



## Coastal Fishes of São Tomé and Príncipe islands, Gulf of Guinea (Eastern Atlantic Ocean)—an update

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## Abstract

Here we report 59 new records of shore fishes for São Tomé and Príncipe islands (Gulf of Guinea), Eastern Atlantic Ocean. Ten of these are new species still to be described, including a new genus of a gobiid fish that lives in association with an axiid shrimp. A large proportion of the shore fishes of São Tomé and Príncipe occur on both sides of the Atlantic and many have their sister-species in the western Atlantic. To a lesser degree, there are also affinities to the western Indian Ocean.

**Key words:** Eastern Central Atlantic, marine biodiversity, reef fish, ampho-Atlantic species

## Introduction

Afonso *et al.* (1999) summarized the state of knowledge of the coastal marine fishes of São Tomé and Príncipe; they reported the presence of 185 species. Here we report 59 additional species recorded during an expedition in February 2006 sponsored by the National Geographic Society (principal investigator S.R. Floeter) and two previous expeditions (August 2002, February 2004) by the first author, as well as species caught during two multidisciplinary expeditions sponsored by the California Academy of Sciences in March–April 2001 (see Drewes & Wilkinson 2004) and in April–May 2006. We also include species identified from underwater photos taken by Jean Louis Testori and Pedro Vasconcelos. In addition, we include the information that has appeared on shore fishes from São Tomé and Príncipe since the publication of Afonso *et al.* (1999).

The fish fauna of the archipelago of São Tomé and Príncipe is of special interest because the easterly flowing Equatorial currents (the seasonal Equatorial Counter Currents and the subsurface Equatorial Undercurrent) link the western Atlantic and the eastern Atlantic at this latitude. The marine invertebrate fauna of São Tomé and Príncipe is known to consist of a mix of the two faunal regions (Scheltema 1971, 1995; Laborel 1974; Wirtz 2001, 2003, 2004).

## Material and methods

Observations were made while snorkeling or SCUBA diving. Specimens were caught under water or from tide pools with hand nets using quinaldine and the ichthyocide rotenone. A minnow seine was used in river mouths. Additional specimens were obtained from local fishermen, who had caught them with beach seine nets or with hook and line, and from the fish market of São Tomé City.

Fish were photographed under water and during numerous visits to São Tomé fish markets. Selected species were also photographed in a small photo-aquarium.

Coastal fish are here defined as fish that can be encountered in the first 60 m depth starting from shore (i.e. in SCUBA diving range) and those open sea species that come close enough to the shore to be occasionally seen by divers.

Specimens are deposited in the collections of the following institutions: California Academy of Sciences, San Francisco (CAS), Staatliches Museum für Naturkunde Stuttgart, Germany (SMNS), Universidade Federal da Bahia, Salvador, Brazil (UFBA), Universidade Federal do Espírito Santo, Vitória, Brazil (UFES), and Bavarian State Collection of Zoology, München, Germany (ZSM).

The taxonomy mainly follows Eschmeyer (2006). The families are ordered according to Nelson (2006); species are arranged alphabetically under the family name.

Geographical coordinates of the main sampling sites are as follows. Príncipe: Bom Bom Islet: 1°41'N, 7°24'E; Pedra da Galé: 1°43'N, 7°22'E; São Tomé: São Tomé City: 0°20'N, 6°44'E; Ilhéu das Cabras: 0°25'N, 6°42'E; Kia: 0°25'N, 6°42'E; Morro Peixe: 0°24'N, 6°39'E; Lagoa Azul: 0°24'N, 6°37'E; Diogo Vaz: 0°19'N, 6°29'E; Santana Islet: 0°15'N, 6°46'E; Sete Pedras: 0°03'N, 6°38'E; Rolas Island: 0°00'N, 6°31'E.

## Results

Below we present a list of the 59 new records, including 10 new species and one new genus. We provide additional information on another 17 species.

### Torpedinidae

#### *Torpedo* n. sp. 1

A small, spotted electric ray, collected from a patch of sandy bottom in about 30 m depth on the steep seaward side of Pedra da Galé, Príncipe Island; released after being photographed (Figure 1). The species is currently being described by B. Seret.



**FIGURE 1.** *Torpedo* n. sp., Pedra da Galé, photo P. Wirtz.

### ***Torpedo n. sp. 2***

A brown electric ray that, according to J. L. Testori, is common around São Tomé. The species was identified from the photo (Figure 2) taken at Morro Peixe (no specimen collected). The species is currently being described by B. Seret.



**FIGURE 2.** *Torpedo n. sp.*, Morro Peixe, photo J.L. Testori.

### **Dasyatidae**

#### ***Dasyatis aff. hastata* DeKay, 1842**

A photograph taken by Jean Louis Testori near Pedra da Galé, Príncipe Island, shows a species very similar to the western Atlantic *Dasyatis hastata* DeKay, 1842. Bernard Seret (pers. comm. to PW in May 2006) wrote that this stingray is probably a similar but distinct species.

#### ***Taeniura grabata* (Geoffroy Saint-Hilaire, 1817)**

This species was observed during a dive at Diogo Vaz, São Tomé, in about 15 m depth and photographed by P. Vasconcelos near Rolas Island and by J. L. Testori at Pedra da Galé, Príncipe.

### **Muraenidae**

#### ***Echidna peli* (Kaup, 1856)**

CAS 215007 (32 juv. specimens), mouth of creek flowing into Praia Rei, Baia das Agulhas, Príncipe. CAS 224116 (45 specimens), small stream flowing into Praia das Agulhas at southern end, Príncipe. SMNS 25267 (1 juv. specimen), from a tide pool near Lagoa Azul, São Tomé. Recorded from São Tomé by Smith (in press).

## Congridae

### *Heteroconger longissimus* Günther, 1870

Despite small differences in color (a white band on the nape, see Figure 3), this common garden eel probably belongs to the species *H. longissimus*, known from the tropical western Atlantic and from Madeira to the Cape Verde Islands in the eastern Atlantic. Specimens are needed to confirm its identity. Colonies were seen on soft bottoms, no shallower than 10 m depth and down to at least 30 m depth, at Lagoa Azul, Diogo Vaz and Santana Islet.



**FIGURE 3.** *Heteroconger longissimus*, Diogo Vaz, photo P. Wirtz.

### *Paraconger caudilimbatus* (Poey, 1867)

The head of a *Paraconger* species (Figure 4) was seen sticking out of holes in the sand in Lagoa Azul at a depth of about 25 m, in the same area where *Heteroconger longissimus* was observed. A small congrid, probably belonging to the same species, was seen swimming over the sand during a night dive at the same place and was collected (SMNS 25228). It is *Paraconger caudilimbatus*, previously only known from the western Atlantic, from North Carolina to Venezuela. The specimen was identified using the key published by Kanazawa (1961: 7); though the vertebral formula could not be determined, the specimen differs from the eastern Atlantic species *Paraconger notialis* Kanazawa, 1961 in the presence of a 5<sup>th</sup> supraorbital pore and postorbital pores. The specimen otherwise well agrees with *P. caudilimbatus*, having 38 pores in the lateral line anterior to the anus, the gill opening anterior to the upper edge of the pectoral fin base, 13 pectoral fin rays, 10 preoperculo-mandibular pores, and a supratemporal pore.



**FIGURE 4.** *Paraconger caudilimbatus*, Lagoa Azul, photo P. Wirtz.



FIGURE 5. Unidentified ophichthyid, in front of Lagoa Azul, photo L.A. Rocha.

## Ophichthidae

### *Ophichthus rufus* (Rafinesque-Schmaltz, 1810)

CAS 214569 (1 specimen); Príncipe Island; mouth of Agua Maria Correia, Baia das Agulhas; rotenone.

### *Ophichthinae* indet.

This snake eel was photographed in front of Lagoa Azul in about 15 m depth (Figure 5). Identification follows a pers. comm. by J. McCosker to PW (March 2006).

### *Dalophis boulengeri* (Blache, Cadenat & Stauch, 1970)

CAS 219924 (2 specimens); mouth of creek flowing into Praia Rei, Baia das Agulhas, Príncipe Island.

## Clupeidae

### *Ethmalosa fimbriata* (Bowdich, 1825)

CAS 214636 (1 specimen) taken off Marlin Beach Hotel in São Tomé by local fishermen using a large beach seine.

### *Sardinella rouxi* (Poll, 1953)

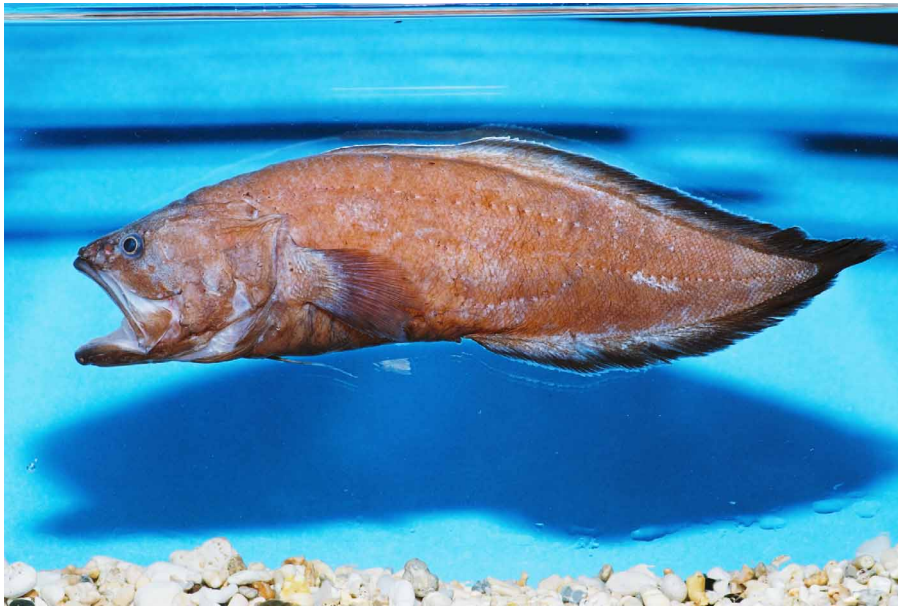
CAS 224092 (4 specimens), Praia das Agulhas, Príncipe Island. Dense swarms of this species were commonly seen near the pier of Bom Bom islet, Príncipe (SMNS 24245, 1 specimen). Another specimen was obtained from a fisherman at Lagoa Azul (SMNS 25240, 1 specimen).

## Bythitidae

### *Grammonus longhursti* (Cohen, 1964)

SMNS 24200 (1 specimen), 25236 (2 specimens). A wide channel, 6 m deep, transverses Santana Islet. On the seaward side of this channel, a small cave extends about 8 m into the rock. Five individuals of an unidentified bythitid were observed in this cave (Figure 6). J. Nielsen of the Zoologisk Museum, University of Copenhagen identified the three collected specimens as *Grammonus longhursti*. This species was previously

known only from the type series from Nigeria. The presence of this fish species at São Tomé island was briefly mentioned in a paper on shrimps from São Tomé and Príncipe (Wirtz, 2004).



**FIGURE 6.** *Grammonus longhursti*, animal from Santana Island, photo JL Gasparini;

***Antennarius multiocellatus* (Valenciennes in Cuvier & Valenciennes, 1837)**

SMNS 25245 (1 specimen). This species was encountered in a night dive at Lagoa Azul, São Tomé, in about 8 m depth.

***Antennarius pardalis* (Valenciennes in Cuvier & Valenciennes, 1837)**

SMNS 24241 from near Bom Bom islet, Príncipe, in 15 m depth. Afonso *et al.* (1999) noted that the presence of this species at São Tomé needs confirmation because of the bad preservation of a specimen previously reported by Osório (1891, 1898). Our specimen is in perfect condition and clearly belongs to this species.

**Mugilidae**

***Liza grandisquamis* (Valenciennes in Cuvier & Valenciennes 1836)**

CAS 2145625 (1 specimen) São Tomé, Agua Micondo, using rotenone.

***Mugil curema* Valenciennes in Cuvier & Valenciennes, 1836**

CAS 214430 (1 specimen) Príncipe, mouth of Agua Maria Correia, Baia das Agulhas, rotenone. Also photographed (by PW) in Lagoa Azul in about 5 m depth.

**Syngnathidae**

***Hippocampus algiricus* Kaup, 1856**

CAS 21441 (1 specimen) Príncipe, mouth of a creek flowing into Praia Rei, Bahia das Agulhas. UFES 154 (4 specimens) Lagoa Azul. Afonso *et al.* (1999) used the synonym *H. punctulatus* Guichenot, 1853. A color photo of an animal from São Tomé was printed in Debelius (1998) and in Kuitert (2000) under the syn-

onym *H. deanei* Duméril, 1857. According to Lourie *et al.* (2004), the habitat is unknown. The NGS expedition found this to be a common species in shallow water (from 1 m depth down to at least 25 m depth), frequently clinging to large sponges.

***Microphis brachyurus aculeatus* (Kaup, 1856)**

CAS 214545 (1 specimen) São Tomé, Rio Provache (Provaz) near mouth, by minnow seine. CAS 214627 (10 specimens) São Tomé, near the mouth of Rio Lemba, minnow seine. CAS 214437 (1 specimen) Príncipe Island, mouth of a creek flowing into Praia Rei, Baía das Agulhas, rotenone.

**Scorpaenidae**

***Pontinus accraensis* Norman, 1935**

CAS 214649 (1 specimen) from São Tomé fish market.

***Scorpaenodes africanus* Pfaff, 1933**

SMNS 25256 (1 specimen) and UFES 145 (1 specimen) from Lagoa Azul, Figure 7.

**Serranidae**

***Alphestes afer* (Bloch, 1793)**

On 4 March 2004, PW photographed a grouper in the fish market of São Tomé City that was unfamiliar to him. A tissue sample for genetic analysis was also obtained. The fish was identified as *Alphestes afer* (Bloch, 1793) by P.C. Heemstra and an examination of DNA sequences by M.T. Craig also indicated that the specimen was close to western Atlantic specimens of the same species (Craig *et al.* 2007).



**FIGURE 7.** *Scorpaenodes africanus*, animal from Lagoa Azul, photo J.L. Gasparini.

***Serranus n. sp.***

SMNS 24244 (2 specimens) from Bom Bom islet. UFES 150 (4 specimens) from Lagoa Azul. This undescribed species of the genus *Serranus* is common on hard and soft bottoms at São Tomé and Príncipe (Figure 8). A photograph by PW of this serranid is given in Debelius (1998: 148). This species is currently being described by P. Heemstra. Because the fin ray counts of this species are similar to those of the Mediterranean-



eastern Atlantic species *Serranus cabrilla*, and because it is very a common species difficult to overlook, we suspect that this is what Osório (1891, 1898) called *Serranus cabrilla*.



