare, unidentified or questionable specimens were also retained. Most specimens were identified on board, though some species are the subject of further study, as discussed below. Each fish kept was labelled with a code number written in pencil on plastic paper, which was inserted in the mouth or gillcover, cross-referenced with the field notes and station number. Full collection details were added later from the vessel's trawl records at SAIAB where the collection of 1704 specimens of 277 species was transferred to 60% propanol or 70% ethanol and catalogued. The full species list is given in Appendix B.

When time permitted and specimens of the various species were available in good condition, photographs were taken, generally against a standard yellow background, using the vessel's Olympus digital camera. Some photographs were also taken on slide film. Most photographed specimens were kept and preserved, with the specimen and photo cross-referenced, though some larger and/or commoner species were not retained.

In addition to the 2001 and 2002 survey collections, specimens of the uncommon *Lestidiops cadenati*, *Cataetyx bruuni* and *Pachycara crossacanthum* were obtained by Dr Tomio Iwamoto, California Academy of Sciences (CAS), during the UNDP/NORAD cruise of March-April 2005. Data from these specimens were incorporated into our accounts, with the station data added to Appendix A.

Counts and measurements in the species accounts follow Hubbs & Lagler (1947), Fernholm & Hubbs (1981) and McMillan & Wisner (1984) for hagfishes, Robins & Robins (1970) and Smith & Kanazawa (1977) for eels, Bradbury (1988, 1999) for batfishes, Pietsch (1974) and Bertelsen and Krefft (1988) for anglerfishes, Eschmeyer (1969) for scorpionfishes, Anderson (1994) for zoarcids and Robins (1960, 1962) for ophidioids. Counts of vertebrae and unpaired fin rays of elongate fishes were taken from radiographs. Abbreviation used

are as follows: SL – standard length; TL – total length; HL – head length; Pelv. – pelvic fin rays.

Authorities for original descriptions are available in Eschmeyer's on-line Catalog of Fishes, <http://www.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>, and are not included in the reference list here.

## SYSTEMATICS

### MYXINIDAE

#### *Myxine ios* Fernholm, 1981

This hagfish was the first to be captured in West African waters, and is known to occur from off Western Sahara to Iceland (Fernholm & Vladykov 1984). Fernholm (1981) found the species exists in two populations, a northern one with a light grey body and whitish head, and an African one with a uniformly darker grey colour. A single specimen, 303 mm TL, of the African population was collected off northern Angola in 700 m at station 2799 during the 2002 cruise (Appendix B). It agrees with the original description in every respect except that it has 101 slime pores, compared with 103–116 for the West African population, and slight differences in a few morphometric features.

Head and body uniformly dark purplish-grey. Ventral part of snout, mouth, barbels, gill apertures, slime pores, cloaca and distal half of ventral fin fold white. Proportions as percent total length: prebranchial length 30; trunk length 57; tail length 13; body width 4.8; body depth including fin fold: 6.5; body depth excluding fin fold: 5.6; body depth at cloaca: 5.3; tail depth 5.7; first barbel length 1.3; second barbel length 1.3; third barbel length 1.5. Slime pore counts, left side: prebranchial 29, trunk 61, tail 11 = 101 total. Seven gill pouches on each side. Tooth counts: cusps on multicuspid 2/2 each side; unicuspid, right side: outer row 9, inner row 9; unicuspid left side: outer row 10, inner row 9; total cusps 45.

### TORPEDINIDAE

#### *Torpedo bauchotae*

Cadenat, Capapé & Desoutter 1978  
(Plate 1J)

This electric ray was described from two juveniles taken off the Congo and Senegal, depths unknown. Other (unpublished) specimens are known from Ivory Coast and Senegal (B. Seret pers. comm., 2003). Two juvenile females, 148–150 mm TL, were taken off northern Angola during the 2001 cruise in 24 m (Appendix B).

Anterior edge of disk straight, pelvic fins gently rounded. Characteristic black variegations snaking around disk; these wider, therefore disk darker, in 148

**Table 1.** New records, range and depth extensions for fishes caught in the Angolan trawl surveys. The sources for the previous data, followed by page number, are: C = CLOFETA; S = Smith 1989; L = Lloris 1986.

Name	From	To	Source
<b>MYXINIFORMES</b>			
<i>Myxine ios</i>	W. Sahara	N. Angola	CI:1
<b>ANGUILLIFORMES</b>			
<i>Coloconger cadenati</i>	Gulf of Guinea	N. Angola	CI:168
<i>Uroconger syringinus</i>	Gulf of Guinea	C. Angola	CI:166
<i>Nettastoma melanurum</i>	Gulf of Guinea	N. Angola	CI:174
<i>Xenomystax congroides</i>	Gulf of Guinea	N. Angola	S:566
<i>Hoplunnis punctatus</i>	Gulf of Guinea	N. Angola	CI:173
<i>Chlopsis olokun</i>	Congo	N. Angola	CI:150
<i>Dysommia rugosa</i>	(First East-Central Atlantic record)		S:242
<b>SILURIFORMES</b>			
<i>Galeichthys feliceps</i>	Walvis Bay	S. Angola	CI:230
<b>SALMONIFORMES</b>			
<i>Talismania homoptera</i>	Congo	S. Angola	CI:263
<b>AULOPIFORMES</b>			
<i>Aulopus cadenati</i>	NW Africa	N. Angola	CI:349
<i>Bathypterois quadrifilis</i>	Gulf of Guinea	C. Angola	CI:357
<i>Lestidiops cadenati</i>	Gorée, Senegal	N. Angola	CI:375
<b>GADIFORMES</b>			
<i>Nezumia africana</i>	Gulf of Guinea	S. Angola	CII:560
<b>OPHIDIIFORMES</b>			
<i>Ophidion lozanoi</i>	Senegal	C. Angola	CII:574
<i>Cataetyx bruuni</i>	First since original description (off Angola)		CII:574
<b>LOPHIIFORMES</b>			
<i>Lophiodes kempi</i>	Congo	C. Angola	CII:479
<i>Antennarius senegalensis</i>	Congo	C. Angola	CII:482
<i>Diceratias pileatus</i>	Gulf of Guinea	C. Angola	CII:496
<b>SCORPAENIFORMES</b>			
<i>Scorpaena elongata</i>	Guinea	C. Angola	CII:671
<i>Neomerinthe folgori</i>	Mauritania	N. Angola	CII:667
<i>Careproctus albescens</i>	So. Namibia	S. Angola	L:320
<b>PERCIFORMES</b>			
<i>Boops boops</i>	São Tome-Principe	S. Angola	CII:790
<i>Mycteroperca rubra</i>	Zaire	Luanda	CII:702
<i>Cephalopholis nigri</i>	Zaire	Luanda	CII:695
<i>Chaetodon robustus</i>	Gulf of Guinea	Luanda	CII:838
<i>Labrisomus nuchipinnis</i>	Equatorial Guinea	Luanda	CII:918
<i>Lutjanus fulgens</i>	Gulf of Guinea	C. Angola	CII:776
<i>Pachycara crossacanthum</i>	Gabon	N. Angola	
<i>Priacanthus arenatus</i>	Gulf of Guinea	S. Angola	CII:712
<i>Apogon affinis</i>	Gulf of Guinea	C. Angola	CII:814
<i>Synagrops bellus</i>	Gulf of Guinea	N. Angola	CII:693
<i>Xyrichthys novacula</i>	Gabon	C. Angola	CII:882
<i>Trachinus pellegrini</i>	Nigeria	N. Angola	CII:895
<i>Foetorepus phaeton</i>	Gabon	N. Angola	CII:924
<i>Trachinotus goreensis</i>	Gulf of Guinea	C. Angola	CII:749
<i>Ariomma bondi</i>	Gulf of Guinea	N. Angola	CII:1019
<b>PLEURONECTIFORMES</b>			
<i>Microchirus wittei</i>	Ghana	N. Angola	CII:1043
	Depth: 145-460 m	43-44 m	
<i>Cynoglossus cadenati</i>	Depth: 10-20 m	729-738 m	CII:1051

mm specimen than in the larger individuals. Pale spots surrounded by thin black lineations in this specimen, spots paler (whitish), without lineations in 150 mm specimen. Spiracle surrounded by 9–10 finger-like papillae. Molariform teeth in four rows anteriorly in both jaws. Proportions as percent disk width: total length 1.4–1.5; disk length 83–87; snout to origin of first dorsal fin 93–99; snout to origin of second dorsal fin 1.0; interdorsal distance 3.7–4.1; first dorsal fin base 9.3–9.8; second dorsal fin base 7.5–7.7; transverse spiracle diameter 2.7–2.9; interspiracular width 7.0–7.9; interorbital width 4.8–5.0; mouth width 9.3–9.4; internasal width 5.8–5.9; snout to mouth 13; first gill slit interdistance 25; fifth gill slit interdistance 23–24.

#### SYNAPHOBRANCHIDAE

##### *Dysommia rugosa* Ginsburg 1951

This cutthroat eel has been reported reliably from upper slope depths in the northwestern Atlantic and Hawaii. A single 362 mm TL specimen was taken off northern Angola in 536–542 m during the 2002 cruise (Appendix B) that agrees with North Atlantic specimens (Robins & Robins 1989).

Total vertebrae 133; predorsal vertebrae 11; Dorsal fin rays (D) 314; Anal fin rays (A) 290; Pectoral fin rays (P) 16; Caudal fin rays (C) 15. Pores: preoperculomandibular 5 (pore in position five, under posterior margin of eye, not open on both sides); infraorbital 5; supraorbital 3. No supratemporal commissure. Vomer with four caniniform teeth. Proportions as percent TL: predorsal length 17; preanal 28; body depth at anus 5.9; head length 13; head width 3.3. Proportions as percent head length (HL): head width 26; snout 28; eye diameter 13; jaw length 45; gill opening 16; interbranchial distance 12; pectoral-fin 24; interorbital 15. Colour uniformly dark chocolate brown.

#### OPHICHTHIDAE

##### *Pisodonophis semicinctus* (Richardson 1848) (Plate 3Y)

This distinctive snake eel was originally described as *Ophisurus semicinctus* Richardson 1848. This name, however, is a junior homonym of *Ophisurus semicinctus* Lay & Bennett 1839, another snake eel now placed in the genus *Leiuranus* Bleeker (McCosker 1977). Richardson's name has been wrongly treated as valid by authors as *Pisodonophis semicinctus*. Also, the species does not belong to *Pisodonophis sensu stricto*, thus a replacement name is required (J. McCosker, pers. comm.). This eel ranges from the Mediterranean coast of Algeria to Angola at inner shelf depths (Bauchot 1986). Three specimens, 616–813 mm TL, were taken during the cruises off northern and central Angola in

25–40 m (Appendix B). Recent descriptive literature for the species includes Blache et al. (1970), Blache & Saldanha (1972), Saldanha (1982) and Bauchot (1986), summarised below.

Total vertebrae 155–162. Lateral line pores: prepectoral 10–12; preanal 53–59. Pectoral-fin rays 10–11. Caudal fin absent, tip of tail a stiff lobe. Proportions as percent total length (TL) (Blache & Saldanha 1972): predorsal length 6.7–8.9; preanal 32–43; head 11–12; body depth 3.3–4.3. Proportions as percent HL: predorsal length 63–79; body depth 29–40; snout 19–21; eye diameter 6.6–10.0; interbranchial distance 18–20; pectoral-fin 28–33.

