

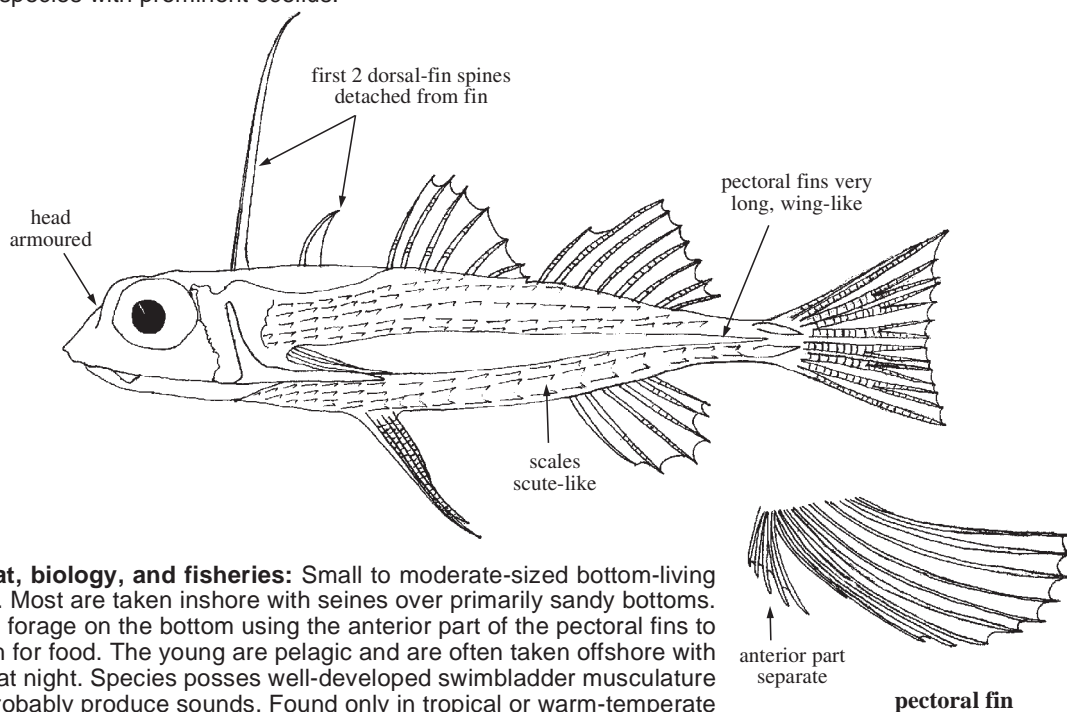
Order SCORPAENIFORMES

DACTYLOPTERIDAE

Flying gurnards (helmet gurnards)

by S.G. Poss and W.N. Eschmeyer

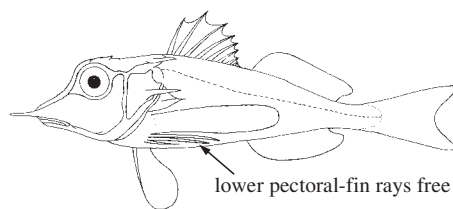
Diagnostic characters: Moderately elongate scorpaeniform fishes (size to 40 cm). **Head large, heavily armored.** Eyes large. Interorbit wide, concave. Mouth small, subterminal, and protractile; teeth minute, nodular or absent. **A small movable bone (pontinal) between plate-like bones around eye and preopercle. Preopercle with a prominent elongate spine.** Gill openings restricted and fused to isthmus. Spinous and soft parts of dorsal fin separated by a deep notch and 1 short spine (reduced to a short spinous point); **total number of dorsal-fin spines VII or VIII**, with first or first 2 anterior spines separated from remainder of fin; soft-rayed part of dorsal fin with 8 or 9 rays. Anal fin without spines and with 6 or 7 soft rays. **Caudal fin emarginate. Base of pectoral fins horizontal, the fins divided into 2 sections: a short anterior part, with 5 to 7 rays, and an elongate posterior part reaching to caudal-fin base in adults, with 25 to 31 rays.** Pelvic fins with 1 spine and 4 soft rays. Lower side of posterior part of trunk with 2 to 4 enlarged, keel-like scales. Scales scute-like, forming prominent keels. Lateral line present or absent (obscured by scute-like scales), if present, extending to near base of caudal fin. Swimbladder divided at midline into 2 halves; swimbladder musculature present. **Colour:** usually, dusky red or purple with brown spots above, pinkish or whitish below, changing somewhat with growth; upper surface of pectoral-fin rays brightly coloured, usually bluish, with dark brown and often whitish spots, and young of some species with prominent ocellus.



