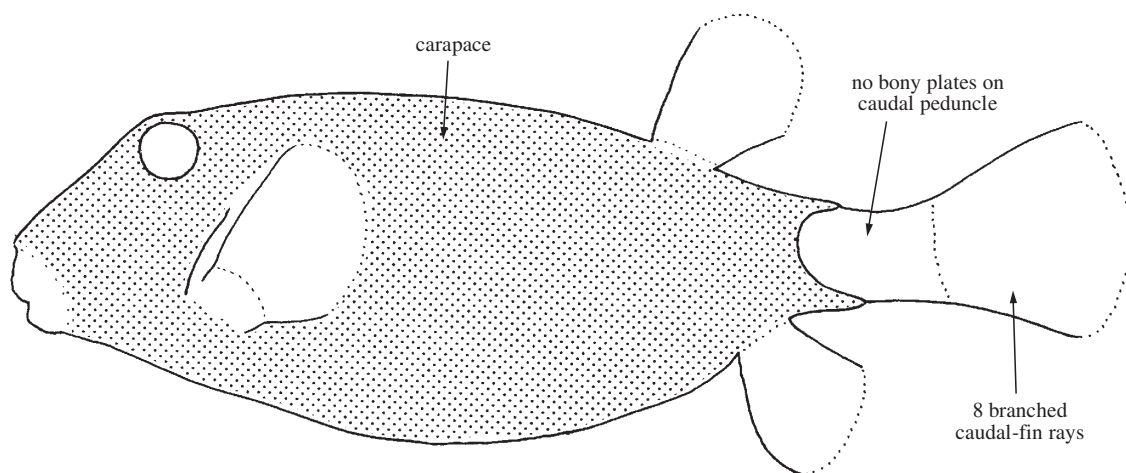


OSTRACIIDAE

Boxfishes

by K. Matsuura

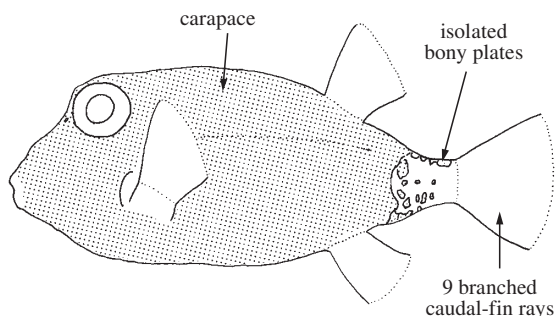
Diagnostic characters: Small to medium-sized (to 40 cm) fishes; **body almost completely encased in a bony shell or carapace formed of enlarged, thickened scale plates, usually hexagonal in shape and firmly sutured to one another; no isolated bony plates on caudal peduncle. Carapace triangular, rectangular, or pentangular in cross-section, with openings for mouth, eyes, gill slits, pectoral, dorsal, and anal fins, and for the flexible caudal peduncle. Scale-plates often with surface granulations which are prolonged in some species into prominent carapace spines over eye or along ventrolateral or dorsal angles of body.** Mouth small, terminal, with fleshy lips; teeth moderate, conical, usually less than 15 in each jaw. Gill opening a moderately short, vertical to oblique slit in front of pectoral-fin base. Spinous dorsal fin absent; most dorsal-, anal-, and pectoral-fin rays branched; **caudal fin with 8 branched rays**; pelvic fins absent. Lateral line inconspicuous. **Colour:** variable, with general ground colours of either brown, grey, or yellow, usually with darker or lighter spots, blotches, lines, and reticulations.



Habitat, biology, and fisheries: Slow-swimming, benthic-dwelling fishes occurring on rocky and coral reefs and over sand, weed, or sponge-covered bottoms to depths of 100 m. Feed on benthic invertebrates. Taken either by trawl, other types of nets, or traps. Several species considered excellent eating in southern Japan, although some species are reported to have toxic flesh and are also able to secrete a substance when distressed that is highly toxic, both to other fishes and themselves in enclosed areas such as holding tanks.

Similar families occurring in the area

Aracaniidae: isolated bony plates on caudal peduncle; caudal fin with 9 branched rays.



Aracaniidae

Key to the genera of Ostraciidae occurring in the area

- 1a. No spines on carapace *Ostracion*
- 1b. Spines present on carapace (Figs 1 to 3) → 2
- 2a. A short, sharp spine projecting anteriorly from eye; a sharp, stout spine projecting posteriorly from rear end of ventrolateral ridge (Fig. 2) *Lactoria*
- 2b. No anteriorly projecting spine from eye; 1 or 2 minute spines on supraorbital ridge; no spine at rear end of ventrolateral ridge (Figs 1 and 3) *Tetrosomus*

