

An underwater photograph showing a large school of fish, likely a species of snapper or surgeonfish, swimming in clear blue water. The fish are silvery with a yellowish-brown stripe along their sides and blue-tinted fins. They are swimming in a loose formation, with some individuals in the foreground and others receding into the background. The background is filled with a dense, shimmering school of smaller fish. In the lower portion of the image, a coral reef is visible, featuring various types of coral and smaller, colorful fish, including some yellow ones. The overall scene is vibrant and captures the natural habitat of these coastal fish.

VOLUME 4

COASTAL FISHES OF THE
**WESTERN
INDIAN
OCEAN**

EDITED BY

Phillip C Heemstra • Elaine Heemstra • David A Ebert • Wouter Holleman • John E Randall

COASTAL FISHES OF THE
**WESTERN
INDIAN
OCEAN**

VOLUME 4

EDITED BY

Phillip C Heemstra

Elaine Heemstra

David A Ebert

Wouter Holleman

John E Randall



Copyright © South African Institute for Aquatic Biodiversity, a National Research Facility of the National Research Foundation (NRF-SAIAB)

Published by the South African Institute for Aquatic Biodiversity, Private Bag 1015, Makhanda, 6140, South Africa

First edition 2022

Print ISBNs:

Hard covers

978-1-998950-40-9 (Set)
978-1-990951-23-7 (Volume 1)
978-1-990951-24-4 (Volume 2)
978-1-990951-25-1 (Volume 3)
978-1-990951-26-8 (Volume 4)
978-1-990951-27-5 (Volume 5)

Soft covers

978-1-998950-41-6 (Set)
978-1-998950-35-5 (Volume 1)
978-1-998950-36-2 (Volume 2)
978-1-998950-37-9 (Volume 3)
978-1-998950-38-6 (Volume 4)
978-1-998950-39-3 (Volume 5)

Electronic (PDF) ISBNs:

978-1-990951-28-2 (Volume 1)
978-1-990951-29-9 (Volume 2)
978-1-990951-30-5 (Volume 3)
978-1-990951-31-2 (Volume 4)
978-1-990951-32-9 (Volume 5)

Copyright in the text is vested in the authors.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any such information storage or retrieval system, without prior permission in writing from the publisher.

The authors and publisher have made every effort to obtain permission for and to acknowledge the use of any copyrighted material. Should any infringement of copyright have occurred, please contact the publisher, and every effort will be made to rectify omissions or errors in the event of a reprint or future edition.

The publisher gratefully acknowledges the funding from the South African Department of Science and Innovation (DSI) toward the publication of this work.

The views expressed in this publication do not reflect those of the National Research Foundation or the South African Institute for Aquatic Biodiversity, unless specifically stated.

Copy editor: Cindy Kulongowski

Proofreaders: Jenny Gon, Liz Gowans and Robert McKenzie

Design and layout: Ink Design Publishing Solutions, Cape Town, www.inkdesign.co.za

Front cover photographs: Allen Walker Photography (www.awphotosa.com)

Inside cover maps: Willem Coetzer and Susan Abraham

Printed by CADAR Printers, Gqeberha, South Africa

CONTENTS

CLASS OSTEICHTHYES – BONY FISHES (*cont.*)

ORDER PERCIFORMES (<i>cont.</i>)	4
Key to perciform families	4
FAMILY OPLEGNATHIDAE – Knifejaws	18
FAMILY BRAMIDAE – Pomfrets	19
FAMILY EMMELICHTHYIDAE – Rovers	25
FAMILY CARANGIDAE – Trevallies	28
FAMILY CORYPHAENIDAE – Dorado or dolphinfishes ..	68
FAMILY RACHYCENTRIDAE – Cobia	69
FAMILY ECHENEIDAE – Remoras	70
FAMILY CIRRHITIDAE – Hawkfishes	73
FAMILY CHEILODOCTYLIDAE – Fingerfins	82
FAMILY LATRIDAE – Trumpeters	84
FAMILY POLYNEMIDAE – Threadfins	86
FAMILY PEMPHERIDAE – Sweepers	93
FAMILY TOXOTIDAE – Archerfishes	117
FAMILY POMACENTRIDAE – Damselfishes	119
FAMILY LABRIDAE – Wrasses	166
FAMILY SCARIDAE – Parrotfishes	266
FAMILY PINGUIPEDIDAE – Sandperches	293

FAMILY TRICHONOTIDAE – Sand-divers	299
FAMILY CREEDIIDAE – Sandburrowers	302
FAMILY PERCOPHIDAE – Duckbills	305
FAMILY OPISTOGNATHIDAE – Jawfishes	309
FAMILY CEPOLIDAE – Bandfishes	315
FAMILY CHAMPSODONTIDAE – Gapers	318
FAMILY URANOSCOPIDAE – Stargazers	320
FAMILY BLENNIIDAE – Blennies	326
FAMILY CLINIDAE – Klipfishes	384
FAMILY TRIPTERYGIIDAE – Triplefin blennies	406
FAMILY AMMODYTIDAE – Sandlances	431
FAMILY GOBIESOCIDAE – Clingfishes	436
FAMILY CALLIONYMIDAE – Dragonets	444
FAMILY DRACONETTIDAE – Slope dragonets	466

Colour plates

see separate PDF

Scientific and common name indexes (Volume 4)

..... **see separate PDF**

CLASS

OSTEICHTHYES



Bony Fishes

...continued



ORDER PERCIFORMES

Order Author

The Perciformes, or perch-like fishes (also called the Percomorpha), are the largest group of fishes in the world, with more than 10 000 species in about 160 families. They are the most numerous of vertebrates and comprise about 40% of all bony fish species.

The classification of this group is controversial and according to some authors should include the Scorpaeniformes (Volume 2), Tetraodontiformes and Pleuronectiformes

(Volume 5), which are treated as separate orders in these volumes.

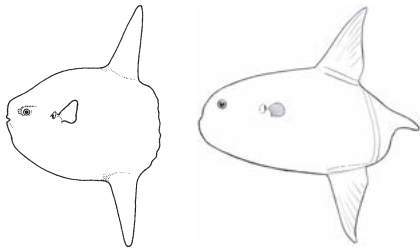
They occur in marine and fresh waters around the world, from shallow ponds to more than 2 500 m in the oceans. Most species are found in coastal areas in tropical and temperate regions. They range in size from the mature male stout flouter, *Schindleria brevipinguis* at 6.5 mm SL, to the 3.3-m bluefin tuna, *Thunnus thynnus*.

KEY TO PERCIFORM FAMILIES

Wouter Holleman and Shirleen Smith

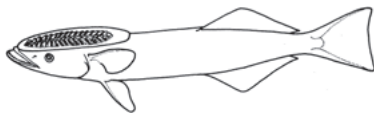
NOTE: This key is for families of fishes with species that occur in the Western Indian Ocean in less than ~200 m. (M) designates a monotypic family.

1a Body truncate, as if rear chopped off, orbiculate, compressed see **TETRAODONTIFORMES** Volume 5



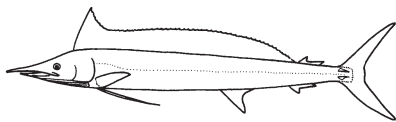
1b Body not as above 2

2a Oval, laminated suction disc on top of head **ECHENEIDAE**
(Remoras) Volume 4



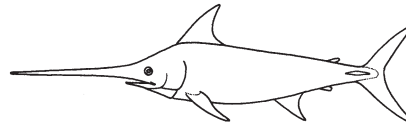
2b No suction disc on top of head 3

3a Upper jaw elongated forming a bony, spear-like bill 4

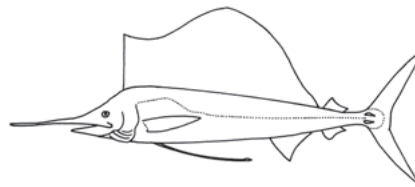


3b Upper jaw not elongated into a spear-like bill 5

4a Bill a long, flat spear; juveniles with a long, continuous dorsal fin, adults with two well-separated, short dorsal fins; one keel each side of caudal peduncle **XIPHIIDAE (M)**
(Swordfish) Volume 5

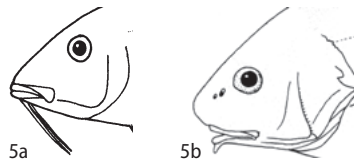


4b Bill short, rounded; dorsal fin long, its base longer than its height; two keels each side of caudal peduncle
..... **ISTIOPHORIDAE (Billfishes)** Volume 5



5a Pair of long barbels on chin; dorsal fin with 8 or 9 soft rays **MULLIDAE**
(Goatfishes) Volume 3

5b One or two short barbels on chin; dorsal fin with 21–44 soft rays **SCIAENIDAE IN PART**
(Croakers and drums) Volume 3

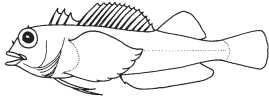


5c No barbels on chin 6

Continued ...

KEY TO PERCIFORM FAMILIES

- 6a Three separate dorsal fins, 1st of 3 or 4 spines, 2nd of 11–15 spines, 3rd of 16–22 rays **TRIPTERYGIIDAE**
(Triplefin blennies) *Volume 4*

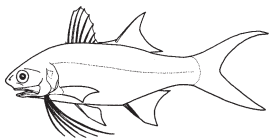


- 6b Two separate dorsal fins or one continuous dorsal fin, which may be deeply notched 7

- 7a Lower pectoral-fin rays longer than upper, and membranes incised at least partially 8

- 7b Lower pectoral-fin rays not longer than upper 9

- 8a Lower 3–8 pectoral-fin rays separate from fin and filamentous; 2 separate dorsal fins, 1st with 8 spines; snout projecting in front of mouth **POLYNEMIDAE** (Threadfins) *Volume 4*



- 8b Lower 5–7 pectoral-fin rays simple, membranes deeply incised; dorsal fin continuous and notched, with 10 spines, with cirri at tips **CIRRHITIDAE** (Hawkfishes) *Volume 4*



- 8c Lower 4–7 pectoral-fin rays simple, deeply incised; dorsal fin continuous and notched, with 17–20 spines, without cirri at tips **CHEILODACTYLIDAE** (Fingerfins) *Volume 4*



- 8d Lower 4 or 5 pectoral-fin rays simple, incised, with one elongated ray reaching to anal-fin origin; dorsal fin continuous and notched with 15–20 spines, without cirri at tips **LATRIDAE** (Trumpeters) *Volume 4*



- 9a Pelvic fins with 2 spines, one on either side of 3 rays; anal fin with 7 spines **SIGANIDAE** (Rabbitfishes or spinefoots) *Volume 5*



- 9b Pelvic fins (if present) with single spine in front (invisible in some Blenniidae), none behind 10

- 10a Teeth fused into parrot-like beak 11

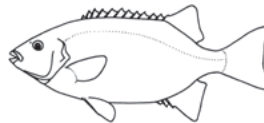


- 10b Teeth separate or absent 12

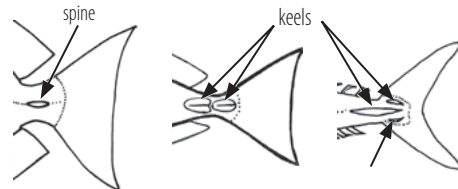
- 11a Dorsal-fin spines and rays usually of same length, fin with 9 spines, 10 rays **SCARIDAE, SCARINAE** (Parrotfishes) *Volume 4*



- 11b Dorsal-fin spines shorter than rays, fin with 11 or 12 spines, 11–24 rays **OPLEGNATHIDAE** (Knifejaws) *Volume 4*

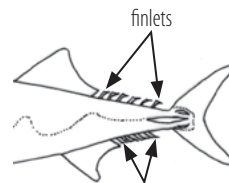


- 12a Caudal peduncle or base of caudal fin with spines or keels ... 13



- 12b Caudal peduncle without spines or keels 18

- 13a Dorsal and anal fins with finlets 14



- 13b No finlets present 15

- 14a Finlets 4 or 5; dorsal-fin spines very short; LL in sinusoidal curve; single keel on either side of peduncle **GEMPYLIDAE** IN PART,
Lepidocybium (Escolar) *Volume 5*



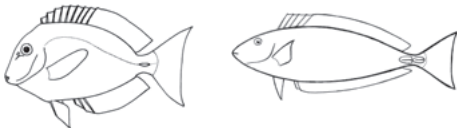
Continued ...

KEY TO PERCIFORM FAMILIES

- 14b Finlets 6 or more; dorsal-fin spines usually same length or longer than rays; LL straight or curved; usually 2 keels either side of peduncle, sometimes 1 or 3 keels. **SCOMBRIDAE**
(Mackerels, Spanish mackerels, bonitos and tunas) *Volume 5*



- 15a Body deep and compressed; peduncle with single sharp spine in groove on either side, or 1 or 2 bony plates, one behind the other, with sharp keel on either side; dorsal fin continuous, with 4–9 spines **ACANTHURIDAE** (Surgeonfishes) *Volume 5*



- 15b Body not deep and compressed **16**

- 16a Pelvic fins rudimentary or absent; dorsal and anal fins without spines but with short, unbranched, bony rays; bony keel each side of caudal peduncle; large fish (up to 2 m TL) with rounded head and small terminal mouth. **LUVARIDAE** (M) (Luvar) *Volume 5*

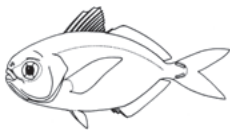


- 16b Pelvic fins well-developed **17**

- 17a Caudal peduncle long and square in cross-section, with 2 keels on either side at base of caudal fin; dorsal-fin spines much shorter than rays; scales with heavy keels. **TETRAGONURIDAE**
(Squartails) *Volume 5*



- 17b Peduncle not square in cross-section, with 2 small, low fleshy keels on either side at base of caudal fin (sometimes difficult to see); dorsal-fin spines longer than rays, fin divided into spinous and rayed parts; scales cycloid **ARIOMMATIDAE**
(Ariommas) *Volume 5*



- 18a Pelvic fins reduced (to scale-like spine in Trichiuridae) or absent **19**

- 18b Pelvic fins present **26**

- 19a Body deep, compressed, silver in colour; pelvic fins rudimentary in juveniles, absent in adults **20**

- 19b Body not deep and compressed; pelvic fins present, or rudimentary in juveniles and absent in adults **21**

- 20a Dorsal and anal fins with 25–30 rays, fins mostly covered by skin and scales; caudal fin lunate **MONODACTYLIDAE**
(Moonies) *Volume 3*



- 20b Dorsal fin 37–50 rays, anal fin 34–43 rays (dorsal- and anal-fin spines embedded in *P. argenteus*); fins not covered by skin and scales; caudal fin forked to lunate **STROMATEIDAE** IN PART,
Pampus (Pomfrets) *Volume 5*



- 21a Body elongate and compressed, or eel-like **22**

- 21b Body fusiform to slightly elongate, generally blue to brownish in colour; pelvic fins, if present, fold into shallow groove; dorsal and anal fins without spines; dorsal fin with 40–51 soft rays, anal fin with 33–38 soft rays; opercle with 2 flat spines; gill membranes not separate from each other; scales usually cycloid and easily shed **STROMATEIDAE** IN PART,
Stromateus (Butterfishes) *Volume 5*



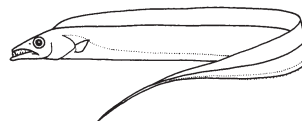
- 22a Lower jaw longer than upper, both jaws with fangs; dorsal fin with spines; body compressed **23**

- 22b Lower jaw longer than upper, without fangs; dorsal fin without spines; caudal fin forked **AMMODYTIDAE** (Sandlances) *Volume 4*



- 22c Lower jaw not longer than upper; lower jaw without fangs . **24**

- 23a Body long and ribbon-like; caudal fin small or absent, when absent body long and pointed **TRICHIURIDAE**
(Cutlassfishes) *Volume 5*



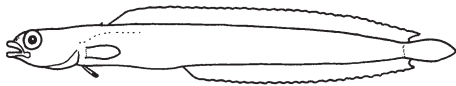
- 23b Body elongate, not ribbon-like; caudal fin deeply forked or lanceolate **GEMPYLIDAE** IN PART (Snake mackerels) *Volume 5*



Continued ...

KEY TO PERCIFORM FAMILIES

- 24a Dorsal fin without spines 25
- 24b Dorsal fin with 1 short, separate spine; dorsal and anal fins joined to caudal fin **PSEUDOCROMIDAE, CONGROGADINAE** (Snakelets) *Volume 3*



- 25a Body <20 mm, larval-like, without scales, transparent **SCHINDLERIIDAE** (Schindler's fishes) *Volume 5*



- 25b Body >20 mm, with scales; eyes on top of head; caudal fin rounded **CREEDIIDAE** (Sandburrowers) *Volume 4*

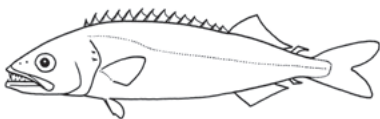


- 26a Single dorsal and anal fins, far back on body; pelvic fins modified as a sucking disc; body without scales; generally small fishes, <50 mm **GOBIESOCIDAE** (Clingfishes) *Volume 4*



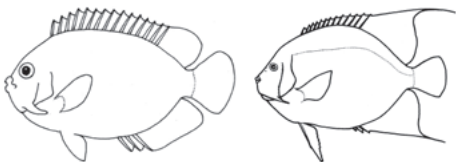
- 26b Fins not as above; body usually with scales 27

- 27a Dorsal fin 13–40 spines, 11–44 rays + 0–7 finlets; anal fin 1–2 spines, 10–35 rays + 0–7 finlets; spined dorsal-fin base longer than base of rayed part of dorsal fin (excluding finlets, if present); lower jaw longer than upper, upper jaw not protrusile, both jaws with large canines **GEMPYLIDAE** IN PART (Snake mackerels) *Volume 5*



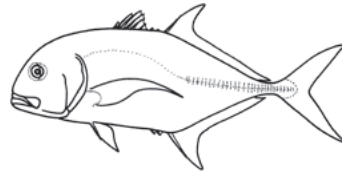
- 27b Not as above 28

- 28a Corner of preopercle with long, sharp spine; body compressed and deep **POMACANTHIDAE** (Angelfishes) *Volume 3*



- 28b Preopercle without spine, or if spine present, body not deep and compressed 29

- 29a Anal fin with 1 or 2 separate spines, sometimes embedded, before fin, + 1 spine, 15–30 rays **CARANGIDAE** (Trevallies) *Volume 4*



- 29b Anal fin without separate spines before fin 30

- 30a Two separate dorsal fins, space between last element of the anterior fin and first element of the posterior fin greater than the space between spines in anterior fin; or with separate spines between anterior and posterior fins 31

- 30b Single dorsal fin, continuous or notched, if notched to the base, the space between the last element of the anterior portion and the first element of the posterior portion about equal to the space between spines in the anterior portion; 1st element of soft dorsal fin often a spine 52

- 31a First dorsal fin 7–9 short, isolated spines, 2nd fin with 1–3 spines, 26–33 rays; body long with broad silver band **RACHYCENTRIDAE** (M) (Cobia) *Volume 4*



- 31b First dorsal fin not as above 32

- 32a First dorsal fin 7–10 spines + 3–5 short, separate spines, 2nd fin 9–11 rays; soft dorsal and anal fins in scaly sheath **EMMELICHTHYIDAE** IN PART, *Emmelichthys* (Rovers) *Volume 4*



- 32b First dorsal fin not as above; spines joined by membrane 33

- 33a Soft dorsal fin with 1 spine in front of rays 34
- 33b Soft dorsal fin without spine in front of rays 46



33a

33b

Continued ...