**FIGURE 8.** *Serranus n. sp.*, Rolas Island, photo P. Wirtz

***Liopropoma n. sp.***

An undescribed species of the genus *Liopropoma* was encountered when diving at steep cliff walls at Pedra da Galé, Príncipe (Figure 9) and at Diogo Vaz, São Tomé. The solitary animals were encountered between 32 and 45 m depth. Attempts to catch a specimen failed. This is the first record of the genus *Liopropoma* in the eastern Atlantic. This genus was known only from the Indo-Pacific and from the western Atlantic.



**FIGURE 9.** *Liopropoma n. sp.*, Pedra da Galé, photo P. Wirtz.

***Mycteroperca sp.***

An unidentified serranid of the genus *Mycteroperca*, closely resembling *Mycteroperca fusca* (Lowe, 1836), was briefly seen near Rolas Island in 20 m depth and two locally caught individuals of this species were seen in a restaurant. Unfortunately no photographs, measurements, or samples for genetic analysis were taken and thus we cannot state if the species is *Mycteroperca fusca*, the closely related and similar species *M. rubra* (Bloch, 1793), or an undescribed species.

### ***Rypticus subbifrenatus* Gill, 1861**

The presence of this species at São Tomé was recorded by Carlin *et al.* (2003). A juvenile was caught in a tide pool at Bom Bom islet, Príncipe Island (SMNS 24511, 1 specimen). An adult animal was photographed by CLS at Lagoa Azul, São Tomé in 7 m depth.

### ***Rypticus saponaceus* (Bloch & Schneider, 1801)**

UFBA 02802 (2 specimens) from Kia. Carlin *et al.* (2003) noted that the fish from the Cape Verde Islands and from São Tomé Island tentatively identified as *Rypticus saponaceus* are so genetically distinct from western Atlantic specimens that they may belong to a different species. A morphological comparison between eastern and western Atlantic animals is being carried out by C. L. Sampaio, C. E. L. Ferreira and M. Craig.

### ***Pseudogramma guineensis* (Norman, 1935)**

*Pseudogramma guineensis* was previously known only from the holotype (as redescribed by Randall and Baldwin, 1997: 31–32, fig. 6). The specimens in SMNS 25235 (18.2–25.5 mm SL) from rocky bottom in 22 m depth at Sete Pedras agree with the holotype in lacking a supraorbital tentacle, having VII, 20 dorsal fin rays, and 17–18 pectoral fin rays. The SMNS specimens have III, 17 and III, 16 anal fin rays, respectively, while the similar species *P. gregoryi* (Breder, 1927) has III, 14–16. The holotype of *P. guineensis* has 16 lateral line scales, while SMNS has 22–24, and *P. gregoryi* has 24–30. The lateral scales in a longitudinal row are 48 in the holotype of *P. guineensis*, 46–48 in SMNS 25235, and 42–46 in *P. gregoryi*. Lateral line scales and longitudinal lateral scale rows are thus not useful to distinguish the two species. Brito *et al.* (1999) recorded *Pseudogramma bermudensis* (Kanazawa, 1952) from the Cape Verde Islands. Lubbock (1980) recorded this species from Ascension Island. *Pseudogramma bermudensis* is a synonym of *P. gregoryi* (Breder, 1927). Alberto Brito informed us (pers. comm. to PW) that his specimen from the Cape Verde Islands has now been re-identified as *P. guineensis* and suggested that the São Tomé *Pseudogramma* might belong to this species. The identity of the Ascension *Pseudogramma* needs checking.

## **Apogonidae**

### ***Apogon imberbis* (Linnaeus, 1758)**

SMNS 24205 (5 specimens) North coast Príncipe Island and 25259 (1 specimen) Diogo Vaz; UFBA 02796 (1 specimen) from Diogo Vaz. Afonso *et al.* (1999) recorded this species based on an underwater photograph. Our collected specimens allowed identification not only morphologically but also by genetic comparison with specimens from the Azores and from the Canary Islands (Vera Domingues, pers. comm. to SRF).

### ***Apogon affinis* (Poey, 1875)**

UFES 174 (many specimens) and UFBA 02795 (1 specimen) from 17 m depth at Kia, where the species formed large schools at the lower edge of a rocky wall.

### ***Apogon pseudomaculatus* Longley, 1932**

UFES 175 (2 specimens) and UFBA 02797 (3 specimens) from Diogo Vaz.. This species, previously only known from the western Atlantic, was encountered at a steep rocky cliff in 37 to 41 m depth (Figure 10). It appeared to be common in small caves and under ledges. Its identity was confirmed in a genetic comparison with Brazilian specimens of the same species (Rocha, unpublished).



**FIGURES 10.** *Apogon pseudomaculatus*, Diogo Vaz, photo L.A. Rocha.

***Phaeoptix pigmentaria* (Poey, 1860)**

A single specimen of this species turned up in material collected at Lagoa Azul (SMNS 25260). It is no longer possible to reconstruct the depth and habitat, where the animal was taken. This predominantly western Atlantic species, known from Bermuda to Brazil, has previously been recorded from Annobón Island in the eastern Atlantic (Fraser & Robins, 1970).

**Epigonidae**

***Epigonus constanciae* (Giglioli, 1880)**

Several individuals of *E. constanciae* were seen in the small cave in Santana Island and one was collected (SMNS 25277, 1 specimen).

**Carangidae**

***Caranx lugubris* Poey, 1860**

This circumtropical carangid was seen at Diogo Vaz by LR and CLS, between 10 and 20 m depth, and again between 25 and 30 m. Photographed by J.L. Testori at Diogo Vaz.

***Caranx* n. sp.**

This undescribed species resembling *C. hippos* (Linnaeus, 1766) is being described by W. Smith-Vaniz and K. Carpenter (in press). It is characterized by a conspicuously white anal fin edge and large adults have a rather deep body and long dorsal and anal fin lobes. A large adult was photographed near Bom Bom Islet, Príncipe, in 15 m depth (Figure 11) and observed by CLS and PW at Diogo Vaz, São Tomé, in 25–30 m depth. Elsewhere this species has been recorded from Mauritania to Angola and from Ascension Island (Smith-Vaniz, pers. comm.). The species was identified from photos (only a tissue sample was collected from a specimen from São Tomé fish market).

***Caranx hippos* (Linnaeus, 1766)**

*Caranx hippos* also occurs at São Tomé. It is characterized by a yellow anal fin, shorter dorsal and anal fin lobes and fewer anal fin rays (16 or 17 versus 17–19, usually 18) than the undescribed *Caranx* species. It was

observed by PW in São Tomé City fish market. The records mentioned in Afonso *et al.* (1999) could belong to either *Caranx* species.



**FIGURES 11.** *Caranx n. sp.*, Bom Bom, photo P. Wirtz.

***Carangoides bartholomaei* (Cuvier in Cuvier & Valenciennes, 1833)**

Carangids that appear to be this species, previously only known from the western Atlantic, were repeatedly observed and photographed near Bom Bom Islet, Príncipe Island (Wirtz 2005a). Specimens are needed to confirm the identification.

***Caranx latus* Agassiz, 1831**

This species can commonly be seen in São Tomé City fish market. It was also frequently observed and photographed, both at Príncipe and São Tomé Islands. CAS 214558 (1 juv.) at mouth of Rio do Ouro, São Tomé and CAS 214560 (1 juv.) at Rio Papagaios, Príncipe.

***Seriola rivoliana* Valenciennes in Cuvier & Valenciennes, 1833**

An underwater photo of this common circumtropical species was taken by Pedro Vasconcelos at Sete Pedras.

**Lutjanidae**

***Lutjanus endecacanthus* Bleeker, 1863**

An underwater photo of this species was taken near Rolas Island, São Tomé (Figure 12). The CAS expedition collected this species at the mouth of a creek flowing into Praia Rei, Baía das Agulhas, São Tomé (CAS 214626, 4 juv.) and at Praia das Agulhas, Príncipe (CAS 224117, 1 specimen).

**Haemulidae**

***Brachydeuterus auritus* (Valenciennes in Cuvier & Valenciennes, 1831)**

SMNS 25242 (2 specimens) from fish market São Tomé City.



FIGURES 12. *Lutjanus endecacanthus*, Rolas Island, photo P. Wirtz.

### Sciaenidae

#### *Pseudotolithus senegallus* (Cuvier, 1830)

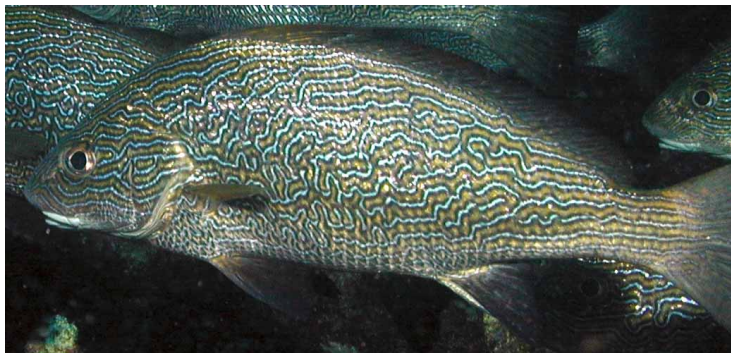
CAS 224121 (1 specimen) and CAS 224126 (1 specimen) from São Tomé City fish market. This was called *P. brachygnathus* Bleeker, 1863 by Afonso *et al.* (1999).

#### *Pseudotolithus senegalensis* (Valenciennes, 1833)

CAS 224126 (1 specimen) from São Tomé City fish market.

#### *Umbrina cirrosa* (Linnaeus, 1758)

Seen in São Tomé City fish market. Photographed (Figure 13) near Rolas Island.



FIGURES 13. *Umbrina cirrosa*, Rolas Island, photo P. Vasconcelos.

### Monodactylidae

#### *Monodactylus sebae* (Cuvier, 1829)

Photographed by J. L. Testori below the pier near the Marlin Beach Hotel.

## Pomacanthidae

### *Centropyge aurantonotus* Burgess, 1974

This angelfish, previously only known from the western Atlantic (from Barbados to south-eastern Brazil), was collected at Sete Pedras, on rocky bottom in about 22 m depth (SMNS 25234, 1 specimen). The dive guide knew the species and claimed to have seen it several times already; thus the specimen collected probably was not a lone stray animal.

## Chaetodontidae

### *Prognathodes marcellae* (Poll, 1950)

SMNS 25251 (1 specimen), Diogo Vaz; SMNS 25280 (1 specimen) Diogo Vaz. UFES 158 (4 specimens) Ilhéu Santana, São Tomé. This is a common species at São Tomé island, predominantly from deeper than 20 m but occasionally as shallow as 5 m depth. A photo of a pair from Rolas Island was printed in Wirtz (2005a) under the name *Chaetodon marcellae*.

## Pomacentridae

### *Abudefduf taurus* (Müller & Troschel, 1848)

This is a common species in shallow water and in tide pools at São Tomé and Príncipe. It is surprising that it has not previously been recorded. It was observed in cleaning activities at Lagoa Azul.

## Labridae

### *Bodianus pulchellus* (Poey, 1860)

UFES 173 (4 specimens) and UFBA 02807 (1 specimen) from Diogo Vaz, São Tomé. The animals at São Tomé appear somewhat different in color from those in the western Atlantic (see the photo on page 204 in Debelius, 1998). Genetic comparisons are being carried out by L. Rocha. A juvenile was observed cleaning a Green Turtle, *Chelonia mydas* (Linnaeus, 1758), in 12 m depth by CLS at Diogo Vaz.

### *Clepticus africanus* Heiser, Moura & Robertson, 2000

UFBA 02798 (1 specimen) from Diogo Vaz. Afonso *et al.* (1999) noted the presence of an undescribed *Clepticus* at São Tomé. The species was later described by Heiser *et al.* (2000) with specimens from São Tomé. It is a common shore fish not only at São Tomé but also at Príncipe. J. Laborel (pers. comm. to PW) stated that it is also common at Annobón Island.

### *Thalassoma newtoni* (Osório, 1891)

SMNS 23066 (1 specimen) São Tomé City; SMNS 23131 (3 specimens) Rolas Island; SMNS 24878 (20 specimens) Rolas Island. UFES 172 (12 specimens) Praia Quinze, near Lagoa Azul, São Tomé. For a long time, *T. newtoni* was treated as a junior synonym of *T. pavo* (Linnaeus, 1758). Afonso *et al.* (1999) also used the name *T. pavo* but noted that the color pattern of animals from São Tomé island was distinctly different (Figure 14). In a genetic comparison of the Atlantic species of the genus *Thalassoma*, Costagliola *et al.* (2004) noted a large genetic divergence between specimens from São Tomé and Mediterranean specimens of *T. pavo*; furthermore, the species *T. ascensionis* and *T. sanctaehelenae* were more closely related to animals from São Tomé than these were to *T. pavo*. Thus, *T. newtoni* appears to be a valid species but a morphological comparison with *T. pavo* is still outstanding. Juveniles of this species were frequently observed cleaning other fish.



**FIGURES 14.** *Thalassoma newtoni* male, Rolas Island, photo P. Wirtz.

***Acantholabrus palloni* (Risso, 1810)**

An adult specimen was photographed by PW in São Tomé fish market.

***Xyrichtys sanctaehelenae* (Günther, 1868)**

SMNS 23065 (1 specimen) Rolas Island, São Tomé, from sandy bottom in about 15 m depth. The conspicuously yellow animal appeared quite different from *X. novacula* (Linnaeus, 1758), which is a common species at São Tomé and Príncipe.

**Scaridae**

***Nicholsina usta* (Valenciennes, 1840)**

UFES 160 (1 specimen) from the fish market in São Tomé City. Encountered over a dense growth of *Caulerpa* sp. near Ilhéu das Cabras in about 10 m depth (SMNS 25233, 1 specimen). The eastern Atlantic *Nicholsina usta* are generally considered to form the subspecies *N. usta collettei* Schultz, 1968. Two animals from São Tomé analysed by Robertson *et al.* (2006) were genetically distinct from four western Atlantic animals to such a degree that the authors suggested the recognition of the two subspecies as valid species.

