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FAO SPECIES IDENTIFICATION GUIDE FOR FISHERY PURPOSES

# THE LIVING MARINE RESOURCES OF THE EASTERN CENTRAL ATLANTIC

VOLUME 3

**Bony fishes part 1 (Elopiformes to Scorpaeniformes)**

edited by

**Kent E. Carpenter**

Department of Biological Sciences  
Old Dominion University  
Norfolk, Virginia, USA

and

**Nicoletta De Angelis**

(former FAO, Rome)

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### **SUMMARY**

This multivolume field guide covers the species of interest to fisheries of the major marine resource groups exploited in the Eastern Central Atlantic. The area of coverage includes FAO fishing area 34 and part of 47. The marine resource groups included are bivalves, gastropods, chitons, cephalopods, stomatopods, shrimps, lobsters, crabs, hagfishes, sharks, batoid fishes, chimaeras, bony fishes and sea turtles. The introductory chapter outlines the environmental, ecological, and biogeographical factors influencing the marine biota, and the basic components of the fisheries in the Eastern Central Atlantic. Within the field guide, the sections on the resource groups are arranged phylogenetically according to higher taxonomic levels such as class, order, and family. Each resource group is introduced by general remarks on the group, an illustrated section on technical terms and measurements, and a key or guide to orders or families. Each family generally has an account summarizing family diagnostic characters, biological and fisheries information, notes on similar families occurring in the area, a key to species, a checklist of species, and a short list of relevant literature. Families that are less important to fisheries include an abbreviated family account and no detailed species information. Species in the important families are treated in detail (arranged alphabetically by genus and species) and include the species name, frequent synonyms and names of similar species, an illustration, FAO common name(s), diagnostic characters, biology and fisheries information, notes on geographical distribution, and a distribution map. For less important species, abbreviated accounts are used. Generally, this includes the species name, FAO common name(s), an illustration, a distribution map, and notes on biology, fisheries, and distribution. Each volume concludes with its own index of scientific and common names.

**Production staff:** FAO FishFinder, Marine and Inland Fisheries Branch, Fisheries and Aquaculture Resources Use and Conservation Division, Fisheries and Aquaculture Department, FAO.

**Project coordinators:** P. Oliver (former FAO, Rome), J. Lleonart (former FAO, Rome), M. Lamboeuf (former FAO, Rome), J. Fischer (former FAO, Rome).

**Programme manager:** K. Friedman (FAO, Rome).

**Scientific reviser:** N. De Angelis (former FAO, Rome).

**Editorial assistance:** M. Kautenberger-Longo (former FAO, Rome), E. Biesack (Old Dominion University, Norfolk, VA, USA), B. Polidoro (Arizona State University, Phoenix, AR, USA).