Habitat, biology, and fisheries: Small to moderate-sized bottom-living fishes. Most are taken inshore with seines over primarily sandy bottoms. Adults forage on the bottom using the anterior part of the pectoral fins to search for food. The young are pelagic and are often taken offshore with lights at night. Species possess well-developed swimbladder musculature and probably produce sounds. Found only in tropical or warm-temperate waters. These fishes are usually of little commercial importance, but are often taken as bycatch in nearshore fisheries. The flesh is edible and consumed in some localities.

Similar families occurring in the area

Triglidae: also with large, heavily armored head, but additionally with rostral projections; bony scutes present; pectoral fins smaller, with lowermost rays free; lack the small movable bone (pontinal) at the angle of the preopercle; all dorsal fin-spines united by a fin membrane.



Triglidae

Key to the species of Dactylopteridae occurring in the area

- 1a. A single elongate spine anterior to continuous part of spinous dorsal fin (Fig. 1a) → 2
- 1b. A spine about midway between elongate anteriormost spine and those in continuous part of spinous dorsal fin (Fig. 1b) → 3

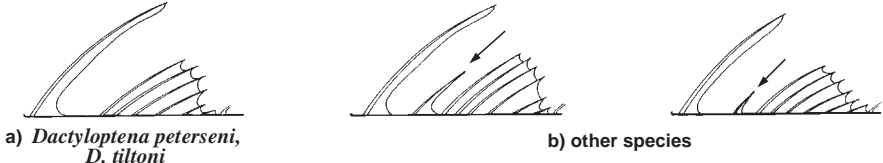


Fig. 1 first dorsal fin (after Eschmeyer, 1997)

- 2a. Snout rounded (Fig. 2a); scales on sides with a single, strong, transverse knife-like ridge at middle of each scale *Dactyloptena peterseni*
- 2b. Snout pointed (Fig. 2b); scales on sides with multiple transverse ridges on each scale, with middle ridges slightly stronger *Dactyloptena tiltoni*

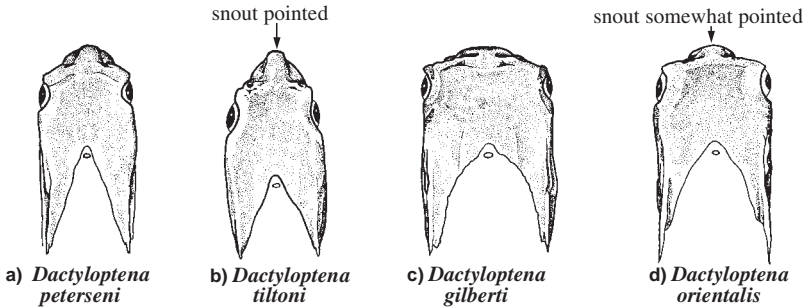


Fig. 2 dorsal view of head (after Eschmeyer, 1997)

- 3a. Interorbit very wide, 16 to 23% of standard length (Fig. 2c, d) → 4
- 3b. Interorbit moderate, 12 to 16% of standard length → 5
- 4a. Posttemporal spine lying flat against body; granular projections on snout arranged in rows; snout somewhat rounded and wide (Fig. 2c) *Dactyloptena gilberti*
- 4b. Posttemporal spine elevated at rear; granular projections on snout scattered uniformly; snout somewhat pointed and narrow (Fig. 2d) *Dactyloptena papilio*
- 5a. Preopercular spine not extending further posteriorly than posttemporal spine; many dark spots on pectoral fins, upper flank, and top of head in specimens over 15 cm standard length; 1 dark ocellus about 2/3 from tip of fin in specimens between about 5 and 6.5 cm standard length *Dactyloptena orientalis*
- 5b. Preopercular spine usually extending further posteriorly than posttemporal spine; usually 1 dark blotch, which often contains small pale spots on pectoral fins, situated about 1/2 distance from tip of fin *Dactyloptena macracantha*

List of species occurring in the area

The symbol is given when species accounts are included.

- ? *Dactyloptena cheirophthalmus* (Bleeker, 1854)^{1/}
- Dactyloptena gilberti* Snyder, 1909
- Dactyloptena macracantha* (Bleeker, 1854)
- Dactyloptena orientalis* (Cuvier, 1829)
- Dactyloptena papilio* Ogilby, 1910
- Dactyloptena peterseni* (Nyström, 1887)
- Dactyloptena tiltoni* Eschmeyer, 1997