KEY TO PERCIFORM FAMILIES

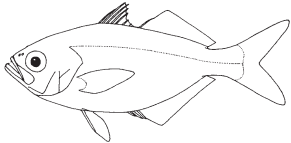
- 34a Body with LL scales 35
- 34b Body without LL scales; head with rows of sensory papillae; 1st dorsal fin 4–10 spines, 2nd dorsal fin 1 spine, 6–29 rays 44

- 35a First dorsal fin 5 spines, 2nd dorsal fin 1 spine, 8 or 9 rays; anal fin 2 spines, 8 or 9 rays; soft dorsal and anal fins opposite each other, situated far back on torpedo-shaped body
..... **SPHYRAENIDAE** (Barracudas) *Volume 5*



- 35b First dorsal fin >5 spines 36

- 36a First dorsal fin with 7 or 8 spines, 2nd dorsal fin with 1 spine, 19–23 rays; anal fin with 3 spines, 25–28 rays; body strongly compressed **LACTARIIDAE** (M) (False trevally) *Volume 3*



- 36b First dorsal fin 7 or 8 low spines, 2nd dorsal fin with 1 spine, 23–28 rays, fin depressible into groove; anal fin 2 minute spines, 23–27 rays **POMATOMIDAE** (M) (Bluefish or elf) *Volume 3*



- 36c Not as above 37

- 37a First dorsal fin with 9–11 spines, 2nd dorsal fin with 1 or 2 spines, 15–32 soft rays; anal fin with 1–3 small weak spines and 15–30 soft rays; 1st dorsal and pelvic fins fold into a groove; upper jaw not protrusile; 2 flat points on opercle
..... **NOMEIDAE** (Cigarfishes and driftfishes) *Volume 5*

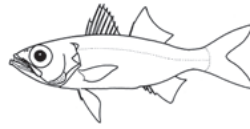


- 37b First dorsal fin with 10 spines, 2nd with 1 spine 10–12 rays; anal fin 3 spines, 9 or 10 rays; dorsal and anal fins with basal scaly sheath; pelvic fins with well-developed axillary process
..... **EMMELICHTHYIDAE** IN PART, *Erythrocles* (Rovers) *Volume 4*



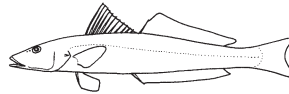
- 37c Not as above 38

- 38a First dorsal fin with 8 or 9 spines, 2nd dorsal fin with 1 spine, 13 or 14 soft rays; anal fin with 3 spines, 12 or 13 soft rays; 1st dorsal and pelvic fins do not fold into a groove; upper jaw not protrusile; maxilla with scales **SCOMBROPIDAE**
(Gnomefishes) *Volume 3*



- 38b Not as above 39

- 39a First dorsal fin with 11–13 spines, 2nd dorsal fin with 1 spine, 16–24 soft rays; anal fin with 2 spines, 17–26 soft rays; gill membranes not attached to isthmus and not separate from each other **SILLAGINIDAE** (Sillagos, smelts or Indo-Pacific whiting) *Volume 3*



- 39b Not as above 40

- 40a First dorsal fin with 12 spines, 2nd dorsal fin with 1 spine, 14 or 15 soft rays; anal fin with 2 or 3 spines, 16–18 soft rays; upper jaw with 2 or 3 large fangs in front; opercle with 5 flat points
..... **SCOMBROLABRACIDAE** (M) (Black mackerel) *Volume 5*



- 40b Not as above 41

- 41a One flat point or spine on opercle, 0–3 spines on preopercle; 1st dorsal fin with 6–8 spines, 2nd dorsal fin with 1 spine, 8–14 soft rays; anal fin with 2 spines, 8–18 soft rays; no scales on anal and dorsal fins **APOGONIDAE** (Cardinalfishes) *Volume 3*



- 41b Not as above 42

- 42a LL continues onto caudal fin; 1st dorsal fin with 6–8 spines, 2nd dorsal fin with 1 spine, 8–11 soft rays; anal fin with 1–3 spines, 7–10 soft rays; opercle with 1 or 3 spines; dorsal and anal fins with scales at least on base **EPIGONIDAE**
(Deepwater cardinalfishes) *Volume 3*



- 42b Not as above 43

Continued ...

KEY TO PERCIFORM FAMILIES

43a Opercle with 2 flat spines; 1st dorsal fin with 8–10 spines, 2nd dorsal fin with 1 spine, 9 or 10 soft rays, anal fin with 2 or 3 spines, 7–8 soft rays; LL with 25–55 scales; canines may be present, if no canines then teeth are in more than one row
 **ACROPOMATIDAE** (Lanternbellies) *Volume 3*



43b Opercle with 1–8 spines; lower end of subopercle with 1 or 2 large spines; 1st dorsal fin with 8 spines, 2nd dorsal fin with 1 spine, 8–10 soft rays, dorsal fins are well separated; anal fin with 3 spines, 6–8 soft rays; no canines, teeth in one row.....
 **HOWELLIDAE** (Pricklefishes) *Volume 3*



44a Branchiostegal rays 5; pelvic fins with frenum, innermost rays usually joined to form a disc **GOBIIDAE**
 (Gobies and mudskippers) *Volume 5*

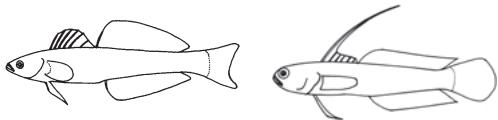


44b Branchiostegal rays 5 or 6; pelvic fins without frenum 45

45a First dorsal fin 5 or 6 spines, 9–15 rays (except *Allomicrodesmus* with 2 spines, 29–33 rays, which might occur in WIO); anal fin 9–14 rays; lower lip with completely free ventral edge; body naked or with very fine scales, 6 branchiostegal rays.....
 **XENISTHMIDAE** (Wrigglers) *Volume 5*



45b First dorsal fin 5 or 6 spines, >15 rays; anal fin 13–19 or 22–39 rays; lower lip not free; body with cycloid and/or ctenoid scales, 5 branchiostegal rays..... **MICRODESMIDAE**,
PTERELEOTRINAE (Dartgobies) *Volume 5*



45c First dorsal fin 6–10 spines, 6–12 rays; lower lip not free; 6 branchiostegal rays..... **ELEOTRIDAE** (Sleepers or gudgeons) *Volume 5*



46a Preopercle with strong spine 47

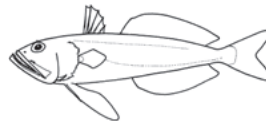


46b Preopercle without strong spine 48

47a Preopercle with strong, serrate spine; dorsal fin with 1–4 spines, 6–10 rays; scales absent **CALLIONYMIDAE** (Dragonets)
Volume 4



47b Preopercle with strong, curved spine; dorsal fin with 5 spines, 19–20 rays; scales spinoid, resembling shark denticles; pectoral fins small, not reaching anal-fin origin; pelvic fins twice length of pectoral fins **CHAMPSODONTIDAE** (Gapers) *Volume 4*



48a Opercle and subopercle with straight, sharp spine; dorsal fin with 3 spines, 12–18 rays; scales absent; pelvic-fin spine visible **DRACONETTIDAE** (Slope dragonets) *Volume 4*



48b Not as above 49

49a Dorsal-fin spines very low or embedded, showing as short, conical tubercles in front of rays 50

49b Dorsal-fin spines at least half height of rays 51

50a Dorsal-fin spines very low, with 22–27 rays; anal fin with 1 spine, 27–32 rays; pelvic-fin rays weak; LL 100–150; scales highly deciduous **AMARSIPIIDAE** (M) (Amarsipa) *Volume 5*



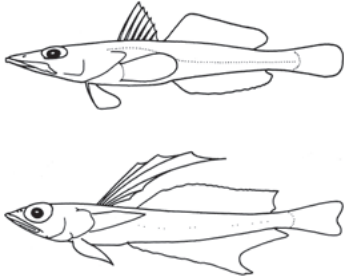
50b Dorsal-fin spines embedded, 9 or 10 rays; anal fin without spine, 10 rays, mostly covered by skin and denticles; LL obscure..... **URANOSCOPIIDAE** IN PART,
Pleuroscopus (Stargazers) *Volume 4*



Continued ...

KEY TO PERCIFORM FAMILIES

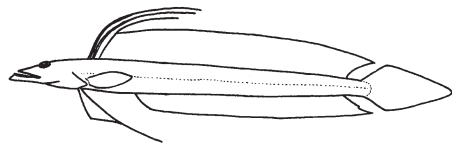
51a Mouth large, flat, bill-like, reaching to below eye; body elongate, subcylindrical and compressed posteriorly; pectoral fins reach further than anal-fin origin; no spine on preopercle; scales ctenoid **PERCOPHIDAE** (Duckbills) *Volume 4*



51b Mouth large, nearly vertical; body thick and compressed; eyes on top of head; pectoral fins short, not reaching anal-fin origin; spines on ventral preopercle; pelvic-fin spine not visible; scales absent or cycloid **URANOSCOPIDAE** IN PART (Stargazers) *Volume 4*



52a Dorsal fin with 3–8 spines, 34–47 rays; anal fin with 1 spine, 32–42 rays; pelvic fins 1 spine, 5 rays (no pelvic axillary scale); lower jaw longer than upper and with fleshy extension; gill membranes free from isthmus and separate from each other; pectoral fins as long as pelvic fins, pelvic fins reaching anus; scales large, cycloid **TRICHONOTIDAE** (Sand-divers) *Volume 4*



52b Dorsal fin without spines 53

52c Dorsal fin with 1 or more spines 56

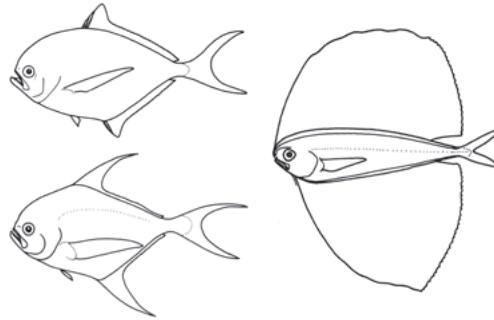
53a Body stout and depressed anteriorly or compressed and deep 54

53b Body elongate or tapered to a point 55

54a Body depressed; dorsal and anal fins situated far back on body; dorsal fin 12–14 rays; anal fin 17 or 18 rays; mouth large and nearly vertical **URANOSCOPIDAE** IN PART, *Xenocephalus* (Stargazers) *Volume 4*



54b Body compressed; dorsal and anal fins high, origin at mid-body or further forward; pelvic-fin rays not elongate; dorsal fin 31–57 rays; anal fin 21–50 rays; mouth oblique and usually to below eye **BRAMIDAE** (Pomfrets) *Volume 4*



54c Body compressed; dorsal and anal fins low; first 2 pelvic-fin rays elongate; dorsal fin with 3 or 4 rudimentary spines (lost with age), 40–45 rays; anal fin with 2 spines (lost with age), 30–33 rays **MENIDAE** (M) (Moonfish) *Volume 3*



55a Body elongate, compressed, and tapered to a point, dorsal and anal fins connected to pointed caudal fin; snout rounded; dorsal fin 82–89 rays; attains 50 cm SL, body orange-red with yellow bands **CEPOLIDAE** IN PART, *Acanthocephala* (Bandfishes) *Volume 4*



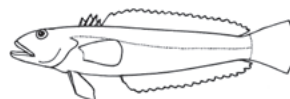
55b Body elongate, compressed and tapered; caudal fin forked; snout rounded, dorsal fin 52–66 rays; body with many colours **CORYPHAENIDAE** (Dorado or dolphinfishes) *Volume 4*



56a Anal fin without spines (first 2 rays spine-like in Pinguipedidae) 57

56b Anal fin with 1 or more spines 59

57a Anal fin 17–25 rays; pelvic fins 1 spine, 5 rays; body not elongate; dorsal fin spines shorter than rays, resembling a low crest **PINGUIPEDIDAE** (Sandperches) *Volume 4*



57b Not as above 58

Continued ...

KEY TO PERCIFORM FAMILIES

58a Dorsal fin 6–28 spines; anal fin 28–41 rays; pelvic fins with visible spine; body very elongate, almost eel-like; base of anal fin about half length base of dorsal fin **MICRODESMIDAE, MICRODESMINAE** (Wormfishes) *Volume 5*



58b Dorsal fin 3–17 spines; anal fin 99–119 rays; pelvic-fin spine present, but not visible, and with 1–4 rays; body eel-like..... **BLENNIIDAE** IN PART, *Xiphasia* (Blennies) *Volume 4*



58c Dorsal fin 1 short, separate spine; anal fin 26–66 rays..... **PSEUDOCHROMIDAE, CONGROGADINAE** (Snakelets) *Volume 3*



59a Dorsal fin 1–4 spines, 43–60 rays; anal fin 1 spine, 37–53 rays; pelvic fins reach halfway to anus, half length of pectoral fins; caudal fin square; scales ctenoid, except for some cycloid scales on head..... **BRANCHIOSTEGIDAE** IN PART, *Malacanthus* (Sand-tilefishes) *Volume 3*



59b Not as above..... **60**

60a Body small and elongate, depth ~8 in SL, naked; mouth with prominent chin; head with small flaps along lower edge of preopercle; dorsal fin 4–6 spines, 13–17 rays; pelvic fins 1 spine, 5 rays..... **KRAEMERIIDAE** (Sand-darts) *Volume 5*

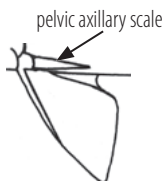


60b Not as above..... **61**

61a Body deep and compressed, depth 0.9–1.8 in SL (*Pempheris* from 2.0 in SL – see 68a)..... **62**

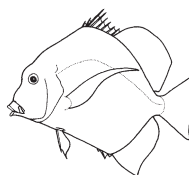
61b Body not deep or greatly compressed, depth >1.8 in SL **67**

62a Pelvic axillary scale present **63**



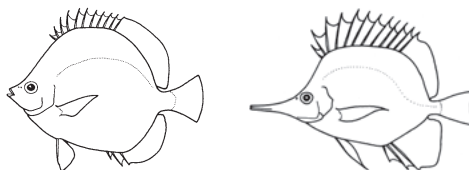
62b Pelvic axillary scale absent **65**

63a Dorsal fin 8–10 spines, 19–22 rays; anal fin 3 spines, 16–19 rays; upper jaw protrusile; pectoral fins long and falciform, reaching caudal peduncle; mouth small; dorsal-, anal- and pelvic-fin spines striated..... **DREPANEIDAE** (Sicklefishes) *Volume 3*

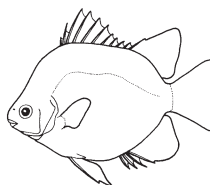


63b Not as above..... **64**

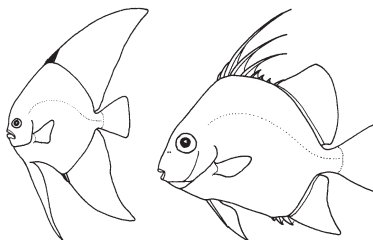
64a Dorsal fin without notch between spines and rays, with 11–17 spines, 14–30 rays; anal fin 3 or 4 spines, 14–23 rays; upper jaw protrusile..... **CHAETODONTIDAE** (Butterflyfishes) *Volume 3*



64b Dorsal fin with notch between spines and rays, with 11 or 12 spines, 16–18 rays; anal fin 4 spines, 13–16 rays; upper jaw not protrusile..... **SCATOPHAGIDAE** (Scats) *Volume 5*



65a Upper jaw not protrusile; LL complete, to base of caudal fin; dorsal fin 5–10 spines, 19–39 rays **EPHIPPIDAE** (Spadefishes, orbfishes and platax) *Volume 5*



65b Upper jaw protrusile..... **66**

Continued ...

KEY TO PERCIFORM FAMILIES

66a Dorsal fin 6 or 7 spines, fin with long whip-like filament, and 39–42 rays; caudal fin with black bar; pectoral fins with 18 or 19 rays **ZANCLIDAE** (M) (Moorish idol) *Volume 5*



66b Dorsal fin 7–10 spines, 23–38 rays; anal fin 2 or 3 spines, 22–34 rays; pectoral fins with 12–14 rays **CAPROIDAE** (Boarfishes) *Volume 3*

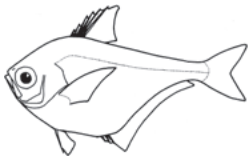


67a Dorsal fin 1 spine, anal fin 1 spine; dorsal fin without notch; body elongate **PSEUDOCHROMIDAE, ANISOCHROMINAE** (Annies) *Volume 3*



67b Dorsal and anal fins not as above **68**

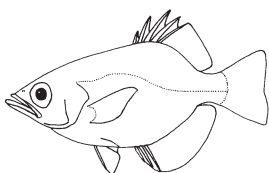
68a Base of anal fin longer than base of dorsal fin (~3× as long in *Pempheris*, and <1½× in *Parapriacanthus*); eye large; LL to end of caudal fin **PEMPHERIDAE** (Sweepers) *Volume 4*



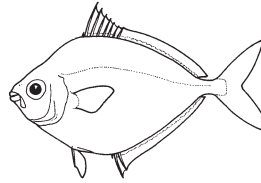
68b Base of anal fin about same length as base of dorsal fin **69**

68c Base of anal fin usually ½–¾ length base of dorsal fin **70**

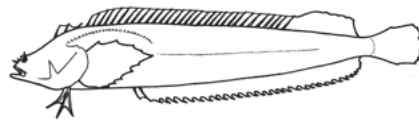
69a Dorsal fin 4–6 spines, 11–14 rays; dorsal and anal fins situated far back **TOXOTIDAE** (Archerfishes) *Volume 4*



69b Dorsal fin 7–9 spines, 15–17 rays; mouth very protrusile **LEIOGNATHIDAE** (Ponyfishes or slipmouths) *Volume 3*



69c Dorsal fin >30 spines, 3–14 rays; body elongate **CLINIDAE** IN PART, *Cancellolus* (Klipfishes) *Volume 4*

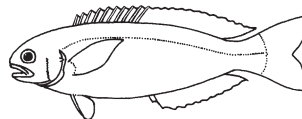


70a Head profile steep; eye large, situated far forward; mouth/maxilla more than twice eye diameter; body elongate; pelvic fins with outer 2 rays unbranched, inner 3 rays branched **OPISTOGNATHIDAE** (Jawfishes) *Volume 4*

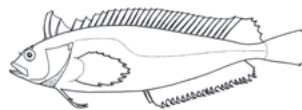


70b Not as above **71**

71a Dorsal fin 3–10 spines, 13–34 rays; anal fin 1 or 2 spines, 12–20 rays; pelvic fins 1 spine, 5 rays; opercle with 1 flat spine, preopercle with spine at angle **BRANCHIOSTEGIDAE** IN PART, *Hoplolatilus* (Sand-tilefishes) *Volume 3*



71b Dorsal fin 24–50 spines, 0–14 rays, first 3–5 spines often forming a crest; anal fin 2 spines, 19–57 rays; pelvic fins 1 hidden spine, 2 or 3 rays; body elongate **CLINIDAE** IN PART (Klipfishes) *Volume 4*



71c Not as above **72**

72a Dorsal fin deeply notched before last spine, and last spine usually longer than penultimate spine **73**

72b Dorsal fin without notch before last spine or not significantly notched (first 2 or 3 spines sometimes forming crest, or elongate in *Iniistius*) **77**

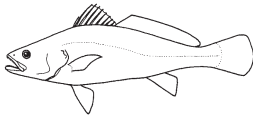
Continued ...

KEY TO PERCIFORM FAMILIES

- 73a Dorsal fin 6 or 7 + 1 spines; head bones serrate; scales cycloid **AMBASSIDAE** (Glassfishes) *Volume 3*



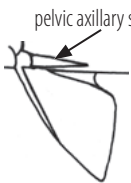
- 73b Dorsal fin 5–12 (usually 10) + 1 spines; head bones not serrate; base of anal fin < ½ length of dorsal-fin base; LL to end of caudal fin **SCIAENIDAE** IN PART (Croakers and kob) *Volume 3*



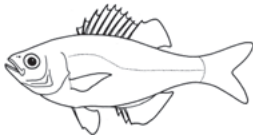
- 73c Dorsal fin >7 + 1 spines; head bones not serrate **74**

- 74a Pelvic axillary scale absent **75**

- 74b Pelvic axillary scale present **76**



- 75a Dorsal fin 9 + 1 spines; opercle with 2 spines; scales ctenoid **KUHLIIDAE** (Flagtails) *Volume 3*



- 75b Dorsal fin 10–12 + 1 spines; preopercle serrate; opercle with 2 spines **TERAPONTIDAE** (Thornfishes) *Volume 3*



- 76a Dorsal fin total spines 8 or 9; caudal fin rounded; maxilla to well behind eye; preopercle with spines **LATIDAE** (Barramundi) *Volume 3*



- 76b Dorsal fin total spines 10; caudal fin deeply forked; maxilla to anterior half of eye; opercle with one flat point **LUTJANIDAE** IN PART, *Etelis* (Snappers) *Volume 3*



- 77a Body without scales, elongate; dorsal fin with 3–17 spines; anal fin with 2 spines, often reduced and not visible in females; pelvic fins 1 spine (often hidden), 1–4 rays; LL not divided **BLENNIIDAE** IN PART (Blennies) *Volume 4*

- 77b Not as above **78**

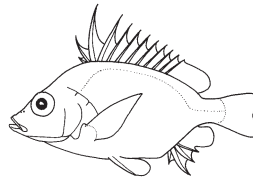
- 78a Anal fin 4–6 spines **79**

- 78b Anal fin 0–3 spines **80**

- 79a Anal fin 5 or 6 spines, 12–14 rays; scales cycloid and deciduous; lachrymal bone serrate **GERREIDAE** IN PART, *Pentapiron* (Silverbiddies) *Volume 3*



- 79b Anal fin 4–6 spines, 7–10 rays; scales ctenoid, head bones exposed **PENTACEROTIDAE** IN PART, *Pentaceros* (Armourheads) *Volume 3*



- 80a Dorsal fin 1–4 spines **81**

- 80b Dorsal fin >4 spines **82**

- 81a Anal fin 3 spines, 8–10 rays; dorsal fin tall, 4 spines, 25–27 rays, spines strong; caudal fin emarginate; head bones exposed **PENTACEROTIDAE** IN PART, *Histioporus* (Armourheads) *Volume 3*



- 81b Anal fin 1 spine, 13 or 14 rays; dorsal fin 3 spines, 21 rays; pelvic fins 1 spine, 5 rays; caudal fin long and pointed; reddish in colour **CEPOLIDAE** IN PART, *Owstonia* (Bandfishes) *Volume 4*



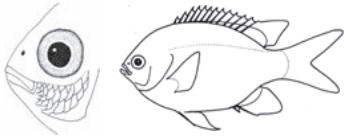
Continued ...