**Desktop publisher:** M. Kautenberger-Longo (former FAO, Rome).

**Scientific illustrator:** E. D'Antoni (FAO, Rome).

**Cover:** E. D'Antoni (FAO, Rome).

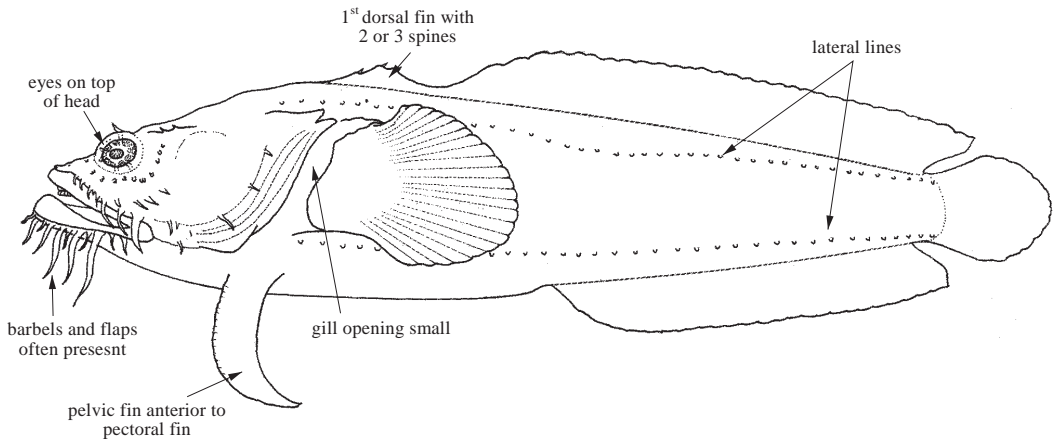
## Order BATRACHOIDIFORMES

### BATRACHOIDIDAE

#### Toadfishes

by B.B. Collette, National Marine Fisheries Service Systematics Laboratory, National Museum of Natural History, Washington, DC, USA and D.W. Greenfield, California Academy of Sciences, San Francisco, CA, USA

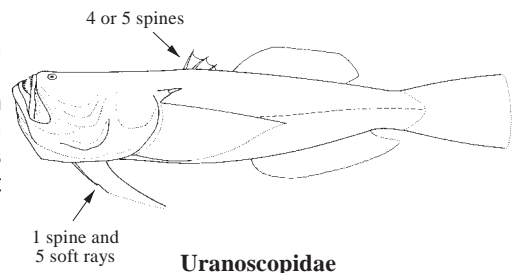
**Diagnostic characters:** Small to medium-sized fishes (to about 30 cm in the area) easily recognized by their characteristic shape. **Head broad and flattened, often with barbels and/or fleshy flaps around jaws;** mouth large, terminal and slightly protrusible; rather strong and pointed teeth present in jaws as well as on roof of mouth; **gill openings small, restricted to sides of body;** opercle and subopercle with spines. Glandular tissue may be present in the opercular region and in the pectoral-fin axil. Two separate dorsal fins, **the first with 2 or 3 spines (3 in all eastern Atlantic species),** the second long, with 16 to 25 soft rays; **anal fin somewhat shorter than second dorsal,** with 13 to 23 soft rays; pectoral fins large and broad-based; **pelvic fins jugular in position and composed of 1 spine and 2 soft rays.** Skin scaly or naked. Lateral-line system very well developed, lateral line either single or multiple. Swimbladder closed and capable of producing loud sounds. Number of vertebrae ranging from 27 to 45. **Colour:** rather variable; back and sides usually brownish, often with spots, saddles, bars or other markings.



**Habitat, biology, and fisheries:** Toadfishes are bottom-dwellers ranging from littoral areas to rather deep waters. Several species enter rivers, and some migrate regularly between shallow and deep waters. Eastern Atlantic toadfishes are sluggish ambush predators, feeding mainly on molluscs, sea urchins, and crustaceans. They often hide in the sediment or in rock crevices. Although none of the species occurring in Fishing Area 34 are presently of commercial importance, they are taken in local artisanal or trawl fisheries and are used as food or in the production of fishmeal and oil. The spines may inflict wounds to people handling these fishes.

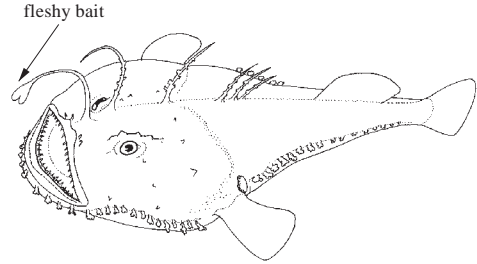
#### Similar families occurring in the area

Uranoscopidae (stargazers): head rounded rather than depressed, the mouth strongly oblique, opening dorsally; gill openings wide, not restricted to sides; first dorsal fin with 4 or 5 spines (3 in eastern Atlantic Batrachoididae); anal-fin base equal to or longer than second dorsal-fin base (always shorter in Batrachoididae); pelvic fins with 1 spine and 5 soft rays (1 spine and 2 soft rays in Batrachoididae).