Head cuneiform in lateral view when mouth closed. Dorsal and anal fins well developed, dorsal-fin origin distinctly in advance of gill opening. Background colour yellow, lighter ventrally, with 14–18 dark brown saddles from nape to tail tip. Pectoral fin yellow. Head with large dark saddle blotch and smaller black spots.

#### CONGRIDAE

##### *Xenomystax congroides* Smith & Kanazawa in Smith, 1989

This eel is chiefly known from the Gulf of Mexico to off northern Brazil in depths of about 150–500 m, but is also known in the eastern Atlantic from 10 specimens taken from off Liberia to Congo in 156–400 m (Smith 1989). Two specimens were taken off northern Angola during the 2001 cruise at depths of 327–355 m (Appendix B). One specimen (SAIAB 64867, 445 mm TL) has lost the end of its tail (172 total vertebrae) and has a regenerated pseudocaudal fin. Both specimens agree well with the Gulf of Guinea population in the original description but have one less supraorbital pore.

Predorsal vertebrae 4; preanal vertebrae 39–40; precaudal vertebrae 60–61; total vertebrae 216 (undamaged specimen). Branchiostegal rays 10. Pectoral-fin rays 12–13. Pores: lateral line to anus 36–37; preoperculomandibular 14; infraorbital 5 + 0 + 3; supraorbital 1 + 4; supratemporal commissure 3. Proportions as percent TL (undamaged specimen): predorsal 12; preanal 34; head 14. Proportions as percent preanal length (both specimens): predorsal 34–35; head length 41; head width 9.0–10.1; depth at anus 11; pectoral fin 9.2–10.1. Proportions as percent HL: snout 32; eye 11; upper jaw 55–56; gill opening 9.2–10.3; interbranchial 10; pectoral fin 23–25.

Body and tail brownish dorsally with scattered melanophores. Lateral line area pale. Ventral surface pale yellowish. Edges of vertical fins posteriorly and gut black. Intermaxillary tooth patch with three large canines anteriorly (Smith 1989, fig. 598).

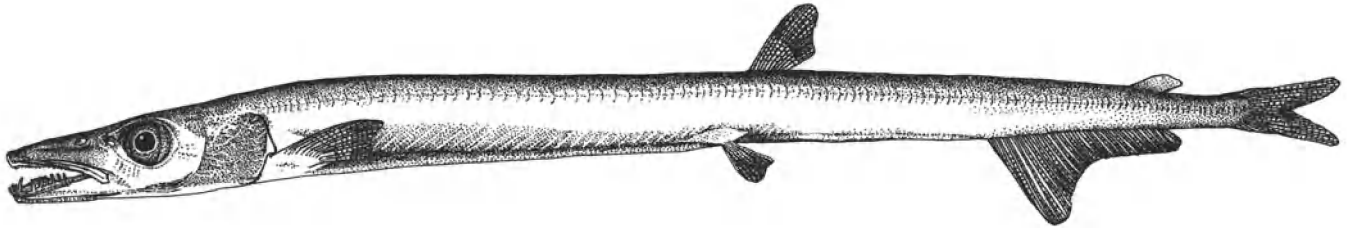


Fig. 1. *Lestidiops cadenati*, 218 mm SL, SAIAB 66083.

PARALEPIDIDAE

*Lestidiops cadenati* (Maul 1962)  
(Figs. 1 & 2)

This barracudina was described from a single beach-cast juvenile, 82.5 mm SL, found near Dakar, Senegal in 1953 (Maul 1962). Subsequent references that we found all refer to the holotype (Blache et al. 1970; Post 1972, 1991). Nineteen specimens, 210–233 mm SL, were collected during the two cruises off northern Angola at five stations ranging in bottom depth from 259 m to 364 m (Appendix B). The 2005 CAS collection contains seven specimens 217–318 mm SL from stations 3630, 3656, 3675, 3698 and 3709 (Appendix A). Barracudinas are considered coastal, mesopelagic fishes (Rofen 1966). Vertebral and caudal-fin counts were taken from radiographs of 15 specimens. Other counts and measurements were taken from all 26 fish where possible.

Vertebrae 36–40 + 41–45 = 79–84; D 9–11 (usually 10); A 25–27; P 11–12; Pelv. 9; C xiii–xiv + 10–11 + 9 + ix–xvii (19–20 principals); lateral line sections 130–140; gill rakers 4–13 + 22–29 = 26–41; branchiostegal rays 5; pseudobranch filaments 16–19. Proportions as percent SL: head length 22–24; head width 4.1–4.8; head depth 6.4–7.5; postorbital length 8.4–9.3; upper jaw length 8.4–10.2; lower jaw length 11–13; predorsal length 60–63; preanal length 79–80; prepelvic length 56–60; pectoral-fin length 7.9–9.3; pelvic-fin length 5.2–5.9; body depth at dorsal-fin origin 5.2–7.3; body depth at anal-fin origin 5.0–6.1; gill slit length 11–12; caudal peduncle length 5.2–7.2; caudal peduncle least depth 2.5–2.8; dorsal-fin base 4.5–5.6; anal-fin base 14–15. Proportions as percent HL: head width 19–21; head depth 28–34; postorbital length 38–41; upper jaw length 38–43; lower jaw length 50–57; pectoral base depth 9.2–11.6; pectoral-fin length 35–42; pelvic-fin length 23–25; snout length 44–46; orbit diameter 16–18; gill slit length 50–52; bony interorbital width 9.2–11.0.

Head depressed, snout long and tapering to tip of upwardly-protruding lower jaw that fits into the median diastema of the upper jaw. Over 60 tiny teeth on each premaxilla. Maxilla closely joined to premaxilla, edentate, as is vomer. Palatines with 6–9 retrorse, caniniform teeth in anterior half, usually arranged in groups of two, with innermost the larger; single row

of 8–19 smaller, retrorse teeth posteriorly. Dentary with double row of teeth posterior to symphysis, outer teeth small, retrorse, inner teeth long, dagger-like. Eye large, rounded, with adipose eyelid covering anterior and posterior third of pupil. Gill cavity black, gill arches and pseudobranch filaments elongate. Gill rakers reduced to placodes bearing 1–4 strong denticles, with 4–13 placodes on epibranchial, 12–17 on ceratobranchial and 9–12 on hypobranchial. Operculum and suborbital regions with complex, radiating pattern of sensory canals. Body strongly laterally compressed. Ventral carinas (adipose keels) between pectoral and pelvic fins and pelvic and anal fin dotted with tiny melanophores. Lateral line scales (sections) one per myomere anteriorly; three upper and three lower pores posteriorly on each scale to mid-anal fin (Fig. 2; Maul 1962, fig. 5; compare with Rofen 1966, figs. 101, 102). Scales abruptly diminish in size near posterior end of anal fin, becoming two per myomere and with a single dorsal and single ventral pore. Lateral line scales extend to end of caudal peduncle where they are three per myomere, with a few scales turning dorsally right at end. Anus on vertical through dorsal-fin rays 4–8, center of anus situated 20.8–26.2% HL posterior to pelvic-fin insertion. Fins relatively small; pectorals wedge-shaped, dorsalmost five rays longest. Anal fin deeply notched anteriorly, rays 4–6 longest. Dorsal fin low, usually of 10 rays, its origin one eye diameter posterior to vertical through pelvic-fin origin.

Colouration: dorsum dusky brown, pale silvery ventrally. Eye and opercular areas dark blue. Peritoneal pigment patches absent in our material. Fins of largest specimen (CAS 222645; 318 mm SL) dusky.

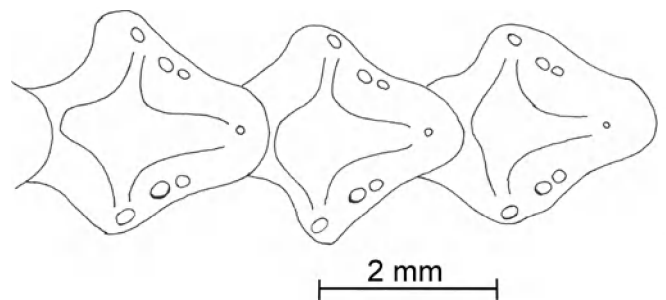


Fig. 2. *Lestidiops cadenati*, SAIAB 66083, lateral line scale detail.

## OPHIDIIDAE

*Ophidion lozanoi* Matallans 1990

This cusk-eel was described from two specimens taken off Western Sahara (holotype) and Senegal (paratype). No further published records are known (J. Matallans pers. comm.), but Robins (1999: 40) listed it from Spain as well. Twenty-one specimens, 117–208 mm SL, were collected during the 2002 cruise off central and northern Angola (Porto Amboim to the Congo River mouth) at depths of 40–259 m (Appendix B). Counts of vertebrae and unpaired fin-rays were taken from six radiographed specimens. Other counts and measurements were taken from 15 specimens 144–208 mm SL (the two types were 130 & 138 mm SL).

Vertebrae 15–16 + 51–53 = 67–69; D 130–147; A 108–119; P 24–25; C 9; Pelv. 2; lower limb gill rakers 4; branchiostegal rays 7; pseudobranch filaments 4–5. Proportions as percent SL: head length 21–22; head width 8.7–11.3; head depth 13–14; predorsal length 26–29; preanal length 40–41; prepelvic length 5.2–6.4; gnathoproctal length 37–38; lateral line length 88–90;

body depth at occiput 14–25; body depth at dorsal-fin origin 14–15; body depth at anal-fin origin 13–14; gill slit length 12–15; occipital length 13–14; postorbital length 12–13. Proportions as percent HL: upper jaw length 49–54; lower jaw length 55–60; pectoral base depth 18–19; pectoral-fin length 43–46; pelvic-fin length 33–53; snout length 19–21; orbit diameter 24–27; gill slit length 56–68; bony interorbital width 14–17; occipital length 61–63; postorbital length 57–59.

Anterodorsal edge of snout high as result of large rostral spine; tip of snout vertical (Fig. X). Tail laterally compressed, lateral line coursing along its dorsal third, extending to posterior seventh of total length. First dorsal-fin pterygiophore inserted between vertebrae 6 and 7. Epibranchial tooth plates 2–3, four elongate gill rakers on ceratobranchial. Vomerine teeth 28–51, in triangular or rhomboidal patch. Palatine teeth in three (smallest fish) to five (largest) irregular rows. No pyloric caeca. Peritoneum and orobranchial chamber black, mouth dusky toward sides. Body greyish-brown dorsally with yellowish tinges ventrally in smaller specimens.



Fig. 3. *Cataetyx bruuni*, 100 mm SL, SAIAB 65946, pectoral and caudal fin details from separate specimen, SAIAB 65871.

## BYTHITIDAE

*Cataetyx bruuni* (Nielsen & Nybelin 1963)  
(Fig. 3)

This rare brotula was originally described in the genus *Oculospinus* Koefoed 1927 from three specimens taken off Angola at depths of 235–510 m, but was assigned to *Cataetyx* by Cohen (1981). No other descriptive records were found, but Nielsen (1990) mentioned there were a “few specimens from the Gulf of Guinea”. We found that these are 27 specimens in four lots in the Museum de La Rochelle, France, and the National Museum of Natural History, Washington, D.C., USA. They range from Senegal to Gabon at depths of 329–1355 m. Three specimens were collected during the 2002 cruise off central Angola (north of Benguela to off Cabo Ledo) at depths of 504–707 m (Appendix B), an adult male

92 mm SL and two gravid females 87–100 mm SL. The CAS 2005 collection is of 21 specimens 65–122 mm SL from stations 3601, 3622, 3641, 3649 and 3656 at depths of 604–809 m (Appendix A).