KEY TO PERCIFORM FAMILIES

81c Anal fin 1–3 spines, 12–21 rays; dorsal fin even, 1–4 spines, 21–32 rays, spines weak; caudal fin rounded to truncate; cheek and opercle without scales **PSEUDOCROMIDAE** (Dottybacks) *Volume 3*



82a One pair of nostrils; anal fin 2 spines; body compressed; anal fin 2 spines; LL interrupted or complete **POMACENTRIDAE** (Damsel-fishes) *Volume 4*



82b Two pairs of nostrils 83



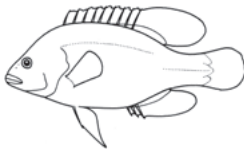
83a Anal fin 1 or 2 spines; canines present 84

83b Anal fin 2 or 3 spines; no canines present 85

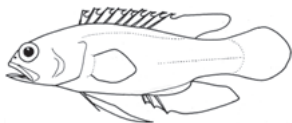
84a Anal fin 1 or 2 spines; teeth villiform with few canines; scales ctenoid; opercle with 1 spine **BRANCHIOSTEGIDAE** IN PART, *Branchiostegus* (Tilefishes) *Volume 3*



84b Anal fin 2 spines; teeth molariform with canines in front, often protruding; scales large, cycloid **LABRIDAE** IN PART (Wrasses) *Volume 4*



85a Pelvic fins 1 spine, 2–4 rays; scales mostly ctenoid; LL divided below rear of dorsal fin; pectoral fins long, extending to or beyond origin of anal fin; caudal fin round to pointed **PLESIOPIIDAE** (Longfins, comets and spiny basslets) *Volume 3*

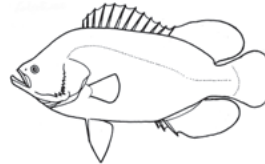


85b Pelvic fins 1 spine, 5 rays 86

86a Dorsal-fin spines much shorter than rays 87

86b Dorsal-fin spines about same length or longer than ray 88

87a Dorsal and anal fins rounded posteriorly, reaching past base of caudal fin; caudal fin rounded **LOBOTIDAE** (Tripletails) *Volume 3*



87b Dorsal and anal fins not rounded, do not reach past caudal-fin base; caudal fin forked **CENTROLOPHIDAE** (Ruffs, butterfishes and driftfishes) *Volume 5*



87c Soft dorsal, anal and caudal fins truncate; LL to end of caudal fin **DINOPERCIDAE** (Cavebasses) *Volume 3*



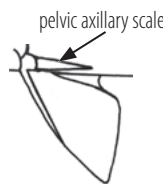
88a Pelvic fins joined to body; pectoral fins shorter than HL; scales spinoid, adherent, covering most of head; eye large, mouth strongly oblique **PRIACANTHIDAE** (Bigeyes) *Volume 3*



88b Not as above 89

89a Pelvic axillary scale absent 90

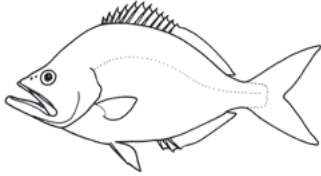
89b Pelvic axillary scale present 94



Continued ...

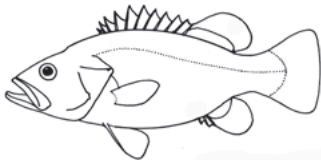
KEY TO PERCIFORM FAMILIES

- 90a Anal fin 13–15 rays; lower jaw strongly protruding
..... **PARASCORPIDIDAE** (M) (Jutjaw) *Volume 3*



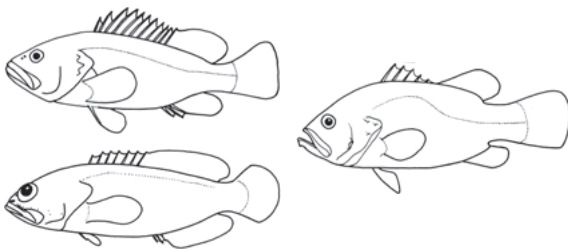
- 90b Anal fin <13 rays; lower jaw not as above 91

- 91a Opercle with horizontal ridge ending in a spine; preopercle serrate in adults, without spines; pelvic- and anal-fin spines serrate; pectoral fins shorter than pelvic fins **POLYPRIONIDAE** (Wreckfishes) *Volume 3*



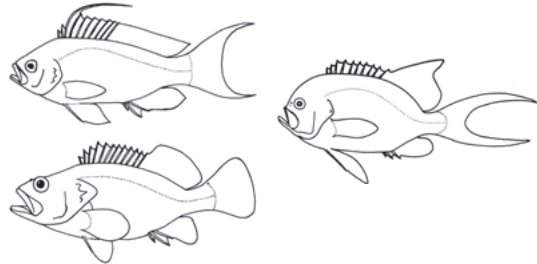
- 91b Opercle with 1–3 flat spines; preopercle serrate, sometimes with spines; pelvic- and anal-fin spines not serrate; pectoral fins generally longer than pelvic fins 92

- 92a Body scales small, LSS >78, from upper end of gill opening to caudal-fin base (reduced to 40–60 in Pseudogrammini); LL scales often inconspicuous (disjunct LL in Pseudogrammini), usually smaller than main body scales, and mostly covered by them; flap of skin joining upper part of pectoral-fin base to body; maxilla naked; supramaxilla present, covered by skin and loosely attached to upper rear edge of maxilla
..... **EPINEPHELIDAE** (Groupers, podges and soapfishes) *Volume 3*



- 92b Body scales larger, LSS usually <80, from upper end of gill opening to caudal-fin base; LL scales typically distinct; subequal in size and number to adjacent body scales; no flap of skin joining pectoral-fin base to body; supramaxilla typically absent (present in *Acanthistius* and present, but small, in some *Plectranthias*) 93

- 93a Maxilla scaly in most species; caudal fin lunate or forked in most species; branched caudal-fin rays 13 in most species (15 in *Acanthistius*); LL 25–64 scales; dorsal fin 13–20 rays
..... **ANTHIADIDAE** (Goldies, basslets, perchlets and swallowtails) *Volume 3*



- 93b Maxilla naked; caudal fin emarginate to truncate; branched caudal-fin rays 15; LL 67–77 (*Serranus*) or 42–44 (*Chelidoperca*) scales; dorsal fin 13–15 (*Serranus*) or 9–10 (*Chelidoperca*) rays
..... **SERRANIDAE** (Perchlets and sea basses) *Volume 3*



- 94a Premaxilla with 1 or 2 postmaxillary processes, visible from inside mouth; jaws highly protrusile; teeth small to minute; no teeth on vomer; preopercle not serrate; branchiostegal rays 7; often with blue and yellow stripes **CAESIONIDAE** (Fusiliers) *Volume 3*

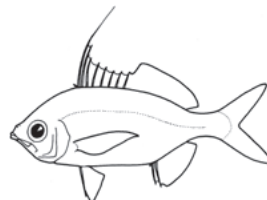


- 94b Not as above 95

- 95a Scales cycloid, often very large 96

- 95b Scales ctenoid 99

- 96a Caudal fin deeply forked; cheeks and opercle scaly; single row of scales at base of dorsal and anal fins **GERREIDAE** IN PART, *Gerres* (Silverbiddies) *Volume 3*

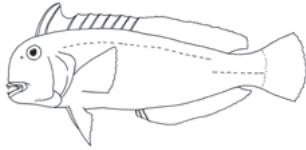


- 96b Caudal fin rounded, truncate to slightly emarginate 97

Continued ...

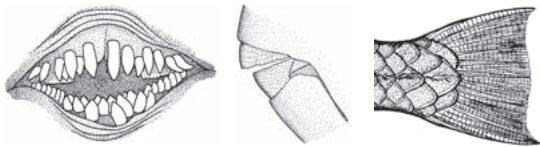
KEY TO PERCIFORM FAMILIES

97a Body compressed, profile of head steep and sharp, with 'razor-edge'; first 2 or 3 spines sometimes elongate or forming crest **LABRIDAE** IN PART, *Iniistius* (Razorfishes) *Volume 4*

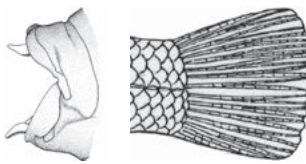


97b Not as above **98**

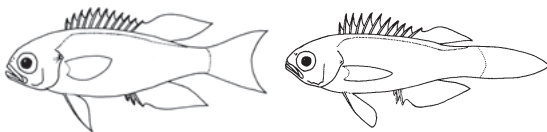
98a Three or 4 large scales at base of caudal fin; outer teeth separate or fused into a dental plate **SCARIDAE, SPARISOMATINAE** (Parrotfishes) *Volume 4*



98b No large scales at caudal-fin base; teeth in jaws conical, usually with canines anteriorly (incisors in *Anampses* and *Pseudodax*) **LABRIDAE** IN PART (Wrasses) *Volume 4*



99a LL runs along base of dorsal fin and just below top of peduncle; dorsal fin 9–11 rays; anal fin 9–11 rays; usually gold in colour **CALLANTHIIDAE** (Seaperches) *Volume 3*



99b Not as above **100**

100a Mouth highly protrusile, toothless or with few small teeth; gill rakers long and numerous; dorsal fin with deep notch before last spine, penultimate spine the shortest; dorsal and anal fins in scaly sheath (but see also 107b) **EMMELICHTHYIDAE** IN PART, *Plagiogeneion* (Rovers) *Volume 4*



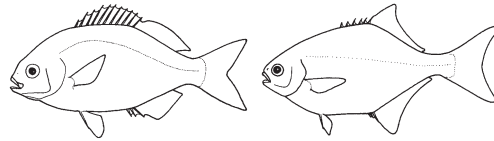
100b Not as above **101**

101a Dorsal fin with 18–23 rays; fins scaly; no spines or flat points on opercle; gill membranes attached to isthmus and attached to each other **DICHISTIIDAE** (Galjoen) *Volume 3*



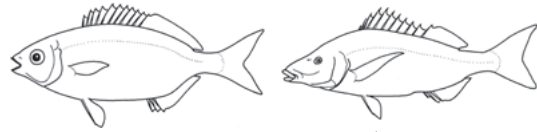
101b Not as above **102**

102a Dorsal fin 11–15 rays; fins without scales; a single row of incisor-like teeth; minute canine-like teeth in 2 or 3 rows medial to incisor-like teeth; opercle with 2 small, weak, retrorse spines **KYPHOSIDAE** (Sea chubs or rudderfishes) *Volume 3*



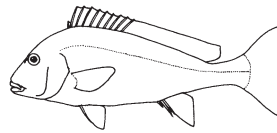
102b Not as above **103**

103a Dorsal fin 10–15 spines, 9–17 rays (but never 10 spines, 9 rays); opercle with or without spines; maxilla slots into groove in outer end of premaxilla; preopercle not serrate; no teeth on vomer; gill membranes separate from each other; no pores on chin **SPARIDAE** (Seabreams and porgies) *Volume 3*

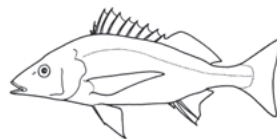


103b Not as above **104**

104a Dorsal fin 15–25 rays; cheek and opercle scaly; head scaly except front of snout; pores on chin **HAEMULIDAE** (Grunters and rubberlips) *Volume 3*



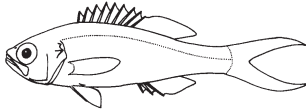
104b Not as above **105**



Continued ...

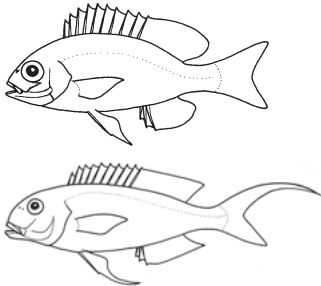
KEY TO PERCIFORM FAMILIES

105a Dorsal fin 9 spines, 10 or 11 rays; opercle with 2 spines, lower larger; uppermost pectoral- and caudal-fin rays often elongate
 **SYMPHYSANODONTIDAE** (Slopefishes) *Volume 3*



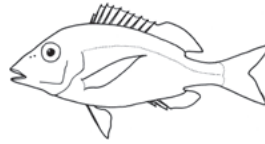
105b Not as above **106**

106a Dorsal fin 10 spines, 8–10 rays; anal fin with 7 rays; opercle without spines (some have a flat point); dorsal and anal fins in shallow groove; gill membranes separate from each other
 **NEMIPTERIDAE** (Threadfin breams, monocle breams and dwarf monocle breams) *Volume 3*

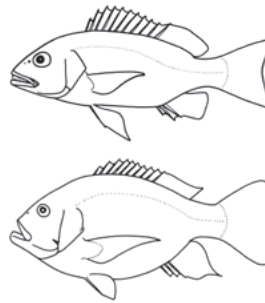


106b Not as above **107**

107a Dorsal fin 9 or 10 rays; opercle with single flat spine; gill rakers few and knob-like; gill membranes not separate from each other **LETHRINIDAE** (Emperors, emperor snappers and large-eye breams) *Volume 3*



107b Dorsal fin 10–16 rays; opercle with 2 flat points, upper hidden by skin and scales; gill rakers not as above; gill membranes separate from each other **LUTJANIDAE** IN PART (Snappers) *Volume 3*



FAMILY OPLEGNATHIDAE

Knifejaws

Phillip C Heemstra

Body oblong, somewhat compressed, covered with minute, adherent, weakly ctenoid scales. Dorsal fin continuous, with 11 or 12 short spines, 11–24 rays; anal fin 3 weak spines, 11–17 rays; caudal fin 15 branched rays, fin emarginate or forked with rounded tips. Teeth fused to form strong parrot-like beak as in parrotfishes (family Scaridae, but the two families are not at all closely related); small juveniles with separate incisiform teeth on jaws; no teeth on vomer and palatines. Preopercle and opercle smooth (no spines or serrae). Branchiostegal membranes united and free from isthmus. Adults mostly dark greyish brown; juveniles yellow with black bands.

Common in rocky areas, from shore to ~100 m deep. Feed on algae and benthic invertebrates (sponges, tunicates, sea urchins, bryozoans and barnacles). Good eating. Apparently an antitropical group, also occurring at Japan, Australia and on the west coast of South America.

One genus, *Oplegnathus* Richardson 1840, with 7 species; 3 species in WIO, all endemic to southern Africa.

KEY TO SPECIES

- 1a Dorsal fin 12 spines, 11–14 rays; soft-rayed dorsal-fin base ~½ spinous base; anal fin 3 spines, 11–14 rays; juveniles yellow with 2–4 black bands *O. conwayi*
- 1b Dorsal fin 11 spines, 20–24 rays; soft-rayed dorsal-fin base subequal to spinous base; anal fin 3 spines, 14–17 rays; juveniles yellow with 4 black bands 2
- 2a Body depth 2.5–2.7 in SL; scales begin on top of head behind eyes *O. peaolopesi*
- 2b Body depth 1.8–2.1 in SL; scales begin over front of eyes *O. robinsoni*

Oplegnathus conwayi Richardson 1840

Cape knifejaw

PLATE 1

Oplegnathus conwayi Richardson 1840: 27 (Port Arthur, Tasmania, Australia) [in error; known only from South Africa].

Oplegnathus conwayi: Richardson 1849*; SFSA No. 461*; Smith & Smith 1966*; SSF No. 206.1*; Heemstra & Heemstra 2004*.

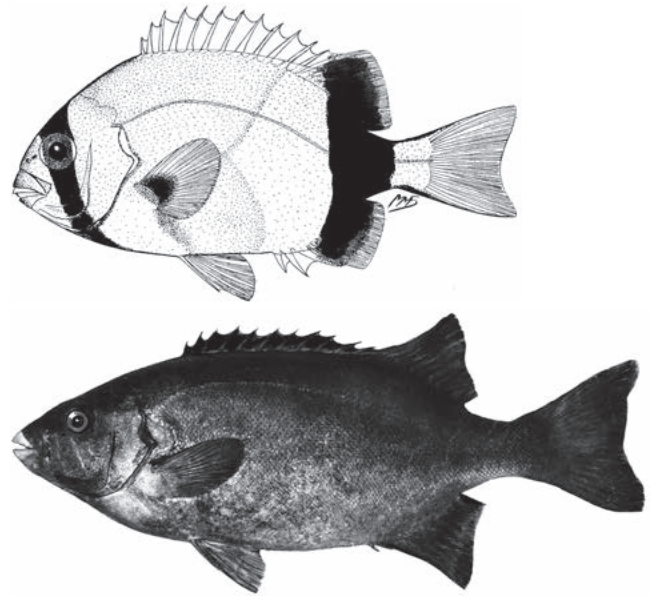
Ichthyorhamphos pappei Castelnau 1861: 35 (Kalk Bay, False Bay, South Africa).

Hoplegnathus algoensis Gilchrist & Thompson 1916: 56, Fig. (Algoa Bay, South Africa).

Hoplegnathus conwayi: Barnard 1927*.

Body depth 1.8–2.8 in SL, more elongate with growth. Top of head naked.

Adults grey, with darker diffuse mask-like area over eyes; underside of head and body whitish; anal fin and pelvic fins whitish. Juveniles bright yellow, with curved black band from interorbital area over eye to isthmus, and another curved black band from basal half of soft-rayed portion of dorsal fin, across peduncle, to basal half of anal fin. Attains 90 cm TL, at least 7 kg, ~14 years.



Oplegnathus conwayi, 10 cm TL, juvenile (top); 50 cm TL, adult (bottom) (both South Africa). Source: SFSA (top); SSF (bottom)

DISTRIBUTION WIO: Endemic to South Africa, from False Bay, Western Cape, to Aliwal Shoal, KwaZulu-Natal.

REMARKS Matures at ~40 cm FL. Found on rocky reefs, in 5–100 m. Seldom caught with hook and line, but easily speared.

Oplegnathus peaolopesi Smith 1947

Mozambique knifejaw

PLATE 1

Oplegnathus peaolopesi Smith 1947: 798 (Maputo Bay to Beira, Mozambique); SFSA No. 463*; SSF No. 206.2*; Heemstra & Heemstra 2004.

Dorsal fin 11 spines, 20 or 21 rays; anal fin 3 spines, 16 rays; pectoral fins 18 or 19 rays; lower GR 15. Large adults with bony bump between eyes.

Adults dark bronzy brown; colour of juveniles unknown. Attains 75 cm TL.



Oplegnathus pealopesi, 60 cm TL, holotype (Mozambique). Source: SSF

DISTRIBUTION WIO: Mozambique (Beira) to South Africa (Sodwana Bay), and northern Madagascar.

REMARKS Genetic data indicate that this may be the same species as *O. robinsoni*.