***Sparisoma* n. sp. (Figures 15 and 16)**

SMNS 25275, 1 specimen, from Lagoa Azul, CAS 214635, 1 specimen, from off Marlin Beach Hotel, CAS 224080, 1 specimen caught by hook and line off a private dock near São Tomé airport. UFES 153 (1 specimen) Praia das Furnas, near Diogo Vaz, São Tomé. This species is common in the tropical eastern Atlantic and has been called *Sparisoma rubripinne* (Valenciennes, 1839) by many authors (e.g. Afonso *et al.* 1999; Brito *et al.* 1999). It is, however, the undescribed eastern Atlantic sister species to the Brazilian *S. axillare*. The species is currently being described by L. Rocha and A. Brito.



**FIGURES 15.** *Sparisoma* n. sp. male, Rolas Island, photo L. Rocha.



**FIGURES 16.** *Sparisoma* n. sp. female, Rolas Island, photo P. Wirtz.

## **Ammodytidae**

### Unidentified species

A large swarm of fish belonging to this family was observed and photographed over sandy bottom in about 20 m depth near Kia. The species cannot be identified from the photos. No species of this family have so far been recorded from São Tomé and Príncipe. The only ammodytid known from the eastern Atlantic, *Ammodytes cicerelus* (Rafinesque, 1810) is recorded from the Mediterranean and Black seas, and along the African coast from Morocco to Angola (Quéro 1990).

## **Blenniidae**

### ***Hypleurochilus pseudoaequipinnis* Bath, 1994**

SMNS 24224 (1 specimen, Bom Bom Islet) and SMNS 24131 (1 specimen, Bom Bom Islet). UFES 141 (1 specimen, Santana Islet). Afonso *et al.* (1999) recorded this species as *Hypleurochilus aequipinnis* Günther, 1861, based on an underwater observation by PW. *H. aequipinnis* and *H. pseudoaequipinnis* are sister species in the eastern and the western Atlantic, respectively. Surprisingly, the three SMNS and UFES specimens from São Tomé and Príncipe correspond to the western Atlantic *pseudoaequipinnis* and not the eastern Atlantic



*aequipinnis* in the shape of the supraorbital tentacles and the colour of the head, as described by Bath (1994). Comparative material: *H. aequipinnis*: SMNS 16660, Senegal; *H. pseudaequipinnis*: SMNS 19384, Netherlands Antilles.

## Gobiesocidae

### *Apletodon wirtzi* Fricke 2007

UFES 139 (2 specimens) Ilhéu Santana, São Tomé. This species of the genus *Apletodon* is common on rocks in shallow water at São Tomé and at Príncipe. The species is being described by Fricke (2007), based on animals from Príncipe. We have also frequently seen it at São Tomé Island (Figure 17). The record of *Apletodon pellegrini* from Annobón Island/Equatorial Guinea, by Briggs (1990) may have been based on this species. The first author has recently (February 2007) collected this species near Limbe, Cameroon.



FIGURES 17. *Apletodon wirtzi*, animal from Santana Island, photo CL Sampaio.

## Callionymidae

### *Callionymus bairdi* Jordan, 1888

UFES 138 (1 specimen) from sandy bottom near Kia, in about 10 m depth. This predominantly western Atlantic species has been recorded by Brito *et al.* (1999) from the Cape Verde Islands in the eastern Atlantic.

## Gobiidae

### *Corcyrogobius lubbocki* Miller, 1988

ZSM 34195 (1 specimen, Sete Pedras, 9 m depth); ZSM 34185 (1 specimen from Kia, 17 m depth); photographed at Bom Bom islet in 10 m depth, always in dark rocky places (Figure 18). The species was previously known from only three specimens from Annobón Island and Ghana (Miller, 1988).



**FIGURES 18.** *Corcyrogobius lubbocki*, Bom Bom, photo P. Wirtz.

**Gen. & sp. nov.**

ZSM 34186 (1 specimen) Diogo Vaz; UFES 133 (1 specimen without tail) Santana island. This is a common species at São Tomé and Príncipe on sandy/gravelly bottoms from about 7 m downwards. It lives in caves of an axiid shrimp, as described by Wirtz (2005b). Color photos of this species were printed in Wirtz (2005b) and are available in the internet (<http://explorebiodiversity.com/Hawaii/Shrimp-goby/general/Grundel-Krebs.htm>). The species is currently being described by Schliewen and Kovačić.

***Gobius* sp. aff. *rubropunctatus* Delais, 1951**

Z SM 34187 (1 specimen), on white sand in 3 m depth, Ilhéu das Cabras, São Tomé; ZSM 34731 (2 specimens), north coast of Príncipe Island. SMNS 24246 (3 specimens) from Bom Bom Islet; ZSM 34729 (1 specimen) from Lagoa Azul. This species is close to *G. rubropunctatus* but differs in details of the head sensory papillae pattern and possibly represents a new species. However, identification depends on inspection of type-material of *G. rubropunctatus* and *G. senegambiensis*. This is a common species on soft bottoms at Príncipe and São Tomé, from about 5 m downwards. Territorial males are darker than females (Figure 19 and 20). A photograph of a male of this species is given in Wirtz (2005a) under the name *Thorogobius angolanus*.



**FIGURE 19.** *Gobius* sp. aff. *rubropunctatus* male, Lagoa Azul, photo L.A. Rocha



**FIGURE 20.** *Gobius* sp. aff. *rubropunctatus* female, Lagoa Azul, photo L.A. Rocha.

***Gorogobius nigricinctus* (Delais, 1951)**

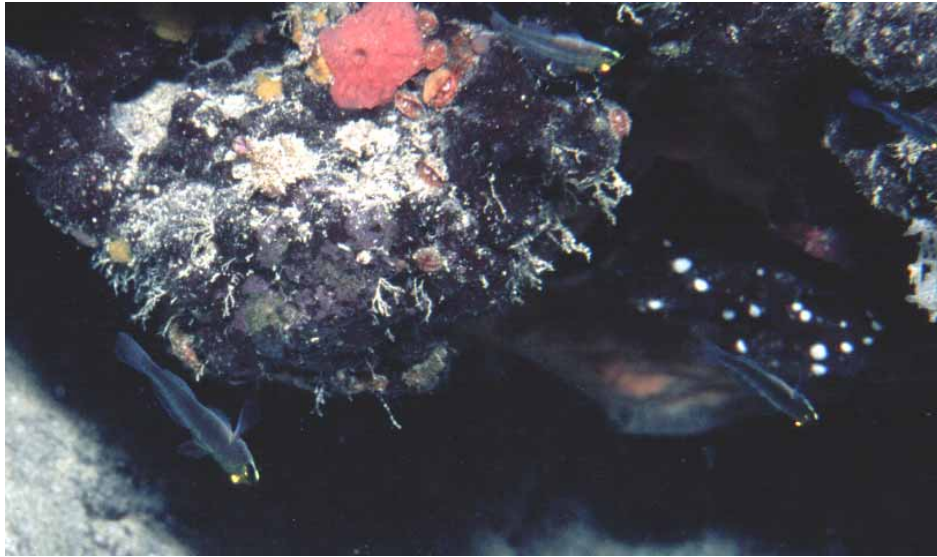
SMNS 23053 (6 specimens) Rolas Island; SMNS 23055 (1 specimen) Rolas Island. ZSM 34193 (4 specimens) Sete Pedras; ZSM 34730 (1 specimen) Diogo Vaz. UFES 140 (2 specimens) Kia, near Ilhéu das Cabras, São Tomé. This is a common species at Príncipe and São Tomé Islands on rocky bottoms from about 3 m downwards. Often under overhangs along walls or in other dark places (Figure 21).



**FIGURE 21.** *Gorogobius nigricinctus*, Rolas Island, photo L.A. Rocha.

***Gorogobius* n. sp.**

SMNS 23053 (1 specimen among 6 *G. nigricinctus*) Rolas Island; SMNS 23054 (4 specimens) Rolas Island; Small individuals (about 4 cm length) were seen hovering upside-down at the entrances of small caves in 20 m depth at Rolas Island (Figure 22). Animals twice this size were seen in small caves in 35 to 40 m depth at Diogo Vaz. The species is currently being described by Kovačić and Schliewen.



**FIGURE 22.** *Gorogobius n. sp.*, Rolas Island, photo P. Wirtz.

***Nematogobius brachynemus* Pfaff, 1933**

ZSM 34189 (10 specimens from Lagoa Azul, intertidal); ZSM 34188 (6 specimens from Lagoa Azul, intertidal); ZSM 34190 (20 specimens from Lagoa Azul, intertidal); UFES 134 and 135 (1 specimen each, from Sao Tome, no precise location data); ZSM 34733 (1 specimen from Príncipe, no precise location data); SMNS 23070 (5 specimens together with 4 *Bathygobius burtoni* from Sao Tomé City); SMNS 23067 (1 specimen together with 1 *Bathygobius burtoni* from Sao Tomé City); SMNS 23078 (4 specimens together with 10 *Bathygobius burtoni* from Rolas Island); Figure 23.



**FIGURE 23.** *Nematogobius brachynemus*, animal from São Tomé (no precise locality data available), photo J.L. Gasparini.

***Nematogobius maindroni* (Sauvage, 1880)**

Found near the mouths of several streams by the CAS expeditions. Príncipe: CAS 214423 (8 specimens, Rio Chimboto); CAS 214553 (4 specimens, Príncipe). São Tomé: CAS 214424 (1 specimens, Agua Azeitona); CAS 214472 (23 specimens, Agua Micondó); CAS 214541 (3 specimens, Rio Angobo).

***Sicydium brevifile* Ogilvie-Grant, 1884**

A common species, found in middle to lower reaches of almost all streams sampled by the CAS expeditions. The species has recently been redescribed by Pezold *et al.* (2006) on the basis of material collected at São Tomé and Príncipe.

***Sicydium bustamantei* Greeff, 1882**

A common species, found in middle to lower reaches of most streams sampled by the CAS expeditions. The species has recently been redescribed by Pezold *et al.* (2006) on the basis of material collected at São Tomé and Príncipe.

***Wheelerigobius maltzani* (Steindachner, 1881)**

ZSM 34183 (1 specimen, Lagoa Azul, 18 m); ZSM 34184 (1 specimen from Kia, 17 m depth); SMNS 23082 (4 specimens from Rolas); SMNS 25252 (1 specimen, Sete Pedras). UFES 136 (2 specimens) Ilhéu Santana, São Tomé. A very common species over rocky bottom (Figure 24). Previously recorded from Senegal, Ghana and Annobón.



**FIGURE 24.** *Wheelerigobius maltzani*, animal from São Tomé (no precise locality data available), photo J.L. Gasparini.

***Wheelerigobius wirtzi* Miller, 1987**

SMNS 23056 (7 specimens from Rolas Island); SMNS 24125 (1 specimen from Bom Bom islet); SMNS 24222 (4 specimens from Bom Bom islet); ZSM 34194 (6 specimens from Sete Pedras). UFES 137 (2 specimens) Ilhéu Santana, São Tomé. This is one of the most common gobiid species at São Tomé and Príncipe. It was recorded by Afonso *et al.* (1999) but they did not realize that the underwater photo of an unidentified gobiid printed as Figure 2f on page 93 shows this species, which lives on a large variety of bottoms and is not “associated with sea urchins” as written by Afonso *et al.* (1999). Another color photo of this species appeared in Debelius (1998: 251).

**Eleotridae**

***Eleotris annobónensis* Blanc, Cadenat & Stauch, 1968**

Fairly common, along with *E. vittata*, in lowermost reaches of most streams sampled by the CAS expeditions. Frank Pezold identified these specimens, which he considers distinct from *E. vittatus*. São Tomé: CAS

214387 (1 specimen, Agua Azeitona); CAS 214400 (20 specimens, Agua Micondó); CAS 214404 (2 specimens, Rio Provache); CAS 214405 (24 specimens, small tidal stream into Praia Mutamba); CAS 214406 (2 specimens, Rio Lembá); CAS 214408 (2 specimens, small tidal stream into Praia Mutamba); CAS 214409 (6 specimens, Rio Contador); CAS 214414 (19 specimens, Rio Lembá); CAS 214417 (27 specimens, Rio Anambo). Príncipe: CAS 214390 (11 specimens, Agua Maria Correia); CAS 214402 (38 specimens, Agua Maria Correia); CAS 214399 (16 specimens, creek into Praia Rei).

## **Sphyraenidae**

### ***Sphyraena guachancho* Cuvier in Cuvier & Valenciennes 1829**

CAS 214646 (3 specimens) taken off Marlin Beach Hotel in São Tomé; SMNS 25263 (2 specimens) from fish market at São Tomé City.

## **Bothidae**

### ***Arnoglossus* sp.**

SMNS 25264 (1 specimen), fish market São Tomé City. This specimen is part of the *Arnoglossus laterna* (Walbaum, 1792) complex, and agrees with the typical *A. laterna* in its 88 dorsal fin rays, 70 anal fin rays, eye and lower jaw proportions, and lacking elongate dorsal fin rays. However, it differs in having 59 lateral line scales (50–56 in *A. laterna*), 9 pectoral fin rays (10–11 in *A. laterna*), the first ray elongate (normal in *A. laterna*). The São Tomé population probably belongs to an undescribed species, but more material is needed to determine the variability of its counts and measurements.

## **Soleidae**

### ***Dicologlossa cuneata* (Moreau, 1881)**

SMNS 25269 (1 specimen) from sandy bottom in 3 m depth at Lagoa Azul.

## **Cynoglossidae**

### ***Cynoglossus monodi* Chabanaud 1949**

CAS 214642 (2 specimens) in front of Hotel Marlin Beach, São Tomé City, collected by local fishermen using a large beach seine.

## **Tetraodontidae**

### ***Canthigaster supramacula* Moura & Castro, 2002**

SMNS 23127, 2 specimens, Rolas Island; SMNS 24219, 1 specimen, Bom Bom Islet; SMNS 24223, 4 specimens, Bom Bom Islet; SMNS 24239, 3 specimens, Bom Bom Islet; SMNS 25258, 1 specimen, Lagoa Azul. UFES 152, 1 specimen, Lagoa Azul, São Tomé. The common sharpnose pufferfish from Príncipe and from São Tomé belongs to this species, identified by the prominent spot on the back (Wirtz 2005a). This spot can, however be greatly reduced in adult animals (Figures 25 and 26). *C. supramacula* lives in rocky areas from about 2 m depth downwards.