Reference

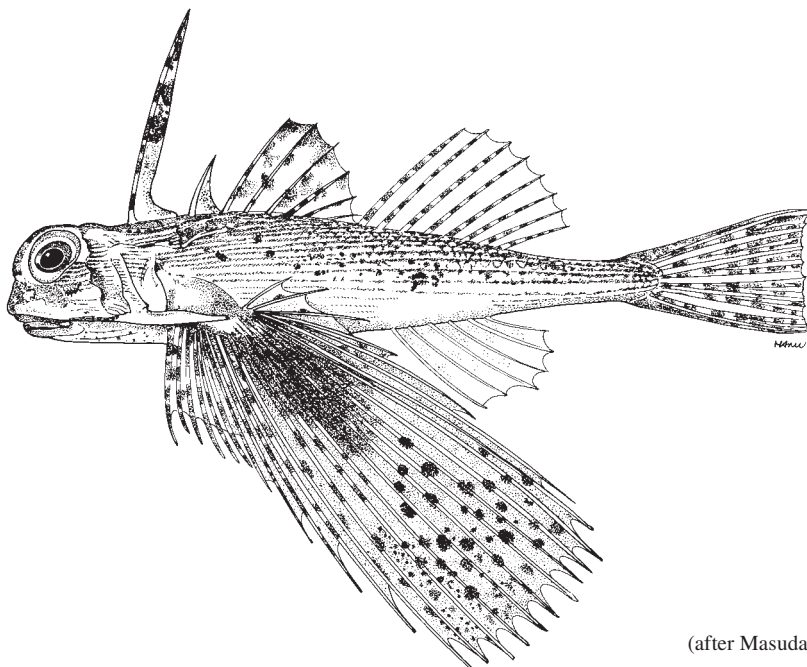
Eschmeyer, W.N. 1997. A new species of Dactylopteridae (Pisces) from the Philippines and Australia, with a brief synopsis of the family. *Bull. Mar. Sci.*, 60(3):727-738.

1/ May be a synonym of *Dactyloptena macracantha*. Not included in the identification key.

***Dactyloptena gilberti* Snyder, 1909**

Frequent synonyms / misidentifications: None / *Dactyloptena jordani* Franz, 1910.

FAO names: En - Flateared helmet gurnard.



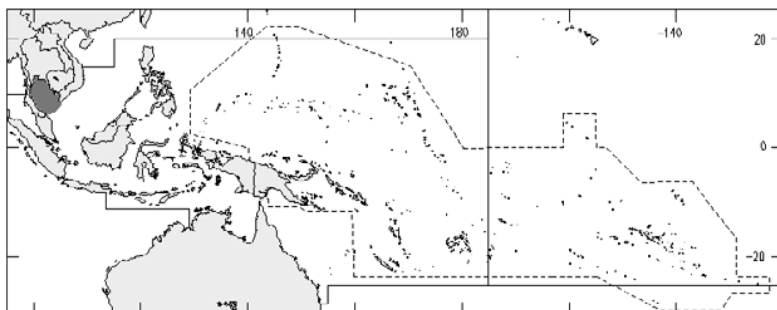
(after Masuda et al., 1984)

Diagnostic characters: Body moderately elongate, squarish in cross-section. Head very broad, blunt, depressed anteriorly, with a prominent keeled spine extending posteriorly from nape to below second spine of continuous spinous part of dorsal fin. **Posttemporal spine strong, but not markedly elevated above rest of cranium. Granular projections on snout arranged in rows.** Angle of preopercle with a long, prominent spine. Eyes large. **Interorbit extremely wide (width 18 to 23% of standard length) and strongly concave, with depth 12 to 17% of head length.** Mouth small, subterminal, and protractile. Upper jaw largely obscured by bones surrounding eye. Minute teeth present on jaws, vomer, and palatines. Anterior 2 dorsal-fin spines separated from remainder of spinous dorsal fin, the first spine elongate, the second short; continuous part of spinous dorsal fin with V spines, followed by I short spinous point and the soft dorsal fin with 8 rays (dorsal-fin formula: I, I, V+I, 8). Anal fin with 6 or 7 soft rays. Caudal fin elongate. Pectoral fins with 28 to 32 rays. Pelvic fins with I spine and 4 soft rays. Scales strong, each with a distinct ridge and no secondary ridges. Large scute-like scales posteriorly on caudal peduncle. **Lateral line present, extending to caudal fin. Colour: pectoral fins dusky, with large dark spots arranged in row and especially dark over middle fin rays; separated anterior portion of pectoral fins paler, with no large ocellus or spot; pectoral fins mostly black in juveniles, but without black spot or ocellus.**

Size: Maximum total length 22 cm.

Habitat, biology, and fisheries: Little is known of the biology of this species. Taken nearshore with seines or trawls and occasionally marketed fresh, it forms a minor component to the fisheries of the area. Captured over sand or mud-sand bottoms at depths of 20 to 71 m.