Oplegnathus robinsoni (Regan 1916)

Natal knifejaw

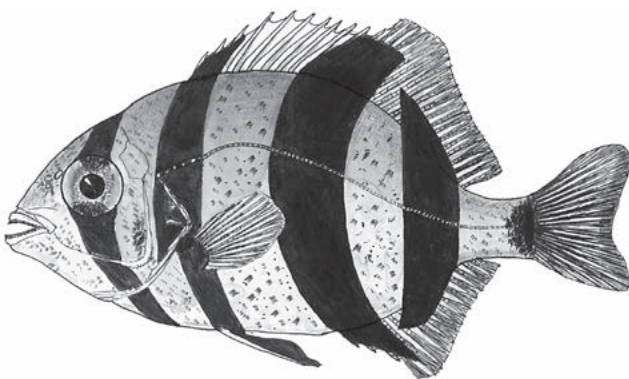
PLATE 1

Hoplegnathus (Scarostoma) robinsoni Regan 1916: 168 (Durban, KwaZulu-Natal, South Africa); Barnard 1927; Smith 1935.

Oplegnathus robinsoni: Fowler 1935; Smith 1946; SFSA No. 462*; SSF No. 206.3*; Heemstra & Heemstra 2004.

Dorsal fin 11 spines, 20–24 rays; anal fin 3 spines, 14–17 rays; pectoral fins 18 or 19 rays; lower GR 16–19.

Adults dark grey; juveniles yellow, with 4 black bars (resembling young zebra sparid *Diplodus hottentotus*). Attains 60 cm TL.



Oplegnathus robinsoni, 8 cm TL, juvenile (South Africa). Source: SFSA

DISTRIBUTION WIO: Mozambique (Pomene; adults common north of Maputo Bay) and South Africa (to Xora River, Eastern Cape; stray juveniles to False Bay).

REMARKS Found in 20–100 m. Taken occasionally on hook and line near reefs.

FAMILY BRAMIDAE

Pomfrets

M Eric Anderson

Body elongate to deep, laterally compressed. Two subfamilies recognised: Pteraclinae, oblong body with large sail-like dorsal and anal fins that fold into scaly sheaths; and Braminae, deeper-bodied with shorter, stiffer dorsal and anal fins that do not fold into scaly sheaths, but with anterior lobes in adults. Unpaired fins without true spines in all pomfrets, instead with 'flexible spines' — unsegmented rays divided at base. Pectoral fins long, narrow and wing-like. Pelvic fins thoracic, with normal perciform formula of 1 spine, 5 rays in bramines, or reduced and jugular (or nearly so), with 1 spine, 3 or 4 rays in pteraclines. Pelvic fins with scaly axillary process (fulcral scale) in all genera except *Pteraclis*. Caudal fin lunate or forked in adults and late juveniles, truncate or rounded in earlier stages; principal rays 15–17. Maxilla scaled; no supramaxilla. Small sharp teeth in bands on jaws, 1 row of teeth on palatines, and larger fish occasionally with tooth patch on vomer. Rear margin of preopercle with moderate to large spines in larvae and juveniles, lost with growth. Gill rakers generally shorter and fewer in pteraclines than bramines. Scales ctenoid or cycloid; those on body large, high, often with dorsal and ventral prolongations, and with median spine; LL pored scales arching above pectoral fins in bramines; lateral line disappearing in large adults of some species. Body generally dark or silvery. Total vertebrae 36–47 in Braminae, 45–54 in Pteraclinae.

Coastal to oceanic, epipelagic or mesopelagic, in tropical to subpolar seas. Although highly prized as food fishes, only some bramines enter local fisheries as bycatch, with the exception of *Brama brama* which is targeted in the eastern Atlantic, including off the west coast of South Africa. Pomfrets undergo great change in body form during metamorphosis. The key given here is based on late (metamorphosed) juveniles (>5 cm SL) and adults, and is taken largely from Mead (1972) and Last & Moteki (2001).

Seven genera and 20 species; 5 genera and 7 species in WIO.

KEY TO GENERA

[Specimens >5 cm SL]

- 1a Dorsal-fin origin in front of vertical through pectoral-fin origins; dorsal fin high, scaleless, flexible, depressible into sheath of elongate scales at base; pelvic fins small, with 1 spine, 3 or 4 rays 2
- 1b Dorsal-fin origin on or behind vertical through pectoral-fin origins; dorsal fin scaly, not greatly flexible, without sheath of elongate scales at base; pelvic fins moderate, with 1 spine, 5 rays 3
- 2a Dorsal-fin origin on or behind vertical through rear margin of eyes; scales present in midline before dorsal-fin origin; length of dorsal-fin base <80% SL; anterior rays of dorsal and anal fins of similar thickness; pelvic fins with scaly axillary process; total vertebrae 45–51 *Pterycombus*
- 2b Dorsal-fin origin on snout; area before dorsal-fin origin naked; length of dorsal-fin base >90% SL; one of 5 anteriormost dorsal- and anal-fin rays notably thicker than adjacent rays; pelvic fins without scaly axillary process; total vertebrae 51–54 *Pteraclis*
- 3a GR 12–20; LSS 51–80; longest dorsal-fin ray less than HL *Brama*
- 3b GR 8–12; LSS 34–50; longest dorsal-fin ray greater than HL 4
- 4a Anal fin 21–26 rays; longest dorsal-fin ray subequal to HL; LSS 43–50; head profile anterodorsal to eyes flat or very slightly convex; vertebrae 39–42 *Taractes*
- 4b Anal fin 26–30 rays; longest dorsal-fin ray greater than HL; LSS 34–46; head profile above eyes noticeably convex; vertebrae 44–47 *Taractichthys*

GENUS *Brama* Bloch & Schneider 1801

Dorsal-fin origin over pectoral-fin bases; dorsal and anal fins of adults each with low anterior lobe; median fins stiff, covered with scales at least basally, not fitting into scaly sheath; pelvic-fin origins under rear half of pectoral-fin bases in adults, farther forward in young; scaly axillary process of pelvic fins well-developed. Branchiostegal rays 7; GR 12–20. Scales cycloid, those below lateral line vertically elongate; LSS 51–80. Total vertebrae 36–43, including urostyle. Nine very similar-looking species, 3 in WIO.

KEY TO SPECIES

- 1a Pectoral fins set low on body, distance from lower end of pectoral-fin base to pelvic-fin origin 7–12% SL; preanal length 53–61% SL; anal fin 25–29 rays; LSS 60–68 *B. dussumieri*
- 1b Pectoral fins set higher on body, distance from lower end of pectoral-fin base to pelvic-fin origin 13–16% SL; preanal length 54–66% SL; anal fin 28–31 rays; LSS 48–57 2
- 2a Distance from snout tip to pectoral-fin bases (pre-pectoral distance) 31–35% SL in fish <8 cm SL; preanal length 62–68% SL; caudal-fin upper lobe 39–42% SL *B. orcini*
- 2b Pre-pectoral length 28–30% SL in fish <8 cm SL; preanal length 56–60% SL; caudal-fin upper lobe >50% SL *B. myersi*

Brama dussumieri Cuvier 1831

Lesser bream

PLATE 2

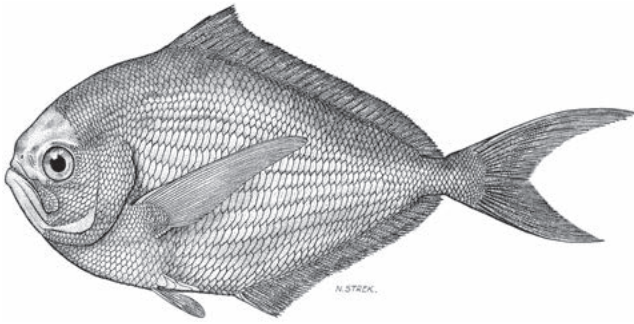
Brama dussumieri Cuvier in Cuv. & Val. 1831: 294 [eastern Indian Ocean]; Fowler 1936; Mead 1972*; Gloerfelt-Tarp & Kailola 1984*; Masuda *et al.* 1984*; Nakamura 1986*; Winterbottom *et al.* 1989; Pavlov 1991; Grove & Lavenberg 1997*; Fricke *et al.* 2009.

Brama raii (non Bloch & Schneider 1801): Parr 1933; Abe 1961.

Brama brama (non Bonnaterre 1788): Duarte-Bello 1959.

Dorsal fin 31–35 rays; anal fin 24–29 rays; pectoral fins 19–22 rays. Dorsal-fin anterior lobe weak, except in largest adults; anal-fin anterior lobe barely expressed; caudal fin rounded in small fish (<1 cm SL), becoming deeply forked in largest specimens; caudal-fin upper lobe usually not elongated in juveniles, but Mead (1972: 58) reported a 10.4-cm-SL specimen with upper lobe 65% SL, and Pavlov (1991) reported on a specimen of ~3 cm SL with elongate upper lobe. Percentage SL: body depth 41–63%, HL 27–35%, snout length 5–9%, eye diameter 8–16%, upper jaw length 13–20%, predorsal length 36–50%, preanal length 53–63%, dorsal-fin base 48–60%, anal-fin base 39–48%, and distance from base of lowermost pectoral-fin ray to pelvic-fin insertion 7–12%. Eyes large, rounded, without adipose tissue. Teeth usually present on vomer and palatines (occasionally absent). Preopercular spines disappear at ~4.5 cm SL. GR 3–6/8–14 = 11–20. Lateral line indistinct or absent in larger specimens. Scales present on maxilla and cheeks, absent on snout and above eyes; LSS 57–70. Vertebrae 14–17 + 24–27 = 40–43.

Adults with dark brown to tan head and body, with silvery cast (lost soon after capture), and unpaired fins darker than body. Juveniles silvery, fins hyaline. Attains 50 cm TL.



Brama dussumieri, 15 cm SL (Gulf of Mexico). Source: Mead 1972

DISTRIBUTION Circumglobal in tropical to warm-temperate seas, and possibly cold-temperate areas. WIO: East Africa to South Africa, Madagascar, Seychelles, Mascarenes, Chagos, Maldives and India.

REMARKS Highly oceanic, epipelagic, but may stray near coastal areas, especially around islands. Nakamura (1986) reported captures in cold-temperate waters off Chile, to 45° S.

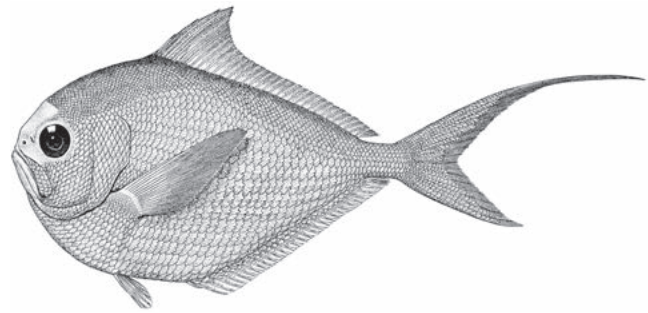
Brama myersi Mead 1972

Myer's pomfret

Brama myersi Mead 1972: 76, Figs. 35–36 (western Pacific, 15°14' N, 159°55' E); Masuda *et al.* 1984*; Moteki *et al.* 1995.

Dorsal fin 32–36 rays; anal fin 28–31 rays; pectoral fins 19 or 20 rays. Dorsal-fin anterior lobe well-developed in largest specimens; anal fin without anterior lobe; caudal fin deeply forked, upper lobe elongate, filamentous. Percentage SL: body depth 51–59%, HL 29–32%, snout length 5–7%, eye diameter 9–13%, upper jaw length 12–16%, predorsal length 40–46%, preanal length 56–60%, dorsal-fin base 52–56%, anal-fin base 43–53%, and distance from base of lowermost pectoral-fin ray to pelvic-fin insertion 13–16%. Teeth in bands on jaws; small teeth on palatines usually present. No preopercular spines in largest specimens. GR 3 or 4/9 or 10 = 12–14. Lateral line distinct, arching over pectoral fins. Scales of early juveniles as in *B. dussumieri* (unknown at other sizes); LSS 52–63. Vertebrae 14–17 + 23–26 = 40–42.

Juveniles silvery, dorsum darker; fins unpigmented except caudal fin darker distally. Adult colouration unknown. Maximum size unknown.



Brama myersi, 8 cm SL, holotype (central Pacific). Source: Mead 1972

DISTRIBUTION Presumably tropical Indo-Pacific to central Pacific. Records from Tanzania (Zanzibar) in WIO; elsewhere, Hong Kong, southern Japan (Ogasawara Is.), New Caledonia and Hawaii.

REMARKS Known only from juveniles (<8.5 cm SL). Very similar to *B. dussumieri* but distinguished chiefly by its higher pectoral fins, earlier expression of the dorsal-fin anterior lobe, and an elongate caudal-fin upper lobe.

Brama orcini Cuvier 1831

Tropical pomfret

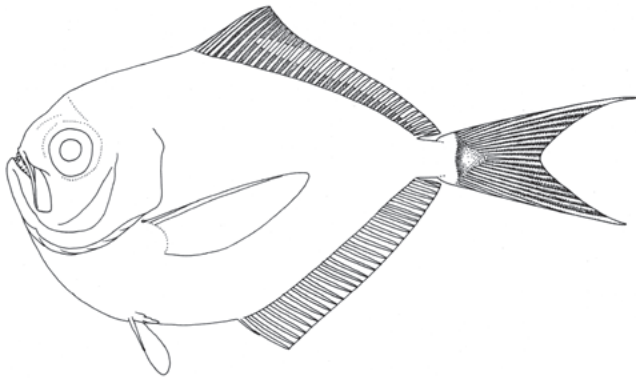
PLATE 2

Brama orcini Cuvier in Cuv. & Val. 1831: 295 [eastern Indian Ocean, ~00° N, 87°20' E]; Mead 1972*; Masuda *et al.* 1984*; SSF No. 207.2*; Smale *et al.* 1995; Anderson *et al.* 1998; Heemstra & Heemstra 2004; Fricke *et al.* 2009.

Collybus drachme Snyder 1904: 525, Pl. 9, Fig. 16 (off Niihau I., Hawaii); Fowler 1936; Mead 1957; Gosline & Brock 1960*; Grindley & Penrith 1965; Munro 1967*.

Dorsal fin 32–36 rays; anal fin 28–30 rays; pectoral fins 20–22 rays. Dorsal- and anal-fin anterior lobes weak in largest specimens; caudal fin deeply forked. Percentage SL: body depth 48–68%, HL 25–33%, snout length 6–8%, eye diameter 7–12%, upper jaw length 13–18%, predorsal length 37–50%, preanal length 53–68%, dorsal-fin base 49–59%, anal-fin base 46–50%, and distance from base of lowermost pectoral-fin ray to pelvic-fin insertion 13–17%. Teeth in bands on jaws; teeth present on vomer and palatines. Lateral line distinct, arching over pectoral fins. GR 3–5/9–11 = 12–16. Scales as in *B. dussumieri*; LSS 48–55. Vertebrae 15–17 + 20–24 = 38–40.

Body uniformly dark brown with silvery sheen that disappears soon after capture. Attains 35 cm TL.



Brama orcini, 7 cm SL, juvenile (SE of Hawaii). Source: Mead 1972

DISTRIBUTION Tropical to warm-temperate waters of all three major oceans, usually near land masses. WIO: Kenya to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Mascarenes, St Brandon Shoals, Chagos, Maldives, Lakshadweep and Sri Lanka in WIO.

REMARKS Found to ~100 m deep.

GENUS *Pteraclis* Gronow 1772

Dorsal-fin origin on snout; predorsal area and vertical fins naked; dorsal and anal fins enormous in adults, forming a 'fan' and folding into sheath of enlarged scales (scutes); one of 5 anterior rays of dorsal and anal fins greatly thickened; pelvic fins without scaly axillary process. Vertebrae 51–54. Three species, 1 in WIO.

Pteraclis velifera (Pallas 1770)

Spotted fanfish

Coryphaena velifera Pallas 1770: 19, Pl. 3, Fig. 1 [Indian Ocean].

Pteraclis pinnata Gronow 1772: 44, Pl. 2 (Indian Ocean).

Oligopodus veliferus: Lacepède 1800.

Pteraclis velifera: Oken 1816; Jordan 1919*; Barnard 1927; Smith 1949*; Mead 1972*; SSF No. 207.4*; Paulin *et al.* 1989; Fricke *et al.* 2009.

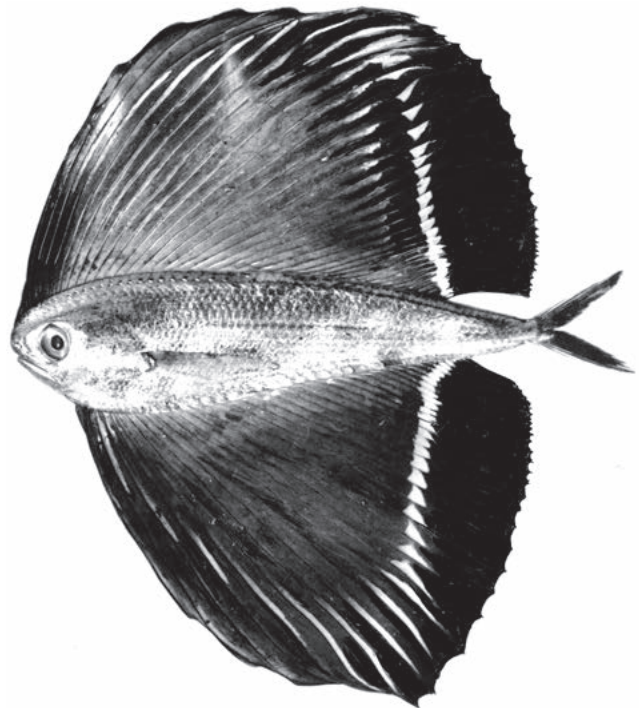
Pteraclis ocellatus Valenciennes *in* Cuv. & Val. 1833: 363, Pl. 271 (Mozambique Channel); Jordan 1919.

Pteraclis trichipterus Valenciennes *in* Cuv. & Val. 1833: 367 ('Indian seas'); Jordan 1919*.

Dorsal fin 52–57 rays; anal fin 45–50 rays; pectoral fins 18–20 rays. Usually 4th ray of dorsal fin and 2nd ray of anal fin thickened; caudal fin rounded or truncate in early juveniles, becoming deeply forked in adults, lobes subequal. Percentage SL: body depth 20–25%, HL 19–21%, snout length 4–5%,

eye diameter 4–5%, upper jaw length 8–9%, predorsal length 1–4%, preanal length 12–18%, dorsal-fin base 95–100%, and anal-fin base 82–90%. Teeth small, sharp, in bands on jaws; teeth present on vomer and palatines. GR 0 or 1/6 or 7, short. Lateral line present anteriorly, indistinct. Scales large, ctenoid, those along dorsal- and anal-fin bases scute-like; LSS 55–59. Vertebrae 20 or 21 + 30–33 = 51–54.

Body uniformly silvery, iridescent in life; median fins dark blue, with turquoise spots; eyes dark blue, iris silvery. Attains 46 cm SL.



Pteraclis velifera, 24 cm TL (South Africa). Source: SSF

DISTRIBUTION Tropical to temperate waters of Southern Hemisphere, including South Africa (off St Helena Bay, in southeastern Atlantic) to Mozambique, Mozambique Channel, Madagascar, Walters Shoals and Mascarenes in WIO.

REMARKS Pelagic in deep water of open ocean.

GENUS *Pterycombus* Fries 1837

Dorsal-fin origin on or behind vertical through rear margin of eyes; dorsal and anal fins triangular (sail-like) in adults, folding into sheath formed by enlarged scales (scutes); immediate predorsal area scaly; anal fin with anterior lobe in adults; vertical fins naked; pelvic fins with scaly axillary process. Vertebrae 45–51. Two species, 1 in WIO.

Pterycombus petersii (Hilgendorf 1878)

Prickly pomfret

PLATE 2

Centropholis petersii Hilgendorf 1878: 1 (Enosima, Japan); Jordan 1919; Kuronuma 1941*; Kamohara 1962*.

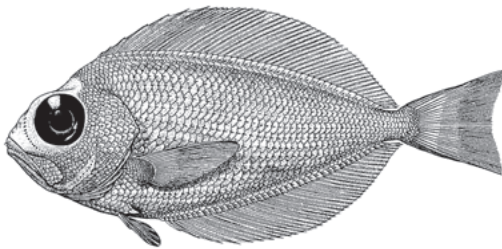
Pterycombus falcatus Barnard 1927: 599, Pl. 25, Fig. 1 (Cape seas [likely Table Bay], South Africa); Williams 1966.

Centrolophoides falcatus: Smith 1949.