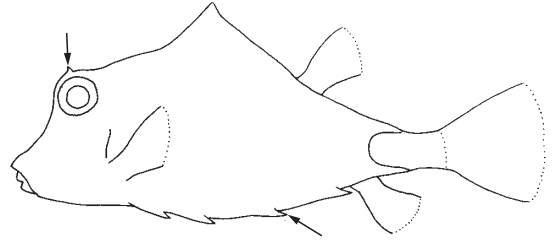


Fig. 1 *Tetrosomus*

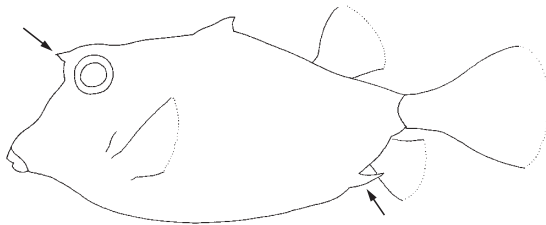


Fig. 2 *Lactoria*

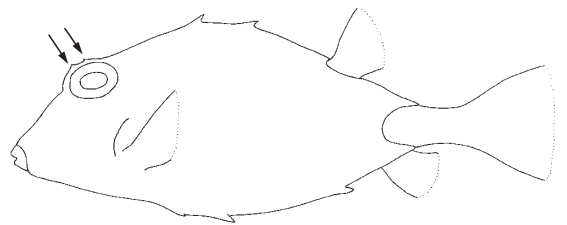


Fig. 3 *Tetrosomus*

List of species occurring in the area

The symbol is given when species accounts are included.

- Lactoria cornuta* (Linnaeus, 1758)
- Lactoria diaphana* (Bloch and Schneider, 1801)
- Lactoria fornasini* (Bianconi, 1846)
- Ostracion cubicus* Linnaeus, 1758
- Ostracion meleagris* Shaw and Nedder, 1796
- Ostracion nasus* Bloch, 1785
- Ostracion rhinorhynchus* Bleeker, 1852
- Ostracion solorensis* Bleeker, 1853
- Tetrosomus gibbosus* (Linnaeus, 1758)
- Tetrosomus reipublicae* (Ogilby, 1913)

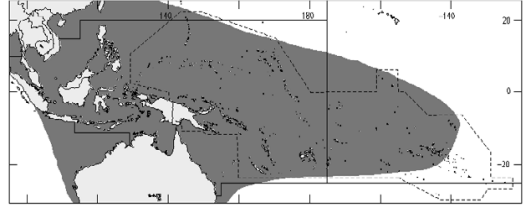
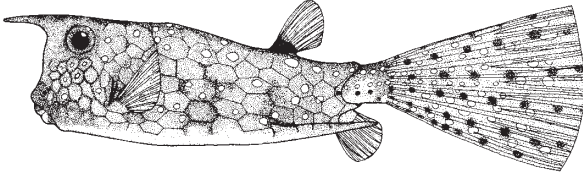
Reference

Randall, J.E., G.R. Allen, and R.C. Steene. 1990. *Complete diver's and fisherman's guide to fishes of the Great Barrier Reef and Coral Sea*. Bathurst, Crawford House Press, 507 p.

Lactoria cornuta (Linnaeus, 1758)

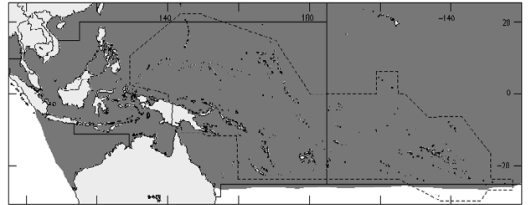
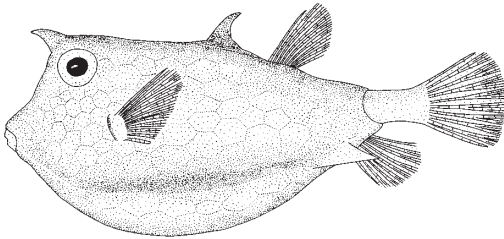
En - Longhorn cowfish; **Fr** - Coffre buffle; **Sp** - Torito cornudo.

Maximum total length 50 cm. Coastal on coral and rocky reefs, to depths of 100 m. Feeds on benthic invertebrates. Taken by trawl; not marketed. Widespread in the tropical Indo-West Pacific from South Africa eastward through Indonesia to the Marquesas Islands, northward to southern Japan. Distinguished from *Lactoria diaphana* and *L. fornasini* by having a long caudal fin (1/2 to 2/3 of carapace length).

***Lactoria diaphana*** (Bloch and Schneider, 1801)

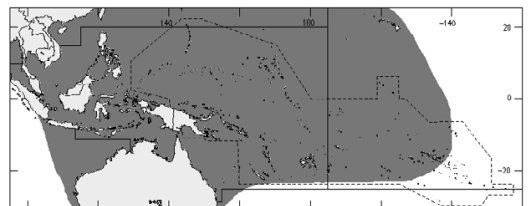
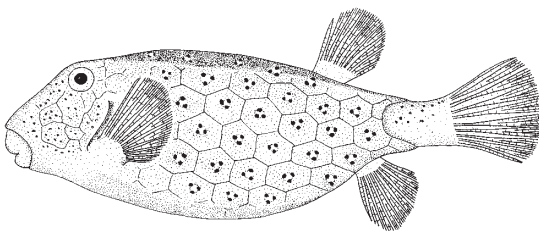
En - Roundbelly cowfish.