**FIGURE 25.** *Canthigaster supramacula*, young individual, Lagoa Azul, photo L.A. Rocha.



**FIGURE 26.** *Canthigaster supramacula*, old individual, Lagoa Azul, photo L.A. Rocha.

**TABLE 1.** Checklist of the coastal fishes of São Tomé and Príncipe, indicating geographical distribution.

Family	Species	First record from São Tomé and Príncipe	Distribution range outside São Tomé and Príncipe	Afonso <i>et al.</i> (1999)
Ginglymostomatidae	<i>Ginglymostoma cirratum</i> (Bonnaterre, 1788)	Wirtz, 1992	Western Atlantic from New York/U.S.A. south to southern Brazil; eastern Atlantic from Cape Verde Islands south to Gabon; eastern Pacific from Gulf of California south to Peru.	p. 68
Odontaspidae	<i>Carcharias taurus</i> Rafinesque-Schmaltz, 1810	Afonso <i>et al.</i> , 1999	Worldwide in warm tropical and warm temperate seas, except for the East Pacific; Mediterranean Sea and eastern Atlantic from Portugal south to Cameroon.	p. 68
Carcharhinidae	<i>Carcharhinus galapagensis</i> (Snodgrass & Heller, 1905)	Compagno (1981: 2 pp.)	Worldwide in tropical waters, especially around offshore islands; eastern Atlantic including Saint Paul's Rocks.	p. 82

Carcharhinidae	<i>Prionace glauca</i> (Linnaeus, 1758)	Osório (1891: 139) as <i>Carcharias</i> ( <i>Prionodon</i> ) <i>glauca</i>	Worldwide in tropical and temperate seas.	p. 82
Carcharhinidae	<i>Rhizoprionodon acutus</i> (Rüppell, 1837)	Osório (1891: 138) as <i>Carcharias</i> ( <i>Scoliodon</i> ) <i>walbeemhii</i>	Western Mediterranean and eastern Atlantic from Mauritania south to Angola; Indo-West Pacific from Red Sea and East Africa east to Indonesia, north to Bonin/Ogasawara Islands, south to Natal/South Africa and northern New South Wales/ Australia.	p. 68
Sphyrnidae	? <i>Sphyrna couardi</i> Cadenat, 1951	Guimarães, 1884 and Osório (1893b: 182) as <i>Zygaena tudes</i>	(Eastern Atlantic from Senegal to Congo).	p. 82
Sphyrnidae	<i>Sphyrna lewini</i> (Griffith & Smith, 1834)	Afonso <i>et al.</i> , 1999	Worldwide in tropical and warm temperate seas including Mediterranean and eastern Atlantic from Portugal south to Namibia.	p. 68
Torpedinidae	<i>Torpedo n. sp. 1</i>	present paper	Known only from Principe Island.	--
Torpedinidae	<i>Torpedo n. sp. 2</i>	present paper	Known only from São Tomé Island.	--
Torpedinidae	? <i>Torpedo nobiliana</i> Bonaparte, 1835	Osório (1891: 139) as <i>Torpedo hebetans</i> ; Afonso <i>et al.</i> , 1999 as <i>T. nobiliana</i>	(Western Atlantic from Nova Scotia/Canada south to Brazil; Mediterranean Sea and eastern Atlantic from North Sea south to South Africa).	p. 82
Torpedinidae	? <i>Torpedo torpedo</i> (Linnaeus, 1758)	Osório (1891: 139) as <i>Torpedo narce</i> ; Afonso <i>et al.</i> , 1999 as <i>T. torpedo</i>	(Mediterranean Sea and eastern Atlantic from Bay of Biscay to Angola).	p. 82
Dasyatidae	<i>Dasyatis sp. 1</i>	present paper	Known only from Principe Island.	--
Dasyatidae	<i>Taeniura grabata</i> (Geoffroy Saint-Hilaire, 1817)	present paper	Mediterranean Sea and eastern Atlantic from Madeira, Canary Islands and Mauritania south to Angola; immigrated into Red Sea through Suez Canal.	--
Elopidae	<i>Elops senegalensis</i> Regan, 1909	Afonso <i>et al.</i> , 1999	Eastern Atlantic from Mauritania south to Congo.	p. 68
Albulidae	<i>Albula goreensis</i> Valenciennes in Cuvier & Valenciennes, 1846	Osório (1893b: 182, S. Thomé, as <i>Esunculus sp.</i> ); Frade & Costa, 1956, as <i>Albula vulpes</i>	Eastern Atlantic from Senegal south to Angola.	p. 68, as <i>Albula vulpes</i>
Myrocongridae	<i>Myroconger compressus</i> Günther, 1870	Osório (1893b : 180–181)	Known only from eastern Atlantic at Cape Verde Islands, Senegal and Saint Helena.	p. 82
Muraenidae	<i>Channomuraena vittata</i> Richardson, 1845	Osório (1893b: 181) as <i>Gymnomuraena vittata</i>	Worldwide in tropical and equatorial seas; in the eastern Atlantic at Cape Verde Islands, Annobón and Ascension Islands.	p. 68–69
Muraenidae	<i>Echidna peli</i> (Kaup, 1856)	present paper	Eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands and Annobón.	--



Muraenidae	<i>Enchelycore nigricans</i> (Bonnaterre, 1788)	Osório (1893b: 182)	Western Atlantic from Florida/U.S.A. and Bahamas south to Brazil; eastern Atlantic from Senegal south to Gabon including offshore islands and reefs.	p. 69
Muraenidae	<i>Gymnothorax afer</i> Bloch, 1795	Blache <i>et al.</i> , 1970	Eastern Atlantic from Mauritania south to Namibia, including Cape Verde Islands and Annobón.	p. 69
Muraenidae	<i>Gymnothorax mareei</i> Poll, 1953	Afonso <i>et al.</i> , 1999	Eastern Atlantic from Senegal south to Namibia, including Annobón and Saint Helena.	p. 69
Muraenidae	<i>Gymnothorax vicinus</i> (Castelnau, 1855)	Osório (1893b: 181) as <i>Muraena maculipinnis</i> ; Fowler (1936: 311–312) as <i>Lycodontis vicinus</i>	Western Atlantic from Bermuda and Florida/U.S.A. south to Brazil; eastern Atlantic from Cape Verde Islands, Ghana and Annobón.	p. 82
Muraenidae	<i>Muraena melanotis</i> (Kaup, 1860)	Osório (1891: 134)	Eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands and Annobón .	p. 69
Muraenidae	<i>Muraena robusta</i> Osório, 1911	Osório, 1911	Western Atlantic from North Carolina/U.S.A. south to Colombia; eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands.	p. 69
Ophichthidae	<i>Callechelys guineensis</i> (Osório, 1893)	Osório (1893b: 179–180, S. Thomé, as <i>Ophichthys</i> ( <i>Sphagebranchus</i> ) <i>guineensis</i> )	Western Atlantic from Bahamas and Florida south to Venezuela; eastern Atlantic from Senegal and Cape Verde Islands.	p. 69, as synonym of <i>Myrichthys pardalis</i>
Ophichthidae	<i>Dalophis boulengeri</i> (Blach, Cadenat & Stauch, 1970)	present paper	Eastern Atlantic from Mauritania south to Angola.	--
Ophichthidae	<i>Myrichthys pardalis</i> (Valenciennes, 1839)	Osório (1891: 134) as <i>Ophichthys pardalis</i>	Eastern Atlantic from Canary Islands south to Annobón.	p. 69
Ophichthidae	<i>Ophichthus ophis</i> (Linnaeus, 1758)	Osório (1891: 133–134) as <i>Ophichthys triserialis</i> ; Blache, 1977 as <i>Ophichthus ophis</i>	Western Atlantic from Florida/U.S.A. and Bermuda south to Brazil; western Mediterranean and eastern Atlantic from Senegal south to Angola, including Cape Verde Islands.	p. 82
Ophichthidae	<i>Ophichthus rufus</i> (Rafinesque-Schmaltz, 1810)	present paper	Mediterranean Sea; probably more widespread.	--
Ophichthidae	<i>Pisodonophis semicinctus</i> (Richardson, 1848)	Osório (1906: 158) as <i>Ophichthys semicinctus</i>	Algeria in western Mediterranean and eastern Atlantic from Morocco south to Angola.	p. 82
Ophichthidae	Ophichthinae gen. sp.	present paper	Known only from São Tomé Island.	--

Congridae	<i>Heteroconger longissimus</i> Günther, 1870	present paper	Western Atlantic from Bahamas and Florida south to southeastern Brazil; eastern Atlantic at Madeira, Canary Islands, Senegal and Cape Verde Islands, probably more widespread.	--
Congridae	<i>Paraconger caudilimbatus</i> (Poey, 1867)	present paper	Western Atlantic from North Carolina/U.S.A. and Bahamas south to Venezuela.	--
Clupeidae	<i>Ethmalosa fimbriata</i> (Bowdich, 1825)	Osório (1891: 133) as <i>Clupea senegalensis</i> ; Osório (1906: 157, Ilha de S. Thomé, as <i>Clupea dorsalis</i> ); Fowler (1936: 175–177)	Eastern Atlantic from Western Sahara south to Angola, including Cape Verde Islands.	p. 82
Clupeidae	<i>Sardinella aurita</i> Valenciennes in Cuvier & Valenciennes, 1847	Afonso <i>et al.</i> , 1999	Western Atlantic from Massachusetts/U.S.A. south to Argentina; Mediterranean and Black seas and eastern Atlantic from Gibraltar south to South Africa.	p. 69
Clupeidae	<i>Sardinella maderensis</i> (Lowe, 1838)	Osório (1891: 133) as <i>Clupea maderensis</i>	Mediterranean Sea and eastern Atlantic from Gibraltar south to Namibia, including Annobón; immigrated into northern Red Sea through Suez Canal.	p. 83
Clupeidae	<i>Sardinella rouxi</i> (Poll, 1953)	present paper	Eastern Atlantic from Senegal south to Congo, probably Angola.	--
Synodontidae	? <i>Synodus intermedius</i> (Spix & Agassiz, 1829)	Osório (1893b: 179) as <i>Saurus intermedius</i> ; record needs verification	(Western Atlantic from Bermuda and North Carolina/U.S.A. south to Guyana and Suriname).	p. 83
Synodontidae	<i>Synodus synodus</i> (Linnaeus, 1758)	Afonso <i>et al.</i> , 1999	Western Atlantic from Florida/U.S.A. south to Uruguay; eastern Atlantic from Madeira, Canary Islands, Cape Verde Islands, and Saint Helena.	p. 70
Synodontidae	<i>Trachinocephalus myops</i> (Forster in Bloch & Schneider, 1801)	Osório (1891: 130–131) as <i>Saurus myops</i>	Worldwide in tropical and warm temperate waters except for eastern Pacific; in eastern Atlantic from Mauritania south to Namibia including Cape Verde, Ascension and Saint Helena islands.	p. 69–70
Myctophidae	? <i>Hygophum benoiti</i> (Cocco, 1838)	Osório (1893a: 140) as <i>Scopelus benoiti</i> ; record needs verification	(Mediterranean Sea and North Atlantic circulatory system)	--
Bythitidae	<i>Grammonus longhursti</i> (Cohen, 1964)	present paper	Known from Gulf of Guinea; also Canary Islands.	--
Antennariidae	<i>Antennarius multio-cellatus</i> (Valenciennes, 1837)	present paper	Western Atlantic from Bermuda and Bahamas south to Salvador/Brazil; Ascension Island.	--

Antennariidae	<i>Antennarius pardalis</i> (Valenciennes, 1837)	present paper; Osório (1891: 120–121) as <i>Antennarius vulgaris</i> ; Fowler (1936: 1129–1130) as <i>Histrio histrio</i>	Eastern Atlantic from Senegal south to Congo, including Cape Verde Islands.	p. 83, as <i>?Antennarius pardalis</i>
Mugilidae	<i>Chelon dumerili</i> (Steindachner, 1870)	Osório (1893a: 139) as <i>Mugil brasiliensis</i>	Eastern Atlantic from Mauritania south to South Africa; Indian Ocean from Delagoa bay/Mozambique south to South Africa.	p. 83, as <i>Liza dumerili</i>
Mugilidae	<i>?Chelon labrosus</i> (Risso, 1827)	Osório (1891: 122) as <i>Mugil chelo</i> ; record needs verification	(Mediterranean and Black seas and eastern Atlantic from Norway and Iceland south to Senegal and Cape Verde Islands).	p. 83
Mugilidae	<i>Liza grandisquamis</i> (Valenciennes, 1836)	Frade & Costa, 1956 as <i>Mugil grandisquamis</i>	Eastern Atlantic from Mauritania south to Equatorial Guinea.	p. 83
Mugilidae	<i>Mugil cephalus</i> Linnaeus, 1758	Frade & Costa, 1956	Worldwide in tropical and warm temperate seas; Mediterranean and Black seas and eastern Atlantic from Bay of Biscay south to South Africa.	p. 83
Mugilidae	<i>Mugil curema</i> Valenciennes, 1836	present paper	Western Atlantic from Nova Scotia/Canada south to southern Brazil; eastern Atlantic from Senegal south to Namibia; eastern Pacific from San Diego/U.S.A. and Gulf of California south to Chile.	--
Atherinidae	<i>Atherina lopeziana</i> (Rossignol & Blache, 1961)	Osório (1893a: 139) as <i>Atherina boyeri</i> ; Fowler (1936: 580–581) as <i>Atherina hepsetus</i>	Eastern Atlantic at Cape Verde Islands, Annobón and other islands in Gulf of Guinea.	p. 83
Exocoetidae	<i>Cheilopogon pinnatibarbatus</i> (Bennett, 1831)	Osório (1891: 132) as <i>Exocoetus lineatus</i>	Western Atlantic at southern Brazil; eastern Atlantic from Spain south to Libearia and Saint Helena, including Azores, Madeira, Canary and Cape Verde islands.	p. 83
Exocoetidae	<i>Cypselurus melanurus</i> (Valenciennes in Cuvier & Valenciennes, 1847)	D'Almeida <i>et al.</i> , 1996 as <i>Cypselurus melanurus</i>	Western Atlantic from Massachusetts/U.S.A. south to southern Brazil; eastern Atlantic from Senegal south to Liberia.	p. 70, as <i>Cheilopogon melanurus</i>
Exocoetidae	<i>Exocoetus volitans</i> Linnaeus, 1758	Fowler (1936: 421–423)	Worldwide in tropical and warm temperate seas.	p. 83
Exocoetidae	<i>Fodiator acutus</i> (Valenciennes in Cuvier & Valenciennes, 1847)	Arnoult <i>et al.</i> , 1966	Eastern Atlantic from Senegal south to Angola.	p. 83
Hemiramphidae	<i>Hemiramphus balao</i> LeSueur, 1821	Osório (1891: 132) as <i>Hemirhamphus vittatus</i>	Western Atlantic from New York/U.S.A. south to Brazil; eastern Atlantic from Canary Islands south to Angola.	p. 70