**Uranoscopidae**

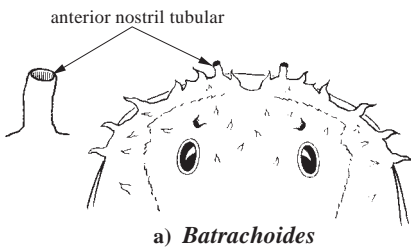
Lophiidae: body and head more strongly depressed; first dorsal-fin spine modified into a long fishing rod with a fleshy bait.



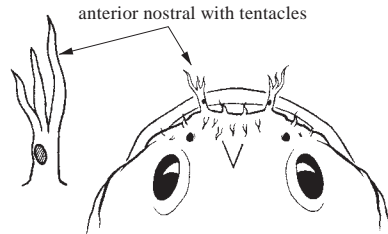
**Lophiidae**

**Key to the species of Batrachoididae occurring in the area**

- 1a. Eyes small, contained 8 to 12 times in head length; anal-fin rays 21 to 23; dorsal-fin rays 24 to 26; anterior nostril tubular, without tentacles (Fig. 1a); vertebrae 33 to 35  
 ..... ***Batrachoides liberiensis***
- 1b. Eyes larger, contained 4 to 8 times in head length; anal-fin rays 13 to 17; dorsal-fin rays 16 to 21; anterior nostril with tentacles (Fig. 1b); vertebrae 27 to 30. .... → 2



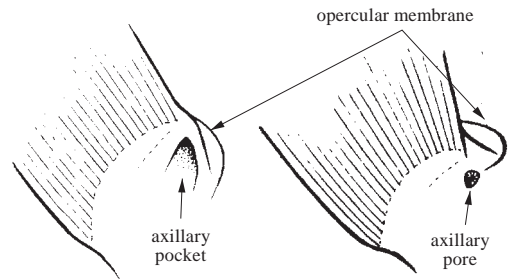
a) *Batrachoides*



b) *Chatrabus*

**Fig. 1 anterior nostril**

- 2a. Head rounded and narrow, head depth in width 1.3 times or less; a more or less funnel-shaped pocket (axillary pocket) present on upper part of pectoral axilla (Fig. 2a)  
 ..... ***Perulibatrachus* → 3**
- 2b. Head flattened and wide, head depth in width 1.6 times or greater; pectoral axilla without a pocket; a small foramen (axillary pore) present or absent, if present, it is a small hole high up in the pectoral axilla just below edge of opercular membrane (Fig. 2b) ..... → 4
- 3a. Body colour a network of irregular dark lines on head and sides; 26 pectoral-fin rays; more than 60 pores in the dorsal lateral line; axillary pocket deep ..... ***Perulibatrachus elminensis***
- 3b. Dark spots on body and pectoral fins; 23 pectoral-fin rays; about 35 pores in the dorsal lateral line; axillary pocket shallow. .... ***Perulibatrachus rossignoli***
- 4a. No foramen on upper part of pectoral axilla; body without reticulate pattern, dark with traces of dorsal bars . . ***Chatrabus damaranus***
- 4b. A small foramen (axillary pore) high up in pectoral axilla just below edge of opercular membrane (Fig. 2b); body with reticulate pattern, dark spots on pectoral and caudal fins  
 ..... ***Halobatrachus didactylus* → 5**









a) *Perulibatrachus*      b) *Halobatrachus*

**Fig. 2 pectoral fin (folded forward)**

- 5a. Eye small, 5.1 to 8.0 times in head length, 5.3 to 7.9% standard length; interorbital space wide, 12.2 to 16.1% standard length . . . . . **small-eyed form (northern area)**
- 5b. Eye large, 3.6 to 5.1 times in head length, 7.8 to 11.19% standard length; interorbital space narrow, 8.8 to 12.1% standard length . . . . . **large-eyed form (southern area)**

### List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Batrachoides liberiensis* (Steindachner, 1867).
-  *Chatrabus damaranus* (Barnard, 1927).
-  *Halobatrachus didactylus* (Bloch and Schneider, 1801).
-  *Perulibatrachus elminensis* (Bleeker, 1863).
-  *Perulibatrachus rossignoli* (Roux, 1957).