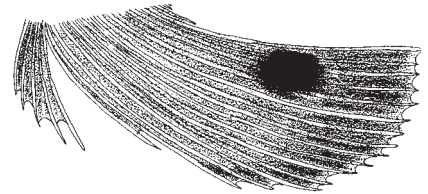
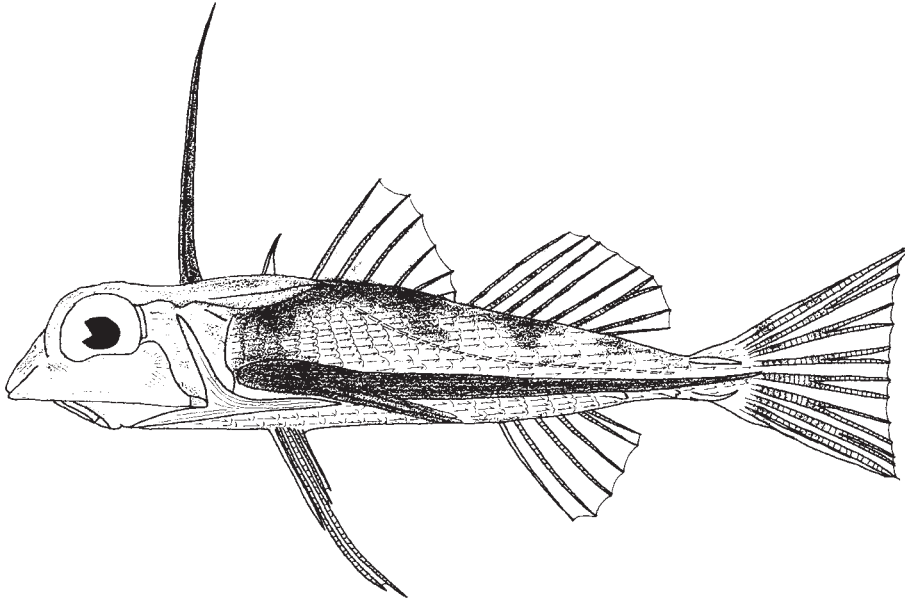
Distribution: Ranges from southern Japan and Gulf of Thailand to India and the Arabian Peninsula.



Dactyloptena macracantha (Bleeker, 1854)

Frequent synonyms / misidentifications: None / None.

FAO names: En - Spotwing helmet gurnard; Fr - Grondin volant cocarde; Sp - Alón buho.



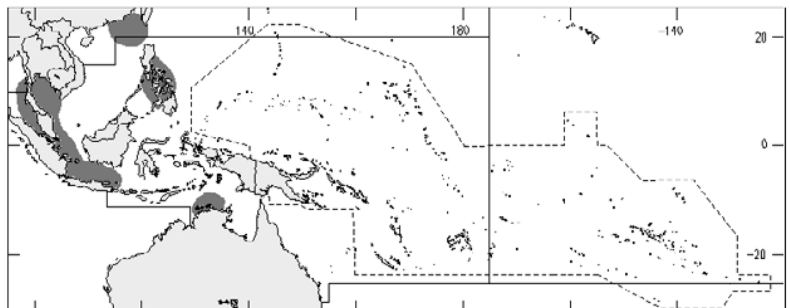
pectoral fin

Diagnostic characters: Body moderately elongate, squarish in cross-section. Head broad, blunt, depressed anteriorly, with a prominent keeled spine extending posteriorly from nape to below second spine of continuous spinous part of dorsal fin. Angle of preopercle with a long, prominent spine. Eyes large. **Interorbital width 12 to 15% of standard length; interorbit weakly concave, with depth 6 to 8% of head length.** Mouth small, subterminal, and protractile. Upper jaw largely obscured by bones surrounding eye. Minute teeth present on jaws, vomer, and palatines. Anterior 2 dorsal-fin spines separated from remainder of spinous dorsal fin, the first spine elongate, the second short (rarely missing); continuous part of spinous dorsal fin with V spines, followed by I short spinous point and the soft dorsal fin with 8 or 9 rays (dorsal-fin formula: I, I, V+I, 8-9; rarely I, 0, V+I, 8). Anal fin with 6 soft rays. Caudal fin elongate. Pectoral fins with 31 to 34 rays. Pelvic fins with I spine and 4 or 5 soft rays. Scales strong, each with a distinct ridge. Large scute-like scales posteriorly on caudal peduncle. Scales in about 45 to 47 rows. **Lateral line present, extending to caudal fin.** **Colour:** dusky violet above and pinkish below; an oblong black blotch over middle of pectoral fins.

Size: Maximum total length 16.5 cm.

Habitat, biology, and fisheries: Typically, this species has been reported from depths of 45 to 125 m. However, a single record from 128 to 177 m is known. Usually taken near shore with trawls or handlines and occasionally marketed fresh.