Hemirhamphidae	<i>Hyporhamphus picarti</i> (Valenciennes in Cuvier & Valenciennes, 1847)	Osório (1891: 132) as <i>Hemiramphus Schlegeli</i>	Southern Mediterranean and eastern Atlantic from Morocco south to Angola.	p. 83–84
Belonidae	<i>Ablennes hians</i> (Valenciennes in Cuvier & Valenciennes, 1846)	D’Almeida <i>et al.</i> , 1996	Worldwide in tropical and warm temperate seas; in eastern Atlantic from Senegal and Cape Verde Islands south to Namibia,	p. 70
Belonidae	<i>Platybelone annobonensis</i> Collette & Parin, 1970	Osório (1891: 131) as <i>Belone lovii</i> ; Collette & Parin, 1970	Eastern Atlantic at Bioco and Annobón/Equatorial Guinea.	p. 83
Belonidae	<i>Tylosurus rafale</i> Collette & Parin, 1970	Osório (1891: 131–132) as <i>Belone choram</i>	Eastern Atlantic from Sierra Leone south to Angola.	p. 70, as <i>Tylosurus acus rafale</i>
Belonidae	<i>Tylosurus crocodilus</i> (Peron & LeSueur in LeSueur, 1821)	Osório (1893a: 140) as <i>Belone raphidoma</i>	Tropical and warm temperate waters of Atlantic and Indo-West Pacific; in eastern Atlantic from Senegal south to Equatorial Guinea including Cape Verde and Ascension islands.	p. 70
Holocentridae	<i>Holocentrus adscensionis</i> (Osbeck, 1765)	Osório (1891: 98–99) as <i>Holocentrum longipinne</i>	Western Atlantic from Bermuda and North Carolina/U.S.A. south to Brazil; eastern Atlantic from Gabon to Angola, including Saint Paul’s Rocks, Annobón, Ascension and Saint Helena islands; straying to the Canary Islands.	p. 70, as <i>Holocentrus ascensionis</i>
Holocentridae	<i>Myripristis jacobus</i> Cuvier in Cuvier & Valenciennes, 1829	Osório (1891: 98, Principe, as <i>Myripristis viridensis</i> ); Greenfield (1981: 2 pp.)	Western Atlantic from Bahamas and North Carolina/U.S.A. south to Brazil; eastern Atlantic at Saint Paul’s Rocks, Cape Verde, Annobón, Ascension and Saint Helena islands; straying to the Canary Islands.	p. 71
Holocentridae	<i>Sargocentron hastatum</i> (Cuvier in Cuvier & Valenciennes, 1829)	Osório (1891: 99) as <i>Holocentrum hastatum</i>	Eastern Atlantic from Portugal south to Angola, including Cape Verde Islands.	p. 70, as <i>Sargocentron hastatus</i>
Syngnathidae	<i>Hippocampus algiricus</i> Kaup, 1856	present paper; Osório (1891: 134) as <i>Hippocampus guttulatus</i>	Eastern Atlantic from Senegal south to Angola, including Cape Verde Islands and possibly Saint Helena.	p. 71, as <i>Hippocampus punctulatus</i>
Syngnathidae	<i>Microphis aculeatus</i> (Kaup, 1856)	present paper	Eastern Atlantic from Senegal south to Angola.	--
Aulostomidae	<i>Aulostomus strigosus</i> Wheeler, 1955	Osório (1893b: 178) as <i>Aulostoma coloratum</i>	Eastern Atlantic from Madeira and the Canary and Cape Verde Islands south to Angola, including Annobón.	p. 71
Fistulariidae	<i>Fistularia tabacaria</i> Linnaeus, 1758	Osório (1891: 122–123) as <i>Fistularia tabaccaria</i>	Western Atlantic from southern Canada and Bermuda south to Brazil; eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands and Annobón.	p. 71

Dactylopteridae	<i>Dactylopterus volitans</i> (Linnaeus, 1758)	Osório (1906: 157)	Western Atlantic from Massachusetts/U.S.A. south to Argentina; Mediterranean Sea and eastern Atlantic from English Channel south to Angola, including Azores and Madeira, Canary and Cape Verde Islands.	p. 71
Scorpaenidae	<i>Pontinus accraensis</i> Norman, 1935	Frade & Costa, 1956	Eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands.	p. 84, as ? <i>Pontinus accraensis</i>
Scorpaenidae	<i>Pontinus kuhlii</i> (Bowdich, 1825)	Osório (1891: 112) as <i>Sebastes kuhlii</i>	Western Mediterranean and eastern Atlantic from Portugal, Madeira and Azores south to Angola, including Canary and Cape Verde islands.	p. 71
Scorpaenidae	<i>Scorpaena laevis</i> Troschel, 1866	Capello (1871: 200) as <i>Scorpaena grandicornis</i> ; Osório (1891: 112–113) as <i>Scorpaena senegalensis</i> ; Osório (1893b: 182); Osório (1906: 156) as <i>Scorpaena scrofa</i>	Eastern Atlantic from Mauritania south to Congo, including Cape Verde Islands.	p. 71; p. 84, as ? <i>Scorpaena scrofa</i>
Scorpaenidae	<i>Scorpaena plumieri</i> (Bloch, 1790)	Osório, 1906: 157 (Ilha de S. Thomé); record needs verification.	Western Atlantic from Bermuda and Massachusetts/U.S.A. south to southern Brazil; eastern Atlantic from Ascension Island and Saint Helena.	--
Scorpaenidae	<i>Scorpaenodes africanus</i> Pfaff, 1933	present paper	Eastern Atlantic from Senegal south to Annobón.	--
Serranidae	<i>Alphestes afer</i> (Bloch, 1793)	present paper	Western Atlantic from Bermuda and North Carolina/U.S.A. south to Uruguay; eastern Pacific at Galapagos Islands.	--
Serranidae	<i>Anthias anthias</i> (Linnaeus, 1758)	Osório (1891: 99) as <i>Anthias sacer</i>	Mediterranean Sea and eastern Atlantic from Portugal and Azores south to Namibia.	p. 72
Serranidae	<i>Cephalopholis nigri</i> (Günther, 1859)	Osório (1891: 100) as <i>Serranus nigri</i>	Eastern Atlantic from Canary Islands and Senegal south to Angola, including Bioco Island.	p. 72
Serranidae	<i>Cephalopholis taeniops</i> (Valenciennes in Cuvier & Valenciennes, 1828)	Osório (1891: 100) as <i>Serranus taeniops</i>	Eastern Atlantic from Western Sahara south to Angola, including Cape Verde Islands.	p. 72
Serranidae	<i>Epinephelus adscensionis</i> (Osbeck, 1765)	Osório (1891: 100–101) as <i>Serranus capreolus</i>	Western Atlantic from Massachusetts/U.S.A. and Bermuda south to southern Brazil; eastern Atlantic at Annobón, Ascension and Saint Helena Islands, possibly more widespread.	p. 72
Serranidae	<i>Epinephelus aeneus</i> (Geoffroy Saint-Hilaire, 1817)	Osório (1895: 61) as <i>Serranus aeneus</i>	Southern Mediterranean and eastern Atlantic from Morocco south to Angola.	p. 72

Serranidae	<i>Epinephelus goreensis</i> (Valenciennes in Cuvier & Valenciennes, 1830)	Afonso <i>et al.</i> , 1999	Eastern Atlantic from Mauritania south to Angola., including Cape Verde Islands.	p. 72
Serranidae	<i>Epinephelus marginatus</i> (Lowe, 1834)	Osório (1906: 156) as <i>Serranus gigas</i>	Western Atlantic from southern Brazil south to Argentina; Mediterranean Sea, and eastern Atlantic from British Isles south to South Africa, and around the Cape of Good Hope to southern Mozambique and Madagascar in the Indian Ocean.	p. 84
Serranidae	? <i>Epinephelus morio</i> (Valenciennes in Cuvier & Valenciennes, 1828)	Osório (1893b: 173) as <i>Serranus erythrogaster</i> ; Fowler (1936: 759–760) as <i>Serranus morio</i> ; record needs verification	(Western Atlantic from Massachusetts/ U.S.A. and Bermuda south to southern Brazil).	p. 84
Serranidae	<i>Liopropoma n. sp.</i>	present paper	Known only from São Tomé and Príncipe.	--
Serranidae	<i>Mycteroperca</i> sp.	present paper; probably Osório, (1893b: 174) as <i>Serranus armatus n. sp.</i> )	Known only from São Tomé and Príncipe.	probably p. 84, as <i>Mycteroperca rubra</i>
Serranidae	<i>Paranthias furcifer</i> (Valenciennes in Cuvier & Valenciennes, 1828)	Osório (1893a: 136) as <i>Anthias furcifer</i>	Western Atlantic from Bermuda and Florida/U.S.A. south to southern Brazil; eastern Atlantic at Ascension Island, Bioco and Annobón.	p. 72
Serranidae	<i>Pseudogramma guineensis</i> (Norman, 1935)	present paper	Eastern Atlantic from Cape Verde Islands to Gulf of Guinea.	--
Serranidae	<i>Rypticus saponaceus</i> (Bloch & Schneider, 1801)	Osório (1891: 101) as <i>Rhypticus saponaceus</i>	Western Atlantic from Bermuda and Florida/U.S.A. south to southeastern Brazil; eastern Atlantic from Mauritania south to South Africa, including Saint Paul's Rocks, Cape Verde Islands, Annobón, Ascension and Saint Helena.	p. 72
Serranidae	<i>Rypticus subbifrenatus</i> Gill, 1861	present paper	Western Atlantic from Bahamas and Florida/U.S.A. south to southeastern Brazil; eastern Atlantic from Senegal south to Angola, including Cape Verde Islands and Annobón.	--
Serranidae	<i>Serranus n. sp.</i>	Osório (1891: 99–100) as <i>Serranus cabrilla</i> ; Debelius (1997: 148) and Afonso <i>et al.</i> , 1999 as <i>Serranus</i> sp.	Known only from São Tomé and Príncipe.	p. 81–82 ; p. 84 as <i>Serranus cabrilla</i>

Priacanthidae	<i>Heteropriacanthus cruentatus</i> (Lacepède, 1802)	Wirtz, 1992	Worldwide in tropical and warm temperate seas; in eastern Atlantic exclusively around offshore islands, from Madeira south to Saint Helena.	p. 73
Priacanthidae	<i>Priacanthus arena-tus</i> Cuvier in Cuvier & Valenciennes, 1829	Wirtz in Debelius (1997: 152)	Western Atlantic from Bermuda and North Carolina/U.S.A. south to northern Argentina; Mediterranean Sea and eastern Atlantic from Madeira south to Angola.	p. 84
Apogonidae	<i>Apogon affinis</i> Poey, 1865	present paper	Western Atlantic from Bahamas and Florida/U.S.A. south to Venezuela and Suriname; eastern Atlantic from Cape Verde Islands and Gulf of Guinea.	--
Apogonidae	<i>Apogon imberbis</i> (Linnaeus, 1758)	Osório (1891: 102)	Mediterranean Sea and eastern Atlantic from Azores, Madeira and Portugal south to Gulf of Guinea, including Canary and Cape Verde Islands.	p. 73
Apogonidae	<i>Apogon pseudomaculatus</i> Longley, 1932	present paper	Western Atlantic from New England/U.S.,A. and Bermuda south to southeastern Brazil.	--
Apogonidae	<i>Phaeoptyx pigmentaria</i> (Poey, 1860)	present paper	Western Atlantic from Bermuda and Florida/U.S.A. south to southeastern Brazil, including Rocas Atoll and Fernando Noronha; eastern Atlantic at Gulf of Guinea.	--
Epigonidae	<i>Epigonus constanciae</i> (Giglioli, 1880)	present paper; Osório [1891: 103, S. Thomé, as <i>Pomatomus telescopium</i> (non Risso, 1810)]	Western Mediterranean Sea and eastern Atlantic from Senegal south to Gulf of Guinea.	--
Malacanthidae	<i>Branchiostegus semifasciatus</i> (Norman, 1931)	Afonso <i>et al.</i> , 1999	Eastern Atlantic from Morocco south to Angola.	p. 73
Pomatomidae	<i>Pomatomus saltarix</i> (Linné, 1766)	Osório, 1898 as <i>Temnodon saltator</i>	Worldwide in tropical and temperate waters except for southeastern and northwestern Pacific.	p. 84, as <i>Pomatomus saltator</i>
Coryphaenidae	<i>Coryphaena equiselis</i> Linnaeus, 1758	D'Almeida <i>et al.</i> , 1996	Worldwide in tropical and warm temperate seas.	p. 73
Echeneidae	<i>Echeneis naucrates</i> Linnaeus, 1758	Osório (1891: 117)	Worldwide in tropical and temperate seas.	p. 84
Echeneidae	<i>Remora brachyptera</i> (Lowe, 1839)	Afonso <i>et al.</i> , 1999	Worldwide in tropical and warm temperate seas.	p. 73
Carangidae	<i>Alectis alexandrinus</i> (Geoffroy Saint-Hilaire, 1817)	Osório (1891: 118) as <i>Caranx alexandrinus</i>	Mediterranean Sea and eastern Atlantic from Morocco south to Angola, including Bioco Island.	p. 73
Carangidae	<i>Carangoides bartholomaei</i> (Cuvier, 1833)	present paper	Western Atlantic from Massachusetts/U.S.A. and Bermuda south to southeastern Brazil including offshore islands; eastern Atlantic from Saint Paul's Rocks.	--