Vertebrae 15–16 + 48–50 = 61–66; D 107–120; A 81–89; P 26–28; C 10; Pelv. 1; lower limb gill rakers 3; branchiostegal rays 9; pseudobranch absent. Proportions as percent SL: head length 23–26; head width 10–14; head depth 11–13; predorsal length 31–34; preanal length 47–51; prepelvic length 19–21; gnathoproctal length 42–46; body depth at occiput 11–14; body depth at dorsal-fin origin 11–17; body depth at anal-fin origin 11–13; gill slit length 15–16; postorbital length 14–15; pectoral fin length 13–15. Proportions as percent HL: upper jaw length 43–49; lower jaw length 49–56; pectoral base depth 21–26; pectoral fin length 56–63; pelvic fin length 31–42; snout length 21–23; orbit diameter 19–20; gill slit length 63–66; bony interorbital

width 14–16; postorbital length 56–60.

Head ovoid, depressed; tip of snout steeply sloping (Fig. 3). Tail laterally compressed; lateral line not evident. First dorsal-fin pterygiophore inserted between vertebrae 7 and 8. Rudimentary gill rakers on epibranchials 2–3; three elongate rakers on upper part of ceratobranchial and seven rudiments ventrally. Vomerine teeth 16–27, in two arcing rows. Palatine teeth in three irregular rows. No pyloric caeca. Opercle with stout, V-shaped spine arrangement; uppermost projecting posteriad, lower projecting ventroposteriad. Skin flap on opercle above posteriorly-directed spine ending in a wide pore. Cleithrum with posteriorly-directed spine just above pectoral base. Posteriorly-directed preorbital spine directly behind posterior nostril. Pelvic fins inserted under opercle. Top of head and body brown, head darker. Opercle, lower side of head and area under eye blue. Cheeks yellowish. Orobranchial chamber and peritoneum black.

#### OGCOCEPHALIDAE

##### *Dibranchius atlanticus* Peters 1876

This batfish is known in the western Atlantic from Canada to Brazil and in the eastern Atlantic from the Gulf of Guinea to Angola in depths of about 100–1260 m (Bradbury 1999). Twenty-six specimens were taken off central and northern Angola during the cruises at depths of 112–614 m (Appendix B). The specimens agree with Bradbury's detailed description, but most have very large tubercles more like those of *D. tremendus* Bradbury 1999 than typical *D. atlanticus* (Bradbury 1999, fig. 8). The central spines of our specimens are not greatly elongated on the tubercles of the tail, as in *D. tremendus*. All tubercles are decorated with spinules, however, and this, with the small sizes and shallow collection depths, identify the species as *D. atlanticus*.

Counts and body proportions from 10 specimens 81–105 mm SL: D 5–6; A 4; P 13–14; Pelv. 5. Neuromast counts: preopercular 2; subopercular 5–6; tail 10–11. Proportions as percent SL: disk margin length 42–44; skull length 28–31; cranium width 20–22; eye width 9.7–10.7; distance jaw to anus 49–53; jaw to anal fin origin 71–74; predorsal length 58–60; interorbital width 8.6–9.4; jaw length 11–12; mouth width 14–16.

#### DICERATIIDAE

##### *Diceratias pileatus* Uwate 1979

This double anglerfish is known in the literature from 45 specimens ranging across the tropical Atlantic from the Bahamas to the Gulf of Guinea (Uwate 1979; Fujii 1983). Pietsch & Randall (1987) reported the first occurrence of the species outside the Atlantic (off

Hawaii), which is the largest specimen known at 275 mm SL. Twenty-two female specimens, 20–114 mm SL, from nine stations were collected during our cruises off Angola (Appendix B). This species is mesopelagic and bottom depths ranged from 446–769 m.

Following counts and proportions taken from the ten best specimens, 20–65 mm SL: D 6–7; A 4; P 12–13; C 9; vomerine teeth 0–8 (absent in 20 mm fish); upper jaw teeth 9–17; lower jaw teeth 14–22. Proportions as percent SL: predorsal length 76–79; preanal length 86–89; body depth 59–62; illicial length 36–40; head length 37–40; head depth 57–59; head width 33–36; lower jaw length 44–47. Esca a simple bulb with a small cap (absent in 20 mm fish). Body solid black, covered in minute spinules.

#### HIMANTOLOPHIDAE

##### *Himantolophus paucifilosus* Bertelsen & Krefft 1988

This footballfish was described from 17 females taken at mesopelagic depths across the tropical Atlantic. A single female, 147 mm SL, was taken off central Angola in 2002, bottom depth 672 m (Appendix B).

Counts and proportions as percent SL: D 5; A 4; P 16; C 9; head length 39; head depth 56; predorsal length 87; preanal length 87; body depth 65; illicial length 46; diameter esca bulb 5.5; length distal esca appendage 2.0; anterior appendage absent; length posterior appendage 9.5; length illicial appendage 15. Two illicial appendages just below esca, each with an unbranching filament. Colour solid black.

#### SCORPAENIDAE

##### *Neomerinthe folgori* (Postel & Roux 1964) (Fig. 4)

This rare scorpionfish was described from a single specimen, 287 mm SL, taken off the Cape Verde Islands in 180–200 m. We found that only two other specimens have been reported, one from Mauritania in 310 m (Cervignon 1960, reported as *Scorpaena* sp. (Eschmeyer 1969)) and another from Namibia in about 200 m (Penrith 1980; Eschmeyer 1986). The species was not mentioned by Blache *et al.* (1970). A gravid female, apparently the largest specimen known at 417 mm SL, was collected off northern Angola during the 2001 cruise in 322–324 m (Appendix B). It agrees with published descriptions, but as it is much larger than the other three (to 340 mm), has significantly shorter predorsal and snout lengths and fewer gill rakers (lowermost somewhat coalesced); variation in other morphometric features is insignificant.

D XII, 11; A III, 5; P 17; C 16; Pelv. I, 5; gill rakers 8 + 8; tubed lateral line scales 28; lateral line scale rows 78.

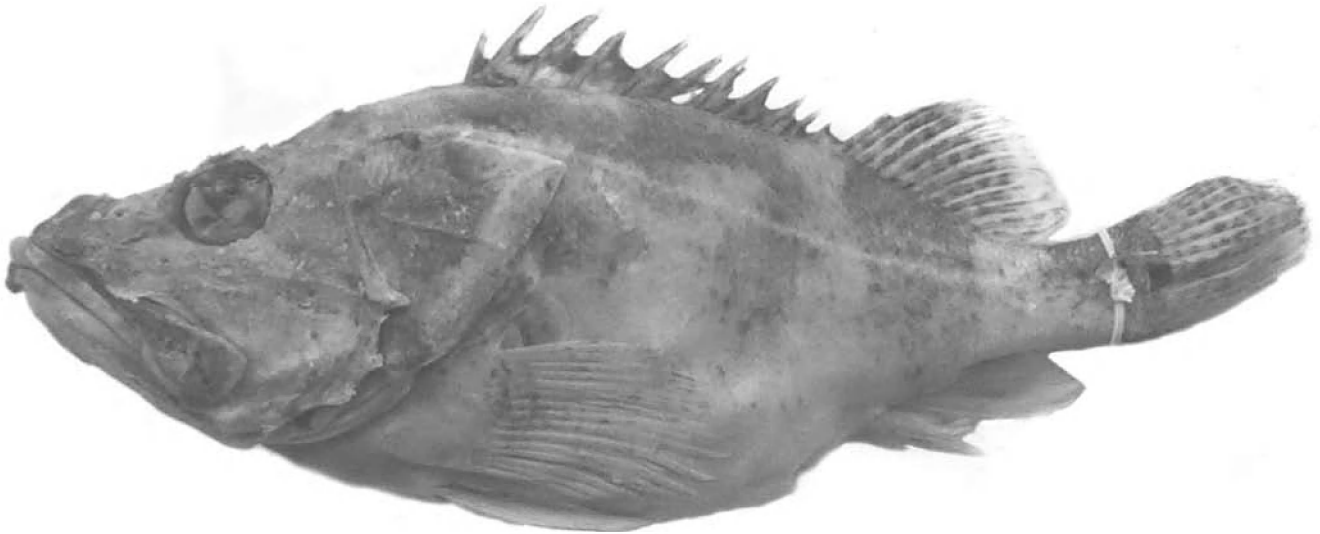


Fig. 4. *Neomerinthe folgori*, 417 mm SL, SAIAB 65015, photograph of right side in mirror image.

Proportions as percent SL: head length 45; head width 25; head depth 32; body depth 36; predorsal length 35; preanal length 73; prepelvic length 36; pectoral-fin length 23. Proportions as percent HL: head width 57; head depth 71; postorbital length 55; orbit diameter 19; snout length 31; upper jaw length 47; pectoral-fin length 51.

Preorbital bone with two spinous lobes over upper jaw, with 11 lateral points and five cirri. Suborbital ridge with 34 small points along centre line. First preopercular spine longest, second small (absent on left side), third and fourth present, fifth a mere nub under skin. Supplemental preopercular spine present. Postorbital ridge with upper posttemporal spine embedded (unexposed); supracleithral, lower posttemporal, pterotic and sphenotic spines present, latter two with several small points. Scales on body ctenoid, 78 lateral scale rows (the count by Postel and Roux 1964, of 85 in the holotype was corrected by Poss & Duhamel 1991, to 77). Cirri on head weakly developed, mostly absent. Background colouration yellowish with black and brownish variegations. Four variegated black bands on body. Caudal fin with narrow bands, posterior margin without wide black band as in holotype.

#### LIPARIDAE

*Careproctus albescens* Barnard 1927

*Careproctus griselda* Lloris 1982

This snailfish was described from six juveniles taken off Cape Town in 1152–1463 m. It is still rare in collections, and we are aware of 16 other specimens from Cape Town north to off southern Namibia. Lloris (1982) described the first adults as *C. griselda*. A single adult, 126 mm SL, was taken during the 2002 cruise off

southern Angola in 603 m (Appendix B).

Vertebrae 11 + 51 = 62; D 55; A 49; P 26 + 11 = 37; C 11; branchiostegal rays 6. Proportions as percent SL: Predorsal length 23; preanal length 36; head length 23; head width 14; head depth 18; body depth 20; gill slit length 8.2; pectoral-fin length 19. Proportions as percent HL: head width 60; head depth 77; upper jaw length 37; lower jaw length 43; pectoral base depth 32; pectoral-fin length 82; body depth 86; disk width 23; disk length 26; snout length 32; eye diameter 22; gill slit length 36; bony interorbital width 19. Colour uniformly pale grey anteriorly grading into blackish tail. Peritoneum dusky (densely dotted with melanophores, typical of adult, shallow-dwelling *Careproctus* species). Teeth mostly simple, retrorse, a few in inner rows of lower jaw trilobed (tips triangular).