Maximum total length 25 cm. Coastal on coral and rocky reefs, to depths of 50 m. Feeds on benthic invertebrates. Taken by trawl and set nets; not marketed. Widespread in the tropical Indo Pacific from South Africa eastward through Indonesia to Easter Island and Peru, northward to southern Japan. Similar to *Lactoria fornasini* but differing in having a short, compressed spine on dorsal ridge, and dorsal profile of head 65° to horizontal (45° in *L. fornasini*).

***Ostracion cubicus*** Linnaeus, 1758

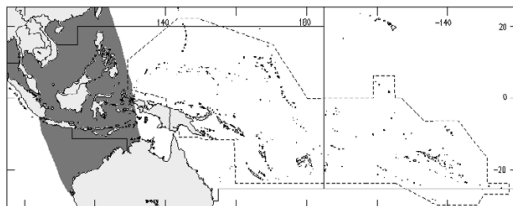
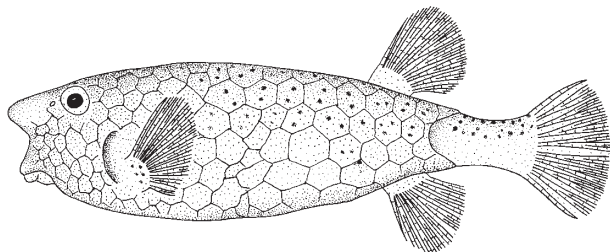
En - Yellow trunkfish.

Maximum total length 45 cm. Coastal on coral and rocky reefs, to a depth of 50 m. Feeds on benthic invertebrates. Taken by trawl and seines. Not marketed, but an aquarium trade fish. Widespread in the tropical Indo-West Pacific from South Africa eastward through Indonesia to the Tuamotu Islands, northward to southern Japan.

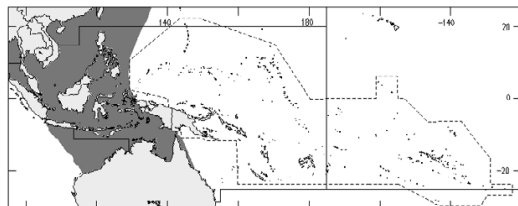
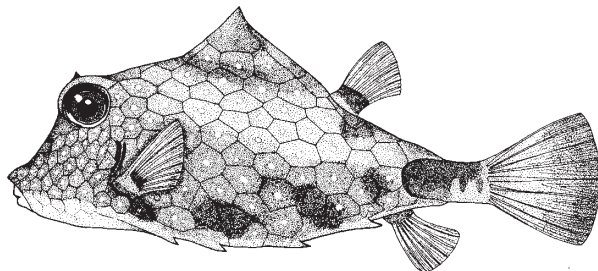


Ostracion rhinorhynchus Bleeker, 1852**En** - Horn-nosed boxfish.

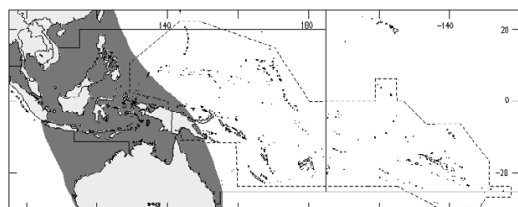
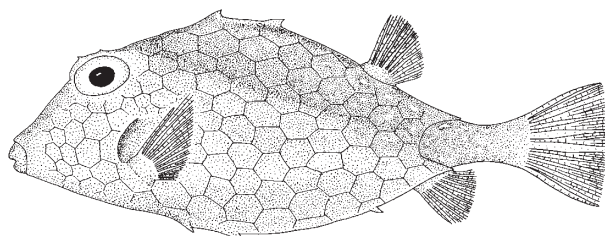
Maximum total length 35 cm. Coastal on coral reefs and flat bottoms, to a depth of 50 m. Feeds on benthic invertebrates. Taken by trawl and set nets; not marketed. Widespread in the tropical Indo-West Pacific from East Africa eastward through Indonesia to northern Australia, northward to southern Japan. Similar to *Ostracion nasus* Bloch, 1785, but distinguished by bump on snout.

***Tetrosomus gibbosus*** (Linnaeus, 1758)**En** - Humpback boxfish; **Fr** - Coffre bossu; **Sp** - Cofre jorobado.

Maximum total length 30 cm. Coastal, frequently found in seagrass beds and sandy bottoms to depths of 50 m; feeds on benthic invertebrates. Taken by trawl; not marketed. Widespread in the tropical Indo-West Pacific from East Africa eastward through Indonesia to northern Australia, northward to southern Japan.