Carangidae	<i>Caranx crysos</i> (Mitchill, 1815)	Frade & Costa, 1956	Western Atlantic from Nova Scotia/Canada south to Brazil; eastern Atlantic from Azores south to Angola, including Saint Paul's Rocks and Ascension Island.	p. 73
Carangidae	<i>Caranx hippos</i> (Linné, 1766)	Osório (1891: 118) as <i>Caranx caran-</i> <i>gus</i>	Western Atlantic from Nova Scotia/Canada south to Uruguay; eastern Atlantic from Portugal south to Angola; exact eastern Atlantic distribution not certain, the species complex is at present under revision by W.F. Smith-Vaniz.	p. 73, as <i>Caranx</i> <i>hippos</i>
Carangidae	<i>Caranx latus</i> Agas- siz, 1831	present paper	Western Atlantic from New Jersey/U.S.A. and Bermuda south to Rio de Janeiro/Brazil; Eastern Atlantic from Canary Islands to Gulf of Guinea; Saint Paul's Rocks, Ascension Island.	--
Carangidae	<i>Caranx lugubris</i> Poey, 1860)	present paper	Circumglobal in tropical and warm temperate seas, in eastern Atlantic from Azores Madeira, and Canary Islands south to Gulf of Guinea.	--
Carangidae	<i>Caranx rhonchus</i> Geoffroy Saint- Hilaire, 1817	Osório (1893a : 139) as <i>Caranx</i> <i>rhoncus</i>	Southern Mediterranean and eastern Atlantic from Morocco south to Namibia, including Annobón.	p. 84, as <i>Caranx</i> <i>rhoncus</i>
Carangidae	<i>Caranx n. sp.</i>	present paper	Mediterranean Sea and eastern Atlantic from Mauritania south to Angola, Bioco, and Ascension Island.	--
Carangidae	<i>Chloroscombrus</i> <i>chrysurus</i> (Linné, 1766)	Osório (1891: 118–119) as <i>Micropteryx chry-</i> <i>surus</i>	Western Atlantic from Massachusetts/ U.S.A. and Bermuda south to Uruguay; eastern Atlantic from Mauritania south to Angola.	p. 84
Carangidae	<i>Decapterus macarel-</i> <i>lus</i> (Valenciennes in Cuvier & Valencie- jannes, 1833)	Afonso <i>et al.</i> , 1999	Worldwide in tropical and temperate seas ; in eastern Atlantic from Azores and Madeira south to Saint Helena.	p. 73
Carangidae	<i>Decapterus puncta-</i> <i>tus</i> (Cuvier, 1829)	Frade & Costa, 1956	Western Atlantic from Nova Scotia/Canada south to southern Brazil; eastern Atlantic from Madeira and Morocco south to Saint Helena and South Africa, including Annobón.	p. 73
Carangidae	<i>Elagatis bipinnulata</i> (Quoy & Gaimard, 1825)	Wirtz in Debelius (1997: 160)	Worldwide in tropical and warm temperate seas; in eastern Atlantic from Azores, Canary Islands, Ivory Coast to Angola, including Cape Verde Islands and Saint Paul's Rocks.	p. 73–74
Carangidae	<i>Lichia amia</i> (Lin- naeus, 1758)	Osório (1891: 119)	Mediterranean Sea and eastern Atlantic from Bay of Biscay south to South Africa, and around the Cape of Good Hope into Western Indian Ocean, north to Delagoa Bay/Mozambique.	



Carangidae	<i>Selar crumenophthalmus</i> (Bloch, 1793)	Osório (1891: 118) as <i>Caranx crumenophthalmus</i>	Worldwide in tropical and warm temperate seas; eastern Atlantic from Cape Verde Islands south to Angola, including Annobón.	p. 74
Carangidae	<i>Selene dorsalis</i> (Gill, 1863)	Osório [1891: 118, Principe, as <i>Argyreiosus setipinnis</i> (non Mitchill, 1815)]; Afonso <i>et al.</i> , 1999	Eastern Atlantic from Portugal south to South Africa, including Madeira and Cape Verde Islands.	p. 74
Carangidae	<i>Seriola rivoliana</i> Valenciennes, 1833	present paper	Circumglobal in tropical and warm temperate seas.	--
Carangidae	<i>Trachinotus goreensis</i> Cuvier in Cuvier & Valenciennes, 1832	Osório (1891: 120)	Eastern Atlantic from Senegal south to Angola, including Bioco Island.	
Carangidae	<i>Trachinotus ovatus</i> (Linnaeus, 1758)	Osório (1891: 119–120) as <i>Lichia glauca</i>	Mediterranean Sea and eastern Atlantic from southern Norway south to Angola, including Cape Verde Islands and Annobón.	p. 74
Carangidae	? <i>Trachurus capensis</i> Castelnau, 1861	Osório (1891: 117) as <i>Trachurus trachurus</i> ; record needs verification	(Eastern Atlantic from Gulf of Guinea south to South Africa).	p. 84, as ? <i>Trachurus trachurus</i>
Carangidae	<i>Uraspis secunda</i> (Poey, 1860)	Afonso <i>et al.</i> , 1999	Worldwide in tropical and warm temperate seas, in eastern Atlantic from Mauritania south to South Africa.	p. 74
Emmelichthyidae	<i>Erythrocles monodi</i> Poll & Cadenat, 1954	Afonso <i>et al.</i> , 1999	Western Atlantic from Bahamas and South Caroline/U.S.A. south to Venezuela; eastern Atlantic from Mauritania south to Angola; straying to the Canary Islands.	p. 74
Lutjanidae	<i>Apsilus fuscus</i> Valenciennes in Cuvier & Valenciennes, 1830	Wirtz in Debelius (1997: 167)	Eastern Atlantic from Mauritania south to Namibia, including Cape Verde Islands.	p. 74
Lutjanidae	<i>Lutjanus agennes</i> Bleeker, 1863	Osório (1893b: 174) as <i>Lutjanus agenes</i>	Eastern Atlantic from Senegal south to Angola, including Cape Verde Islands.	p. 85
Lutjanidae	<i>Lutjanus dentatus</i> (Duméril, 1861)	Osório (1895: 61, Saint Thomé, as <i>Lutjanus euctatus</i> ); Osório (1898: 195) as <i>Lutjanus eutactus</i>	Eastern Atlantic from Senegal south to Angola.	p. 85
Lutjanidae	<i>Lutjanus endecacanthus</i> Bleeker, 1863	present paper	Eastern Atlantic from Ghana to Congo and Guinea.	--
Lutjanidae	<i>Lutjanus fulgens</i> (Valenciennes in Cuvier & Valenciennes, 1830)	Osório (1891: 102) as <i>Lutjanus Maltzani</i>	Eastern Atlantic from Senegal south to northern Angola, including Cape Verde Islands, Bioco and Annobón.	p. 74

Lutjanidae	<i>Lutjanus goreensis</i> (Valenciennes in Cuvier & Valenciennes, 1830)	Zarske, 1993	Eastern Atlantic from Senegal south to Congo, including Canary and Cape Verde Islands.	p. 74
Lutjanidae	? <i>Lutjanus griseus</i> (Linnaeus, 1758)	Osório (1891 : 102) as <i>Lutjanus jocu</i> ; Fowler (1936: 792–793) as <i>Lutjanus griseus</i>	(Western Atlantic from Bermuda and Massachusetts/U.S.A. south to southern Brazil; eastern Atlantic probably at Bioco).	p. 85
Lobotidae	<i>Lobotes surinamensis</i> (Bloch, 1790)	Osório (1891: 103–105) as <i>Lobotes auctorum</i>	Worldwide in tropical and warm temperate seas; in the eastern Atlantic from Madeira south to South Africa including the Mediterranean Sea.	p. 74
Gerreidae	<i>Eucinostomus melanopterus</i> (Bleeker, 1863)	Osório (1891: 105, 123) as <i>Gerres melanopterus</i>	Western Atlantic from Bermuda and Florida/U.S.A. south to southern Brazil; eastern Atlantic from Mauritania south to Angola, including Bioco Island.	p. 74–75
Haemulidae	<i>Brachydeuterus auritus</i> (Valenciennes, 1831)	present paper	Eastern Atlantic from Morocco south to Angola.	--
Haemulidae	<i>Parakuhlia macrophthalmus</i> (Osório, 1893)	Osório (1893b: 174–175) as <i>Haemulon macrophthalmum</i>	Eastern Atlantic from Senegal south to Angola.	p. 76, under Kuhliidae
Haemulidae	<i>Plectorhinchus macrolepis</i> (Boulenger, 1899)	Fowler (1936: 808–809) as <i>Parapristipoma latifrons</i>	Eastern Atlantic from Senegal south to Angola.	p. 85
Haemulidae	<i>Pomadasys incisus</i> (Bowdich, 1825)	Osório (1893a: 137) as <i>Pristipoma bennettii</i> ; Fowler (1936: 801–802)	Eastern Atlantic from Gibraltar (straying to Bay of Biscay) south to Angola, including Madeira, Canary and Cape Verde Islands and Annobón.	p. 85
Haemulidae	<i>Pomadasys perotaei</i> (Cuvier in Cuvier & Valenciennes, 1830)	Osório (1891: 103) as <i>Prestipoma Perotaei</i>	Eastern Atlantic from Mauritania south to Angola.	p. 85, as <i>Pomadasys peroteti</i>
Haemulidae	<i>Pomadasys rogerii</i> (Cuvier in Cuvier & Valenciennes, 1830)	Afonso <i>et al.</i> , 1999 as <i>Pomadasys rogeri</i>	Eastern Atlantic from Mauritania south to Angola.	p. 74, as <i>Pomadasys rogeri</i>
Haemulidae	<i>Pomadasys suillus</i> (Valenciennes in Cuvier & Valenciennes, 1833)	Osório (1893a: 137) as <i>Pristipoma suillum</i>	Eastern Atlantic from Senegal south to Angola, including Annobón.	p. 85
Lethrinidae	<i>Lethrinus atlanticus</i> Valenciennes in Cuvier & Valenciennes, 1830	Osório (1891: 108) as ? <i>Lethrinus atlanticus</i>	Eastern Atlantic from Senegal south to Gabon, including Cape Verde Islands.	p. 75
Sparidae	<i>Boops boops</i> (Linnaeus, 1758)	Osório (1891: 108) as <i>Box vulgaris</i>	Mediterranean and Black seas and eastern Atlantic from Norway south to Angola.	p. 75

Sparidae	<i>Dentex congoensis</i> Poll, 1954	Domanevskaya, 1987 as <i>Dentex</i> ( <i>Polysteganus</i> ) <i>congoensis</i>	Eastern Atlantic from Senegal south to Angola.	p. 75
Sparidae	<i>Dentex gibbosus</i> (Rafinesque- Schmaltz, 1810)	Osório (1891: 106) as <i>Dentex filiosus</i>	Mediterranean Sea and eastern Atlantic from Portugal to Angola.	p. 85
Sparidae	<i>Dentex mac-</i> <i>rophthalmus</i> (Bloch, 1791)	Osório (1891: 106)	Mediterranean Sea and eastern Atlantic from Portugal south to Namibia.	p. 75
Sparidae	? <i>Pachymetopon</i> <i>grande</i> Günther, 1859	Osório (1906: 156); record needs verification	(Western Indian Ocean from southern Mozambique and Madagascar south to ape of Good Hope/South Africa).	p. 85
Sparidae	<i>Pagellus bellottii</i> Steindachner, 1882	Osório (1893a: 137) as <i>Pagellus</i> <i>Bellottii</i>	Mediterranean Sea (Morocco to Tunisia) and eastern Atlantic from Gibraltar south to Angola, including Canary Islands and Bioco Island.	p. 75
Sparidae	<i>Pagrus caeruleostic-</i> <i>tus</i> (Valenciennes in Cuvier & Valenci- ennes, 1830)	Osório (1891: 109) as <i>Pagrus Ehren-</i> <i>bergii</i> .	Mediterranean Sea and eastern Atlantic from Portugal south to Angola.	p. 75
Sparidae	<i>Pagrus pagrus</i> (Lin- naeus, 1758)	Osório (1891: 109) as <i>Pagrus vulgaris</i>	Mediterranean Sea and tropical and warm temperate coastal waters of the Atlantic Ocean.	p. 85
Centracanthidae	<i>Spicara nigricauda</i> (Norman, 1931)	Osório (1891: 106) as <i>Smaris melanu-</i> <i>rus</i> ; Heemstra (1981: 2 pp.)	Eastern Atlantic from Ghana south to Angola, including Cape Verde Islands and Annobón.	p. 75
Polynemidae	<i>Galeoides decadac-</i> <i>tylus</i> (Bloch, 1795)	Osório (1891: 114) as <i>Galeoides poly-</i> <i>dactylus</i>	Eastern Atlantic from Morocco south to Angola; straying into southwestern Mediter- ranean.	p. 75
Sciaenidae	<i>Pseudotolithus</i> <i>brachygnathus</i> Bleeker, 1863	Frade & Costa, 1956 as <i>Johnius</i> <i>brachygnathus</i>	Eastern Atlantic from Mauritania south to Angola.	p. 85
Sciaenidae	<i>Pseudotolithus sene-</i> <i>galensis</i> (Valenci- ennes in Cuvier & Valenciennes, 1833)	present paper	Eastern Atlantic from Morocco south to Namibia.	--
Sciaenidae	<i>Umbrina cirrosa</i> (Linnaeus, 1758)	present paper	Mediterranean and Black seas, and eastern Atlantic from Bay of Biscay south to Morocco, probably more widespread along the West African coast.	--
Mullidae	<i>Mulloidichthys mar-</i> <i>tinicus</i> (Cuvier in Cuvier & Valenci- ennes, 1829)	Wirtz in Debelius (1997: 186); record of <i>Mullus</i> <i>surmuletus</i> by Osório (1891: 107) probably refers to this species	Western Atlantic from Bermuda and Flor- ida/U.S.A. south to southern Brazil; eastern Atlantic from Cape Verde Islands; straying to the Canary Islands.	p. 75, as <i>Mulloides</i> <i>martini-</i> <i>cus</i> ; p. 85 as ? <i>Mullus</i> <i>surmuletus</i>