#### CARISTIIDAE

The manefishes are in great need of systematic revisionary study. No keys to all the species exist (but see below) and a few undescribed genera and species are known in collections (M. Leiby pers. comm. 2002). Until recently, two subgenera of *Caristius* Gill & Smith 1905 were usually recognised, *Platyberyx* Zugmayer 1911, with a high, curved lateral line and vomerine and palatine teeth, and *Caristius* Gill & Smith 1905, with lateral line straight or absent and with or without vomerine or palatine teeth. The manefishes were not considered by Blache *et al.* (1970), but Post (1991) lists four species for the Clofeta area, two *Platyberyx* (*P. opalescens* and *P. groenlandicus*) and two *Caristius* (*C. macropus* and *C. maderensis*). Trunov *et al.* (2006) erected *Paracaristius* for *C. maderensis* (type species) and a new southern hemisphere species (*P. heemstrai*), but did not comment on the generic status of *C. macropus*. Nine



specimens, 56–173 mm SL, of a manefish were taken during our cruises off central and northern Angola at bottom depths of 601–776 m (Appendix B).

*Caristius macropus*, originally described from Japan (Bellotti 1903) and well known in the Pacific, has been reported from the Atlantic a few times (e.g., Fraser-Brunner 1931; Parin et al. 1974, but not Norman 1930 [see Maul 1949: 26 for corrected counts]). We distinguish our species from *C. macropus*, and therefore identify it as *P. maderensis*, on the basis of its lower counts and lack of vomerine and palatine teeth. The material agrees well with Mauls' original description and that of Trunov (1981), each based on one specimen. We offer here a tentative key gleaned from other *Caristius* specimens in the SAIAB Fish Collection, the literature and an unpublished key of R. Britz, Natural History Museum, London.

#### KEY TO ATLANTIC SPECIES OF MANEFISHES

- 1A. Lateral line high on dorsum, arched ..... 2  
 1B. Lateral line straight, coursing midlaterally, obsolete ..... 3
- 2A. D 28–31; A 17–19 ..... *Platyberyx opalescens*  
 2B. D 32–36; A 20–22 ..... *Platyberyx groenlandicus*

- 3A. Rear margin of upper jaw not reaching beyond middle of eye; vomerine and palatine teeth absent; D 26–30; A 15–17; P 15–17; vert. 32–33 ..... *Paracaristius maderensis*  
 3B. Rear margin of upper jaw reaches beyond middle of eye; vomerine and palatine teeth present; D 33–37; A 21–23; P 17–20; vert. 39–40 ..... *Caristius macropus*

#### *Paracaristius maderensis* (Maul 1949)

Counts and proportions from Angola material (vertebral counts from radiographs of five specimens): Vertebrae 15 + 17–18 = 32–33; D 27–28; A 17–18; P 16–17; C 17 (principal rays); Pelv. 6; gill rakers 6–8 + 14 = 20–22; branchiostegal rays 7; pseudobranch filaments 11–20. Proportions as percent SL: head length 30–36; head width 13–15; upper jaw length 11–12; lower jaw length 15–20; predorsal length 8.8–9.5; preanal length 56–57; prepelvic length 25–30; length longest dorsal ray 58–81; length longest anal ray 25–43; pectoral length 26–31; pelvic length 59–61; body depth 47–48. Proportions as percent HL: head width 41–44; upper jaw length 32–36; lower jaw length 49–56; pectoral base depth 21–23; snout length 11–13; pupil diameter 31–36.

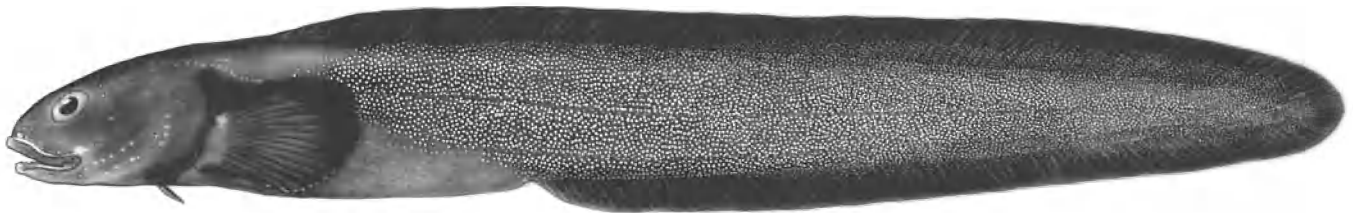


Fig. 5. *Pachycara crossacanthus*, drawing from original description.

#### ZOARCIDAE

##### *Pachycara crossacanthum* Anderson 1989 (Fig. 5)

This rare eelpout was described from six specimens, 227–378 mm SL, collected by French researchers in fish traps set off Senegal and Gabon in depths of 900–1050 m. No other specimens have been reported. Four late juvenile females, 137–155 mm SL, were collected during the two cruises off central and southern Angola at two stations in depths of 672–783 m (Appendix B). The CAS 2005 collection is of four specimens 122–265 mm SL from stations 3609, 3676 and 3684 taken at depths of 725–891 m (Appendix A). Vertebrae and median fin rays were counted from radiographs of all eight fish.

Vertebrae 25–28 + 76–81 = 103–107; D 98–101; A 80–82; C 11–12; P 17; Pelv. 3; vomerine teeth 5–9; palatine

teeth 7–13; gill rakers 3–4 + 13–14; branchiostegal rays 6; pseudobranch filaments 4–5. Proportions as percent SL: head length 17–19; head width 8.3–8.7; head depth 8.8–9.6; pectoral-fin length 10–11; predorsal length 19–22; preanal length 41–44; body depth 9.4–10.7; gill slit length 6.6–7.5; caudal-fin length 3.0–3.7. Proportions as percent HL: head width 44–50; head depth 50–54; upper jaw length 31–38; pectoral-fin length 58–66; snout length 18–22; eye diameter 18–24; gill slit length 38–42; interorbital width 7.9–11.2; interpupillary width 23–27; pelvic-fin length 13–21; pectoral base/length ratio 42–47.

The four SAIAB and two CAS juveniles agree in every respect with the larger specimens but have slightly longer heads, pectoral fins and gill slits. Eight preoperculo-mandibular pores, seven suborbitals, two supraorbitals, four postorbitals (except CAS 222451 and 222647 with three), and no interorbital or occipitals.

Only dorsalmost 5–7 gill rakers on lower limb furcate in the six juveniles (Anderson, 1989, fig. 8). Body lateral lines originating just posterior to postorbital pore four, with mediolateral and ventral branches diverging just above anterior quarter of pectoral fin. Dorsal fin origin associated with vertebra four, with no free pterygiophores. Anal fin origin associated with ultimate precaudal vertebra, with 2–3 ray-bearing pterygiophores inserted anterior to haemal spine of first caudal vertebra in all four fish. Caudal fin with two epural and 9–10 hypural rays.

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## PLATE 1



A. *Cepola pauciradiata*. Station 2762, SAIAB 65971.  
First published live colour photograph of this species.



B. *Coloconger cadenati*. Station 2842, SAIAB 67386.



C. *Physiculus huloti*. Station 2765, SAIAB 66038.



D. *Physiculus cyanostrophus*. Station 2753, SAIAB 64639, paratype. First published live colour photograph of this species.



E. *Bathygadus macrops*. Station 2861, SAIAB 67989.



F. *Trachyrhynchus trachyrhynchus*. RV Dr Fridtjof Nansen collection, photo MARTRO1.jpg.



G. *Syacium micrurum*. Station 2472, SAIAB 65501.



H. *Ebinania costaecanariae*. Station 2701, SAIAB 65804.



I. *Zanobatus schoenlenii*. Station 2556, SAIAB 65726.



J. *Torpedo bauchoti*. RV Dr Fridtjof Nansen collection, photo Rayto13.jpg.



PLATE 2



K. *Stromateus fiatola*. Caught on 12 March 2001, not preserved.



L. *Zenion longipinnis* with mouth everted. RV Dr Fridtjof Nansen collection, photo ZE1Z10.jpg.



M. *Hoplostethus cadenati*. RV Dr Fridtjof Nansen collection, photo TRHH0031.jpg.



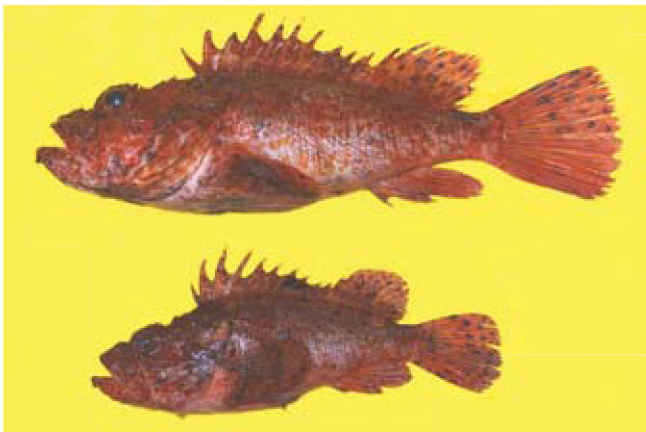
N. *Laemonema lawreysii*. RV Dr Fridtjof Nansen collection, photo MORLA011.jpg.



O. *Centrarchops atlanticus*. Station 2808, SAIAB 68106.



P. *Setarches guentheri*. RV Dr Fridtjof Nansen collection, photo SCRSE031.jpg.



Q. *Scorpaena scrofa*. Two specimens from Station 2555, SAIAB 65733.



R. *Scorpaena normani*. Station 2501, SAIAB 65496.

## PLATE 3



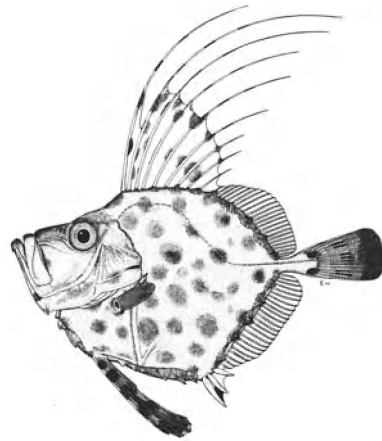
S. *Aulopus cadenati*. Station 2477, SAIAB 64976.



T. *Epigonus constanciae*. Station 2495, SAIAB 64872.



U. *Zenopsis conchifer*. Adult. RV Dr Fridtjof Nansen collection, photo ZEIZN01.jpg.



V. *Zenopsis conchifer*. Juvenile, 89 mm SL, SAIAB 67765.



W. *Uranoscopus albesca*. Station 2481, SAIAB 65507.



X. *Uranoscopus cadenati*. Station 2477, SAIAB 65517.



Y. *Pisodonophis semicinctus*. Station 2798, FMNH 117452.



Z. *Schedophilus pamarco* juvenile. Station 2792, SAIAB 67986.

## APPENDIX A.

A summary of station data for the 2001 and 2002 cruises. The 2005 survey stations from which specimens were provided by T. Iwamoto are also included.