***Tetrosomus reipublicae*** (Ogilby, 1913)**En** - Smallspine turretfish.

Maximum total length 30 cm. Coastal on flat bottoms, to depths of 180 m. Feeds on benthic invertebrates. Taken by trawl; not marketed. Widespread in the tropical Indo-West Pacific from East Africa eastward through Indonesia to northern Australia, northward to southern Japan. Another scientific name, *Tetrosomus concatenatus* (Bloch, 1786), has frequently been applied to this species by authors, but it is a synonym of an Atlantic species, *Lactophrys triquetter* (Linnaeus, 1758).

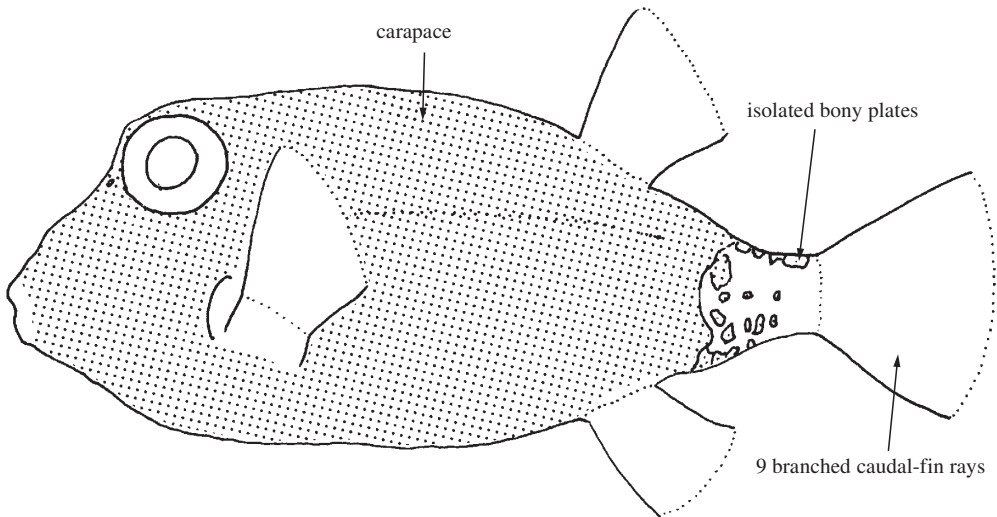


ARACANIDAE

Trunkfishes

by K. Matsuura

Diagnostic characters: Small to medium-sized (to about 40 cm) fishes; **body almost completely encased in a bony shell or carapace formed of enlarged, thickened scale plates, usually hexagonal in shape and firmly sutured to one another; isolated bony plates on caudal peduncle. Carapace triangular or hexagonal in cross-section, with openings for mouth, eyes, gill slit, pectoral, dorsal, and anal fins, and for the flexible caudal peduncle. Scale plates often with surface granulations which are prolonged in some species into prominent carapace spines over eyes or along ventro-lateral or dorsolateral angles of body.** Mouth small, terminal, with fleshy lips; teeth moderate, conical, usually less than 15 in each jaw. Gill opening moderately short, a vertical to oblique slit in front of pectoral-fin base. Spinous dorsal fin absent; most dorsal-, anal-, and pectoral-fin rays branched; **caudal fin with 9 branched rays**; pelvic fins absent. Lateral line inconspicuous. **Colour:** variable, with general ground colours of either brown, grey, yellow, or red usually with darker or lighter spots, blotches, lines, and reticulations.



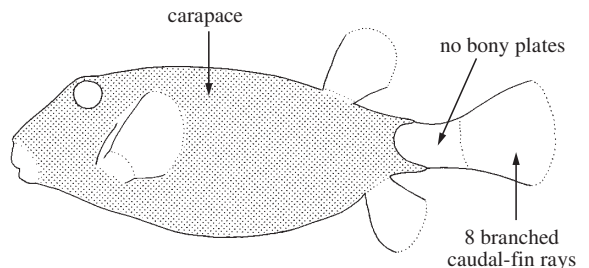
Habitat, biology, and fisheries: Slow-swimming benthic-dwelling fishes occurring on rocky reefs and over sand, weed, or sponge-covered bottoms to depths of 200 m. Feed on benthic invertebrates. Taken by trawls. Some Australian species are reported to be toxic.

Similar families occurring in the area

Ostraciidae: no isolated bony plates on caudal peduncle; caudal fin with 8 branched rays.