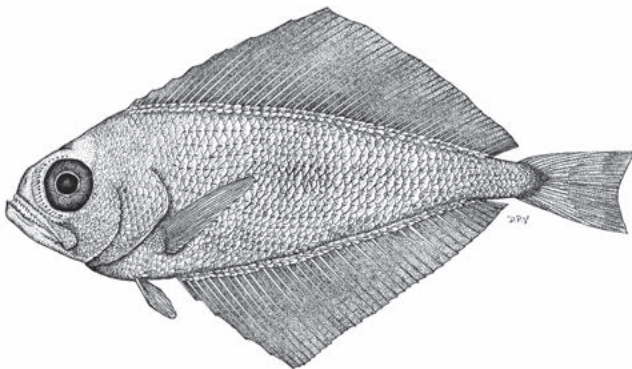
Pterycombus petersii: Hulley 1972; Mead 1972; Masuda *et al.* 1984*; SSF No. 207.5*; Seki & Mundy 1991; Fricke *et al.* 2009.

Dorsal fin 48–50 rays; anal fin 35–41 rays; pectoral fins 20–22 rays. Adults with triangular, sail-like dorsal and anal fins, fins gently rounded in juveniles; anal-fin margin with deep notch in largest adults; caudal fin truncate in early juveniles, deeply forked in larger fish. Percentage SL: body depth 36–43%, HL 22–33%, snout length 5–6%, eye diameter 8–14%, upper jaw length 12–18%, predorsal length 16–21%, preanal length 30–35%, dorsal-fin base 75–77%, and anal-fin base 68–71%. Teeth in bands on jaws, with outer row of large retrorse teeth, and these enlarged anteriorly; no teeth on vomer and palatines. GR 1 or 2/5–7 = 7 or 8. Lateral line distinct in early juveniles, lost in late juveniles. Scales large, ctenoid, with central spine (at all sizes); scales scute-like along dorsal- and anal-fin bases (as in *Pteraclis*); LSS 47–50. Vertebrae 45–48.

Adults silvery, median fins black with bronze tinge; iris silvery. Juveniles creamy yellowish, becoming uniformly silvery with growth. Attains 31 cm TL.



Pterycombus petersii, 4 cm SL, juvenile (off South Africa). Source: Mead 1972



Pterycombus petersii, 8 cm SL (South Africa). Source: SSF

DISTRIBUTION Tropical to temperate waters of southeastern Atlantic, Indo-Pacific and eastern Pacific. WIO: East Africa to South Africa, Madagascar, Seychelles, Mascarenes, and northern India; elsewhere to western Australia, southern Japan, Mariana Is., northern New Zealand, Hawaiian Ridge and Line Is.

REMARKS Deep-pelagic, generally in open ocean.

GENUS *Taractes* Lowe 1843

Head profile above eyes flat or very slightly convex; dorsal-fin origin above pectoral-fin bases, longest dorsal-fin ray subequal to HL (rays longest in smallest juveniles); anal fin 21–26 rays; pelvic fins 1 spine, 5 rays; caudal fin 15 or 16 principal rays; middle of caudal peduncle in juveniles with enlarged scales; LSS 43–50. Vertebrae 39–42. Two species, 1 in WIO.

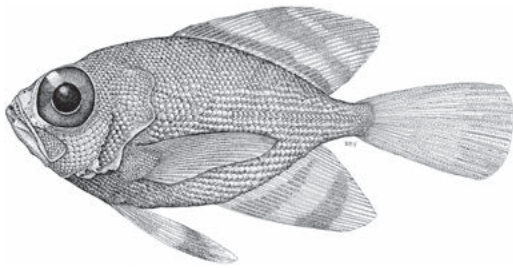
Taractes asper Lowe 1843

Rough pomfret

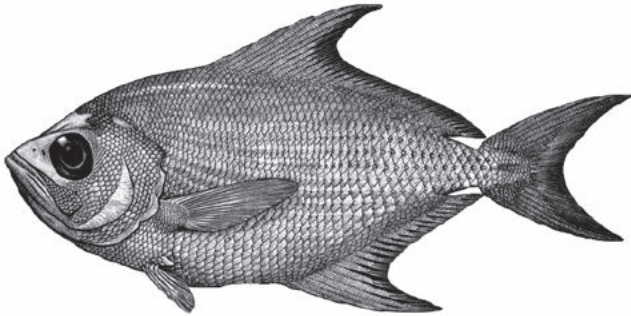
Taractes asper Lowe 1843: 83 (Madeira); Mead & Maul 1958*; Grindley & Penrith 1965; Smith 1966*; Mead 1972*; Peden & Ostermann 1980*; Masuda *et al.* 1984*; SSF No. 207.6*; Paulin *et al.* 1989*; Pavlov 1989; Seki & Mundy 1991*.

Dorsal fin 31–35 rays; anal fin 22–26 rays; pectoral fins 17–20 rays. Percentage SL: body depth 37–47%, HL 30–40%, snout length 8–10%, eye diameter 9–18%, upper jaw length 16–22%, predorsal length 37–46%, preanal length 57–65%, dorsal-fin base 46–54%, and anal-fin base 35–40%. Dorsal and anal fins rounded in juveniles, and middle rays of longest; caudal fin truncate. Dorsal and anal fins of adults with strong anterior lobes, fins scaly; caudal fin lunate. Teeth on lower jaw in 2 rows, outermost teeth largest; teeth on upper jaw in 1 row, generally smaller than mandibular teeth; teeth present or absent on vomer and palatines. GR 1 or 2/7–9 = 8–10. Scales cycloid, somewhat oblong, and with centre spine in juveniles only (spines vary in scale position and with fish size); maxilla and cheek scaly; pelvic-fin axillary scale not developed in early juveniles; juveniles with enlarged median scales on caudal peduncle. Lateral line in juveniles only, dropping down abruptly under anterior portion of dorsal fin; LSS 42–46. Vertebrae 17 or 18 + 23 or 24 = 41–42.

Adults uniformly dark brown, fins darker. Juveniles metallic red dorsally, silvery below; fins translucent with a few black blotches. Attains 50 cm TL.



Taractes asper, 5 cm SL, juvenile (South Africa). Source: SSF



Taractes asper, 31 cm SL (Norway). Source: Mead 1972

DISTRIBUTION Circumglobal (anti-equatorial) in tropical to subpolar waters, including North Sea, Baltic Sea and Hawaiian Ridge. WIO: East Africa to South Africa (Cape Point), Madagascar, Seychelles, Mascarenes and Pakistan.

REMARKS Highly migratory; occurs from offshore continental areas to open ocean. Of minor interest to longline fisheries. Pavlov (1989) gives a flawed table of some morphometric data: all data lines below the first entry (body depth “H”) are actually set in the line below the given character because of the inclusion of values for “least caudal peduncle depth” for “antedorsal (predorsal) length.” In addition, Pavlov has mixed values for “length of central caudal ray” with those of “head length” for Mead’s (1972) values, and these are given in the line “snout length.”

GENUS *Taractichthys* Mead & Maul 1958

Head profile convex; dorsal-fin origin above pectoral-fin bases, longest dorsal-fin ray longer than head (fish >1.5 cm SL); anal fin 26–30 rays; pelvic fins 1 spine, 5 rays; caudal fin 15 or 16 principal rays; caudal peduncle in juveniles without enlarged scales; LSS 34–46. Vertebrae 44–47. Two species, 1 in WIO.

Taractichthys steindachneri (Döderlein 1883)

Sicklefin pomfret

PLATE 2

Argo steindachneri Döderlein in Steindachner & Döderlein 1883: 242 [34], Pl. 7 (Tokyo, Japan).

Taractes steindachneri: Jordan *et al.* 1913; Okada & Suzuki 1956*.

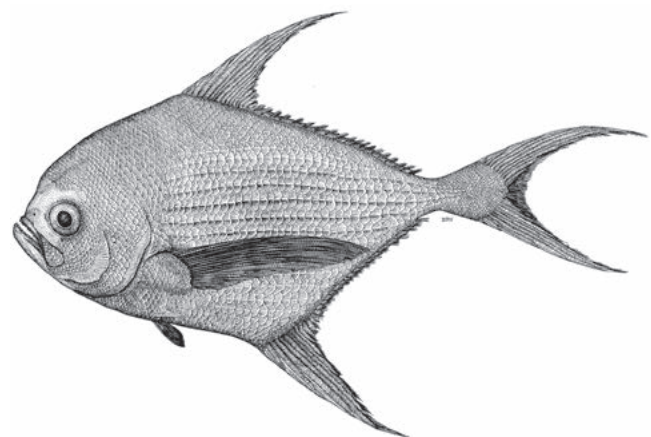
Taractes longipinnis (*non* Lowe 1843): Smith 1949 [in part: not South Africa in Atlantic]; Day *et al.* 1970.

Taractichthys longipinnis (*non* Lowe 1843): Abe 1962*; SSF No. 207.7*.

Taractichthys steindachneri: Mead 1972*; Masuda *et al.* 1984*; Okamura 1985, 1986*; SSF No. 207.8*.

Dorsal fin 33–37 rays; anal fin 26–28 rays; pectoral fins 20–22 rays. Percentage SL: body depth 47–57%, HL 29–32%, snout length 8–10%, eye diameter 6–9%, upper jaw length 13–17%, predorsal length 41–44%, preanal length 54–60%, dorsal-fin base 53–57%, and anal-fin base 40–47%. Dorsal and anal fins low, rounded in early juveniles; caudal fin truncate. Dorsal and anal fins scaly anteriorly in adults, and anterior lobes sickle-shaped; caudal fin lunate. Teeth on jaws in irregular band; teeth in a series posteriorly in lower jaw of adults; teeth present on palatines, absent on vomer. GR 2 or 3/7–9 = 9–11. Lateral line present in juveniles only, indistinct. Scales oblong, cycloid, with centre spine in fish <40 cm SL (spine lost in larger fish); LSS 34–38; maxilla and cheeks scaly (in all sizes); pelvic fins without scaly axillary process; scales present as parallel rows of spinules in early juveniles, and no enlarged peduncle scales in juveniles. Vertebrae 19–21 + 22–25 = 44–46.

Adults silvery grey-blue, with yellowish areas on head, pectoral fins and pelvic-fin axil; caudal-fin margin white, broadest at centre; iris yellow. Attains 83 cm TL.



Taractichthys steindachneri, 48 cm SL (Namibia). Source: SSF

DISTRIBUTION Tropical to warm-temperate waters of Indo-Pacific and eastern Pacific (California), and southeastern Atlantic. WIO: Gulf of Aqaba, Red Sea to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere throughout Indo-Pacific to southern Japan and northern New Zealand.

REMARKS Uncommon; deep pelagic, at ~50–360 m.

GLOSSARY

adipose tissue – fatty tissue.

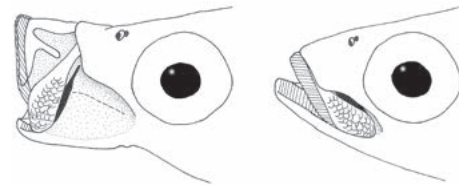
scutes / scute-like – modified (thickened) bony scales with a keel or spiny point.

FAMILY EMMELICHTHYIDAE

Rovers

Phillip C Heemstra

Moderate- to large-sized, body slender, subcylindrical or oblong and somewhat compressed. Mouth oblique; lower jaw slightly protruding, upper jaw very protrusile; maxilla broadly expanded posteriorly, scaly, and not covered by preorbital bone when mouth closed; supramaxilla elongate, separate from maxilla anteriorly; premaxilla with long post-maxillary process; jaws toothless or with a few minute, slender, curved teeth. Nostrils elliptical, close-set. Opercle with 2 inconspicuous flat spines at rear edge (one dorsal and one midlateral), more or less hidden by scales; preopercle edge smooth or weakly serrate, posteroventral edge broadly rounded, projecting slightly posterior to upper edge as thin lamina which is smooth or crenulate with weak serrae. Dorsal fin continuous or divided, with 11–14 spines, 9–12 rays, spinous portion higher than soft-rayed portion; anal fin 3 spines, 9 or 10 rays; pectoral fins pointed, shorter than head, with 18–22 rays; pelvic fins 1 spine, 5 rays, and with large axillary process of fused scales and another midventral scaly process between fins; caudal fin forked, densely scaly at base, with 15 branched rays. Branchiostegal rays 7, gill membranes separate and free from isthmus; gill rakers long and numerous, 9–12/24–31. Lateral line single, continuous, slightly curved. Body and head covered with finely ctenoid, adherent scales; soft-rayed portions of dorsal and anal fins with scaly sheath at base, most developed posteriorly. Swimbladder elongate, fusiform, not bifurcate at either end. Body typically reddish pink or greyish blue dorsally and silvery pink below. Vertebrae 10 + 14; supraneurals: 0/0/0+2/1/1/1/1/.



Head of emmelichthyid fish showing protrusile mouth (supramaxilla in black, with upper and lower lips diagonally hatched). Scales on head not shown.

Occur on outer continental shelf and upper slope, with larvae and juveniles near surface and adults benthopelagic on sandy bottom or rocky reefs, in 20–880 m. Feed on large zooplankton, such as salps, fish and crustacean larvae, pteropods, mysid and segistid shrimps, krill, amphipods and small mesopelagic fish (especially myctophids, astronesthids, paralepidids). Once abundant in bottom trawls from outer shelf and upper slope in some localities (e.g., South China Sea). Excellent eating, and some species are large enough to be important as food fish, but they do not appear to be abundant enough to be of commercial importance in the region.

Three genera and 18 species; all 3 genera and 7 species in WIO.

KEY TO GENERA

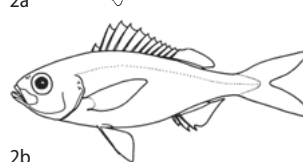
- 1a Body slender, depth 18–25% SL, less than or subequal to HL; spinous dorsal fin separated from soft-rayed fin by distinct gap, with 3–5 short, isolated or buried spines; length of spinous dorsal-fin base (including isolated spines) longer than HL *Emmelichthys*



- 1b Body deeper, depth 23–36% SL, greater than HL; dorsal fin continuous or notched to its base, but not separated by gap with isolated spines; spinous dorsal-fin base shorter than or subequal to HL 2

- 2a Dorsal fin divided to base between spinous and soft-rayed parts; dorsal fin 11 spines *Erythrodes*

- 2b Dorsal fin continuous, not divided into spinous and soft-rayed parts; dorsal fin 12 spines *Plagiogeneion*



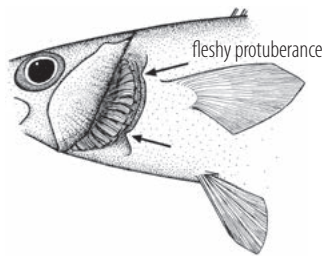
GENUS *Emmelichthys* Richardson 1845

Two dorsal fins: 1st dorsal fin with 7–10 spines, connected by membrane, followed by 2–5 short isolated or buried spines, last spine connected to base of first ray of 2nd dorsal fin; last 2 rays of dorsal and anal fins elongated, distinctly longer than antepenultimate ray; ventral edge of preorbital bone entire or with minute serrae. Seven species, 3 in WIO.

KEY TO SPECIES

- 1a Dorsal fin 8 rays; total GR 26–31..... *E. marisrubri*
- 1b Dorsal fin 9–11 rays; total GR 33–43..... 2

- 2a Rear edge of gill cavity with fleshy protuberance and groove at upper and lower part of cavity; LL scales 90–97; spinous dorsal-fin base 30–36% SL; total GR 37–43 *E. nitidus*



- 2b Rear edge of gill cavity with fleshy protuberance and shallow groove at upper part of cavity but no groove on lower part; LL scales 71–74; spinous dorsal-fin base 28–31% SL; total GR 33–38 *E. ruber*

Emmelichthys marisrubri

Fricke, Golani & Appelbaum-Golani 2014

Red Sea rover

PLATE 2

Emmelichthys marisrubri Fricke, Golani & Appelbaum-Golani 2014: 84, Figs. 1–2 (Eritrea, Red Sea).

Dorsal fin 8 spines joined by membrane + 4 or 5 short isolated spines, 8 rays; anal fin 3 spines, 9 or 10 rays; pectoral fins 18–20 rays. Body depth less than HL, 5–6 in SL; eye diameter subequal to snout length. No midlateral keel on peduncle. Total GR 26–31.

Live colour unknown, uniformly brown in preservative. Attains at least 74 cm SL.

DISTRIBUTION Known only from three type specimens from the Red Sea.

Emmelichthys nitidus Richardson 1845

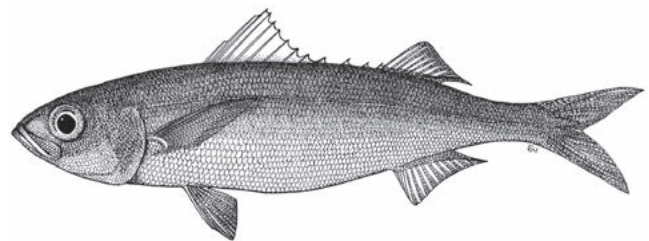
Southern rover

PLATES 2 & 3

Emmelichthys nitidus Richardson 1845: 47, Pl. 29, Figs. 7–8 (Western Australia); Barnard 1927*; SFSA No. 574*; Heemstra & Randall 1977*; SSF No. 209.1*; Heemstra & Heemstra 2004*.

Dorsal fin 9 or 10 spines joined by membrane + 3 or 4 short isolated spines, 9–11 rays; anal fin 3 spines, 9 or 10 rays; pectoral fins 20–23 rays. Body depth less than HL, 4.1–5.2 in SL; eye diameter subequal to snout length. Peduncle with fleshy midlateral keel (in fish >30 cm SL). Two distinct, fleshy protuberances on rear margin of gill cavity. GR 10–12/27–31.

Head and body of adults reddish silvery, darker (bluish grey or reddish brown) dorsally, rosy pink laterally and silvery below; fins pale reddish. Juveniles (<9 cm SL) silvery, with 8 or 9 dark bars across dorsal surface of body. Attains 55 cm TL.



Emmelichthys nitidus, 28 cm SL (Tasmania).

DISTRIBUTION Circumglobal in Southern Hemisphere: Tristan da Cunha, Namibia, South Africa (south coast), Mauritius (Nazareth Bank), Saint-Paul and Amsterdam Is., Australia, Tasmania and New Zealand.

REMARKS Adults occur near sand or mud bottom, in 100–500 m. Feeds on macrozooplankton, mainly krill and copepods. Once abundant in some areas: the Russian Federation reported catches of 23 t in 1997 and 7 t in 1998. Caught with demersal and midwater trawls; flesh excellent.

Emmelichthys ruber Trunov 1976

Red rover

PLATE 3

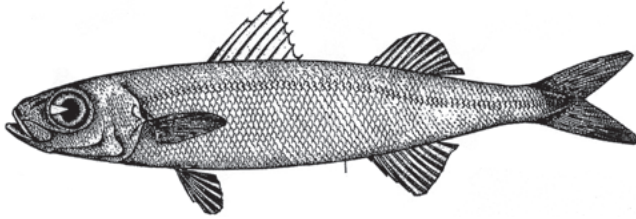
Emmelichthyops ruber Trunov 1976: 268 [233], Fig. 5 (near St Helena I., South Atlantic).

Emmelichthys ruber: Heemstra & Randall 1977*.

First dorsal fin 7–9 spines connected by membrane + 3–5 spines reduced or as buried nubbins (visible on radiographs); 2nd dorsal fin 1 spine, 9–11 rays; anal fin 3 spines, 9 or 10 rays;

pectoral fins 19 or 20 rays. Body depth 4.5–5.2 in SL, distinctly less than HL. No midlateral keel on peduncle. Scale rows continuous across gap between dorsal fins. GR 8–12/24–27.

Body reddish dorsally, silvery with reddish cast below; iris yellow-orange. Attains 20 cm SL.



Emmelichthys ruber, 20 cm TL, holotype (off St Helena). Source: Trunov 1976

DISTRIBUTION Most records from the Atlantic (St Helena I., Jamaica, Gulf of Mexico, northern Brazil, Bermuda), but also the Mascarene Ridge in WIO.

REMARKS Larvae and juveniles occur near surface; adults demersal. At Jamaica, adults were found in large aggregations, in 100–200 m. Feeds on macrozooplankton. Apparently not abundant and of no commercial importance; caught incidentally with trawls.

GENUS *Erythrocles* Jordan 1919

Body oblong, its depth 22–31% SL, less than HL; dorsal fin divided to base before last spine; 1st dorsal fin with 10 spines connected by membrane, and 2nd dorsal fin with 1 short spine, 10–12 rays; last 2 rays of dorsal and anal fins elongated, distinctly longer than antepenultimate ray and mostly covered by scaly sheath; ventral edge of preorbital bone entire or with minute serrae. Five species, 2 in WIO.