2001 cruise				Station	Date	Position (Lat./Long.)	Depth (m)
				2485	12.03.2001	S 09°16' E 12°55'	43–44
<b>Station</b>	<b>Date</b>	<b>Position (Lat./Long.)</b>	<b>Depth (m)</b>	2486	12.03.2001	S 09°17' E 12°53'	65
2426	04.03.2001	S 12°37' E 12°58'	745–750	2487	12.03.2001	S 09°16' E 12°50'	94–95
2427	05.03.2001	S 12°27' E 13°17'	515–530	2488	12.03.2001	S 09°20' E 12°31'	751–769
2428	05.03.2001	S 12°26' E 13°19'	315–326	2489	12.03.2001	S 09°16' E 12°31'	771–776
2429	05.03.2001	S 12°28' E 13°26'	39–45	2490	13.03.2001	S 09°13' E 12°47'	107–108
2430	05.03.2001	S 12°22' E 13°29'	70–75	2494	13.03.2001	S 09°06' E 12°49'	112–125
2431	05.03.2001	S 12°24' E 13°22'	105–107	2495	13.03.2001	S 09°07' E 12°42'	305–341
2432	05.03.2001	S 12°20' E 13°20'	574–614	2496	13.03.2001	S 09°06' E 12°37'	650–697
2433	06.03.2001	S 12°05' E 13°25'	444–445	2497	14.03.2001	S 08°50' E 12°49'	538–541
2434	06.03.2001	S 12°05' E 13°34'	86–87	2499	14.03.2001	S 08°46' E 13°00'	183–185
2435	06.03.2001	S 11°59' E 13°43'	25–29	2501	14.03.2001	S 08°35' E 13°09'	81–83
2436	06.03.2001	S 11°53' E 13°40'	65–66	2502	14.03.2001	S 08°39' E 13°04'	113
2437	06.03.2001	S 11°48' E 13°34'	103–107	2504	14.03.2001	S 08°36' E 12°55'	368–369
2438	06.03.2001	S 11°52' E 13°31'	189–193	2506	14.03.2001	S 08°24' E 12°45'	637
2439	06.03.2001	S 11°51' E 13°27'	268–276	2507	15.03.2001	S 08°25' E 12°45'	624–633
2440	06.03.2001	S 11°46' E 13°21'	432–437	2508	15.03.2001	S 08°21' E 12°55'	164–169
2441	06.03.2001	S 11°28' E 13°20'	624–654	2509	15.03.2001	S 08°24' E 13°03'	108–110
2442	07.03.2001	S 11°29' E 13°27'	109–114	2513	15.03.2001	S 08°14' E 12°46'	322–324
2443	07.03.2001	S 11°30' E 13°33'	73–81	2515	15.03.2001	S 08°15' E 12°39'	780–783
2444	07.03.2001	S 11°29' E 13°40'	35	2517	18.03.2001	S 08°14' E 13°11'	43–44
2445	07.03.2001	S 11°22' E 13°40'	33	2518	18.03.2001	S 08°00' E 12°35'	681–694
2446	07.03.2001	S 11°18' E 13°40'	31–36	2521	19.03.2001	S 07°58' E 12°40'	348–364
2447	07.03.2001	S 11°20' E 13°33'	53–55	2522	19.03.2001	S 08°01' E 12°43'	233–248
2448	07.03.2001	S 11°15' E 13°36'	152–168	2525	19.03.2001	S 07°54' E 12°53'	86–87
2449	07.03.2001	S 11°13' E 13°31'	321–332	2528	19.03.2001	S 07°53' E 13°05'	19–21
2450	07.03.2001	S 11°09' E 13°27'	618–622	2529	19.03.2001	S 07°50' E 12°32'	732–744
2451	08.03.2001	S 10°57' E 13°25'	441–451	2530	20.03.2001	S 07°49' E 12°34'	547–553
2452	08.03.2001	S 10°53' E 13°31'	124–126	2531	20.03.2001	S 07°46' E 12°33'	433–456
2453	08.03.2001	S 10°49' E 13°37'	79–81	2532	20.03.2001	S 07°45' E 12°34'	336–340
2454	08.03.2001	S 10°48' E 13°42'	44–47	2533	20.03.2001	S 07°45' E 12°35'	250–251
2455	08.03.2001	S 10°37' E 13°28'	82–85	2538	20.03.2001	S 07°40' E 12°58'	35–36
2456	08.03.2001	S 10°38' E 13°23'	106–108	2539	20.03.2001	S 07°39' E 12°59'	24–26
2457	08.03.2001	S 10°36' E 13°13'	163–173	2540	20.03.2001	S 07°36' E 12°26'	642–651
2458	08.03.2001	S 10°36' E 13°09'	400–429	2542	21.03.2001	S 07°33' E 12°28'	320–366
2464	09.03.2001	S 10°21' E 13°02'	177–179	2543	21.03.2001	S 07°33' E 12°29'	244–248
2465	09.03.2001	S 10°12' E 12°56'	232–236	2546	21.03.2001	S 07°27' E 12°38'	81–83
2466	09.03.2001	S 10°07' E 12°53'	374–378	2547	21.03.2001	S 07°28' E 12°46'	50–51
2467	09.03.2001	S 10°07' E 12°51'	529–535	2552	22.03.2001	S 07°22' E 12°09'	355–364
2468	09.03.2001	S 10°02' E 12°47'	727–780	2553	22.03.2001	S 07°21' E 12°15'	224–232
2470	10.03.2001	S 10°02' E 12°54'	156	2554	22.03.2001	S 07°18' E 12°20'	143–149
2471	10.03.2001	S 10°03' E 13°01'	94–97	2555	22.03.2001	S 07°18' E 12°27'	101–102
2472	10.03.2001	S 10°02' E 13°08'	69–74	2556	22.03.2001	S 07°13' E 12°43'	31–32
2473	10.03.2001	S 09°56' E 13°13'	29–30	2557	22.03.2001	S 07°09' E 12°30'	52–53
2474	11.03.2001	S 09°44' E 13°11'	23–24	2561	23.03.2001	S 07°11' E 11°59'	342–346
2475	11.03.2001	S 09°45' E 13°03'	81–85	2562	23.03.2001	S 07°10' E 12°03'	256
2477	11.03.2001	S 09°45' E 12°50'	178–179	2566	23.03.2001	S 07°01' E 12°38'	24
2478	11.03.2001	S 09°49' E 12°51'	214–218	2569	24.03.2001	S 06°59' E 11°46'	548–549
2479	11.03.2001	S 09°38' E 12°42'	432–486	2570	24.03.2001	S 06°57' E 11°50'	327–355
2480	11.03.2001	S 09°28' E 12°39'	444–446	2571	24.03.2001	S 06°57' E 11°53'	236–246
2481	12.03.2001	S 09°33' E 12°47'	168–171	2573	24.03.2001	S 06°54' E 12°07'	89–90
2482	12.03.2001	S 09°28' E 12°52'	101	2576	25.03.2001	S 06°37' E 11°57'	110
2484	12.03.2001	S 09°26' E 13°03'	25–27	2577	25.03.2001	S 06°43' E 11°45'	283–285



Station	Date	Position (Lat./Long.)	Depth (m)	Station	Date	Position (Lat./Long.)	Depth (m)
2578	25.03.2001	S 06°44' E 11°43'	336	2756	09.03.2002	S 09°58' E 12°45'	739–749
<b>2002 cruise</b>				2762	09.03.2002	S 09°46' E 13°00'	93–94
2689	01.03.2002	S 17°15' E 11°41'	53–58	2763	09.03.2002	S 09°53' E 12°44'	628–707
2691	01.03.2002	S 17°14' E 11°31'	131–133	2764	10.03.2002	S 09°36' E 12°39'	536–542
2692	01.03.2002	S 17°13' E 11°28'	160	2765	10.03.2002	S 09°32' E 12°51'	112–114
2693	01.03.2002	S 17°14' E 11°21'	344–349	2766	10.03.2002	S 09°28' E 13°00'	50–52
2694	01.03.2002	S 17°13' E 11°16'	603–617	2767	10.03.2002	S 09°27' E 13°04'	25–26
2695	02.03.2002	S 17°00' E 11°41'	36–37	2768	10.03.2002	S 09°15' E 12°58'	24–27
2697	02.03.2002	S 16°58' E 11°33'	102–103	2769	10.03.2002	S 09°14' E 12°51'	74–76
2698	02.03.2002	S 16°31' E 11°34'	93–94	2770	10.03.2002	S 09°16' E 12°47'	114–116
2699	02.03.2002	S 16°18' E 11°40'	65–66	2771	13.03.2002	S 09°12' E 12°42'	259
2701	03.03.2002	S 12°35' E 13°03'	760–773	2772	13.03.2002	S 09°06' E 12°41'	404–438
2702	03.03.2002	S 12°23' E 13°16'	723–737	2773	13.03.2002	S 09°05' E 12°37'	729–738
2703	04.03.2002	S 12°26' E 13°26'	61–70	2774	14.03.2002	S 08°50' E 12°55'	308–343
2704	04.03.2002	S 12°26' E 13°24'	94–97	2776	14.03.2002	S 08°54' E 13°00'	186–195
2705	04.03.2002	S 12°24' E 13°21'	110–111	2777	14.03.2002	S 08°52' E 12°59'	215–219
2706	04.03.2002	S 12°17' E 13°34'	41–50	2779	14.03.2002	S 08°36' E 12°50'	701–708
2707	04.03.2002	S 12°16' E 13°32'	71–74	2780	14.03.2002	S 08°34' E 12°51'	535–574
2708	04.03.2002	S 12°16' E 13°27'	96–97	2782	15.03.2002	S 08°38' E 13°04'	113
2709	04.03.2002	S 12°15' E 13°25'	111–112	2783	15.03.2002	S 08°35' E 13°09'	81–82
2710	04.03.2002	S 11°56' E 13°20'	657–662	2784	15.03.2002	S 08°35' E 13°15'	52–59
2711	05.03.2002	S 11°55' E 13°21'	575–576	2786	15.03.2002	S 08°36' E 13°19'	28–32
2712	05.03.2002	S 11°56' E 13°23'	471–477	2787	15.03.2002	S 08°20' E 13°06'	82–87
2713	05.03.2002	S 11°58' E 13°30'	264–266	2788	15.03.2002	S 08°26' E 12°46'	700–717
2714	05.03.2002	S 11°59' E 13°32'	101–106	2789	15.03.2002	S 08°28' E 12°47'	601–647
2715	05.03.2002	S 12°01' E 13°37'	70–73	2792	16.03.2002	S 08°28' E 12°53'	308–309
2716	05.03.2002	S 12°02' E 13°39'	49–54	2798	16.03.2002	S 08°15' E 13°16'	25–28
2717	05.03.2002	S 11°47' E 13°45'	26–28	2799	16.03.2002	S 08°16' E 12°41'	703–705
2719	05.03.2002	S 11°46' E 13°33'	110–111	2807	17.03.2002	S 08°04' E 13°08'	40–42
2720	05.03.2002	S 11°45' E 13°29'	160–161	2808	17.03.2002	S 08°03' E 13°10'	26–28
2721	05.03.2002	S 11°45' E 13°23'	349–356	2809	17.03.2002	S 08°04' E 12°36'	732–736
2722	05.03.2002	S 11°44' E 13°18'	672–674	2811	18.03.2002	S 08°02' E 12°38'	524–527
2723	06.03.2002	S 11°30' E 13°22'	351–354	2816	18.03.2002	S 07°52' E 12°59'	55–58
2727	06.03.2002	S 11°32' E 13°43'	27–28	2819	18.03.2002	S 07°46' E 12°30'	730–759
2728	06.03.2002	S 11°16' E 13°45'	23–24	2824	19.03.2002	S 07°38' E 12°45'	88–93
2729	06.03.2002	S 11°16' E 13°42'	20–21	2825	19.03.2002	S 07°36' E 12°48'	68–70
2730	06.03.2002	S 11°13' E 13°38'	113–116	2828	19.03.2002	S 07°34' E 12°14'	721–722
2732	06.03.2002	S 11°15' E 13°28'	529–540	2833	20.03.2002	S 07°21' E 12°39'	57–64
2734	07.03.2002	S 10°51' E 13°45'	35–40	2834	20.03.2002	S 07°19' E 12°43'	42
2735	07.03.2002	S 10°55' E 13°44'	52–53	2835	20.03.2002	S 07°15' E 12°47'	24–26
2736	07.03.2002	S 10°55' E 13°35'	114–115	2836	21.03.2002	S 07°03' E 12°39'	26
2737	07.03.2002	S 10°38' E 13°40'	30	2837	21.03.2002	S 07°05' E 12°36'	38
2739	07.03.2002	S 10°42' E 13°30'	91	2841	21.03.2002	S 07°15' E 12°09'	229–235
2740	07.03.2002	S 10°46' E 13°23'	151–152	2842	21.03.2002	S 07°20' E 12°04'	416–423
2741	07.03.2002	S 10°48' E 13°20'	331–336	2843	21.03.2002	S 07°21' E 12°02'	521–529
2742	07.03.2002	S 10°48' E 13°16'	504–514	2846	22.03.2002	S 07°06' E 11°57'	272–276
2744	08.03.2002	S 10°37' E 13°10'	344–349	2852	22.03.2002	S 06°58' E 11°40'	724–728
2745	08.03.2002	S 10°34' E 13°13'	130–131	2855	23.03.2002	S 06°51' E 11°50'	255–267
2747	08.03.2002	S 10°28' E 13°28'	48–50	2856	23.03.2002	S 06°51' E 11°54'	132–146
2748	08.03.2002	S 10°26' E 13°31'	30–31	2857	23.03.2002	S 06°46' E 11°58'	100
2751	08.03.2002	S 10°13' E 13°16'	70–71	2858	23.03.2002	S 06°47' E 11°53'	143–156
2752	08.03.2002	S 10°16' E 13°10'	96	2859	23.03.2002	S 06°46' E 11°55'	117–126
2753	08.03.2002	S 10°22' E 13°03'	168–173	2860	23.03.2002	S 06°49' E 12°01'	90–91
2754	08.03.2002	S 10°24' E 12°55'	610–624	2861	23.03.2002	S 06°38' E 11°25'	704–720
				2868	24.03.2002	S 06°28' E 11°59'	97–98
				2869	24.03.2002	S 06°26' E 12°02'	80