A single species occurring in the area

Kentrocapros flavofasciatus (Kamohara, 1938)



Ostraciidae

References

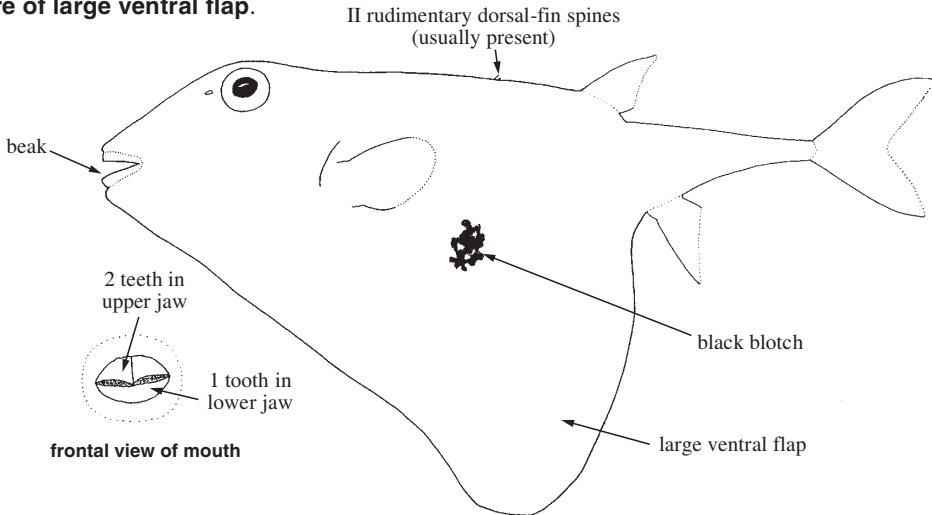
- Kuiter, R. H. 1994. Family Aracaniidae. In *The fishes of Australia's south coast*, edited by M.F. Gomon, J.C. M. Glover and R.H. Kuiter. Adelaide, State Print, pp. 892-902.
- Matsuura, K. and T. Yamakawa. 1982. Rare boxfishes, *Kentrocapros flavofasciatus* and *K. rosapinto*, with notes on their relationships. *Japan. J. Ichthyol.*, 29(1):31-42.

TRIODONTIDAE

Threetooth puffer

by K. Matsuura

Diagnostic characters: A large fish (size to 60 cm); body moderately elongate and moderately compressed, with a **very large ventral flap which is extensible by downward rotation of the long, shaft-like pelvis**. Head large and blunt. Eyes high on head. Gill opening a simple, vertical slit in front of pectoral-fin base. **Jaws modified to form a beak of 3 heavy, massive teeth, 2 above and 1 below**. Dorsal and anal fins located posteriorly, **2 rudimentary dorsal-fin spines present or absent**; caudal fin forked. Lateral line inconspicuous. **Colour:** light brown dorsally, yellow ventrally, with a **black blotch on centre of large ventral flap**.



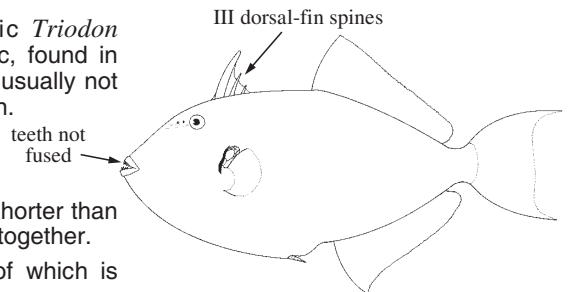
Habitat, biology, and fisheries: The monotypic *Triodon macropterus* occurs in the tropical Indo-West Pacific, found in deep water to depths of 300 m. Rarely collected and usually not marketed, but sold fresh on markets of southern Japan.

Similar families occurring in the area

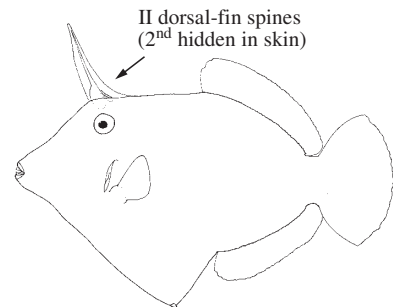
Balistidae: III dorsal-fin spines, the second and third shorter than the first but conspicuous; teeth pointed and not fused together.

Monacanthidae: II dorsal-fin spines, only the first of which is prominent; teeth pointed and not fused together.

Tetraodontidae: no dorsal-fin spines; no ventral flap or pelvis; teeth also fused together, but 2 teeth each in upper and lower jaws.