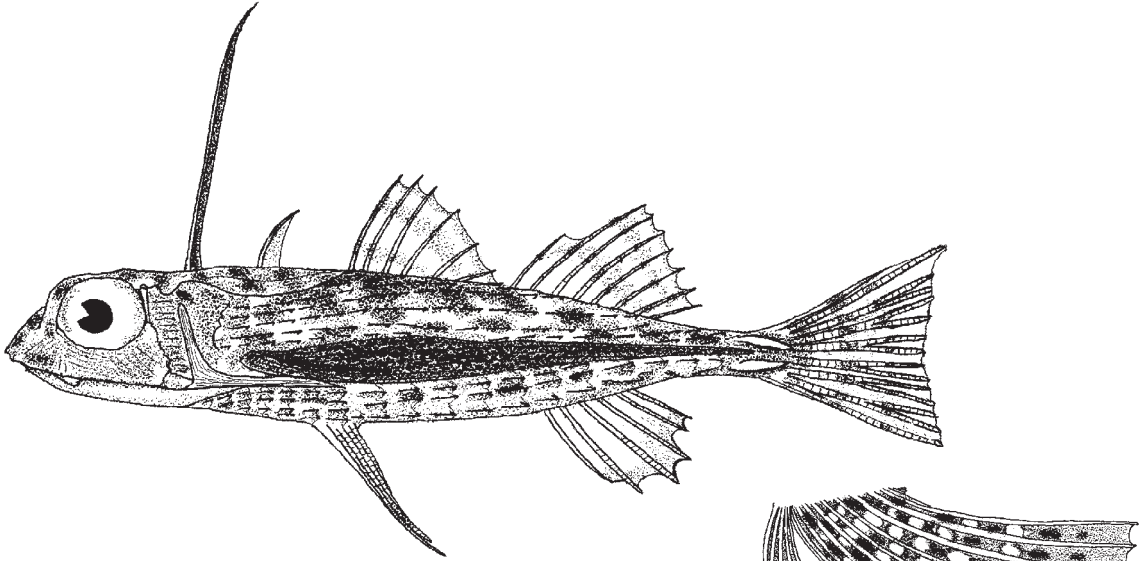
Distribution: This species ranges eastward in the Indian Ocean to India, Sri Lanka, and western Pacific Ocean. Within the area found in Java, the Philippines, the Malay Peninsula, Sumatra, Indonesia, and the Northern Territory (Australia).



Dactyloptena orientalis (Cuvier, 1829)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** - Oriental helmet gurnard; **Fr** - Grondin volant oriental; **Sp** - Alón oriental.



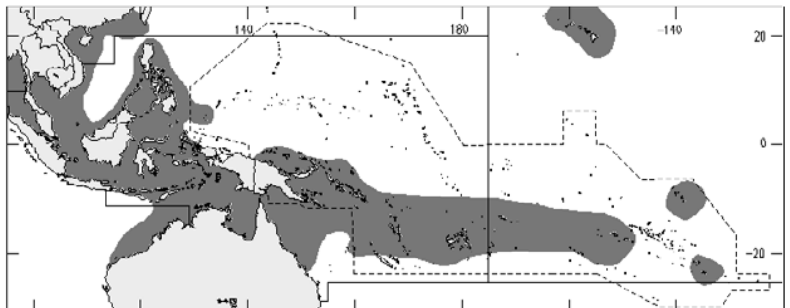
pectoral fin

Diagnostic characters: Body moderately elongate, squarish in cross-section. Head broad, blunt, depressed anteriorly, with a prominent keeled spine (posttemporal) extending posteriorly from the nape to below second spine of continuous spinous part of dorsal fin. Angle of preopercle with a long, prominent spine. Eyes large. **Interorbital width 13 to 15% of standard length; interorbit moderately concave, with depth 8 to 11% of head length.** Mouth small, subterminal, and protractile. Upper jaw largely obscured by bones surrounding eye. Minute teeth present on jaws, vomer, and palatines. **Anterior 2 dorsal-fin spines separated from remainder of spinous dorsal fin, the first spine elongate, the second short;** continuous part of spinous dorsal fin with V spines, followed by I short spinous point and the soft dorsal fin with 8 rays (dorsal-fin formula: I, I, V+I, 8). Anal fin with 6 or 7 soft rays. Caudal fin elongate in adults (much shorter in young). Base of pectoral fins horizontal, the fins divided into 2 sections, a short anterior part with 5 rays, and a long posterior section with 27 to 30 rays. Pelvic fins with 1 spine and 4 or 5 soft rays. Scales strong, each with a distinct ridge. Large scute-like scales posteriorly on caudal peduncle. Scales in about 45 to 47 rows. **Lateral line absent or greatly obscured. Colour:** variable, usually yellowish brown above, lighter brown below; small orange spots over top of head and back; dusky, golden spots on pectoral fins (larger distally); 4 golden bands on caudal fin; a yellow band along upper part of spinous dorsal fin.