Mullidae	<i>Pseudupeneus prayensis</i> (Cuvier in Cuvier & Valenciennes, 1829)	Osório (1891: 107–108) as <i>Upeneus prayensis</i>	Eastern Atlantic from Morocco south to Angola; including eastern Canary Islands (stray) and Cape Verde Islands, straying into western Mediterranean.	p. 75–76
Monodactylidae	<i>Monodactylus sebae</i> (Cuvier, 1829)	present paper	Eastern Atlantic from Canary Islands (stray) south to Angola.	--
Kyphosidae	<i>Kyphosus incisor</i> (Cuvier in Cuvier & Valenciennes, 1831)	Afonso <i>et al.</i> , 1999	Western Atlantic from Massachusetts/U.S.A. south to southern Brazil; eastern Atlantic from Cape Verde Islands and Angola.	p. 76
Kyphosidae	<i>Kyphosus sectator</i> (Linnaeus, 1758)	Frade & Costa, 1956 as <i>Kyphosus sectatrix</i>	Western Atlantic from Bermuda and Massachusetts/U.S.A. south to southern Brazil; eastern Atlantic from Madeira and Morocco south to northern Angola, including Saint Paul's Rocks, Ascension and Saint Helena.	p. 85
Drepaneidae	<i>Drepane africana</i> Osório, 1892	Osório (1892: 207–209) as <i>Drepane punctata</i> var. <i>Africana</i>	Eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands.	p. 76
Chaetodontidae	<i>Chaetodon robustus</i> Günther, 1860	Osório (1891: 109–110) as <i>Chaetodon striatus</i>	Eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands.	p. 76
Chaetodontidae	<i>Prognathodes marcellae</i> (Poll, 1950)	present paper	Eastern Atlantic from Canary Islands (stray) and Senegal south to Angola, including Cape Verde Islands.	--
Pomacanthidae	<i>Centropyge auranotus</i> Burgess, 1974	present paper	Western Atlantic from southern Caribbean Sea south to Santa Catarina/Brazil, including Fernando Noronha and Trindade.	--
Pomacanthidae	<i>Holacanthus africanus</i> Cadenat, 1951	Afonso <i>et al.</i> , 1999 as <i>Holocanthus africanus</i>	Eastern Atlantic from Senegal south to Congo, including Cape Verde Islands.	p. 76
Cirrhitidae	<i>Cirrhitus atlanticus</i> Osório, 1893	Osório (1893a: 138) as <i>Cirrhitites atlanticus</i>	Eastern Atlantic at Ghana.	p. 76
Pomacentridae	<i>Abudefduf hoefleri</i> (Steindachner, 1881)	Osório (1891: 125) as <i>Glyphidodon Hoefleri</i>	Eastern Atlantic from Senegal south to Benin, including Cape Verde Islands.	p. 85
Pomacentridae	<i>Abudefduf saxatilis</i> (Linnaeus, 1758)	Osório (1891: 125) as <i>Glyphidodon saxatilis</i>	Western Atlantic from New York/U.S.A. south to Uruguay; eastern Atlantic from Senegal south to Angola, including Canary Islands (stray) Cape Verde Islands, Bioco Island, Annobón and other offshore islands.	p. 76
Pomacentridae	<i>Abudefduf taurus</i> (Müller & Troschel, 1848)	present paper	Western Atlantic from Florida/U.S.A. south to Trinidad and Tobago and Venezuela; eastern Atlantic at Cape Verde Islands.	--
Pomacentridae	<i>Chromis multilineata</i> (Guichenot, 1855)	Osório (1893a: 139) as <i>Heliastes marginata</i>	Western Atlantic from Florida/U.S.A. south to central Brazil; eastern Atlantic from Ascension and Saint Helena.	p. 76–77

Pomacentridae	<i>Microspathodon frontatus</i> Emery, 1970	Osório (1891: 125–126) as <i>Glyphidodon chrysurus</i>	Eastern Atlantic from Ghana south to Congo, including Bioco and Annobón islands.	p. 77
Pomacentridae	<i>Stegastes imbricatus</i> Jenyns, 1840	Osório (1891: 124–125) as <i>Pomacentrus leucostictus</i>	Eastern Atlantic from Senegal south to Angola, including Canary and Cape Verde Islands, Bioco and Annobón,	p. 77
Labridae	<i>Acantholabrus paloni</i> (Risso, 1810)	present paper	Mediterranean Sea and eastern Atlantic from Norway south to Gabon, including Azores, Madeira, Canary and Cape Verde islands.	--
Labridae	<i>Bodianus pulchellus</i> (Poey, 1860)	Wirtz, 1997	Western Atlantic from Bermuda and South Carolina/U.S.A. south to southeastern Brazil, including offshore islands.	p. 77
Labridae	<i>Bodianus speciosus</i> (Bowdich, 1825)	Osório (1891: 126) as <i>Cossyphus tredecimspinosus</i>	Eastern Atlantic from Mauritania (?) south to Angola; including Cape Verde Islands; records from Madeira and the Canary Islands are erroneous.	p. 77
Labridae	<i>Clepticus africanus</i> Heiser, Moura & Robertson, 2000	Afonso <i>et al.</i> , 1999 as <i>Clepticus</i> sp.	São Tomé and Príncipe and Annobón.	p. 82
Labridae	<i>Coris atlantica</i> Günther, 1862	Osório (1891: 128) as <i>Coris atlantica</i> and <i>C. guineensis</i>	Eastern Atlantic from Cape Verde Islands to Liberia.	p. 77
Labridae	<i>Doratonotus megalepis</i> Günther, 1862	Bauchot & Blanc, 1961	Western Atlantic from Bermuda and Florida/U.S.A. south to Venezuela. Eastern Atlantic: Cape Verde Islands.	p. 85
Labridae	<i>Thalassoma newtoni</i> (Osório, 1891)	Osório (1891: 127) as <i>Julis pavo</i> ; Osório (1891: 127–128) as <i>Julis Newtoni</i>	Endemic to São Tomé and Príncipe; possibly also at Annobón and Bioco islands.	p. 77, as <i>Thalassoma pavo</i> ; p. 85–86 as <i>T. ascensionis</i>
Labridae	<i>Xyrichtys novacula</i> (Linnaeus, 1758)	Osório (1891: 126–127) as <i>Novacula cultrata</i>	Western Atlantic from North Carolina/U.S.A. south to southern Brazil; eastern Atlantic from southern Spain to Gabon including offshore islands.	p. 77
Labridae	<i>Xyrichtys sanctaehelena</i> (Günther, 1868)	present paper	Eastern Atlantic at Saint Helena and Ascension Island.	--
Scaridae	<i>Nicholsina collettei</i> Schultz, 1968	present paper; probably Osório (1906. 157) as <i>Scarus radians</i>	Eastern Atlantic from Senegal south to Annobón Island.	p. 86 as <i>?Scarus radians</i>

Scaridae	<i>Sparisoma n. sp.</i>	present paper; Bauchot & Blanc, 1961 as <i>Sparisoma rubripinne</i> ; probably Osório (1891: 128) as <i>Scarus cretensis</i>	West Africa including Cape Verde Islands.	p. 78; p. 86 as ? <i>Sparisoma cretense</i>
Scaridae	<i>Scarus hoefleri</i> (Steindachner, 1881)	Osório (1891: 128) as <i>Pseudoscarus Hoefleri</i>	Eastern Atlantic from Mauritania south to Congo, including Cape Verde Islands.	p. 78
Ammodytidae	<b>Gen. sp.</b>	present paper	Observed at São Tomé Island, probably more widespread.	--
Trachinidae	<i>Trachinus lineolatus</i> Fischer, 1885	Fischer (1885: 27–29); Osório (1891: 113–114) as <i>Trachinus radiatus</i>	Eastern Atlantic from Guinea Bissau south to Gabon.	p. 86
Uranoscopidae	<i>Uranoscopus polli</i> Cadenat, 1951	Afonso <i>et al.</i> , 1999	Eastern Atlantic from Congo south to Angola, probably more widespread.	p. 78
Blenniidae	<i>Entomacrodus cadenati</i> Springer, 1967	Wirtz in Debelius (1997: 228)	Eastern Atlantic from Senegal south to Guinea including Cape Verde Islands and Annobón.	p. 78
Blenniidae	<i>Hypleurochilus pseudoaequipinnis</i> Bath, 1994	present paper; recorded by Wirtz in Debelius (1997: 230) as <i>Hypleurochilus aequipinnis</i>	Western Atlantic from Florida/U.S.A. south to Recife/Brazil.	p. 78, as <i>Hypleurochilus aequipinnis</i>
Blenniidae	<i>Lipophrys velifer</i> (Norman, 1935)	Afonso <i>et al.</i> , 1999	Eastern Atlantic from Mauritania south to Angola; straying to the Canary Islands; records from Cape Verde Islands erroneous.	p. 78
Blenniidae	<i>Ophioblennius atlanticus</i> (Valenciennes in Cuvier & Valenciennes, 1836)	Osório (1891: 121) as <i>Salarias atlanticus</i>	Western Atlantic from Florida/U.S.A. and Bahamas south to Brazil; eastern Atlantic from Azores, Madeira, Canary Islands and Senegal south to Angola, Ascension and Saint Helena, including Cape Verde Islands and Annobón.	p. 78
Blenniidae	<i>Scartella cristata</i> (Linnaeus, 1758)	Osório (1898: 198) as <i>Blennius galerita</i> ; Afonso <i>et al.</i> , 1999 as <i>Scartella cristata</i>	Mediterranean, eastern Atlantic from Bay of Biscay south to Congo including Canary Islands and Annobón; Western Atlantic from Florida and Bermuda south to Brazil.	p. 78–79
Labrisomidae	<i>Labrisomus nuchipinnis</i> (Quoy & Gaimard, 1824)	Osório (1891: 121) as <i>Clinus nuchipinnis</i>	Western Atlantic from Bermuda and Florida/U.S.A. south to southern Brazil; eastern Atlantic from Madeira and Canary Islands south to Equatorial Guinea, including Annobón and Bioco Island.	p. 78, under Clinidae
Gobiesocidae	<i>Apletodon wirtzi</i>	present paper	São Tomé and Príncipe, coast of Cameroon.	--
Callionymidae	<i>Callionymus bairdi</i> Jordan, 1888	present paper	Western Atlantic from Canada south to Brazil; eastern Atlantic at Saint Helena, Ascension and Cape Verde islands.	--

Eleotridae	<i>Bostrychus africanus</i> (Steindachner, 1879)	Zarske, 1993	Eastern Atlantic from Senegal south to Angola, including Bioco and Annobón.	p. 86
Eleotridae	<i>Eleotris annobonensis</i> Blanc, Cadenat & Stauch, 1968	present paper	Known only from islands in the Gulf of Guinea.	--
Eleotridae	<i>Eleotris vittata</i> Duméril, 1861	Osório (1895: 62, 63) as <i>Eleotris gyrinus</i> ; Zarske, 1993	Eastern Atlantic from Senegal south to Angola, including Bioco and Annobón.	p. 86
Gobiidae	<i>Awaous lateristriga</i> (Duméril, 1861)	Arnoult <i>et al.</i> , 1966 as <i>Gobius guineensis</i>	West African watersheds into African eastern Atlantic from Senegal south to Angola, including islands in Gulf of Guinea.	p. 86, as <i>Chonophorus lateristriga</i>
Gobiidae	<i>Bathygobius burtoni</i> (O'Shaugnessy, 1875)	Miller (1990: 925); probably Osório (1895: 61) as <i>Bathygobius soporator</i>	West African watersheds from Ghana to Cameroon.	p. 79; p. 86 as <i>Bathygobius soporator</i>
Gobiidae	<i>Corcyrogobius lubbocki</i> Miller, 1988	present paper	Eastern Atlantic at Equatorial Guinea and Ghana, possibly more widespread.	--
Gobiidae	<i>Gnatholepis thomsoni</i> Jordan, 1904	Afonso <i>et al.</i> , 1999 as <i>Gnatholepis thomsoni</i>	Western Atlantic from Bermuda and Florida/U.S.A. south to Venezuela and Trinidad and Tobago; eastern Atlantic at Madeira, Canary and Cape Verde Islands, Ascension and Saint Helena.	p. 79, as <i>Gnatholepis thomsoni</i>
Gobiidae	<i>Gobius</i> sp.	present paper	Known only from São Tomé and Príncipe.	--
Gobiidae	<i>Gorogobius nigricinctus</i> Delais, 1951	present paper	Eastern Atlantic from Senegal to Ghana.	--
Gobiidae	<i>Gorogobius</i> n. sp.	present paper	Known only from São Tomé and Príncipe.	--
Gobiidae	<i>Nematogobius brachynemus</i> Pfaff, 1933	present paper	Eastern Atlantic from Senegal south to Congo and Annobón.	--
Gobiidae	<i>Nematogobius maindroni</i> (Sauvage, 1880)	Osório (1895: 61) as <i>Gobius Mendroni</i>	Eastern Atlantic from Senegal south to Angola, including Annobón.	p. 86
Gobiidae	<i>Periophthalmus barbarus</i> (Linné, 1766)	Osório (1891: 120) as <i>Periophthalmus papilio</i> ; Osório (1895: 63, Ile du Prince/Príncipe, as <i>Periophthalmus koelreuteri</i> Pallas var $\varepsilon$ Gunther).	Eastern Atlantic from Senegal south to Angola, including offshore islands.	p. 86
Gobiidae	<i>Porogobius schlegelii</i> (Günther, 1861)	Zarske, 1993	Eastern Atlantic from Senegal south to Congo, including Cape Verde Islands.	p. 86
Gobiidae	<i>Sicydium brevifile</i> Ogilvie-Grant, 1884	Pezold <i>et al.</i> , 2006	São Tomé and Príncipe, Annobón, Bioko.	--