KEY TO SPECIES

- 1a HL 3–3.5 in SL; dorsal fin 10–12 rays; usually 2 distinct fleshy protuberances on rear margin of gill cavity *E. schlegelii*
 1b HL 2.8–2.9 in SL; dorsal fin 12 rays; low fleshy protuberance on upper end of cleithrum but none ventrally *E. acarina*

Erythrocles acarina Kotthaus 1974

Mini rover

Erythrocles acarina Kotthaus 1974: 48, Fig. 320 (Indian Ocean, 09°40' N, 75°38.8' E to 09°45.5' N, 75°38.5' E).

Second dorsal fin 1 spine, 12 rays; anal fin 3 spines, 10 rays; pectoral fins 19 or 20 rays. Body depth 3.6–3.9 in SL; HL 2.8 in SL. Shallow groove and low fleshy lobe on upper part of rear margin of gill cavity, no groove or lobe on ventral margin. Row of minute teeth at front of both jaws. No midlateral keel on peduncle in fish <14 cm SL (presence of keel unknown at larger sizes). GR 7–10/26–29. LL scales 62–68. Live colour unknown. Attains 14 cm SL.

DISTRIBUTION WIO: southwestern India.

REMARKS Known only from specimens 8–14 cm SL caught incidentally in trawls. Larvae and juveniles occur near the surface.

Erythrocles schlegelii (Richardson 1846)

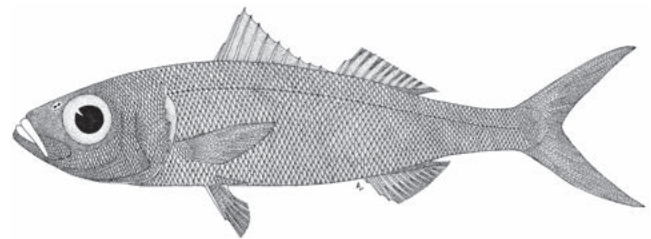
Dusky rover

PLATE 3

Emmelichthys schlegelii Richardson 1846: 272 (Nagasaki, Japan) [based on *Erythrichthys* Temminck & Schlegel 1845: 117, Pl. 63, Fig. 1].
Erythrocles schlegelii: Heemstra & Randall 1977*; SSF No. 209.2*; Heemstra & Heemstra 2004.

Second dorsal fin 1 spine, 10–12 rays; anal fin 3 spines, 9 or 10 rays; pectoral fins 18–20 rays. Body depth 3.7–4.4 in SL; HL 3–3.5 in SL. Peduncle with low, fleshy, midlateral ridge. Row of minute teeth on front of lower jaw of most specimens. One or (usually) 2 fleshy protuberances on rear edge of gill cavity. GR 10 or 11/27 or 28. LL scales 66–72.

Head and body dark red or grey dorsally, scale edges dark; ventral half of head and body pale reddish silvery; caudal fin dark red, other fins reddish pink. Attains 72 cm TL.



Erythrocles schlegelii, 15 cm SL (South Africa). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Oman, and Kenya to South Africa (Eastern Cape); elsewhere, Korea, Japan and northern Australia.

GENUS *Plagiogeneion* Forbes 1890

Body depth 2.8–3.6 in SL, and greater than HL. Dorsal fin continuous, its margin only slightly notched before soft-rayed part; penultimate and last spines of dorsal fin subequal. No fleshy midlateral ridge on peduncle. No groove or fleshy protuberance on rear edge of gill cavity; upper spine on opercle an obtuse flat point or developed as an acute spine; ventral edge of preorbital bone serrate. Few small sharp teeth at front of jaws; vomer and palatines with or without similar teeth. Five species currently recognised, 2 in WIO.

KEY TO SPECIES

- | | | |
|----|----------------------------|-----------------------|
| 1a | Body depth 30–36% SL | <i>P. rubiginosum</i> |
| 1b | Body depth 28–31% SL | <i>P. fioleti</i> |

Plagiogeneion fioleti Parin 1991

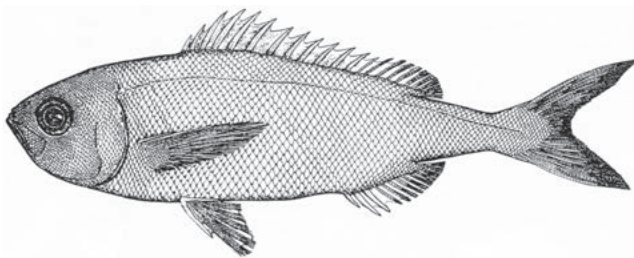
Silver rover

Plagiogeneion sp.: Collette & Parin 1991*.

Plagiogeneion fioleti Parin 1991: 463, Figs. 1c, 2a (Walters Shoals).

Dorsal fin 12 spines, 10 or 11 rays; anal fin 3 spines, 9 or 10 rays; pectoral fins 20–22 rays. Body depth 3.2–3.6 in SL; body width 5.1–6.3 in SL; HL 3–3.7 in SL. Lower opercle spine usually sharper than upper spine. GR 11–13/26–28. LL scales 60–70.

Head and body reddish pink dorsally, silvery white below; pectoral fins hyaline red; caudal fin reddish, outer edges pale, and tips black. Attains 27 cm SL.



Plagiogeneion fioleti (Walters Shoals). Source: Parin 1991; © Proc. Biol. Soc. Wash., Allen Press Publ. Services

DISTRIBUTION Indian Ocean: Walters Shoals and the 90° East Ridge.

REMARKS Known from 20–880 m.

Plagiogeneion rubiginosum (Hutton 1875)

Ruby rover

PLATE 3

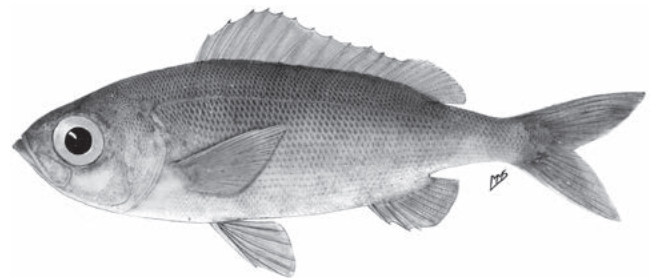
Therapon rubiginosus Hutton 1875: 314 (coast of Otago, Bass Strait, New Zealand).

Plagiogeneion rubiginosus: Barnard 1927; SFSA No. 575*; Heemstra & Randall 1977*; SSF No. 209.3*.

Plagiogeneion rubiginosum: Heemstra & Heemstra 2004.

Dorsal fin 12 spines, 10–12 rays; anal fin 3 spines, 10 rays; pectoral fins 19–23 rays. Body depth/width ratio 1.7–2.4; body depth 3.1–3.3 in SL, greater than HL; body width 5.3–7.7 in SL; HL 3.3–3.5 in SL. GR 10–12/26–30 = 37–40. LL scales 67–72.

Head and body reddish dorsally, silvery below; fins crimson. Attains 47 cm SL.



Plagiogeneion rubiginosum, 15 cm TL (South Africa). Source: SSF

DISTRIBUTION Circumglobal in Southern Hemisphere: Vema Seamount, South Africa (south coast), Saint-Paul and Amsterdam Is., Australia (south coast), Tasmania, New Zealand; and Sri Lanka in Northern Hemisphere.

REMARKS Trawled off South Africa in 150–279 m.

FAMILY CARANGIDAE

Trevallies

William F Smith-Vaniz

Body shape variable, from deep and strongly compressed to elongate and fusiform. Dorsal fin usually divided into separate spinous and soft-rayed fins, or spinous part very low with 4–8 spines (spines rudimentary or embedded in some species, such as *Alectis*); anal fin usually 3 spines, with usually the first 2 anteriorly set and separate, the spines embedded (not visible) in adults of some species (except only 2 anal-fin spines in *Elagatis* and *Seriolina*); caudal fin strong, widely forked, with slender peduncle. Mouth moderate; teeth variable, usually in small rows or bands, or single row of strong to moderate

canines, or teeth absent in adults of some species. Scales small, usually cycloid, those in posterior (straight) part of lateral line often modified as enlarged, thickened, spiny scutes.

In some genera the number of developed gill rakers decreases with growth, with a concomitant increase in the number of rudiments (tubercles or short gill rakers with diameter of the base greater than the height). When large specimens of *Seriola* are being identified, rudiments should not be included in gill-raker counts. In species with relatively numerous gill rakers (particularly *Decapterus* and *Trachurus*), care must be taken not to overlook rakers at either end of the arch. The pattern of breast squamation is important for distinguishing carangid species. Many species of *Carangoides* and *Caranx* have the breast only partially scaly. The pattern is sometimes difficult to observe in fresh specimens, but observation is facilitated by gently scraping the area with a knife to remove mucus and then allowing the area to partially dry. Size and configuration of LL scales and scutes are variable, and there may be a gradual transition from one type to another. LL scutes are modified scales with a small to moderate projecting spine on the rear margin, or are scales with a raised horizontal ridge that ends in an apex with an angle of $<90^\circ$. All scutes should be counted, including those extending onto the caudal-fin base; in some species it may be necessary to remove small body scales that overgrow or otherwise obscure the lateral line. The anterior curved part of the lateral line is measured as a chord of an arch extending from the upper edge of the opercle to its junction with the straight part of the lateral line; the posterior straight part is measured from its junction with the curved part to its termination on the caudal-fin base (end of the last scute).

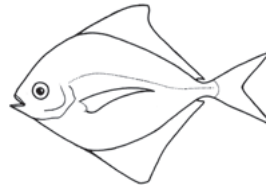
Body shape and colour pattern of these fishes change so much with growth that juveniles and adults of the same species are often difficult to recognise as such. In general, juveniles have deeper bodies, shorter fins (except fins longer in *Alectis* and some *Carangoides*) and more contrasting colour patterns, often consisting of dark bars. Adults are often bluish grey or brownish dorsally, and silvery below, with an iridescent sheen.

Also known as kingfishes, queenfishes, jacks, pompanos and scad. Mostly swift, carnivorous fishes, usually in schools, and found in a variety of habitats, in tropical to all but the coldest seas. Many are of great commercial importance in trawl and purse-seine fisheries, and many species are important sport fish, some reaching large sizes (to ~ 1.9 m TL), and nearly all are good eating. About 28 genera, but some not well-defined, and at least 140 species; 23 genera and 65 species in WIO.

KEY TO GENERA

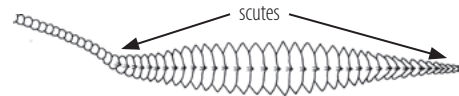
[All key drawings for this family © WF Smith-Vaniz, unless otherwise indicated.]

- 1a Pelvic fins absent or, if present (in young), distinctly in front of vertical at pectoral-fin bases; scales almost completely covering dorsal and anal fins *Parastromateus*



- 1b Pelvic fins always present and never in front of vertical at pectoral-fin bases; scales on dorsal and anal fins, if present, restricted to about basal half of fins 2

- 2a Rear part of lateral line with scutes; in adults, pectoral fins long and falcate, in most genera longer than HL (subequal to HL in *Selar* and *Trachurus*, and shorter than HL in some *Decapterus* species) 3

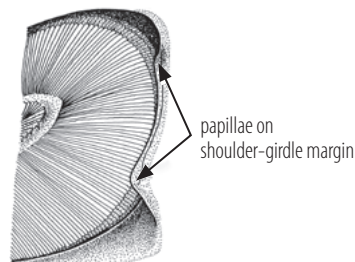


- 2b No scutes in lateral line (only pored scales); pectoral fins usually shorter than HL (~ 0.9 –2 in HL) 17

- 3a Second dorsal fin and anal fin each with ≥ 1 separate finlets at rear 4

- 3b Second dorsal fin and anal fin without finlets at rear 5

- 4a Dorsal and anal fins each with single detached finlet at rear; shoulder-girdle (cleithrum) margin with 2 papillae, lower one larger; maximum scute height less than eye diameter *Decapterus*

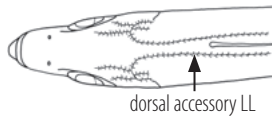


- 4b Dorsal and anal fins each with 7–10 detached finlets at rear; shoulder-girdle margin smooth; maximum scute height greater than eye diameter *Megalaspis*

Continued...

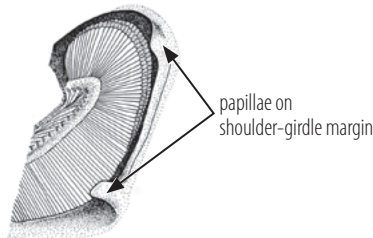
KEY TO GENERA

- 5a Pored scales in curved part of lateral line scute-like, expanded dorsoventrally (in large fish, may be obscured by overgrowth of smaller scales); dorsal accessory lateral line normally extends back at least to below 3rd spine of dorsal fin, usually further *Trachurus*



- 5b No enlarged scute-like scales in curved part of lateral line; dorsal accessory lateral line ending before dorsal-fin origin 6

- 6a Shoulder-girdle (cleithrum) margin with furrow ventrally, large papilla immediately above it and smaller papilla near upper edge *Selar*



- 6b Shoulder-girdle margin smooth 7

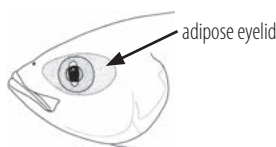
- 7a In adults, spinous dorsal fin wholly buried or spines short and disconnected, height of longest spine subequal to pupil diameter; in young, anterior rays of dorsal and anal fins filamentous *Alectis*

- 7b In adults, height of erect spinous dorsal fin usually greater than eye diameter, and at least anterior spines united by interradial membrane; in young, anterior rays of dorsal and anal fins never filamentous 8

- 8a Tongue, roof and floor of mouth white, the rest of mouth dark *Uraspis*

- 8b Pigmentation of tongue and mouth lining not as above 9

- 9a Adipose eyelid covering eye except for vertical slit centred on pupil; last ray of dorsal and anal fins finlet-like, slightly more separated from other rays but not detached, and about twice length of penultimate ray *Atule*



- 9b Adipose eyelid, if present, not as above; last ray of dorsal and anal fins not finlet-like 10

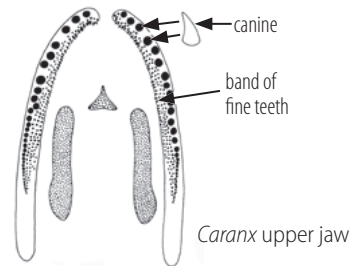
- 10a Gill rakers extremely long, projecting into mouth alongside tongue; lower GR 51–61; lower jaw becoming prominent in large adults, projecting beyond upper jaw *Ulua*

- 10b Gill rakers of standard length and shape; lower GR 14–33; shape of lower jaw not as above 11

- 11a Belly with deep median groove, accommodating folded pelvic fins, anus and anal-fin spines; pelvic fins noticeably long and black, tip of adpressed fin extending almost to anal-fin origin; curved part of lateral line short, its chord 1.5–2 in straight part *Atropus*

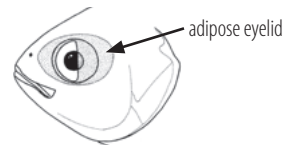
- 11b No deep median groove on belly; pelvic fins not noticeably long and black; curved part of lateral line moderate in most species, its chord <1.5 in straight part 12

- 12a Upper jaw with outer series of moderate to strong canines and inner band of fine teeth; lower jaw with single row of teeth, plus adults with 1 or 2 pairs of canines at symphysis in adults *Caranx*



- 12b Teeth, if present, not as above 13

- 13a Adipose eyelid well-developed only on rear half of eyes 14

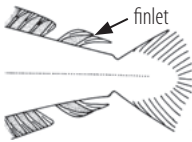


- 13b Adipose eyelid, if present, poorly developed and not as above 15

- 14a Upper jaw strongly protractile, with rear end concave and produced below; no teeth on upper jaw; straight part of lateral line with 13–25 scales, 24–29 small scutes *Selaroides*

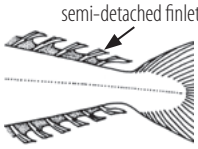
Continued ...

KEY TO GENERA

- 14b Upper jaw not strongly protractile, and rear end not concave and produced below; upper jaw with minute conical teeth; straight part of lateral line with 0–7 scales, 35–69 moderately large scutes *Alepes*
- 15a No teeth on jaws in adults, a few feeble teeth on lower jaw in young *Gnathanodon*
- 15b Teeth always present on jaws, varying from 1 or 2 rows to a band of teeth (teeth difficult to detect in some species of *Carangoides*) 16
- 16a Both jaws with a band of teeth, at least anteriorly; breast naked ventrally (most species) to completely scaly; lips not noticeably papillose in adults (except *C. orthogrammus*) *Carangoides*
- 16b Both jaws with single row of short conical teeth (upper jaw sometimes with inner row of conical teeth anteriorly); breast completely scaly; lips noticeably papillose in adults *Pseudocaranx*
- 17a Length of anal-fin base ~45–70% soft-rayed dorsal-fin base; peduncle with grooves dorsally and ventrally 18
- 17b Base of anal fin as long as, or only slightly shorter than, base of soft-rayed dorsal fin; no peduncle grooves 21
- 18a Single 2-rayed finlet behind end of dorsal and anal fins; upper jaw ends distinctly before eye (to below front margin of eye in young) *Elagatis*
- 
- 18b No finlets behind dorsal and anal fins; upper jaw ends below eye 19
- 19a Upper jaw broadly rounded and reaching below rear margin of eye; GR 4–10, mostly rudiments *Seriolina*
- 19b Upper jaw truncate or slightly rounded and reaching to below front to middle of eye; GR 11–29, mostly well-developed ... 20
- 20a First dorsal fin with 4 or 5 short, partially embedded spines; anal fin 15–17 rays; peduncle with well-developed fleshy keel laterally *Naucrates*
- 20b First dorsal fin with 7 or 8 spines (anterior spines may be embedded in large fish); anal fin 18–22 rays; fleshy keel on peduncle absent to moderately developed *Seriola*

Continued ...

KEY TO GENERA

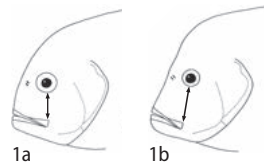
- 21a Several rear rays of dorsal and anal fins forming semi-detached finlets, not connected by membrane for distal ¼–½ length of rays; upper lip joined to snout at midline by bridge of skin (frenum), but crossed by shallow groove in very young *Scomberoides*
- 
- 21b Rear rays of dorsal and anal fins not forming semi-detached finlets; upper lip separated from snout at midline by continuous deep groove 22
- 22a Lateral line irregular and sinuous, following a convex curve above and a concave curve behind pectoral fin; band of teeth in jaws broad anteriorly, narrower posteriorly; upper jaw reaches to behind rear margin of eye *Lichia*
- 22b Lateral line only slightly irregular, weakly to moderately curved above pectoral fin, then straight posteriorly; teeth, if present, in narrow band in jaws; upper jaw not reaching to behind rear margin of eye *Trachinotus*

GENUS *Alectis* Rafinesque 1815

Body deep and strongly compressed; body superficially naked, scales minute and embedded where present; in adults, spinous dorsal fin wholly buried or spines short and disconnected; in young and juveniles, anterior rays of dorsal and anal fins long and filamentous, resembling the stinging tentacles of jellyfishes. Young are pelagic and drift in oceanic environment where this apparent mimicry may provide protection from some potential predators. Three species, 2 in WIO.

KEY TO SPECIES

- 1a Suborbital depth relatively narrow, 1.7–3 in upper jaw length; lower GR 12–17; head profile broadly rounded at nape *A. ciliaris*
- 1b Suborbital depth broad, 0.8–1 in upper jaw length; lower GR 21–26; head profile angular at nape *A. indica*



Alectis ciliaris (Bloch 1787)

African pompano

PLATE 4

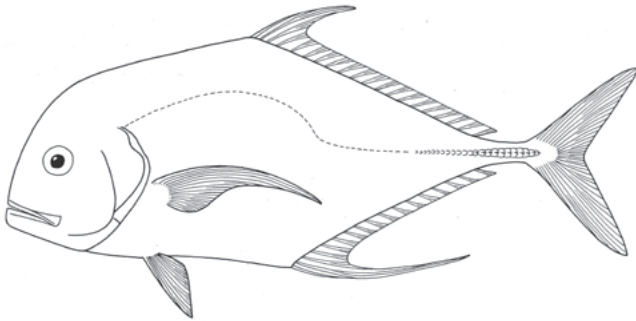
Zeus ciliaris Bloch 1787: 29, Pl. 191 (Surate, India [Indian Ocean]).