Size: Maximum total length 40 cm; commonly to 20 cm.

Habitat, biology, and fisheries: This is a benthic species primarily inhabiting sandy bottoms in shallow coastal waters. It is capable of “walking” on the bottom by alternately moving the pelvic fins and short pectoral-fin rays. Feeds on benthic crustaceans, clams, and small fishes. The enlarged pectoral-fin rays are spread as a defensive behavior. Not commercially fished, but taken incidentally throughout its range.

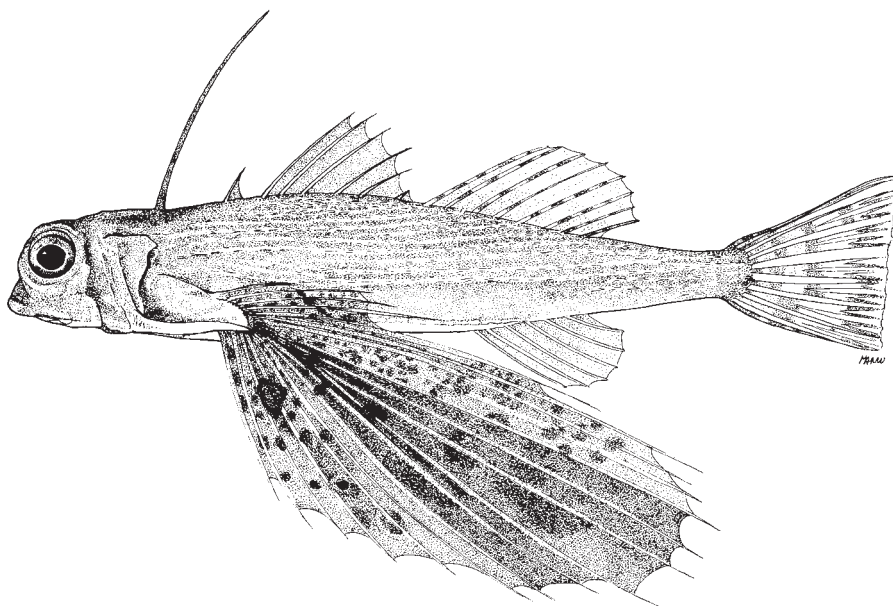
Distribution: This species is the most widely ranging dactylopterid. It has been captured from the Red Sea and South Africa to the Tuamoto Archipelago and Hawaii.



Dactyloptena papilio Ogilby, 1910

Frequent synonyms / misidentifications: None / None.

FAO names: En - Sharpeared helmet gurnard.



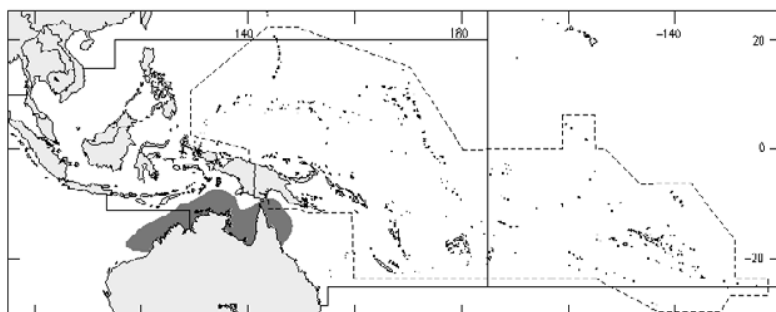
(after Sainsbury, Kailola, and Leyland, 1984)

Diagnostic characters: Body moderately elongate, squarish in cross-section. Head very broad, blunt, depressed anteriorly, with a prominent keeled spine extending posteriorly from the nape to below second spine of continuous spinous part of dorsal fin. **Posttemporal spine strong and elevated above rest of cranium.** Angle of preopercle with a long, prominent spine. Eyes large. **Interorbit extremely wide (width 16 to 20% of standard length) and strongly concave, with depth 12 to 17% of head length.** **Granular projections on snout scattered uniformly.** Mouth small, subterminal, and protractile. Upper jaw largely obscured by bones surrounding eye. Minute teeth present on jaws, vomer, and palatines. Anterior 2 dorsal-fin spines separated from remainder of spinous dorsal fin, the first spine elongate, the second short; continuous part of spinous dorsal fin with V spines, followed by I short spinous point and the soft dorsal fin with 8 rays (dorsal-fin formula: I, I, V+I, 8). Anal fin with 6 or 7 soft rays. Caudal fin elongate. Pectoral fins with 28 to 32 rays. Pelvic fins with I spine and 4 soft rays. Scales strong, each with a single median ridge. Large scute-like scales posteriorly on caudal peduncle. Lateral line present, extending to caudal fin. **Colour:** pectoral fins with group of dark spots and an irregular dark area extending 1/3 length of fin near base; faint dark saddles on dorsum in specimens between 8 and 12 cm standard length.