Station	Date	Position (Lat./Long.)	Depth (m)
2870	24.03.2002	S 06°25' E 12°05'	54–56
2872	25.03.2002	S 06°15' E 11°25'	383–385
2876	25.03.2002	S 06°08' E 11°54'	74
2877	25.03.2002	S 06°07' E 11°58'	69
2878	25.03.2002	S 06°05' E 12°06'	40

### 2005 cruise

3609	01.04.2005	S 12°23' E 13°17'	729–733
3610	01.04.2005	S 12°27' E 13°15'	646–656
3622	03.04.2005	S 11°56' E 13°20'	652–658
3630	03.04.2005	S 11°32' E 13°21'	361–364
3632	04.04.2005	S 11°28' E 13°19'	733–735
3641	04.04.2005	S 11°11' E 13°24'	806–809
3649	05.04.2005	S 10°56' E 13°21'	640–647
3656	06.04.2005	S 10°49' E 13°16'	501–504
3675	08.04.2005	S 10°07' E 12°52'	381–385
3676	08.04.2005	S 10°03' E 12°47'	725–734
3684	09.04.2005	S 09°40' E 12°34'	884–891
3698	11.04.2005	S 08°48' E 12°47'	662–666
3709	12.04.2005	S 08°28' E 12°53'	304–305

## APPENDIX B.

All species collected and deposited in SAIAB from the 2001 and 2002 cruises, indicating the station numbers (see Appendix A for station details) and the SAIAB collection numbers for each species.

NAME	STATION NO. (SAIAB CATALOGUE NO. IN BRACKETS)
<b>MYXINIFORMES</b>	
<i>Myxine ios</i>	2799(66087)
<b>CHONDRICHTHYES</b>	
<b>Scyliorhinidae</b>	
<i>Galeus polli</i>	2497(64537); 2693(65840)
<i>Scyliorhinus cervigoni</i>	2546(65499); 2561(64847); 2562(64602); 2720(65886); 2740(65998); 2745(68094)
<b>Leptochariidae</b>	
<i>Leptocharias smithi</i>	2538(64850); 2539(64960)
<b>Carcharhinidae</b>	
<i>Carcharhinus limbatus</i>	2513(64650)
<b>Squalidae</b>	
<i>Centroscymnus crepidater</i>	2427(64334)
<i>Deania calcea</i>	2426(64340)
<i>Isistius brasiliensis</i>	2427(64998); 2488(65007); 2732(65972)
<b>Squatinae</b>	
<i>Squatina oculata</i>	2477(65006)
<b>Torpedinidae</b>	
<i>Torpedo bauchatae</i>	2539(65676)
<i>T. marmorata</i>	2539(65673); 2704(68029); 2833(67966); 2857(67965); 2859(67983); 2868(68030)
<i>T. mackayana</i>	2485(65514); 2539(65672); 2706(67964); 2718(68088); 2727(68096); 2735(65999); 2748(67984); 2786(66076)
<i>T. torpedo</i>	2429(65541); 2430(65714); 2431(65004); 2435(65560); 2517(65503); 2834(68086)
<i>T. nobiliana</i>	2754(68087)
<b>Rhinobatidae</b>	
<i>Rhinobatos albomaculatus</i>	2429(65718); 2454(66730); 2717(68034); 2737(67971)
<b>Platyrrhinidae</b>	
<i>Zanobatus schoenleinii</i>	2558(65726); 2566(65727)
<b>Rajidae</b>	
<i>Raja</i> sp.	2494(64915)
<i>R. barmardi</i>	2427(64336); 2450(65716); 2497(65715); 2506(64911); 2540(64927)
<i>R. miraletus</i>	2878(67751)
<i>R. straeleni</i>	2478(65725)
<b>Dasyatidae</b>	
<i>Dasyatis marmorata</i>	2878(67752)
<i>Gymnura micrura</i>	2734(68095)
<b>HOLOCEPHALI</b>	
<b>Callorhynchidae</b>	
<i>Callorhynchus capensis</i>	2698(68039)
<b>Chimaeridae</b>	
<i>Hydrolagus</i> sp.	2861(67976)
<i>H. mirabilis</i>	2852(67402)
<b>Rhinochimaeridae</b>	
<i>Neoharriotta pinnata</i>	2479(64323); 2531(64935); 2732(65973); 2782(66066)
<b>ACTINOPTERYGII</b>	
<b>ALBULIFORMES</b>	
<b>Albulidae</b>	
<i>Albula vulpes</i>	2870(65722)
<i>Pterothrissus belloci</i>	2439(65009); 2448(65607); 2691(65836)
<b>NOTACANTHIFORMES</b>	
<b>Halosauridae</b>	
<i>Halosaurus ovenii</i>	2441(64358); 2479(64376); 2504(64893); 2701(65805); 2702(65821); 2754(65933); 2772(66007); 2773(66016)
<b>ANGUILLIFORMES</b>	
<b>Heteranchelyidae</b>	
<i>Pythonichthys microphthalmus</i>	2499(64914); 2697(65849); 2776(68260); 2783(66074)
<b>Chlopsidae</b>	
<i>Chlopsis olokun</i>	2478(64396)
<b>Synphobranchidae</b>	
<i>Dysommia rugosa</i>	2764(66023)
<i>Synphobranchus affinis</i>	2441(64357); 2450(64351); 2496(64900); 2701(65806); 2763(65941); 2764(66024); 2828(66104)
<i>S. kaupii</i>	2515(64885); 2756(65969); 2763(65942); 2764(66025)

NAME	STATION NO. (SAIAB CATALOGUE NO. IN BRACKETS)
<b>Ophichthidae</b>	
<i>Echelus myrus</i>	2485(65746); 2709(67977); 2753(67978); 2856(67946); 2860(67948); 2876(67947); 2877(67945)
<i>E. pachyrhynchus</i>	2562(64937); 2693(68259); 2753(65967); 2855(67979)
<i>Mystriophis rostellatus</i>	2428(67980); 2495(65738); 2689(68257); 2692(67981); 2693(67982); 2697(67953); 2741(67942); 2752(65959)
<i>Pisodonophis semicinctus</i>	2435(65748); 2878(67943)
<b>Colocongridae</b>	
<i>Coloconger cadenati</i>	2497(64878); 2842(67386); 2843(67383)
<b>Congridae</b>	
<i>Bathycongrus bertini</i>	2428(64931); 2439(64936)
<i>Bathuroconger vicinus</i>	2450(64899); 2694(65845); 2701(65807); 2773(66015); 2788(66078); 2789(66084)
<i>Uroconger syringinus</i>	2751(65961); 2770(68258); 2774(66072); 2783(66062); 2852(67403); 2877(67944)
<i>Xenomystax congroides</i>	2532(64867); 2570(64881)
Unidentified leptocephali	2495(64874); 2497(64879)
<b>Muraenesocidae</b>	
<i>Cynoponticus ferox</i>	2435(65748); 2449(64330); 2458(64397); 2479(64375); 2727(67951); 2734(67952); 2807(66092); 2876(67950)
<b>Nemichthyidae</b>	
<i>Nemichthys scolopaceus</i>	2441(64356); 2450(64352); 2467(64402); 2488(64390)
<b>Serrivomeridae</b>	
<i>Serrivomer beanii</i>	2828(66103)
<b>Nettastomatidae</b>	
<i>Facciolella oxyrinchus</i>	2479(64374); 2496(64902); 2504(64894); 2842(67387); 2843(67384)
<i>Hoplunnis punctata</i>	2508(64898); 2509(64936); 2710(65868); 2745(65966)
<i>Nettastoma melanurum</i>	2496(64903); 2764(66026); 2852(67949)
Unidentified leptocephali	2507(64870); station data lost(67764); 2710(65873); 2852(67404)
<b>CLUPEIFORMES</b>	
<b>Clupeidae</b>	
<i>Etrumeus whiteheadi</i>	2689(65834)
<i>Ilisha africana</i>	2727(65898)
<i>Sardinella aurita</i>	2727(65899); 2816(66093)
<i>S. maderensis</i>	2443(65000); 2836(67905)
<b>Engraulidae</b>	
<i>Engraulis encrasicolus</i>	2486(64584); 2878(67754)
<b>SILURIFORMES</b>	
<b>Ariidae</b>	
<i>Arius heudeloti</i>	2798(68263)
<i>A. latiscutatus</i>	2770(67972); 2787(68262)
<i>A. parkii</i>	2435(64845); Luanda Harbour (64846)
<b>SALMONIFORMES</b>	
<b>Alepocephalidae</b>	
<i>Alepocephalus</i> sp.	2701(65813); 2764(66028)
<i>Leptoderma macrops</i>	2861(67734)
<i>Talismania antillarum</i>	2701(65812)
<i>T. homoptera</i>	2450(64350); 2488(64385); 2515(64882); 2701(65811); 2764(66027)
<i>Xenodermichthys copei</i>	2450(64347); 2467(64407); 2488(64386); 2701(65810); 2711(65875); 2722(65891); 2732(65978); 2763(65943); 2861(67735)
<b>Platyroctidae</b>	
<i>Mautisia microlepis</i>	2819(66097)
<b>STOMIFORMES</b>	
<b>Gonostomatidae</b>	
<i>Sigmops elongatus</i>	2488(64388); 2530(64933); 2710(65870); 2742(65990); 2779(66068); 2819(66095)
<i>Triplophos hemingi</i>	2732(65977); 2780(66064); 2788(66079)
<b>Sternoptychidae</b>	
<i>Sternoptyx diaphana</i>	2468(64380); 2488(64391)
<i>S. pseudodiaphana</i>	2468(64381)
<b>Phosichthyidae</b>	
<i>Yarella blackfordi</i>	2732(65974)
<b>Chauliodontidae</b>	
<i>Chauliodus sloani</i>	2742(65991)