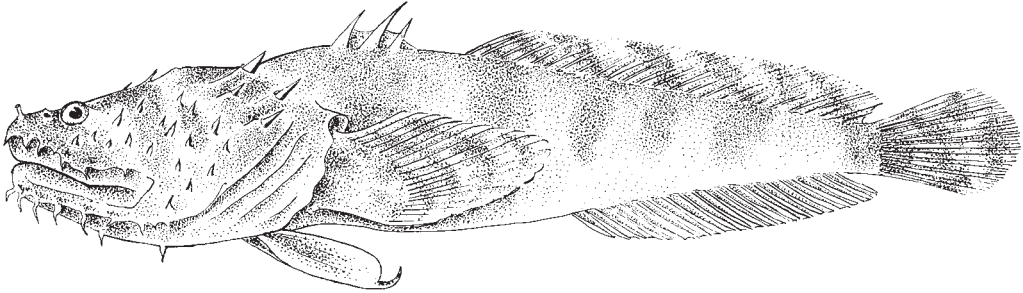
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***Batrachoides liberiensis*** (Steindachner, 1867)

**Frequent synonyms / misidentifications:** *Batrachus liberiensis* Steindachner, 1867; *Batrachoides beninensis* Regan, 1915 / None.

**FAO names:** En – Hairy toadfish; Fr – Crapaud poilu; Sp – Sapo peludo.



**Diagnostic characters:** Body covered with small, embedded, cycloid scales except the head anterior to first dorsal fin and chest anterior to pelvic-fin origin are naked. Head broad, strongly depressed and regularly rounded anteriorly (but more oval in young), **most of its surface covered with numerous short, simple filaments giving it a "hairy" appearance**; underside of lower jaw on each side with a double row of 4 multibranched mental barbels bordering a groove pierced by 4 pores; each one of these lateral grooves followed posteriorly by a crest bearing tentacles; branched tentacles also present above upper jaw; **eyes small, contained 8 to 12 times in head length**; sides of head crossed by a longitudinal groove extending from anterior profile to opercular spines; **anterior, as well as posterior nostrils tubular, without ornamentation**, the former opening on a fleshy frontal lobe above upper lip; **2 spines on both opercle and subopercle**; teeth in upper jaw in 3 or 4 rows anteriorly and 2 or 3 rows laterally; those in lower jaw in 4 or 5 rows anteriorly and a single row laterally; teeth on vomer and palatines (roof of mouth) strong and conical. First dorsal fin with 3 spines, **second dorsal with 24 to 26 soft rays**; **anal fin with 21 to 23 soft rays**; **pectoral fins with 19 to 22 rays**; glands present between 13 and 15 pectoral-fin rays. Body mostly covered with small, embedded, cycloid scales except the head anterior to supratemporal canal and chest anterior to pelvic-fin origin are naked. Two lateral lines, the upper bending upward at level of tenth dorsal-fin ray, the lower bending downward at level of seventh anal-fin ray, both lines thereafter running along fin bases to caudal fin; **upper lateral line with 30 to 41**, the lower with 34 to 42 pores, each pore flanked by a pair of branched tentacles. **Number of vertebrae: 33 to 35.** **Colour:** rather variable, in preserved specimens ranging from dark to light brown, with usually 4 irregular brown cross-bars on body; a brown spot between eyes, and sometimes other spots behind eyes.

**Size:** Maximum to 245 mm total length, 205 mm standard length.

**Habitat, biology, and fisheries:** A bottom-living species occurring mainly in littoral areas and shallow coastal waters less than 30 m deep, but occasionally reported from deeper waters (to about 100 m). Also found in brackish environments. Feeds chiefly on crabs. Minimum size at first maturity 170 mm standard length for males, 122 mm standard length for females. Taken throughout its range, mainly in artisanal fisheries, apparently rather abundant. Separate statistics are not reported for this species. Caught mainly with artisanal fishing gear. Probably marketed mostly fresh.