Balistidae

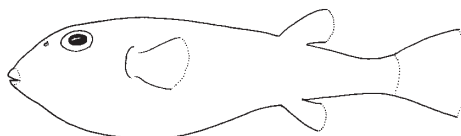


Monacanthidae

2 teeth in each jaw



frontal view of mouth



no ventral flap or pelvis

Tetraodontidae

A single species in the family

Triodon macropterus Lesson, 1829

Reference

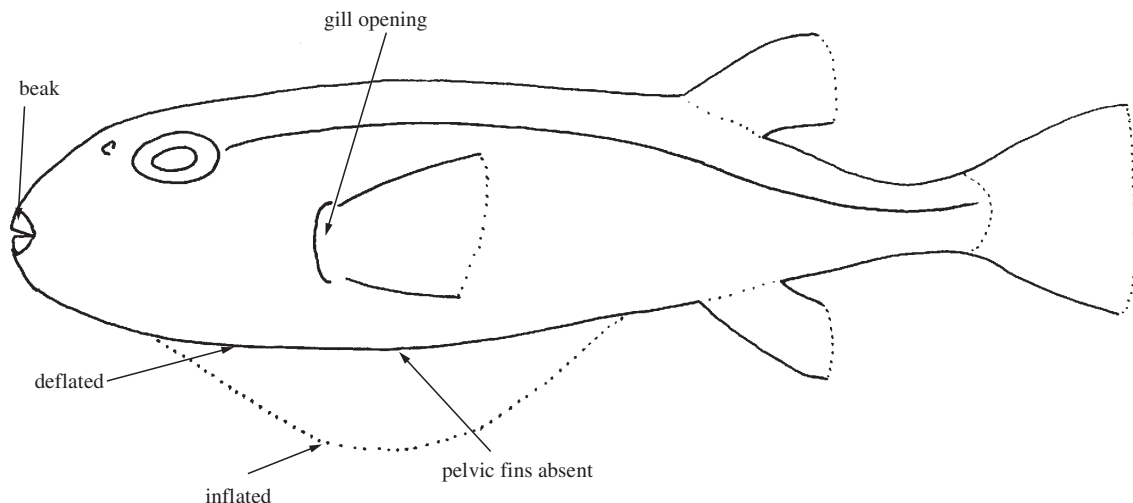
Tyler, J.C. 1967. A redescription of *Triodon macropterus* Lesson, a phylogenetically important fish. *Proc. Koninkl. Nederl. Akad. van Wetensch.*, Ser. C(1):84-96.

TETRAODONTIDAE

Puffers

by K. Matsuura

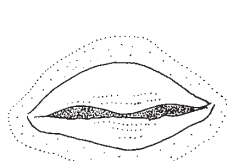
Diagnostic characters: Small to medium-sized (to 80 cm) fishes. Head large and blunt. **Jaws modified to form a beak of 4 heavy, powerful teeth, 2 above and 2 below.** Eyes high on head. Gill opening a simple slit in front of pectoral fins. **Dorsal and anal fins located far posteriorly, containing no spines, but 7 to 15 soft rays;** caudal fin truncate, rounded, or emarginate to somewhat lunate; **pelvic fins absent.** Lateral line (when present) often indistinct, forming an interconnecting pattern on sides of head and body, but quite distinct in some genera (e.g. *Lagocephalus* and *Torquigener*). **Typical scales absent, but many spinules often present on back and/or belly, sometimes on sides.** **Colour:** most species mottled and variegated on back and side, sometimes with spots of various sizes and colours, whereas others uniformly coloured.



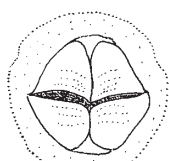
Habitat, biology, and fisheries: Occur in tropical and temperate seas, most frequently in shallow inshore waters, sometimes entering brackish and fresh waters, but a few species are pelagic. Usually found alone, although some species school together, especially for mating purposes. They have the ability to inflate themselves with either air or water as a deterrent to predators. In addition, the viscera, skin, and blood of most species are poisonous; in some species even the flesh is poisonous. Many species of puffers may excrete poison from their skin, which may deter predators. Laymen are strongly recommended not to eat puffers, although connoisseurs like to consume puffers in licensed restaurants in some countries (e.g. Japan). Many people still die each year due to unprofessional cooking and consumption of puffers at home. Taken by trawls, longlines, and traps. Marketed fresh, very important commercially in some countries (e.g. Japan and Korea).

Similar families occurring in the area

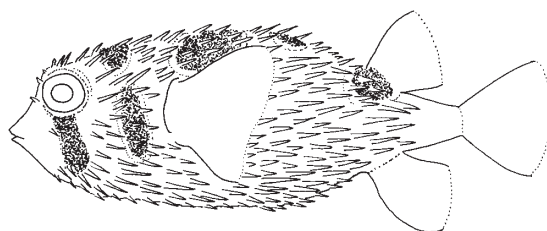
Diodontidae: head and body covered with strong elongate spines; 1 tooth plate in each jaw (2 tooth plates in each jaw in Tetraodontidae).