Size: Maximum total length 22 cm.

Habitat, biology, and fisheries: This species is poorly known and no fishery exists for it.

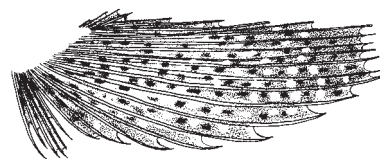
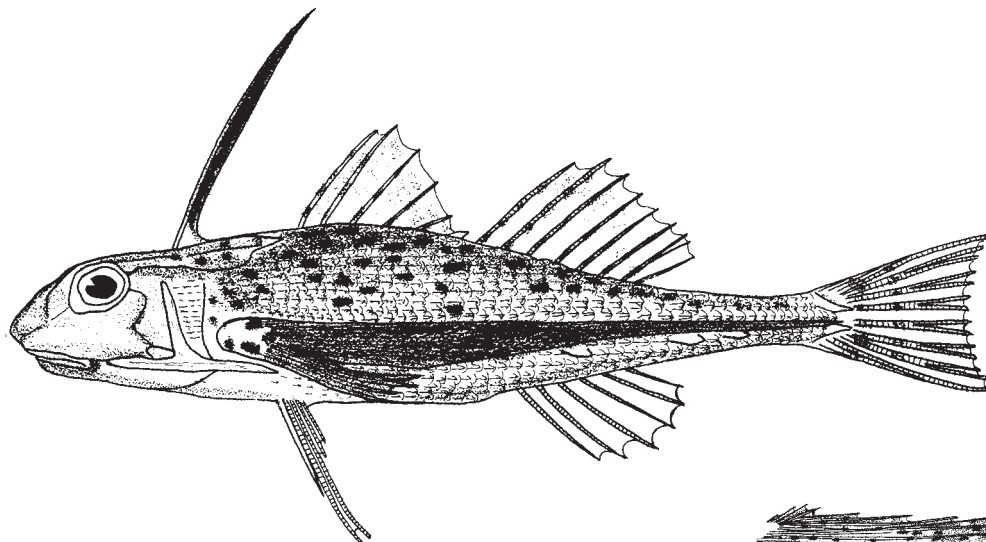
Distribution: *Dactyloptena papilio* is found in western and northern Australia and the Arafura Sea in depths of 13 to 137 m.



Dactyloptena peterseni (Nyström, 1887)

Frequent synonyms / misidentifications: *Daicocus peterseni* (Nyström, 1887) / None.

FAO names: En - Starry helmet gurnard; Fr - Grondin volant étoilé; Sp - Alón estrellado.



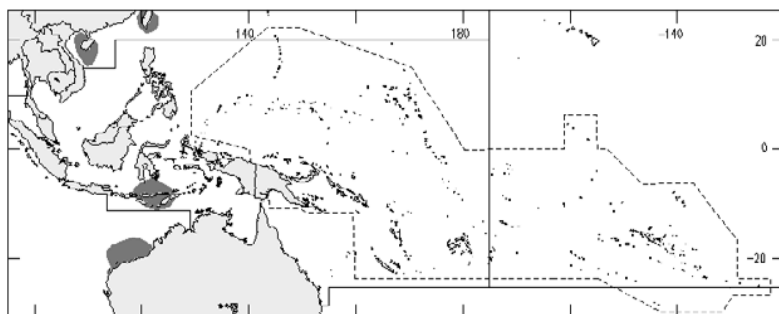
pectoral fin

Diagnostic characters: Body moderately elongate, squarish in cross-section. Head broad, blunt, depressed anteriorly, with a prominent keeled spine (posttemporal) extending posteriorly from the nape to below second spine of continuous spinous part of dorsal fin. Angle of preopercle with a long, prominent spine. Spinous and soft dorsal fins separated by a deep notch. Eyes large. **Interorbital width 13 to 14% of standard length; interorbit region weakly concave, its depth a midline about 2/3 width of pupil (5 to 7% of head length).** Mouth small, subterminal, and protractile. Upper jaw largely obscured by bones surrounding eye. Nodular teeth present on jaws. Small teeth on vomer and palatines. **A single elongate filamentous spine widely separated from remainder of spinous dorsal fin, continuous part of spinous dorsal fin with VII spines, soft dorsal fin with 8 rays** (dorsal-fin formula: I, VII, 8). Anal fin with 6 soft rays. Caudal fin emarginate. Bases of pectoral fins horizontal, the fins divided into 2 sections, a short anterior part with 5 rays and a long posterior part, with 25 or 26 rays that reach to caudal-fin base in adults. **Lower side of posterior part of trunk with 3 enlarged keel-like scales, the first above middle of anal fin.** Scales each with a strong median ridge. **Lateral line absent or greatly obscured.** **Colour:** dusky violet above, pinkish below; an oblong black blotch over middle of pectoral fins.