**Distribution:** West African coast from Senegal to Mangué Grande, northern Angola.

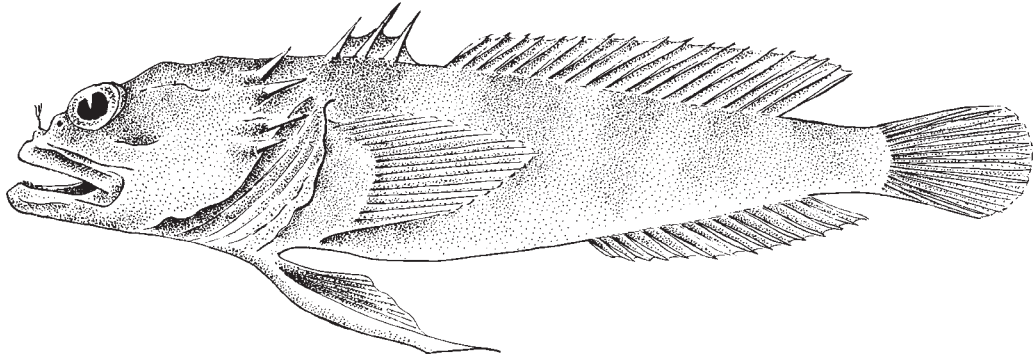




***Chatrabus damaranus*** (Barnard, 1927)

**Frequent synonyms / misidentifications:** *Batrachoides damaranus* Barnard, 1927 / *Chatrabus melanurus* (Barnard, 1927).

**FAO names:** En – Pony toadfish; Fr – Crapaud angolais; Sp – Sapo chasquilla.



**Diagnostic characters:** Body covered with small, embedded, cycloid scales except the head anterior to first dorsal fin and chest anterior to pelvic-fin origin are naked. Body robust. Head massive; underside of lower jaw on each side with a double row of simple and rather flat mental barbels (8 or 9 pairs), each pair bordering a pore; farther posterior, a single row of 2 to 4 isolated, simple barbels on each side; **eyes large, contained 6 to 8 times in head length**; **anterior nostrils tubular** and located on edge of a frontal lobe **bearing 3 or 4 flattened tentacles**; posterior nostrils circular with a slightly prominent margin; **a few small filaments present between anterior nostrils**; 2 spines on both opercle and subopercle. First dorsal fin with 3 spines, second dorsal with 18 or 19 soft rays; **anal fin with 14 or 15 soft rays**; pectoral fins with 24 rays, **their inner surfaces with diffuse glandular tissue (not concentrated in inter-radial pockets)**. **No pore or pocket in pectoral axillary fold**. Body mostly covered with small, embedded, cycloid scales except the head anterior to first dorsal fin and chest anterior to pelvic-fin origin are naked. Two lateral lines, **upper with 29 to 37 pores**, lower scarcely visible, the pores each flanked by a pair of small vertical skin flaps; a third longitudinal row of pores, each flanked by a pair of horizontal flaps, present on midline of body. Number of vertebrae 28 to 30. **Colour:** in preserved specimens, back brownish, belly light brown; brown dots spread over entire body (including belly), sometimes arranged to form eye-like spots (ocelli) on head; 2 brown cross-bars on head and 4 on body.

**Size:** Maximum to 293 mm total length, 237 mm standard length.

**Habitat, biology, and fisheries:** A bottom-living species occurring on the continental shelf to about 200 m depth. Occasionally taken in artisanal and trawl fisheries throughout its range. Separate statistics are not reported for this species. Caught mainly with bottom trawls.