Gobiidae	<i>Sicydium bustamantei</i> Greeff, 1882	Greeff (1882: 37) as <i>Gobius Bustamantei</i>	São Tomé and Príncipe, Annobón, Cameroon.	--
Gobiidae	<i>Wheelerigobius maltzani</i> (Steindachner, 1881)	present paper	Eastern Atlantic from Senegal south to Ghana and Annobón.	--
Gobiidae	<i>Wheelerigobius wirtzi</i> Miller, 1987	Afonso <i>et al.</i> , 1999	Known from Cameroon and São Tomé.	p. 79
Gobiidae	<i>Yongeichthys thomasi</i> (Boulenger, 1916)	Zarske, 1993	Eastern Atlantic from Senegal south to Congo.	p. 86
Gobiidae	Gen. n. sp. n.	present paper	Known only from São Tomé and Príncipe.	--
Ephippidae	<i>Ephippus goreensis</i> Cuvier in Cuvier & Valenciennes, 1831	Osório (1891: 110–112) as <i>Ephippus gigas</i> ; Fowler (1936: 901–902) as <i>Chaetodipterus goreensis</i>	Eastern Atlantic from Mauritania south to Angola, including Cape Verde Islands.	p. 79
Acanthuridae	<i>Acanthurus monroviae</i> Steindachner, 1876	Osório (1891: 122) as <i>Acanthurus chirurgus</i> ; Debelius (1997: 256) as <i>Acanthurus monroviae</i>	Western Atlantic: Brasil; Eastern Atlantic from Morocco south to Angola, including Cape Verde Islands; straying to Canary Islands.	p. 79
Acanthuridae	<i>Prionurus biafraensis</i> (Blache & Rossignol, 1961)	Wirtz in Debelius (1997: 257)	Restricted to eastern Atlantic at Gulf of Guinea.	p. 79
Sphyraenidae	<i>Sphyraena barracuda</i> (Edwards, 1771)	Afonso <i>et al.</i> , 1999	Tropical and warm temperate seas of Indo-West Pacific and Atlantic, in eastern Atlantic from Madeira south to Nigeria, including Saint Paul's Rocks, probably more widespread.	p. 79
Sphyraenidae	<i>Sphyraena guachancho</i> Cuvier, 1829	Osório (1891: 114–115) as <i>Sphyraena bocagei</i> ; Osório (1906: 157) as <i>Sphyraena dubia</i> ; Fowler (1936: 576–578)	Western Atlantic from Massachusetts/U.S.A. south to Brazil; eastern Atlantic from Senegal south to Angola, including Annobón.	p. 79, as <i>Sphyraena sphyraena</i> ; p. 86
Scombridae	<i>Acanthocybium solandri</i> (Cuvier in Cuvier & Valenciennes, 1832)	D'Almeida <i>et al.</i> , 1996	Worldwide in tropical and temperate seas.	p. 79
Scombridae	<i>Auxis thazard</i> (Lacepède, 1800)	D'Almeida <i>et al.</i> , 1996	Worldwide in tropical and warm temperate seas.	p. 79
Scombridae	<i>Euthynnus alletteratus</i> (Rafinesque-Schmaltz, 1810)	Frade & Costa, 1956	Mediterranean and Black seas and tropical and subtropical waters of Atlantic Ocean.	p. 80



Scombridae	<i>Katsuwonus pelamis</i> (Linnaeus, 1758)	D'Almeida <i>et al.</i> , 1996	Worldwide in tropical and warm temperate seas.	p. 80
Scombridae	<i>Scomber colias</i> Gmelin, 1789	Frade & Costa, 1956	In tropical and warm temperate waters of the Atlantic Ocean and Mediterranean, in eastern Atlantic from Bay of Biscay south to South Africa, including offshore islands.	p. 86, as <i>Scomber japonicus</i>
Scombridae	<i>Scomberomorus tritor</i> (Valenciennes in Cuvier & Valenciennes, 1832)	Osório (1891: 115) as <i>Cybius tritor</i>	Eastern Atlantic from Canary Islands and Senegal south to Angola, straying into western Mediterranean.	p. 80
Scombridae	<i>Thunnus albacares</i> (Bonnaterre, 1788)	Frade & Costa, 1956 as <i>Neothunnus albacora</i>	Worldwide in tropical and warm temperate seas.	p. 80
Scombridae	<i>Thunnus obesus</i> (Lowe, 1839)	D'Almeida <i>et al.</i> , 1996	Worldwide in tropical and temperate seas.	p. 80
Istiophoridae	<i>Istiophorus albicans</i> (Latreille, 1804)	D'Almeida <i>et al.</i> , 1996	In tropical and warm temperate waters of the Atlantic Ocean.	p. 80, under Xiphiidae
Nomeidae	<i>Nomeus gronovii</i> (Gmelin, 1789)	Osório (1892: 206)	Worldwide in tropical and temperate seas.	p. 86
Paralichthyidae	<i>Syacium guineensis</i> (Bleeker, 1862)	Osório (1893b: 178–179) as <i>Hemirhombus aramaca</i> ; Osório (1893b: 179) as <i>Hemirhombus guineensis</i>	Eastern Atlantic from Western Sahara and Mauritania south to Namibia.	p. 87, under Bothidae, as <i>Syacium micrurum</i>
Bothidae	<i>Arnoglossus</i> sp.	present paper	Known only from São Tomé, but probably more widespread along the West African coast.	--
Bothidae	<i>Bothus guibei</i> Stauch, 1966	Osório (1891: 129–130) as <i>Rhomboidichthys podas</i>	Eastern Atlantic at Nigeria and Annobón.	p. 80; p. 86–87 as <i>Bothus podas</i>
Bothidae	<i>Bothus lunatus</i> Linnaeus, 1758	Osório (1893b: 179) as <i>Rhomboidichthys lunatus</i>	Western Atlantic from Bermuda and Florida/U.S.A. south to southern Brazil; eastern Atlantic from Gulf of Guinea and Ascension Island.	p. 80
Soleidae	<i>Dicologlossa cuneata</i> (Moreau, 1881)	present paper	Mediterranean Sea and eastern Atlantic from Bay of Biscay south to South Africa.	--
Cynoglossidae	<i>Cynoglossus monodi</i> Chabanaud, 1949	present paper	Eastern Atlantic from Mauritania south to Congo.	--
Cynoglossidae	<i>Cynoglossus senegalensis</i> (Kaup, 1858)	Afonso <i>et al.</i> , 1999	Eastern Atlantic from Senegal south to Angola.	p. 80
Balistidae	<i>Balistes capriscus</i> Gmelin, 1789	Afonso <i>et al.</i> , 1999 as <i>Balistes carolinensis</i>	Western Atlantic from Nova Scotia/Canada and Bermuda south to Argentina; Mediterranean and eastern Atlantic from North Sea south to Angola, including offshore islands.	p. 80, as <i>Balistes carolinensis</i>

Balistidae	<i>Balistes punctatus</i> Gmelin, 1789	Guimarães (1885: 28) and Osório (1891: 135) as <i>Balistes forcipatus</i> ; Afonso <i>et al.</i> , 1999 as <i>B. punctatus</i>	Eastern Atlantic from Morocco south to Angola, including Madeira (?), Canary Islands (stray), Cape Verde Islands, Annobón and Bioco Island.	p. 80–81
Balistidae	<i>Canthidermis sufflamen</i> (Mitchill, 1815)	Afonso <i>et al.</i> , 1999 as <i>Canthidermes sufflamen</i>	Western Atlantic from Bermuda and Massachusetts/U.S.A. south to Brazil; eastern Atlantic from Saint Paul's Rocks, Canary and Cape Verde Islands, Ascension and Saint Helena.	p. 81, as <i>Canthidermes sufflamen</i>
Balistidae	<i>Melichthys niger</i> (Bloch, 1786)	Osório (1891 : 135) as <i>Balistes buniva</i>	Worldwide in tropical and warm temperate seas, in eastern Atlantic from Saint Paul's Rocks, Cape Verde Islands, Ascension and Saint Helena; straying to Canary Islands.	p. 87
Monacanthidae	<i>Aluterus scriptus</i> (Osbeck, 1765)	Afonso <i>et al.</i> , 1999	Worldwide in tropical and warm temperate seas, in eastern Atlantic from Saint Paul's Rocks, Azores, Madeira, Canary and Cape Verde Islands and Ascension.	p. 81
Monacanthidae	<i>Cantherhines pullus</i> (Ranzani, 1842)	Osório (1891: 135–136) as <i>Monacanthus pardalis</i> ; Lozano Cabo (1961: 148) as <i>Cantherhines pullus</i>	Western Atlantic from Bermuda and Massachusetts/U.S.A. south to southern Brazil; eastern Atlantic from the Cape Verde Islands and the Gulf of Guinea, including Annobón.	p. 81, as <i>Cantherhines pullus</i>
Monacanthidae	<i>Stephanolepis hispidus</i> Linné, 1766	Osório (1891: 136) as <i>Monacanthus setifer</i> ; Fowler (1936: 1095–1097) as <i>Monacanthus hispidus</i>	Western Atlantic from Nova Scotia/Canada and Bermuda south to Uruguay; eastern Atlantic from Canary Islands south to Angola, including Cape Verde Islands.	p. 87
Ostraciidae	<i>Acanthostracion guineensis</i> Bleeker, 1865	Osório (1891: 136) as <i>Ostracion quadricornis</i> ; Fowler (1936: 1101–1102) as <i>Ostracion tricornis</i>	Eastern Atlantic from Senegal south to Angola, including Bioco Island.	p. 87
Ostraciidae	<i>Acanthostracion notacanthus</i> Bleeker, 1863	Afonso <i>et al.</i> , 1999	Mediterranean and eastern Atlantic from Azores south to Angola and Ascension, mainly around offshore islands.	p. 81
Tetraodontidae	<i>Canthigaster supramacula</i> Moura & Castro, 2002	present paper	Eastern Atlantic from Ivory Coast and Ghana, probably more widespread.	--
Tetraodontidae	<i>Lagocephalus laevigatus</i> (Linné, 1766)	Afonso <i>et al.</i> , 1999	Western Atlantic from Bermuda and New England/U.S.A. south to Argentina; eastern Atlantic from Mauritania south to Namibia.	p. 81

Tetraodontidae	<i>Sphoeroides marmoratus</i> (Lowe, 1838)	Osório (1891: 137) as <i>Tetrodon spengleri</i> ; Afonso <i>et al.</i> , 1999 as <i>Sphoeroides marmoratus</i>	Eastern Atlantic from Portugal south to Angola, including Azores, Madeira, Canary and Cape Verde islands.	p. 81
Diodontidae	<i>Chilomycterus reticulatus</i> (Linnaeus, 1758)	Afonso <i>et al.</i> , 1999; probably Guimarães, 1884 and Osório (1891: 137–138) as <i>Chilomycterus geometricus</i>	Worldwide in tropical and warm temperate seas, in eastern Atlantic from Portugal south to Namibia.	p. 81; p. 87, as <i>?Chilomycterus spinosus mauretanicus</i>
Diodontidae	<i>Diodon holocanthus</i> Linnaeus, 1758	Arnoult <i>et al.</i> , 1966	Worldwide in tropical and warm temperate seas, in eastern Atlantic from Senegal south to South Africa.	p. 81
Diodontidae	<i>Diodon hystrix</i> Linnaeus, 1758	Osório (1891: 137) as <i>Diodon hystrix</i>	Worldwide in tropical and warm temperate seas, in eastern Atlantic from Madeira south to South Africa.	p. 81

**TABLE 2.** Distribution types of coastal fishes of São Tomé and Príncipe islands.

Distribution type of São Tomé and Príncipe coastal fishes	Number of species	Percentage of total valid species (n = 234)
Endemic to Gulf of Guinea	28	12.0
Tropical West Africa only	73	31.2
Tropical eastern Atlantic reaching to Brazilian islands	1	0.4
Widespread eastern Atlantic	36	15.4
Widespread western and eastern Atlantic	41	17.5
Western Atlantic reaching to Gulf of Guinea or isolated tropical eastern Atlantic islands	23	9.8
Atlantic and Indo-West Pacific	2	0.9
Circumtropical	30	12.8

## Discussion

Table 1 gives an updated checklist of the coastal fishes of São Tomé and Príncipe and their known distribution, a total of 234 valid species, including 59 new records, and an additional 10 doubtful historical records which need to be verified.

Twenty-one of the 59 new records of shore fishes from São Tomé and Príncipe represent fish species that occur on both sides of the Atlantic, i.e. amphi-Atlantic species. A particularly noteworthy example is that of *Centropyge aurantonotus* (Figure 27), previously only known from Barbados to southern Brazil in the western Atlantic. Many other fish species present at São Tomé and Príncipe have their sister species in the western Atlantic (e.g. *Clepticus africanus*, *Microspathodon frontatus*, *Myrichthys pardalis*, *Pseudupeneus prayensis*, *Sparisoma n. sp.*).



**FIGURE 27.** *Centropyge aurantonotus*, Sete Pedras, photo S.R. Floeter

A large proportion of amphi-Atlantic species was already noted for marine invertebrates from São Tomé and Príncipe (Laborel 1974; Wirtz 2001, 2003, 2004). At present, amphi-Atlantic species at São Tomé and Príncipe total 64 species (representing 27.3% of the valid species; see Tab. 2). Even though planktonic larvae could cross the Atlantic in as little as 35 to 105 days in the Equatorial Undercurrent (Scheltema 1971), it remains unclear in most cases if the western and eastern Atlantic populations of amphi-Atlantic species are still linked genetically today. A genetic study of the fish *Ophioblennius atlanticus* by Muss *et al.* (2001) suggested that eastern and western Atlantic populations of this species have been genetically separated for several million years and should probably be considered sister species. In contrast, there appears to be ongoing gene flow between American and African populations of the sea-urchin *Eucidaris tribuloides* (Lessios *et al.* 1999).

Previous biogeographic hypotheses suggest that exchange of species between regions is largely unidirectional: from the most diverse towards the less diverse region (Briggs 1995; Vermeij 1991; Vermeij & Rosenberg 1993). Thus, a null biogeographic hypothesis is that the tropical eastern Atlantic (Gulf of Guinea) receives most of its species from Brazil and the Caribbean and, indeed, after a phylogeographic analysis of the Atlantic species of these genera, invasion from the New World to the Eastern Atlantic was argued for *Thalassoma* (Bernardi *et al.* 2004; Costagliola *et al.* 2004), *Ophioblennius* (Muss *et al.* 2001), *Holacanthus* (Bellwood *et al.* 2004), and *Gnatholepis* (Rocha *et al.* 2005).

To a much lesser degree, the shore fish fauna of São Tomé and Príncipe also shows some affinity with the Indian Ocean. Genera such as *Coris*, *Lethrinus*, *Prionurus*, and *Plectorhynchus*, not present in the western Atlantic, exemplify such cases.

The following species are currently only known from São Tomé and Príncipe and the neighboring (poorly explored) island of Annobón: *Torpedo* sp. 1 and 2, *Clepticus africanus*, *Thalassoma newtoni*, *Scorpaena annobónae*, *Liopropoma* **sp. n.**, *Serranus* **sp. n.**, Gobiidae **gen. & sp. nov.**, *Gorogobius* **n. sp.** Time will tell if they are also present on the more distant (and equally poorly explored) shores of the Gulf of Guinea, i.e. the island of Bioko and the African mainland coast.

Roberts *et al.* (2002) have rightly called the Gulf of Guinea one of the hotspots of marine biodiversity on earth. A few weeks of diving and collecting has resulted in 59 new records of fishes. Ten of these represent undescribed species. The National Geographic expedition has also collected a large number of marine invertebrates new for the area and new for science. This indicates that the marine fauna of the Gulf of Guinea is seri-

ously underestimated. A broad effort is needed to understand how rich the area really is and how species are distributed within that region.

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