<b>Stomidae</b>	
<i>Stomias boa boa</i>	2488(64392); 2732(65976); 2742(65989); 2763(65944)
<b>Astronesthidae</b>	
<i>Astronesthes barbatus</i>	2488(64387)
<i>Borostomias antarcticus</i>	2779(67762); 2861(67736)
<i>B. mononema</i>	2507(64913)
<b>Melanostomiidae</b>	
<i>Melanostomias</i> sp.	2780(66063)
<i>Odontostomias micropogon</i>	2450(64354); 2458(64398); 2467(64405); 2694(65844); 2780(66065)
<i>Photaneptes parvimanus</i>	2732(65975)
<b>AULOPIFORMES</b>	
<b>Aulopidae</b>	
<i>Aulopus cadenati</i>	2477(64976)
<b>Chlorophthalmidae</b>	
<i>Bathypterois quadrifilis</i>	2515(64883); 2773(66018); 2828(66107); 2852(67405)
<i>Chlorophthalmus atlanticus</i>	2439(64322); 2448(64328); 2449(64342); 2465(64411); 2466(64415); 2495(64873); 2577(64890); 2693(65843); 2843(67385); 2846(67377)
<i>Parasudis fraserbrunneri</i>	2449(64329); 2533(64924); 2542(64919); 2577(64889); 2713(65880); 2846(67378)
<b>Notosudidae</b>	
<i>Scopelosaurus smithii</i>	2467(64406); 2496(64901); 2754(65936); 2819(66096); 2828(66106)
<b>Synodontidae</b>	
<i>Sauida brasiliensis</i>	2436(65597); 2438(65564); 2457(65604)
<i>Trachinocephalus myops</i>	2836(67393); 2837(67396)
<b>Paralepididae</b>	
<i>Lestidiops cadenati</i>	2513(64909); 2552(64896); 2771(66012); 2774(66073); 2792(66083)
<i>L. similis</i>	2449(64332)
<i>Lestrolepis intermedia</i>	2774(69153); 2855(67398)
<b>MYCTOPHIFORMES</b>	
<b>Neoscopelidae</b>	
<i>Neoscopelus macrolepidotus</i>	2861(67737)
<b>Myctophidae</b>	
<i>Diaphus diadematus</i>	2878(67753)
<i>Lampadena pontifex</i>	2468(64382); 2489(64906); 2773(66017)
<i>Notoscopelus resplendens</i>	2488(64389)
<i>Scopelopsis mullipunctata</i>	2828(66105)
<b>GADIFORMES</b>	
<b>Macrouridae</b>	
<i>Bathygadus macrops</i>	2754(65934); 2799(66088); 2852(67976); 2861(67989)
<i>B. melanobranchus</i>	2450(64346); 2489(64905); 2828(66110); 2852(67407)
<i>Coelarinchus coelarinchus*</i>	2732(65980)
<i>Hymenocephalus gracilis</i>	2466(64419)
<i>H. italicus</i>	2842(67389)
<i>Malacocephalus occidentalis</i>	2440(64324); 2451(64412); 2458(64399); 2466(64934); 2479(64378)
<i>Nezumia aequalis</i>	2842(67388)
<i>N. africana</i>	2426(64339); 2861(67738)
<i>N. micronychodon</i>	2441(64355); 2722(65895)
<i>Trachyrinchus scabrous</i>	2518(64916); 2809(66091)
<b>Moridae</b>	
<i>Gadella imberbis</i>	2449(64327); 2458(64400); 2466(64420); 2467(64408); 2540(64926); 2722(65894); 2732(65979); 2763(65945); 2771(66013); 2772(66011); 2846(67379); 2852(67408); 2855(67397);
<i>Laemonema laureysi</i>	2458(64401); 2693(65839); 2721(65890); 2772(66010)
<i>Physiculus cyanostrophus</i>	2428(64343); 2709(64638); 2753(64639)
<i>P. huloti</i>	2765(66038); 2876(67742)
<b>Melanonidae</b>	
<i>Melanonus zugmayeri</i>	2701(65808); 2754(65935); 2763(65947); 2779(66071)
<b>Merlucciidae</b>	
<i>Merluccius polli</i>	2438(65563)
<b>OPHIDIIFORMES</b>	
<b>Ophidiidae</b>	
<i>Brotula barbata</i>	2429(65723); 2430(65545); 2431(65005); 2442(65010); 2448(65736); 2539(65011); 2707(68091); 2735(66001); 2762(65970); 2769(66040)
<i>Dicrolene intronigra</i>	2515(64884)
<i>Lamprogrammus exultus</i>	2489(65008); 2694(65848); 2732(65981); 2773(68035)

<i>Monomitopus metriostoma</i>	2515(64888); 2702(65823); 2710(65869); 2754(65938)
<i>Ophidion lozanoi</i>	2753(65968); 2771(66014); 2878(67755)
<b>Bythitidae</b>	
<i>Cataetys bruuni</i>	2710(65871); 2742(65992); 2763(65946)
<i>Cataetys laticeps</i>	2489(64904); 2507(64868)
<b>BATRACHOIDIFORMES</b>	
<b>Batrachoididae</b>	
<i>Perulibatrachus rossignoli</i>	2709(65860); 2856(67750)
<b>LOPHIIFORMES</b>	
<b>Lophiidae</b>	
<i>Lophiodes kempfi</i>	2458(64897); 2466(65609); 2497(64877); 2521(64932); 2529(64934); 2542(64920); 2553(65741); 2554(65744)
<i>Lophius vaillanti</i>	2479(65719); 2504(65720); 2723(65897)
<b>Antennariidae</b>	
<i>Antennarius senegalensis</i>	2739(65996)
<i>A. striatus</i>	2429(65543)
<b>Chaunacidae</b>	
<i>Chaunax suttkusi</i>	2433(64325); 2466(64421); 2479(64377); 2721(65888); 2741(65997); 2772(66009)
<b>Ogcocephalidae</b>	
<i>Dibranchius atlanticus</i>	2427(64333); 2432(64337); 2765(66039); 2772(66008)
<b>Melanocetidae</b>	
<i>Melanocetus johnsonii</i>	2702(65822); 2828(66108)
<b>Himantolophidae</b>	
<i>Himantolophus paucifilosus</i>	2722(65893)
<b>Diceratiidae</b>	
<i>Bufoceratias wedli</i>	2467(64403); 2488(64394); 2710(65864); 2779(66070); 2788(66081)
<i>Diceratias pileatus</i>	2480(64359); 2488(64393); 2710(65865); 2711(65877); 2722(65892); 2779(66069); 2788(66080); 2828(66109); 2852(67406)
<b>Oneirodidae</b>	
<i>Oneirodes eschrichtii</i>	2701(65803)
<b>Ceratiidae</b>	
<i>Ceratias holboellii</i>	2468(64379)
<i>Cryptosaras coeui</i>	2711(65876); 2712(65878)
<b>BELONIFORMES</b>	
<b>Exocoetidae</b>	
<i>Fodiator acutus</i>	Luanda Harbour (65962)
<i>Parexocoetus brachypterus</i>	2710(65872); 2842(67390)
<b>BERYCIFORMES</b>	
<b>Trachichthyidae</b>	
<i>Gephyroberyx darwini</i>	2439(64320); 2448(64341); 2571(64880)
<i>Hoplostethus cadenati</i>	2432(64338); 2515(64887); 2773(67987)
<b>Berycidae</b>	
<i>Beryx splendens</i>	2543(64929); 2742(68107)
<b>Melamphidae</b>	
<i>Scopelogadus beanii</i>	2468(64383); 2489(64907); 2754(65937)
<b>ZEIFORMES</b>	
<b>Macruricyttidae</b>	
<i>Zenion longipinnis</i>	2439(64321); 2495(64876); 2533(64923); 2543(64928); 2577(64892); 2712(65879); 2744(65965)
<b>Zeidae</b>	
<i>Cyrtopsis rosea</i>	2577(64891)
<i>Zenopsis conchifer</i>	Stallion data lost(67765); 2693(65841)
<i>Zeus faber</i>	2697(68100)
<b>Grammicolepididae</b>	
<i>Xenolepidichthys dalgleishi</i>	2495(64871)
<b>SYNGNATHIFORMES</b>	
<b>Fistulariidae</b>	
<i>Fistularia pelimba</i>	2767(66031)
<i>F. tabacaria</i>	2484(65103)
<b>SCORPAENIFORMES</b>	
<b>Scorpaenidae</b>	
<i>Ectreposebastes imus</i>	2468(64384); 2507(64869); 2742(65993); 2773(66019); 2789(66085)
<i>Helicolenus dactylopterus</i>	2428(65745); 2495(65510)
<i>Neomerinthe folgori</i>	2513(65015)
<i>Pontinus accraensis</i>	2428(69408); 2448(65608); 2553(65002); 2709(65862)
<i>P. leda</i>	2449(65588)
<i>Scorpaena angolensis</i>	2728(65987); 2747(65957); 2786(66077)
<i>S. elongata</i>	2495(65511); 2705(68031); 2709(68033)
<i>S. normani</i>	2431(65556); 2501(65496); 2704(65829); 2735(66002); 2736(66004); 2739(65995)
<i>S. scrofa</i>	2555(65733)
<i>S. stephanica</i>	2435(65561); 2538(65551); 2539(65678); 2714(68032)