Diodontidae



Tetraodontidae



Diodontidae

front view of mouth

Key to the genera of Tetraodontidae occurring in the area

- 1a. Nasal organ barely visible without aid of magnification; dorsal surface posterior to eyes distinctly keeled (Fig. 1) *Canthigaster*
- 1b. Nasal organ easily visible without magnification; dorsal surface posterior to eyes more or less smooth, without a distinct keel → 2
- 2a. Nasal organ covered by small sac with 2 nostrils (Fig. 2a) → 3
- 2b. Nasal organ not covered by a small sac with 2 nostrils → 10

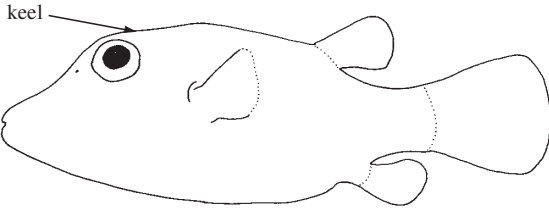


Fig. 1 *Canthigaster*

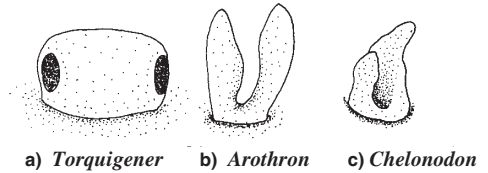


Fig. 2 nasal organ

- 3a. A raised skin fold along lower side of caudal peduncle (Fig. 3) → 4
- 3b. No raised skin fold along lower side of caudal peduncle → 5
- 4a. Top of pectoral-fin base above lower margin of eye (Fig. 4a) *Marilyna*
- 4b. Top of pectoral-fin base below lower margin of eye (Fig. 4b, c) → 6

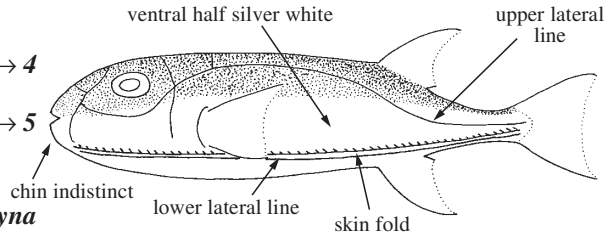


Fig. 3 *Lagocephalus*

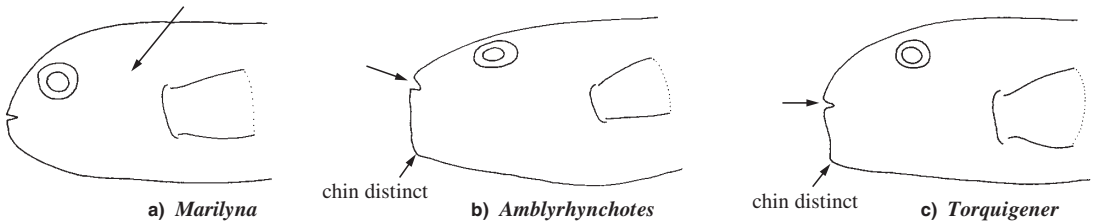


Fig. 4 lateral view of head

- 5a. No spinules on head or body *Sphoeroides*
- 5b. Spinules all over head and body except for caudal peduncle *Tylerius*
- 6a. Mouth supraterminal (Fig. 4b) *Amblyrhynchotes*
- 6b. Mouth terminal (Fig. 4c) → 7
- 7a. Chin distinct (Fig. 4c) *Torquigener*
- 7b. Chin indistinct (Fig. 3) → 8
- 8a. Lower half of body silver white, contrasted to dark dorsal half (Fig. 3) *Lagocephalus*
- 8b. Body variously coloured, but lower half of body not silver white → 9

- 9a. Spinules on back and belly well separated (Fig. 5a) *Takifugu*
- 9b. Spinules cover entire body except for caudal peduncle (Fig. 5b) *Tetractenos*
- 10a. A single lateral line on side of body (Fig. 6a); nasal organ with 2 bifid tentacles (Fig. 2b) *Arothron*
- 10b. Two lateral lines, the upper joining the lower in the region above or behind anal fin (Fig. 6b); nasal organ in form of a depression with slightly raised margin, expanded before and behind into a pair of elongate flaps (Fig. 2c) . . . *Chelonodon*