Caranx ciliaris: Day 1865, 1876.

Alectis ciliaris: Smith & Smith 1966*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.1*; Van der Elst 1988*; Debelius 1993*; Randall 1995*; Khalaf & Disi 1997*; Heemstra & Heemstra 2004.

Dorsal fins 7 spines (embedded and not apparent in adults) + 1 spine, 18–22 rays; anal fin 2 + 1 spines, 18–20 rays. Head profile broadly rounded at nape. GR 4–6/12–17.

Body mostly silvery, with pale bluish, metallic tinge dorsally; small, diffuse, dark opercle spot; juveniles with 5 dark chevron-shaped bands on body. Attains at least 130 cm TL (commonly 100 cm TL).



Alectis ciliaris, 61 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Circumtropical. Indo-Pacific: Persian/Arabian Gulf and Red Sea to South Africa (Algoa Bay), and eastwards to India, Sri Lanka and Australia.

REMARKS Adults usually solitary and frequent shallow coastal waters, to ~100 m deep; young usually pelagic and drifting. IGFA world record 22.9 kg, Daytona Beach, Florida, April 1990.

Alectis indica (Rüppell 1830)

Indian threadfish

PLATE 4

Scyris indicus Rüppell 1830: 128, Pl. 33, Fig. 1 (Jeddah, Saudi Arabia, Red Sea).

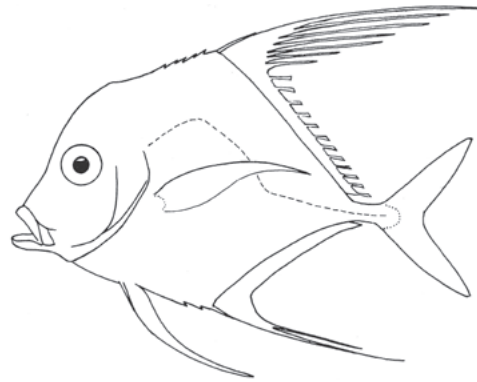
Caranx gallus: Day 1865, 1876*.

Alectis indicus: Smith & Smith 1969*; Masuda *et al.* 1984*; Smith-Vaniz 1984*; SSF No. 210.2*; Van der Elst 1988*; Randall 1995*; Heemstra & Heemstra 2004*; Fricke *et al.* 2009.

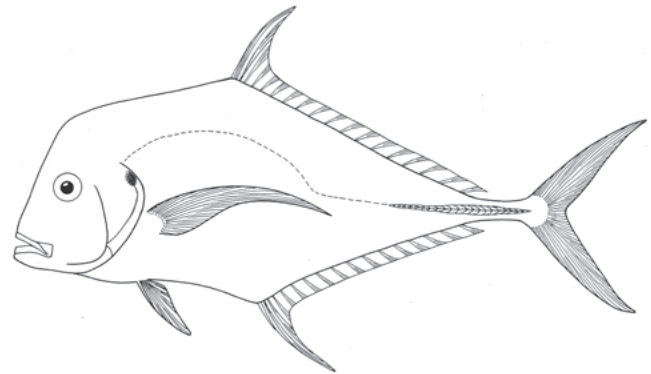
Alectis indica: Smith-Vaniz 1999*.

Dorsal fins 6 spines (embedded and not apparent in adults) + 1 spine, 18–20 rays; anal fin 2 + 1 spines, 18–20 rays. Forehead profile steep, head profile becoming angular at nape. GR 8–11/21–26.

Body mostly silvery, with dusky green tinge dorsally; small, diffuse, dark spot on upper edge of opercle; juveniles with 5–7 broad, dark bands. Attains 160 cm TL (~25 kg).



Alectis indica, small juvenile. Source: Smith-Vaniz 1984



Alectis indica, 69 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Red Sea, Oman to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes, and eastwards to India and Sri Lanka; elsewhere to Bangladesh, Ryukyu Is., Australia and Tuamotu Is.

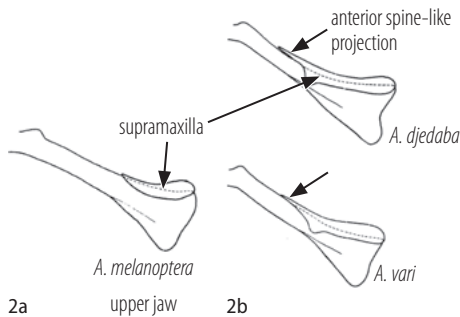
REMARKS Adults form large shoals, common in coastal waters including reef areas; juveniles solitary, often entering estuaries. IGFA world record 16 kg, Bazaruto I., Mozambique, August 2007.

GENUS *Alepes* Swainson 1839

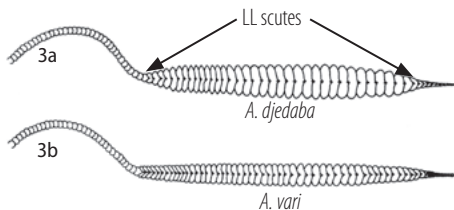
Body fusiform and compressed, with dorsal and ventral profiles almost equally convex; teeth small and conical (no canines); adipose eyelid covering rear half to third of eye only; shoulder-girdle (cleithrum) margin smooth. Relatively small-sized and schooling. Five species, 4 in WIO.

KEY TO SPECIES

- 1a Dark blotch on upper edge of opercle extends onto shoulder; upper jaw with 2 irregular rows of small teeth anteriorly and posteriorly, plus inner surface with numerous blunt teeth *A. kleinii*
- 1b Dark blotch on upper edge of opercle not extending onto shoulder; upper jaw with essentially a single row of small conical teeth 2
- 2a Dorsal-fin interspinous membranes black; total GR 24–30; upper jaw with relatively small supramaxilla without anterior spine-like extension *A. melanoptera*
- 2b Dorsal-fin interspinous membranes transparent to dusky dark; total GR 32–47; upper jaw with relatively large supramaxilla with anterior spine-like extension 3



- 3a Lower GR 27–33; in life, white spot present above dark blotch on upper edge of opercle; LL with 31–36 scales, 39–51 large scutes *A. djedaba*
- 3b Lower GR 23–26; in life, no white spot above dark blotch on upper edge of opercle; LL with 42–50 scales, 48–69 small scutes *A. vari*

*Alepes djedaba* (Fabricius 1775)

Shrimp scad

PLATE 4

Scomber djedaba Fabricius in Niebuhr (ex Forsskål) 1775: 56, xii (Al-Luhayya, Yemen; Jeddah, Saudi Arabia; Suez, Egypt, Red Sea).

Caranx djeddaba: Day 1876*.

Caranx microbrachium Fowler 1934: 420, Fig. 9 (KwaZulu-Natal, South Africa).

Alepes djeddaba: Williams 1958.

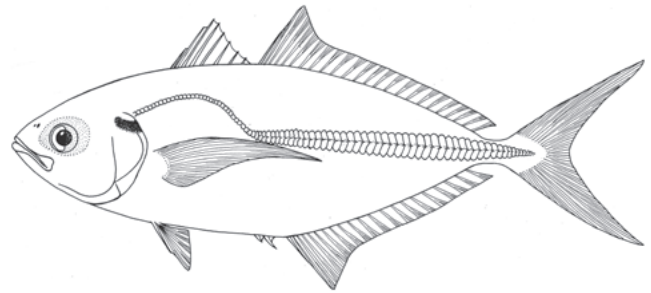
Caranx djedaba: Smith & Smith 1969*.

Alepes djedaba: Smith-Vaniz 1984*, 1999*; SSF No. 210.3*; Van der Elst 1988*; Debelius 1993*; Randall 1995.

Caranx kalla (non Cuvier 1833): Kuronuma & Abe 1986*.

Dorsal fins 8 spines + 1 spine, 23–25 rays; anal fin 2 + 1 spines, 18–20 rays. Adipose eyelid well-developed only on rear half of eye. Both jaws with single row of numerous comb-like teeth; supramaxilla large, with anterior spine-like extension. GR 10–14/27–33. Straight part of LL with 0–2 scales, 39–51 scutes.

Body greyish green dorsally, silvery to white below; distinct black blotch on upper edge of opercle, bordered above by smaller white spot; caudal fin yellowish, upper lobe dusky to black distally. Attains 40 cm TL.



Alepes djedaba, 24 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea and Lessepsian migrant to Mediterranean Sea, Pakistan to South Africa (KwaZulu-Natal) and eastwards to India; elsewhere to Indonesia, Philippines, Taiwan, southern Japan and northern Australia.

REMARKS Common near inshore reefs, often in large schools.

Alepes kleinii (Bloch 1793)

Banded scad

PLATE 4

Scomber kleinii Bloch 1793: 86, Pl. 347, Fig. 2 (Malabar coast, India).

Caranx kalla Cuvier in Cuv. & Val. 1833: 49 (Malabar, India);

Day 1865, 1876*.

Caranx para Cuvier in Cuv. & Val. 1833: 58 (Malabar, India).

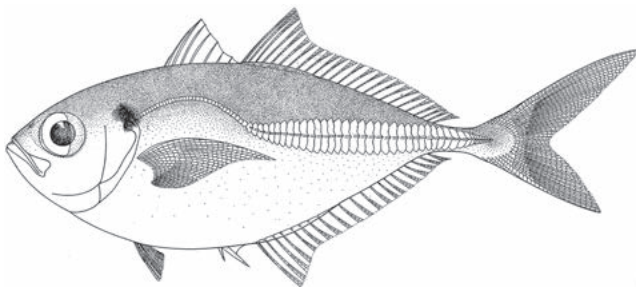
Alepes para: Masuda *et al.* 1984*.

'*Caranx*' *para*: Smith-Vaniz 1984*.

Alepes kleinii: Randall 1995*; Smith-Vaniz 1999*.

Dorsal fins 8 spines + 1 spine, 23–26 rays; anal fin 2 + 1 spines, 19–22 rays. Adipose eyelid well-developed only on rear half of eye. Upper jaw with 2 irregular rows of small teeth anteriorly and posteriorly, plus inner surface with numerous blunt teeth; lower jaw with 1 row of small teeth, except 2 rows anteriorly. GR 10–12/27–32. Straight part of LL with 0–2 scales, 35–45 scutes.

Body bluish grey dorsally, silvery below; dark bands sometimes evident on sides above lateral line; large black spot on upper edge of opercle extending onto adjacent area of shoulder; caudal fin yellowish, upper lobe dark distally. Attains 20 cm TL.



Alepes kleinii, 12 cm FL. Source: Smith-Vaniz 1999

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Gulf of Oman to Pakistan, India and Sri Lanka; elsewhere to Gulf of Thailand, Indonesia, Philippines, Japan, New Guinea and Australia.

REMARKS Coastal, inshore.

Alepes melanoptera (Swainson 1839)

Blackfin scad

PLATE 5

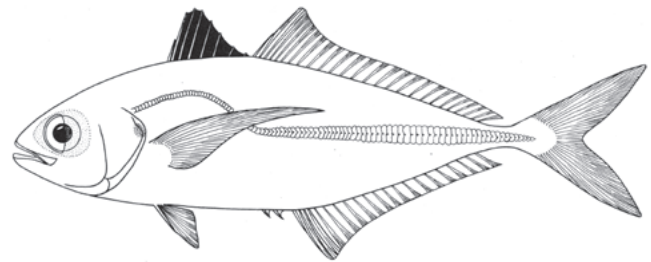
Trachinus (*Alepes*) *melanoptera* Swainson 1839: 248 (Visakhapatnam, India) [based on Russell 1803, Pl. 155].

Caranx nigripinnis Day 1876: 225, Pl. 51, Fig. 5 (Chennai, India).

Alepes melanoptera: Smith-Vaniz 1984*, 1999*; Randall 1995*.

Dorsal fins 8 spines + 1 spine, 23–26 rays; anal fin 2 + 1 spines, 18–21 rays. Adipose eyelid well-developed only on rear third to half of eye. Both jaws with single row of numerous comb-like teeth. GR 7–9/17–24. Straight part of LL with 0–4 scales, 49–69 scutes.

Body greyish blue dorsally, silvery to white below; distinct black blotch on upper edge of opercle, not bordered above by smaller white spot; spinous dorsal-fin membranes black; caudal fin yellowish, upper leading edge darker. Attains 25 cm TL.



Alepes melanoptera, 20 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman to Pakistan, India and Sri Lanka; elsewhere, Gulf of Thailand, Indonesia, Philippines, South China Sea and northern Australia.

REMARKS Inshore, schooling. Feeds mainly on planktonic crustaceans and larval fishes. Marketed fresh and dried-salted.

Alepes vari (Cuvier 1833)

Herring scad

PLATE 5

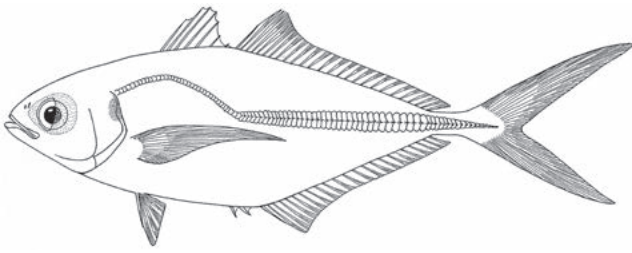
Caranx vari Cuvier in Cuv. & Val. 1833: 48 (Puducherry, India).

Alepes vari: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; Randall 1995*; Carpenter *et al.* 1997*; Bogorodsky *et al.* 2011.

Alepes djedaba (*non* Fabricius 1775): Khalaf & Disi 1997*.

Dorsal fins 8 spines + 1 spine, 23–26 rays; anal fin 2 + 1 spines, 18–21 rays. Adipose eyelid well-developed only on rear half of eye. Both jaws with single row of numerous comb-like teeth; supramaxilla large, with anterior spine-like extension. GR 9–12/23–26. Straight part of LL with 0–7 scales, 48–69 scutes.

Body greyish blue dorsally, silvery to white below; diffuse dusky blotch on upper edge of opercle, but not bordered above by smaller white spot; spinous dorsal fin pale to dusky (darkest in mature males); caudal fin dusky dark, leading edges paler in life. Attains 65 cm TL.



Alepes vari, 19 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Persian/Arabian Gulf, Oman to Pakistan, India and Sri Lanka; elsewhere to Philippines, Taiwan, southern Japan, northern Australia, New Guinea, Solomon Is. and New Caledonia.

REMARKS Adults common in shallow coastal waters, often swimming near surface, in dense schools over clear inner reefs. Feeds chiefly on shrimps, copepods, decapods and small fishes.

GENUS *Atropus* Oken 1817

Deep-bodied, nearly orbicular, compressed; distinguished from all other carangids by adults having deep cleft or groove on ventral midline (accommodating folded pelvic fins, anus, and anal-fin spines), and very elongate, mostly black pelvic fins; these features appear to represent the retention and elaboration of juvenile characters found in certain species of *Carangoides*. One species.

Atropus atropos (Bloch & Schneider 1801)

Cleftbelly trevally

PLATE 5

Brama atropos Bloch & Schneider 1801: 98, Pl. 23 (Tharangambadi, India).

Caranx nigripes Cuvier in Cuv. & Val. 1833: 122 (Bay of Bengal; Puducherry, India).

Caranx atropus: Day 1865, 1876.

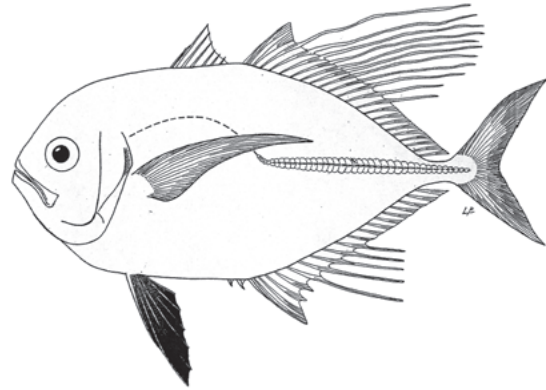
Caranx auricorona Chaudhuri 1909: 142, Fig. 2 (off Chittagong, Bangladesh).

Atropus atropos: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; Kuronuma & Abe 1986*; Randall 1995*.

Diagnosis as for genus. Dorsal fins 8 spines + 1 spine, 19–22 rays; anal fin 2 + 1 spines, 17 or 18 rays. Soft-rayed dorsal-fin lobe shorter than HL; adult males with middle 5–12 dorsal- and anal-fin rays filamentous; pelvic fins markedly long, with tip of adpressed fin extending almost to anal-fin

origin. GR 8–11/19–22. Breast naked to behind pelvic-fin origins and laterally to pectoral-fin bases; straight part of LL with 31–37 scutes.

Body bluish grey dorsally, silvery below; small dusky blotch on upper edge of opercle; pelvic fins black. Attains 30 cm TL.



Atropus atropos, 21 cm FL, male. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman, Pakistan to southern India; elsewhere to Bay of Bengal, Indo-Malayan Archipelago, Taiwan, China and Japan.

REMARKS Common in shallow inshore waters.

GENUS *Atule* Jordan & Jordan 1922

Body fusiform, somewhat elongate, compressed; teeth mostly in single row; adipose eyelid covering eye except for vertical slit centred on pupil; shoulder-girdle (cleithrum) margin smooth; last ray of dorsal and anal fins finlet-like in large adults but not separate (joined to adjacent rays by interradial membrane). One species.

Atule mate (Cuvier 1833)

Yellowtail scad

PLATE 5

Caranx mate Cuvier in Cuv. & Val. 1833: 54 (Puducherry, India; Seychelles; New Guinea); Day 1865; Smith & Smith 1969*.

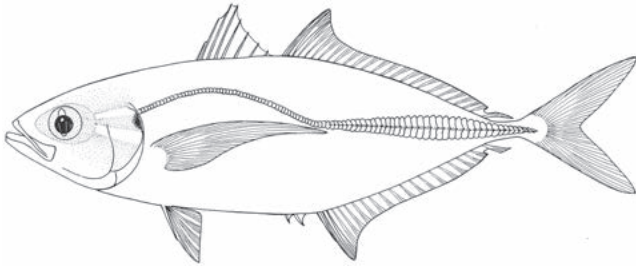
Caranx affinis Rüppell 1836: 49, Pl. 14, Fig. 1 (Massawa, Eritrea, Red Sea); Day 1876*.

Decapterus normani Bertin & Dollfus 1948: 21, Fig. 7 (Nosy Be, Madagascar).

Atule mate: Williams 1958*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.4*; Randall 1995*; Fricke *et al.* 2009.

Diagnosis as for genus. Dorsal fins 8 spines + 1 spine, 22–25 rays; anal fin 2 + 1 spines, 18–21 rays. Both jaws with single row of small conspicuous teeth; large adults also with 2 or 3 rows of small canines anteriorly in upper jaw. GR 10–13/26–31. Straight part of LL with 0–10 scales, 36–39 scutes.

Body silvery, olive-green dorsally, white ventrally; 9 or 10 faint grey bars, wider than pale interspaces, usually present dorsolaterally; dorsal fins and caudal fin dusky greenish yellow; black spot on upper edge of opercle. Attains at least 30 cm TL.



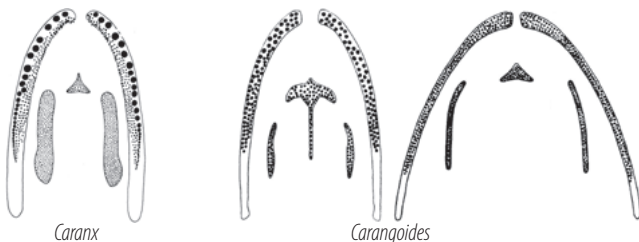
Atule mate, 29 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Red Sea, Oman to Mozambique, Madagascar, Réunion, Seychelles, India and Sri Lanka; elsewhere to Philippines, Japan, Marshall Is., Australia, Fiji, Samoa and Hawaii.

REMARKS Schools in inshore waters, to ~50 m deep; adults found in mangroves and coastal bays.

GENUS *Carangoides* Bleeker 1851

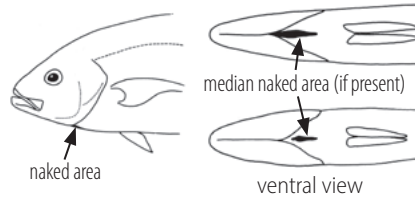
The generic limits of *Carangoides* are not well-established (probably not a monophyletic group), and no known character or combination of characters uniquely defines the group; as here recognised, 22 species, 16 in WIO. Some authors treat *Carangoides* as a subgenus of *Caranx* which has a dentition pattern that is not duplicated in any species of *Carangoides*. Species of *Carangoides* that have variable patterns of breast squamation may key out under both couplets when this character is used.