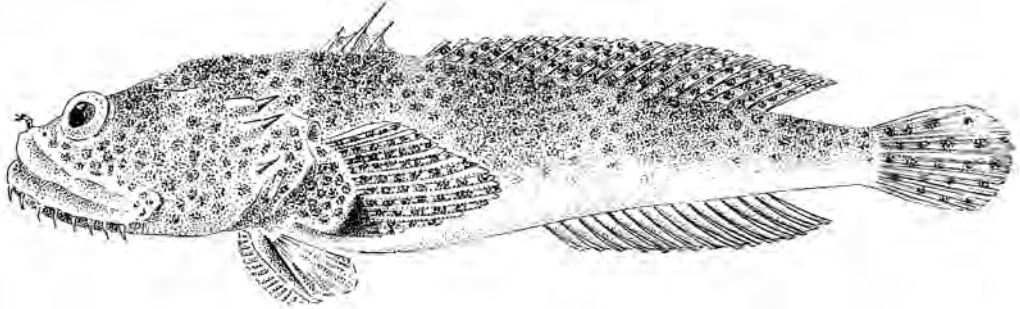
**Distribution:** West African coast from Baía dos Tigres, southern Angola to Walvis Bay, Namibia.



***Halobatrachus didactylus*** (Bloch and Schneider, 1801)

**Frequent synonyms / misidentifications:** *Batrachus didactylus* Bloch and Schneider, 1801; *Halobatrachus conspicillum* (Cuvier, 1829) / None.

**FAO names:** **En** – Lusitanian toadfish; **Fr** – Crapaud-lusitanien; **Sp** – Sapo lusitánico.



**Diagnostic characters:** Body covered with small, embedded, cycloid scales except the head anterior to first dorsal fin and chest anterior to pelvic-fin origin are naked. Head large and massive; a double row of simple mental barbels on each side of lower jaw bordering a groove pierced by about 15 pores, followed laterally by a single row of rather long, simple barbels. **Two forms which may represent separate species, the small-eyed *H. didactylus*, eyes 5.1 to 8.0 times in head length, 5.3 to 7.9% standard length; interorbital space wide, 12.2 to 16.1% standard length; and the large-eyed *H. conspicillum*, eyes 3.6 to 5.1 times in head length, 7.8 to 11.1% standard length, interorbital space narrow, 8.8 to 12.1% standard length.** **Anterior tube-like nostrils** located on anterior profile of head and **bearing a tuft of finger-like tentacles**; posterior nostrils simple rounded openings just in front of eyes; 2 spines on opercle and **1 on subopercle**; anterior teeth of both jaws in 3 rows, upper lateral teeth in 2 rows, lower laterals in a single row; 2 or 3 rows of teeth on vomer and palatines (roof of mouth). First dorsal fin with 3 spines, second dorsal with 19 to 21 soft rays; **anal fin with 16 or 17 soft rays**; pectoral fins with 24 or 25 rays, **their inner surfaces bearing inter-radial pockets of glandular tissue; a small axillary pore on upper part of pectoral axilla beneath upper edge of opercular membrane.** Two lateral lines, the upper comprising 48 pores, each surrounded by minute skin flaps. Number of vertebrae 11 precaudal plus 19 or 20 caudal, total 30 or 31. **Colour:** rather variable; in preserved specimens, darker on back and upper sides, lighter on belly; often 4 dark cross-bars on body and 3 on head (1 between eyes, the other 2 posterior to eyes); head and body covered with small dark spots superimposed on a lighter network; second dorsal fin with brown oblique lines; opercular and dorsal fin spines often surrounded by light areas at bases.

**Size:** Maximum to 277 mm total length, 235 mm standard length. The IGFA all-tackle angling record is 2.50 kg for a fish taken in Dahkla, Western Sahara in 2003.

**Habitat, biology, and fisheries:** A bottom-dwelling species inhabiting mainly shallow coastal waters to about 60 m depth, although some countries fishing in the area have reported it from deeper waters (to about 250 m). Feeds chiefly on molluscs and crustaceans. In the northern part of the range, spawning extends from March to April. Minimum size at maturity 191 mm total length for females, 160 mm for males. Fecundity ranges from 227 to 1 233 eggs/female. Taken in artisanal fisheries and as bycatch in trawl fisheries throughout its range. Separate statistics are not reported for this species. Caught with bottom trawls and artisanal fishing gear. Marketed mostly fresh; also used for fishmeal and oil. Has received special attention in recent years because of its use as an experimental species in toxicology and cardiology experiments.