Size: Maximum total length 25 cm; commonly to 15 cm.

Habitat, biology, and fisheries: Benthic, found on sandy bottoms in coastal waters at depths of 20 to 71 m. It feeds primarily on benthic crustaceans. It is not fished commercially and is rarely used for food. Most adults are taken with trawls.

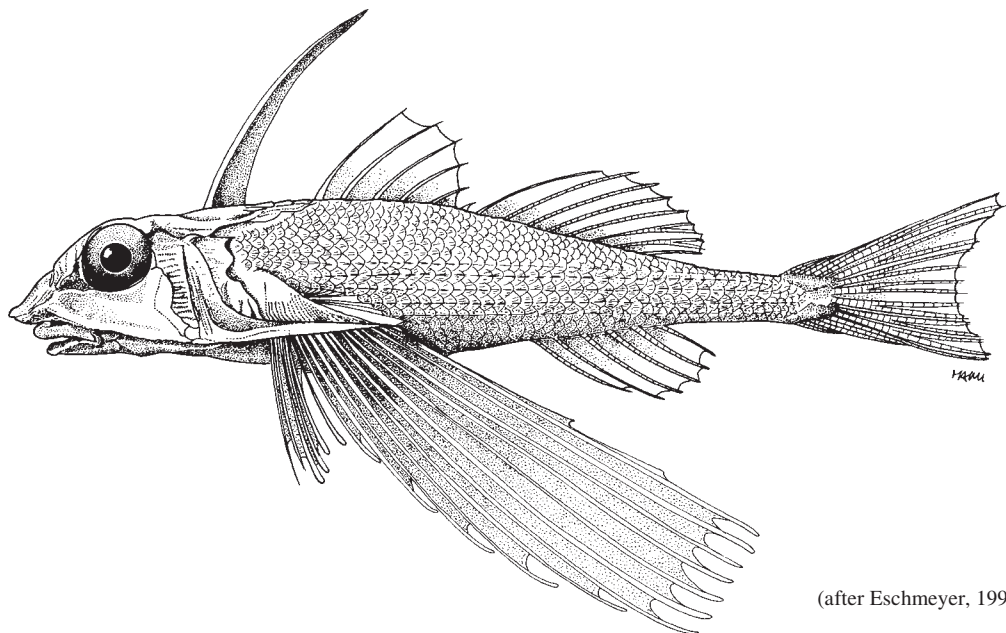
Distribution: This species occurs from southern Japan and the South China Sea to South Africa. The extent of its range in the West Pacific is uncertain as it is sometimes confused with *Dactyloptena orientalis*.



Dactyloptena tiltoni Eschmeyer, 1997

Frequent synonyms / misidentifications: None / None.

FAO names: En - Plain helmet gurnard.



(after Eschmeyer, 1997)

Diagnostic characters: Body moderately elongate, squarish in cross-section. Head broad, blunt, depressed anteriorly, with a prominent keeled spine (posttemporal) extending posteriorly from the nape to below second spine of continuous spinous part of dorsal fin. Angle of preopercle with a long, prominent spine. Eyes large. **Interorbital width 13 to 14% of standard length; interorbit region weakly concave, its depth at midline about 2/3 width of pupil (5 to 8% of head length).** Mouth small, subterminal, and protractile. Upper jaw largely obscured by bones surrounding eye. Nodular teeth present on jaws. Small teeth on vomer and palatines. Spinous and soft dorsal fins separated by a deep notch. **A single elongate filamentous spine widely separated from remainder of spinous dorsal fin; continuous part of spinous dorsal fin with V spines, followed by I short spinous point and the soft dorsal fin with 8 rays** (dorsal-fin formula: I, V, I, 8). Anal fin with 6 soft rays. Caudal fin emarginate. Bases of pectoral fins horizontal; pectoral fins with 29 to 32 rays, the fins divided into 2 sections, a short anterior part and a long posterior part that reaches to caudal-fin base. **Lower side of posterior part of trunk with 3 enlarged keel-like scales, the first above middle of anal fin. Scales scute-like, with those on upper flank with several wavy keel-like ridges, the middle ridge strongest. Lateral line absent or greatly obscured.** **Colour:** unknown in life, but **without spots when preserved**, with mostly dusky pectoral fins and faint bands on the soft dorsal-fin rays, and with pale pelvic, anal, and caudal fins.

Size: Maximum standard length at least 9.4 cm.

Habitat, biology, and fisheries:

Nothing is known about biology of this recently described species other than it appears to be the deepest living dactylopterid; the known specimens were trawled at depths of 119 to 565 m.

Distribution: Known from the Philippines and Western Australia.