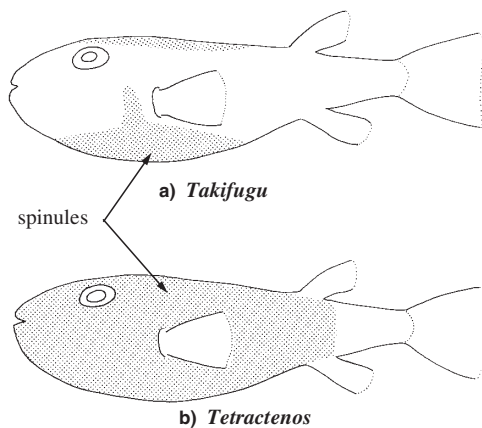


Fig. 5 distribution of spinules on head and body

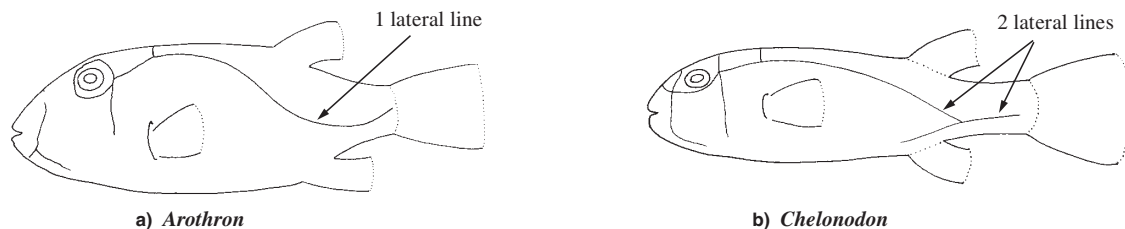


Fig. 6 lateral view of head and body

List of species occurring in the area

- Amblyrhynchotes honckenii* (Bloch, 1795)
- Arothron hispidus* (Linnaeus, 1758)
- Arothron immaculatus* (Bloch and Schneider, 1801)
- Arothron manilenis* (Marion de Procé, 1822)
- Arothron mappa* (Lesson, 1830)
- Arothron meleagris* (Bloch and Schneider, 1801)
- Arothron nigropunctatus* (Bloch and Schneider, 1801)
- Arothron reticularis* (Bloch and Schneider, 1801)
- Arothron stellatus* (Bloch and Schneider, 1801)
- Canthigaster amboinensis* (Bleeker, 1865)
- Canthigaster bennetti* (Bleeker, 1854)
- Canthigaster callisterna* (Ogilby, 1889)
- Canthigaster compressa* (Marion de Procé, 1822)
- Canthigaster coronata* (Vaillant and Sauvage, 1875)
- Canthigaster epilampra* (Jenkins, 1903)
- Canthigaster flavoreticulata* Matsuura, 1986
- Canthigaster investigatoris* (Annandale and Jenkins, 1910)
- Canthigaster janthinoptera* (Bleeker, 1855)
- Canthigaster marquesensis* Allen and Randall, 1977
- Canthigaster ocellicineta* Allen and Randall, 1977
- Canthigaster rapaensis* Allen and Randall, 1977
- Canthigaster rivulata* (Temminck and Schlegel, 1850)
- Canthigaster solandri* (Richardson, 1844)
- Canthigaster tyleri* Allen and Randall, 1977
- Canthigaster valentini* (Bleeker, 1853)

Chelonodon patoca (Buchanan, 1822)
Lagocephalus gloveri Abe and Tabeta, 1983
Lagocephalus inermis (Temminck and Schlegel, 1844)
Lagocephalus lagocephalus Linnaeus, 1758
Lagocephalus lunaris (Bloch and Schneider, 1801)
Lagocephalus scleratus (Gmelin, 1789)
Lagocephalus spadiceus (Richardson, 1844)
Lagocephalus wheeleri Abe, Tabeta, and Kitahama, 1984
Marilyna pleurosticta (Günther, 1872)
Marilyna meraukensis (de Beaufort, 1955)
Sphoeroides pachygaster (Müller and Troschel, 1848)
Takifugu oblongus (Bloch, 1786)
Tetractenos glaber (Fremenville, 1813)
Tetractenos hamiltoni (Gray and Richardson, 1843)
Torquigener altipinnis (Ogilby, 1891)
Torquigener brevipinnis (Regan, 1902)
Torquigener gloerferti Hardy, 1984
Torquigener hicksi Hardy, 1983
Torquigener hypselogeneion (Bleeker, 1852)
Torquigener pallimaculatus Hardy, 1983
Torquigener parcuspinus Hardy, 1983
Torquigener perlevis (Ogilby, 1908)
Torquigener squamicauda (Ogilby, 1911)
Torquigener tuberculiferus (Ogilby, 1912)
Torquigener whitleyi (Paradice, 1927)
Tylerius spinosissimus (Regan, 1908)

References

- Allen, G.R. and J.E. Randall. 1977. Review of the sharpnose pufferfishes (subfamily Canthigasterinae) of the Indo-Pacific. *Rec. Aust. Mus.*, 30(17):475-517.
- Hardy, G.S. 1983. Revision of Australian species of *Torquigener* Whitley (Tetraodontiformes: Tetraodontidae), and two new generic names for Australian puffer fishes. *J. Royal Soc. New Zealand*, 13(12):1-48.
- Hardy, G.S. 1984. *Tylerius*, a new generic name for the Indo-Pacific pufferfish, *Sphoeroides spinosissimus* Regan, 1908 (Tetraodontiformes: Tetraodontidae) and comparisons with *Amblyrhynchotes* (Bibron) Dumeril. *Bull. Mar. Sci.*, 35(1):32-37.
- Matsuura, K. 1990. The pufferfish genus *Fugu* Abe, 1952, a junior subjective synonym of *Takifugu* Abe, 1949. *Bull. Nat. Sci. Mus., Tokyo, Ser. A (Zool.)*, 16(1):15-20.