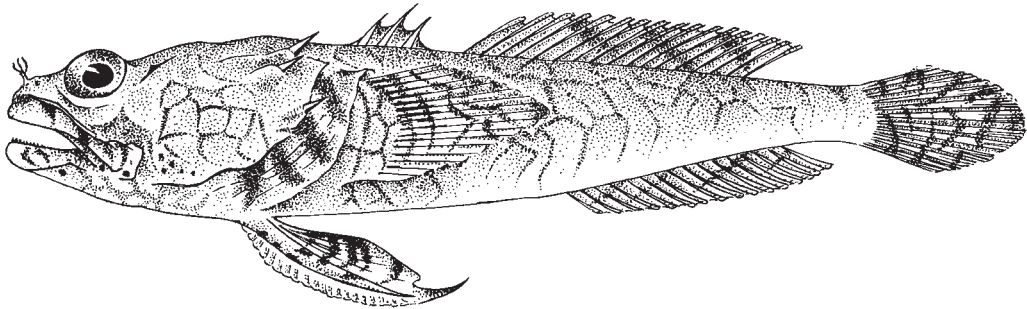
**Distribution:** The small-eyed *H. didactylus* form is known from an old northern record from the Kattegat in Norway south along the coast of the Iberian Peninsula into the Mediterranean and along the coast of northern West Africa. The large-eyed *H. conspicillum* form is found on the West African coast from the Straits of Gibraltar south to at least Ghana and perhaps as far as Nigeria, with some old literature records from the Canary Islands.



***Perulibatrachus elminensis* (Bleeker, 1863)**

**Frequent synonyms / misidentifications:** *Batrachus elminensis* Bleeker, 1863; *Parabatrachus elminensis* (Bleeker, 1863); *Batrachus budkeri* Roux, 1957 / None.

**FAO names:** En – Guinean toadfish; Fr – Crapaud guinéen; Sp – Sapo guineano.



**Diagnostic characters:** Body covered with small, embedded, cycloid scales except the head anterior to first dorsal fin and chest anterior to pelvic-fin origin are naked. Head large and depressed; mouth terminal; underside of lower jaw on each side with a double row of simple or bifid filamentous mental barbels bordering a groove pierced by about 14 pores (each surrounded by a pair of short tentacles) and ending in a rather large orifice on either end; farther back on underside of lower jaw, at level of mouth cleft, another 2 pores surrounded by fringed barbels; **anterior nostrils** located on anterior profile of head and **bearing a tuft of tentacles**; posterior nostrils simple round orifices surrounded by a low wall and located just in front of eyes; 2 spines on opercle and **a single bifid spine on subopercle**; teeth in upper jaw in 3 rows anteriorly and a single row laterally; those in lower jaw in 3 or 4 rows anteriorly followed laterally first by 2 rows and then ending in a single row; 3 or 4 rows of teeth on vomer and 1 or 2 rows on palatines (roof of mouth). First dorsal fin with 3 spines; second dorsal with 16 to 21 soft rays (usually 16 or 17); anal fin with 14 to 17 soft rays; pectoral fins with 26 rays, **their inner sides bearing a variable number of inter-radial globules of glandular tissue**; **a deep axillary pocket (distinct funnel-like depression) occupying the entire upper part of the pectoral axillary fold**. Two lateral lines, **the upper comprising about 60 pores**, each surrounded by 2 short skin flaps. Number of vertebrae: 27. **Colour:** in preserved specimens, back more or less dark brown, sides and belly light brown; **a network of irregular brown lines covering the entire body except belly**; soft dorsal and anal fins with oblique brown stripes; a dark spot on body beneath pectoral fins close to the axillary pocket.