<i>Setarches guentheri</i>	2495(64873); 2542(64922); Station data lost (67763); 2872(67746)
<b>Triglidae</b>	
<i>Cheilodichthys capensis</i>	2689(68264)
<i>C. gabonensis</i>	2475(65734); 2689(65835); 2699(65853); 2709(65859); 2766(66029); 2825(68093)
<i>Lepidotrigla cadmani</i>	2431(65559); 2434(65589); 2436(65596); 2437(65562); 2555(65521); 2573(65500)
<i>Peristedion catephractum</i>	2449(64331); 2578(64856); 2846(67380)
<i>Trigla lyra</i>	2553(65086); 2578(65519); 2693(65842); 2698(65852); 2846(67381); 2855(67399)
<i>Trigloporus lastoviza</i>	2709(68103)
<b>Platycephalidae</b>	
<i>Grammoplites gruveli</i>	2429(65542); 2454(65599); 2472(65611); Station data lost(67766); 2876(67744); 2877(67740)
<b>Psychrolutidae</b>	
<i>Ebinania costaecanarie</i>	2426(65103); 2427(64335); 2450(64353); 2467(64404); 2694(65847); 2701(65804)
<i>Psychrolutes inermis</i>	2710(65867)
<b>Liparidae</b>	
<i>Careproctus albescens</i>	2694(65846)
<b>PERCIFORMES</b>	
<b>Acropomatidae</b>	
<i>Synagrops bellus</i>	2513(64910); 2533(64925)
<i>S. microlepis</i>	2438(64344); 2465(64409)
<b>Dinopercidae</b>	
<i>Centrarchos atlanticus</i>	2539(65735); 2808(68106)
<b>Serranidae</b>	
<i>Anthias anthias</i>	2442(68084); 2555(68085); 2705(68041)
<i>Cephalopholis nigri</i>	Luanda Harbour(65498); 2539(65677)
<i>Epinephelus aeneus</i>	2435(64958); 2444(64996); 2539(65680)
<i>E. caninus</i>	2429(65540)
<i>E. costae</i>	2547(64995); 2747(67970); 2834(68255)
<i>E. haifensis</i>	2429(65539); 2703(65814); 2745(68256)
<i>E. marginalis</i>	2430(65623)
<i>Mycteroperca rubra</i>	Luanda Harbour(65964)
<i>Rypticus saponaceus</i>	2539(65609); 2717(65882); 2878(67756)
<i>Serranus heterurus</i>	2538(65552); 2539(65682)
<b>Priacanthidae</b>	
<i>Priacanthus arenatus</i>	2471(64986); 2703(65819)
<b>Apogonidae</b>	
<i>Apogon affinis</i>	2767(66034); 2878(67759)
<i>A. imberbis</i>	2539(65675); 2767(66035)
<b>Epigonidae</b>	
<i>Epigonus constanciae</i>	2429(64345); 2495(64872); 2721(65889)
<i>E. pandionis</i>	2553(64930); 2842(67391)
<b>Malacanthidae</b>	
<i>Branchiostegus semifasciatus</i>	2443(65724); 2708(67968)
<b>Pomatomidae</b>	
<i>Pomatomus saltatrix</i>	2695(68111)
<b>Carangidae</b>	
<i>Alectis alexandrina</i>	2444(65742)
<i>A. ciliaris</i>	2446(64999)
<i>Caranx hippos</i>	2474(65721)
<i>Chloroscombrus chrysurus</i>	2703(65818); 2748(65955)
<i>Decapterus punctatus</i>	2816(66094)
<i>Selene dorsalis</i>	2429(65538); 2430(64963); 2431(65728); 2473(65620); 2522(65490); 2533(65492); 2703(68114); 2728(65986); 2767(68033)
<i>Trachinotus qoreensis</i>	2446(65012); 2768(68036)
<i>T. ovatus</i>	2717(65883)
<i>Trachurus capensis</i>	2443(65616)
<i>T. trecae</i>	2443(65615); 2824(66102)
<b>Coryphaenidae</b>	
<i>Coryphaena equisetis</i>	Angling near station 2835(65106)
<b>Bramidae</b>	
<i>Brama brama</i>	2701(65809)
<b>Caristiidae</b>	
<i>Paracarastius maderensis</i>	2489(64908); 2754(65939); 2763(65948); 2773(66020); 2788(66082); 2789(66086); 2828(66111)
<b>Emmelichthyidae</b>	
<i>Erythrocles monodi</i>	2464(65594); 2470(65600); 2705(68105)
<b>Lutjanidae</b>	
<i>Lutjanus fulgens</i>	2748(65956)
<b>Garreidae</b>	
<i>Eucinostomus melanopterus</i>	2444(65587); 2473(65621); 2798(66089)
<b>Haemulidae</b>	
<i>Brachydeuterus auritus</i>	2706(65825)
<i>Parakuhlia macrophthalmus</i>	2539(65681); Luanda Harbour(65952); Luanda Harbour(65963)
<i>Parapristipoma octolineatum</i>	2708(68115)
<i>Plectorhinchus mediterraneus</i>	2715(68108); 2717(65884)

<i>Pomadasyus incisus</i>	2703(65820); Luanda Harbour(65954)
<i>P. tubelini</i>	2728(68040)
<i>P. perotaei</i>	2728(67973)
<i>P. rogerii</i>	2539(65674)
<b>Sparidae</b>	
<i>Dentex angolensis</i>	2477(65515); 2705(68116)
<i>D. barnardi</i>	2472(65612); 2698(68092)
<i>D. congoensis</i>	2442(65605); 2471(65591); 2475(64588); 2502(65626)
<i>D. gibbosus</i>	2699(65855)
<i>D. macrophthalmus</i>	2477(64978); 2691(65837)
<i>Diplodus sargus cadenati</i>	Luanda Harbour(65950)
<i>Lithognathus mormyrus</i>	2703(68104)
<i>Pagellus bellottii</i>	2472(65813); 2699(65854)
<i>Spondyliosoma cantharus</i>	2431(64972); 2703(65815); 2707(65828)
<b>Centracanthidae</b>	
<i>Boops boops</i>	2431(65555); 2470(65014); 2703(65816)
<i>Spicara alta</i>	2464(65595); 2470(65601); 2705(65830)
<b>Sciaenidae</b>	
<i>Atractoscion aequidens</i>	2689(65832)
<i>Pseudotolithus senegalensis</i>	Luanda Harbour(64973)
<i>Pteroscion peli</i>	2528(64643); 2878(67758)
<i>Umbrina canariensis</i>	2689(65833)
<b>Mullidae</b>	
<i>Pseudupeneus prayensis</i>	2472(65614); Luanda Harbour(65504); 2703(65817); 2767(66032)
<b>Drepanidae</b>	
<i>Drepane africana</i>	2474(64992); 2728(68090); 2786(88089)
<b>Ephippidae</b>	
<i>Chaetodipterus lippei</i>	2538(65003); 2539(65679)
<b>Chaetodontidae</b>	
<i>Chaetodon hoefleri</i>	2429(64980); 2430(64962); 2431(64964); 2437(64983); 2455(65740); 2482(64648); 2703(68113); 2734(66003); 2767(79497)
<i>C. robustus</i>	2539(65671); 2767(68110); Luanda Harbour(65949)
<i>Prognathodes marcellae</i>	2482(64605); 2525(65485)
<b>Pomacentridae</b>	
<i>Chromis chromis</i>	2538(65554)
<b>Cepolidae</b>	
<i>Cepola pauciradiata</i>	2782(65971)
<b>Polynemidae</b>	
<i>Galeoides decadactylus</i>	2473(65729); Luanda Harbour(64993); 2706(65824); 2727(68112); 2768(66042)
<i>Pentanemus quinquarius</i>	2727(65900)
<b>Labridae</b>	
<i>Bodianus speciosus</i>	2484(64629)
<i>Xyrichtys novacula</i>	2556(65484); 2729(65985)
<b>Zoarcidae</b>	
<i>Pachycara crossacanthum</i>	2515(64886); 2722(65896)
<b>Trachinidae</b>	
<i>Trachinus armatus</i>	2878(67757)
<i>T. pellegrini</i>	2825(66100)
<b>Uranoscopidae</b>	
<i>Uranoscopus albesca</i>	2481(65507); 2554(65487); 2714(65681); 2720(65887); 2730(65983); 2736(67988)
<i>U. cadenati</i>	2431(65558); 2452(65618); 2457(65602); 2477(65517); 2478(65495); 2719(65885)
<b>Percophidae</b>	
<i>Bembrops sp. n.</i>	2457(64414); 2478(64395); 2499(64854)
<i>B. greyi</i>	2542(64921); 2578(64855); 2552(65523)
<b>Labrisomidae</b>	
<i>Labrisomus nuchipinnis</i>	Luanda Harbour(65951)
<b>Callionymidae</b>	
<i>Synchiropus phaeon</i>	2855(67400)
<b>Gobiidae</b>	
<i>Awaous lateristriga</i>	Luanda Harbour(65953)
<i>Lesueurigobius koumansii</i>	2452(65617); 2487(65486); 2499(65625); 2697(65850); 2730(65982); 2735(66000); 2784(66075)
<b>Acanthuridae</b>	
<i>Acanthurus monroviae</i>	2484(64844)
<b>Gempylidae</b>	
<i>Gempylus serpens</i>	2450(65001); 2468(65593)
<b>Trichiuridae</b>	
<i>Aphanopus carbo</i>	2809(68038)
<b>Centrolophidae</b>	
<i>Schedophilus pamarco</i>	2707(65826); 2792(67986)
<b>Nomeidae</b>	
<i>Cubiceps pauciradiatus</i>	2710(65866); 2754(65940); 2773(66021); 2819(66098); 2852(67410)
<i>Psenes pellicidus</i>	2811(68097); 2819(66099); 2861(67739)
<b>Ariommatidae</b>	
<i>Ariomma bondi</i>	2576(65502); 2858(67745); 2859(67747)
<i>A. melanum</i>	2569(64895); 2742(65994); 2841(67392)
<b>Stromateidae</b>	
<i>Stromateus fiatola</i>	2727(65901)

<b>PLEURONECTIFORMES</b>	
<b>Citharidae</b>	
<i>Citharus linguatula</i>	2452(65619); 2454(65598); 2456(65592); 2457(65605); 2557(65739)
<b>Paralichthyidae</b>	
<i>Citharichthys stampflii</i>	2485(65512)
<i>Syacium micrurum</i>	2573(65501)
<b>Bothidae</b>	
<i>Arnoglossus imperialis</i>	2429(65544); 2430(65622); 2555(65520)
<i>Bothus podas</i>	2836(67394); 2878(67760)
<i>Chascanopsotta lugubris</i>	2552(65522); 2578(65518); 2846(67382)
<b>Soleidae</b>	
<i>Monolele microstoma</i>	2440(65506); 2448(65606); 2457(65603); 2477(65516); 2478(65494); 2533(65493)
<i>Dicologlossa cuneata</i>	2689(65831); 2699(65856); 2798(66090); 2878(67761)
<i>Solea hexophthalma</i>	2767(66037)
<i>Microchirus boscanion</i>	2691(65838); 2692(65851)
<i>M. frechkopi</i>	2431(65657); 2501(65497); 2707(65827); 2709(65861); 2752(65960); 2769(66041); 2869(67749); 2876(67743); 2877(67741)
<i>M. wittei</i>	2508(64534)
<i>Monochirus hispidus</i>	2485(65683); 2539(65513); 2766(66030); 2825(66101)
<i>Vanstraelenia chirophthalma</i>	2430(65624); 2703(67969)
<i>Bathysoela polli</i>	2777(66067); 2855(67401)
<b>Cynoglossidae</b>	
<i>Cynoglossus canariensis</i>	2727(67974); 2773(66022); 2869(68099)
<i>Symphurus ligulatus</i>	2518(65491); 2529(65488)
<b>TETRAODONTIFORMES</b>	
<b>Balistidae</b>	
<i>Balistes capriscus</i>	2445(64853); 2446(64849); 2729(68102)
<i>B. punctatus</i>	2566(64965)
<b>Monacanthidae</b>	
<i>Aluterus heudelotii</i>	2445(64852); 2446(64851); 2835(68261); 2836(67395)
<b>Tetraodontidae</b>	
<i>Ephippion guttifer</i>	2444(64997); 2735(68109)
<i>Lagocephalus laevigatus</i>	2716(68037)
<i>Sphoeroides marmoratus</i>	2538(65553); 2539(65670); 2728(65988); 2767(66036)
<i>S. pachygaster</i>	2490(64975)
<b>Diodontidae</b>	
<i>Chilomycterus spinosus</i>	2446(65690); 2706(68101); 2747(65958); 2870(67748)
* Note: Spelling of <i>C. coelorhincus</i> follows recommendation of T. Iwamoto in e-mail to E. Anderson, based on original intent of author.	