**Size:** Maximum to 343 mm total length, 285 mm standard length; common to 200 mm total length.

**Habitat, biology, and fisheries:** A bottom-living species inhabiting coastal waters on the continental shelf. Feeds on crustaceans and molluscs. Occasionally taken in artisanal and trawl fisheries, but apparently nowhere abundant. Separate statistics are not reported for this species. Caught with bottom trawls and artisanal fishing gear. Probably utilized fresh.

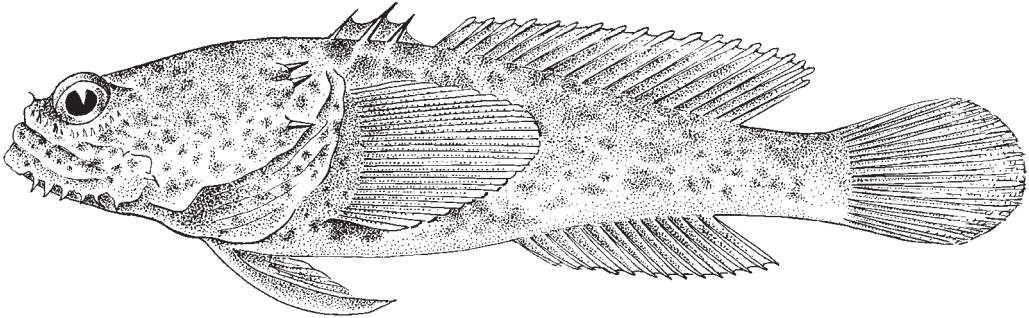
**Distribution:** West African coast from Ghana to Walvis Bay, Namibia.



***Perulibatrachus rossignoli* (Roux, 1957)**

**Frequent synonyms / misidentifications:** *Batrachus rossignoli* Roux, 1957 / None.

**FAO names:** **En** – Rossignol's toadfish; **Fr** – Crapaud de Rossignol; **Sp** – Sapo do Rossignol.



**Diagnostic characters:** Body covered with small, embedded, cycloid scales except the head anterior to first dorsal fin and chest anterior to pelvic-fin origin are naked. Head large and massive; underside of lower jaw on each side with a double row of flat, broad-based mental barbels bordering a groove pierced by about 12 pores (each surrounded by a pair of short tentacles); **eyes large, contained 4 to 5 times in head length**; **anterior nostrils tubular** and located on the edge of a fleshy frontal lobe, **bearing a simple tentacle**; posterior nostrils simple round openings; 2 spines on opercle and **1 on subopercle**; teeth in both jaws small and conical, in 3 rows anteriorly, and successively reduced to 2 and 1 row laterally; a single row of teeth on vomer and palatines (roof of mouth). First dorsal fin with 3 spines, second dorsal with 19 soft rays; anal fin with 13 to 15 soft rays; **pectoral fins with 23 rays, their inner surfaces with diffuse glandular tissue (not concentrated in inter-radial pockets)**. **A shallow funnel-shaped pocket present on upper part of pectoral axillary fold**. Body mostly covered with small, embedded, cycloid scales except the head anterior to first dorsal fin and chest anterior to pelvic-fin origin are naked. **Two lateral lines, the upper comprising about 35 pores**, each surrounded by 2 skin flaps, the lower with about 30 pores. Number of vertebrae 29 or 30. **Colour:** in preserved specimens, back brownish, belly beige; 3 or 4 brown cross-bars on body and 2 on head. Fresh specimens sometimes with brown spots spread over entire body (including belly) arranged to form constellations or eye-like spots (ocelli).

**Size:** Maximum to at least 270 mm total length, 215 mm standard length.

**Habitat, biology, and fisheries:** A bottom-living species occurring on the continental shelf to about 100 m. Feeds chiefly on crustaceans. Separate statistics are not reported for this species. Occasionally taken in artisanal and trawl fisheries throughout its range, but apparently nowhere abundant. Caught with bottom trawls and several types of artisanal gear. Utilized mainly fresh.

**Distribution:** West African coast from Gabon to Walvis Bay, Namibia.