Upper jaw dentition of *Caranx* and *Carangoides*.

KEY TO SPECIES

- 1a Breast completely scaly or with only narrow median area naked 2



- 1b Breast partially to completely naked 5

- 2a Second dorsal fin with anterior black blotch or dark submarginal stripe 3

- 2b No black blotch or dark submarginal stripe on 2nd dorsal fin 4

- 3a Second dorsal fin with black blotch anteriorly; no dark submarginal stripe on 2nd dorsal fin and anal fin; anal fin 18–20 rays *C. praeustus*

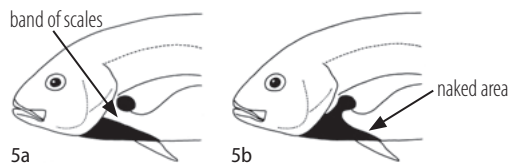
- 3b No black blotch on 2nd dorsal fin; 2nd dorsal fin and anal fin each with dark submarginal stripe; anal fin 21–24 rays *C. equula*

- 4a Anal fin 18–20 rays; preopercle margin black; LL scutes 11–18 *C. plagiotaenia*

- 4b Anal fin 21–24 rays; preopercle margin not black; LL scutes 20–30 *C. bajad*

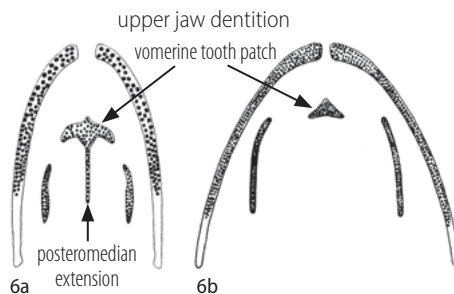
- 5a Naked area of breast separated from naked pectoral-fin bases by broad band of scales 6

- 5b Area from breast to pectoral-fin bases entirely naked 12



- 6a Distal half of 2nd dorsal-fin lobe black; vomerine tooth patch anchor-shaped, with long posteromedian extension *C. praeustus*

- 6b No black blotch on 2nd dorsal-fin lobe; vomerine tooth patch without posterior extension 7

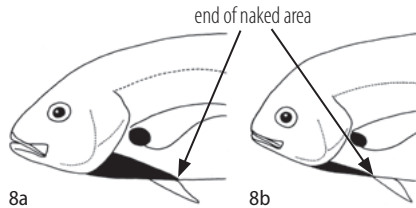


Continued...

KEY TO SPECIES

- 7a Dorsal fin 25–34 rays; anal fin 21–26 rays 8
 7b Dorsal fin 17–23 rays; anal fin 15–19 rays 10

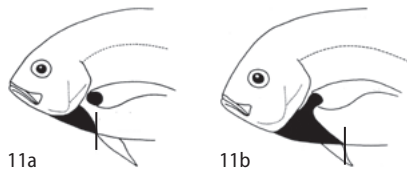
- 8a Naked area of breast extends well beyond pelvic-fin origins
C. fulvoguttatus
 8b Naked area of breast not extending beyond
 pelvic-fin origins 9



- 9a Typically 5 or 6 distinct dusky bands on sides; if present, yellow
 or orange spots on sides small, numerous, and mostly above
 lateral line; lips not papillose in adults *C. ferdau*
 9b No dusky bands on sides; adults with several relatively large
 oblong yellow spots with dark centres on sides, mostly above
 lateral line; lips finely papillose in adults *C. orthogrammus*

- 10a Straight part of lateral line slightly longer than curved part;
 LL scutes 37–45 *C. oblongus*
 10b Straight part of lateral line slightly shorter than curved part;
 LL scutes 20–38 11

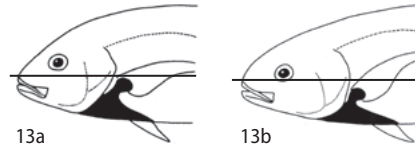
- 11a Dorsal fin 17–19 rays; small dark blotches (larger posteriorly)
 on back between bases of dorsal-fin rays; naked area of
 breast typically not extending beyond pelvic-fin origins
C. dinema
 11b Dorsal fin 20–23 rays; colour pattern not as above;
 naked area of breast extends well beyond pelvic-fin
 origins *C. coeruleopinnatus*



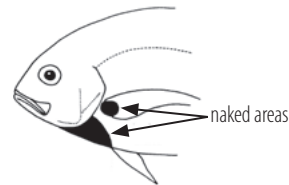
- 12a Dorsal fin 25–32 (rarely 25) rays 13
 12b Dorsal fin 17–23 rays 14

- 13a Profile of snout angular (fish >30 cm FL), horizontal line
 from tip of snout distinctly below level of eye; anal fin 22–26
 (rarely 25 or 26) rays; GR 22–27 *C. fulvoguttatus*

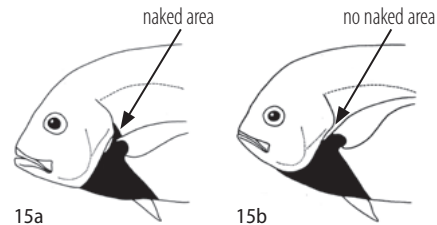
- 13b Profile of snout moderately rounded (fish >30 cm FL),
 horizontal line from tip of snout at or above lower edge
 of eye; anal fin 24–26 (usually 25 or 26) rays; GR 27–31
C. gymnostethus



- 14a Small dark blotches (larger posteriorly) on back between bases
 of dorsal-fin rays; naked area of breast typically not extending
 beyond pelvic-fin origins; dorsal fin 17–19 rays *C. dinema*
 14b Colour pattern not as above; naked area of breast extends well
 beyond pelvic-fin origins; dorsal fin 18–23 rays 15



- 15a Small naked area present just above pectoral-fin base
 opposite gill opening 16
 15b Area just above pectoral-fin base opposite gill opening
 completely scaly 17



- 16a Lower GR 21–27, total GR 32–38; in life, tongue brown to
 greyish brown *C. malabaricus*
 16b Lower GR 19–22, total GR 27–31; in life, tongue pale grey
 to white *C. talamparoides*

- 17a Total GR 31–37; middle 3–12 dorsal- and anal-fin rays
 elongated in mature males *C. armatus*
 17b Total GR 20–27; middle rays of dorsal- and anal-fin rays not
 elongated in mature males 18

Continued...

KEY TO SPECIES

18a Head profile of adults steep, with distinct break or bump in interorbital region; middle 3–8 (usually 5–7) rays of dorsal and anal fins elongated in mature males; eye diameter subequal to or longer than snout *C. hedlandensis*



18b Head profile of adults not as steep, no distinct break or bump in profile in interorbital region; central rays of dorsal and anal fins not elongated in mature males; eye diameter slightly to much shorter than snout 19

19a Dorsal profile of snout gently sloped, then abruptly vertical above mouth cleft; dorsal fin 18–20 rays; anal fin 15–17 rays *C. chrysophrys*

19b Dorsal profile of snout not abruptly vertical above mouth cleft; dorsal fin 21–23 (usually 22 or 23) rays; anal fin 18 or 19 rays *C. coeruleopinnatus*



19a *C. chrysophrys*



19b *C. coeruleopinnatus*

Carangoides armatus (Rüppell 1830)

Longfin trevally PLATES 5 & 6

Sciaena armatus Forsskål in Niebuhr 1775 : 53 ([no locality] Red Sea) – nomen dubium

Citula armata Rüppell 1830: 103 (Red Sea).

Caranx citula Cuvier in Cuv. & Val. 1833: 126, Pl. 250 (New Guinea; Red Sea).

Caranx armatus: Day 1865, 1876*; Smith & Smith 1963*, 1969*.

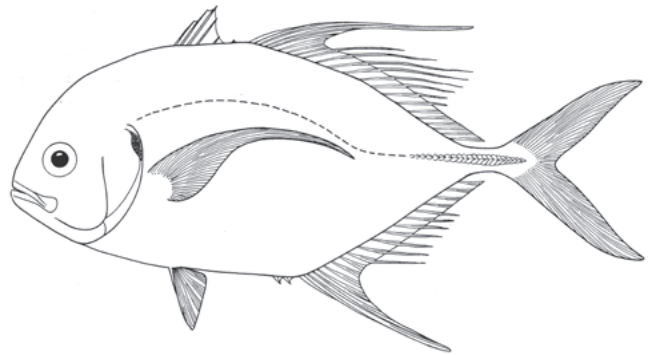
Carangoides armatus: Williams 1958; Smith 1972*; Williams *et al.* 1980*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.5*; Van der Elst 1988*; Debelius 1993*; Randall 1995*; Fricke *et al.* 2009; Bogorodsky *et al.* 2014; Psomadakis *et al.* 2015*.

Carangoides ciliaris: Smith 1973.

Dorsal fins 8 spines + 1 spine, 19–22 rays; anal fin 2 + 1 spines, 16–18 rays. Soft-rayed dorsal fin falcate, longer than HL; adult males with middle 3–12 dorsal- and anal-fin rays filamentous. GR 10–15/20–24. Breast naked to behind pelvic-fin origins

and laterally to pectoral-fin bases; straight part of LL with 11–24 weak scutes.

Body bluish grey dorsally, silvery below; blackish blotch on upper edge of opercle; pelvic fins blackish in young, pale in adults. Attains 60 cm TL.



Carangoides armatus, 22 cm FL, male. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman and Pakistan to India, Red Sea to South Africa (Eastern Cape), Madagascar, Seychelles and Mascarenes; elsewhere to Gulf of Thailand, southern Japan and New Guinea.

REMARKS Inhabits rocky and coral coastlines as well as shallow bays. South African angling record 2.5 kg.

Carangoides bajad (Fabricius 1775)

Orangespotted trevally PLATE 6

Scomber ferdau var. *bajad* Fabricius in Niebuhr (ex. Forsskål) 1775: 55 [Red Sea].

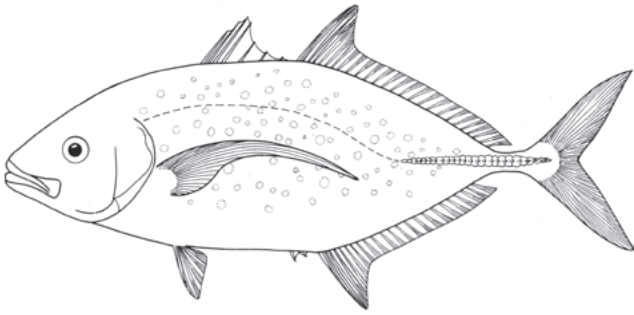
Caranx auroguttatus Cuvier (ex Ehrenberg) in Cuv. & Val. 1833: 71 (Red Sea).

Carangoides auroguttatus: Smith 1972*.

Carangoides bajad: Randall 1983*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; Debelius 1993*; Randall 1995*; Khalaf & Disi 1997*; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 24–26 rays; anal fin 2 + 1 spines, 21–24 rays. Soft-rayed dorsal fin shorter than HL. GR 7–9/18–21. Breast completely scaly or with narrow naked area anteroventrally (at most scarcely visible in lateral view); straight part of LL with 14–26 scales, 20–30 scutes.

Body brassy dorsally, silvery white on sides, and sides with numerous prominent orange spots; body occasionally all yellow-orange; no dark spot on edge of opercle. Attains 55 cm TL.



Carangoides bajad, 38 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Pakistan to Oman, Gulf of Aden and Red Sea; elsewhere to Gulf of Thailand, Indonesia, Philippines, southern Japan and Solomon Is.

REMARKS Inhabits coastal waters, including reef slopes, lagoons and bays. IFGA world record 0.45 kg, Torres Strait, Australia, December 2006.

Carangoides chrysophrys (Cuvier 1833)

Longnose trevally

PLATE 6

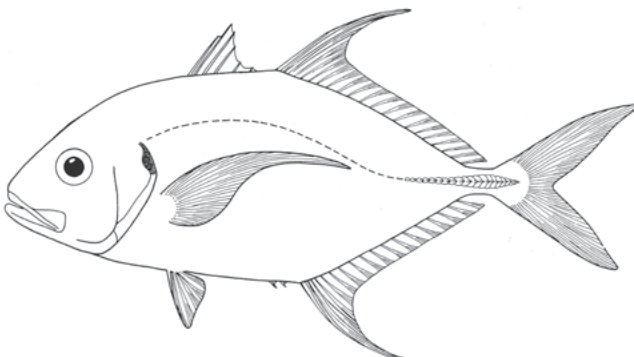
Caranx chrysophrys Cuvier in Cuv. & Val. 1833: 77, Pl. 247 (Seychelles); Smith & Smith 1963*, 1969*; Kuronuma & Abe 1986*.

Caranx nigrescens Day 1868: 704 (near Chennai, India); Day 1876*.

Carangoides chrysophrys: Williams 1958*; Smith 1972*; Kyushin *et al.* 1977*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.7*; Van der Elst 1988*; Randall 1995*; Heemstra & Heemstra 2004; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 18–20 rays; anal fin 2 + 1 spines, 15–17 rays. Dorsal profile of snout gently sloped then abruptly vertical just above mouth cleft; soft-rayed dorsal fin falcate in young, becoming shorter than HL in adults. GR 5–9/15–18. Lateral line straight part, with 20–37 weak scutes; breast naked to behind pelvic-fin origins and laterally to pectoral-fin bases.

Body generally silvery and greenish dorsally; small black spot on upper edge of opercle. Attains 72 cm TL.



Carangoides chrysophrys, 27 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Pakistan to Oman, Red Sea to South Africa (Algoa Bay, Eastern Cape), Madagascar, Seychelles, Mascarenes and southwestern India; elsewhere to east coast of India, Philippines, southern Japan, Australia, New Caledonia and Vanuatu.

REMARKS Inhabits coastal waters to at least 60 m deep. Australian National Sportfishing Association record 5.2 kg, Queensland, Australia, August 2008.

Carangoides coeruleopinnatus (Rüppell 1830)

Coastal trevally

PLATES 6 & 7

Caranx coeruleopinnatus Rüppell 1830: 100 (Jeddah, Saudi Arabia, Red Sea).

Carangoides coeruleopinnatus: Smith 1972*; Kyushin *et al.* 1977*;

Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999* [as *caeruleopinnatus*];

SSF No. 210.6* [as *caeruleopinnatus*]; Van der Elst 1988* [as

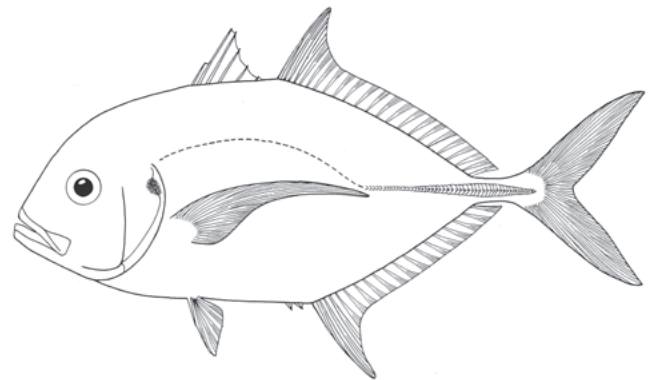
caeruleopinnatus]; Randall 1995*; Heemstra & Heemstra 2004 [as

caeruleopinnatus]; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Carangoides uii: Smith 1967*, 1972*; Masuda *et al.* 1984*.

Dorsal fins 8 spines + 1 spine, 21–23 rays; anal fin 2 + 1 spines, 18 or 19 rays. Soft-rayed dorsal-fin lobe filamentous in juveniles, usually shorter than HL in adults. GR 6–8/15–18. Breast naked to behind pelvic-fin origins, and usually laterally to pectoral-fin bases; straight part of LL with 20–38 small scutes.

Body bluish green dorsally, silvery below; sides with numerous small yellow spots; small black blotch on upper edge of opercle. Attains 50 cm TL.



Carangoides coeruleopinnatus, 27 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Sri Lanka, Pakistan, Persian/Arabian Gulf, Red Sea to South Africa (KwaZulu-Natal), Madagascar and Réunion; elsewhere to Gulf of Thailand, Philippines, southern Japan, Australia, New Caledonia, Fiji and Tonga.

REMARKS Commonly found over deeper coastal reefs, but rarely close to shore. South African angling record 3.7 kg.

Carangoides dinema Bleeker 1851

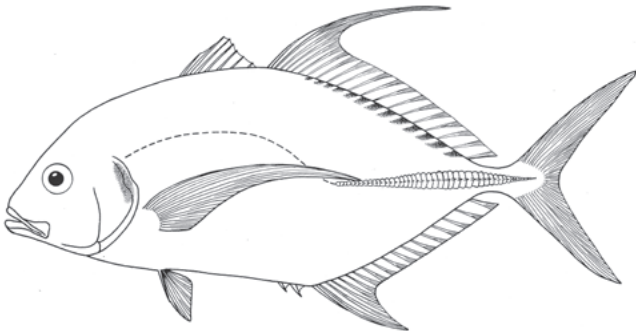
Shadow trevally

PLATE 7

Carangoides dinema Bleeker 1851: 365 (Jakarta, Java, Indonesia); Williams 1958*; Smith 1972*; Smith-Vaniz 1984*, 1999*; SSF No. 210.8*; Debelius 1993*.
Carangichthys dinema: Masuda *et al.* 1984*.

Dorsal fins 8 spines + 1 spine, 17–19 rays; anal fin 2 + 1 spines, 15–17 rays. GR 7–9/16–19. Lateral line straight part, with 0–6 scales, 23–30 scutes, and curved part slightly longer; breast naked to pelvic-fin origins, and small naked area laterally usually separated from naked pectoral-fin bases by band of scales.

Body bluish green dorsally, silvery white below; small dark blotches on back between bases of dorsal-fin rays, becoming larger posteriorly. Attains 60 cm TL.



Carangoides dinema, 43 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Tanzania to South Africa (KwaZulu-Natal); elsewhere to Indonesia, Philippines, southern Japan, New Guinea, Australia, New Caledonia, Fiji, Tonga and Samoa.

Carangoides equula (Temminck & Schlegel 1844)

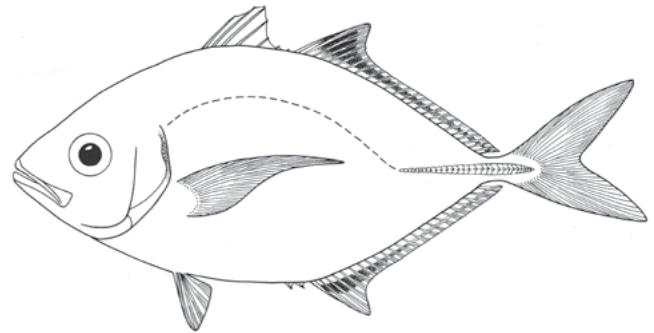
Whitefin trevally

PLATE 7

Caranx equula Temminck & Schlegel 1844: 111, Pl. 60, Fig. 1 (Nagasaki, Japan).
?*Caranx dason*: Jordan & Snyder 1907: 210, Fig. 2 (market at Oahu I., Hawaii).
Carangoides equula: Smith 1972; Smith-Vaniz 1984*, 1999*; SSF No. 210.9*; Randall 1995*; Khalaf & Disi 1997*.
Carangoides acutus Kotthaus 1974: 38, Fig. 314 (Gulf of Aden).
Kaiwarinus equula: Masuda *et al.* 1984*.

Dorsal fins 8 spines + 1 spine, 23–25 rays; anal fin 2 + 1 spines, 21–24 rays. Spinous dorsal-fin height equals or exceeds height of soft-rayed lobe. GR 7–10/18–23. Lateral line straight part, with 0–6 scales, 22 or 23 scutes; breast completely scaly.

Body bluish grey to green dorsally, silvery white below; soft-rayed dorsal fin and anal fin with brownish submarginal stripe, fin lobes white distally; no dark spot on edge of opercle. Attains 54 cm TL.



Carangoides equula, 22 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific, apparently antitropical. WIO: Gulf of Oman, Red Sea, Gulf of Aden, Somalia and South Africa (Algoa Bay, Eastern Cape); elsewhere to southern Japan, Australia, New Caledonia and New Zealand.

REMARKS Benthic; largely restricted to continental shelf and slope habitats, in 100–350 m. If the very similar *Carangoides dason* Jordan & Snyder 1907 is conspecific, distribution also includes Hawaii and Easter I.

Carangoides ferdau (Forsskål 1775)

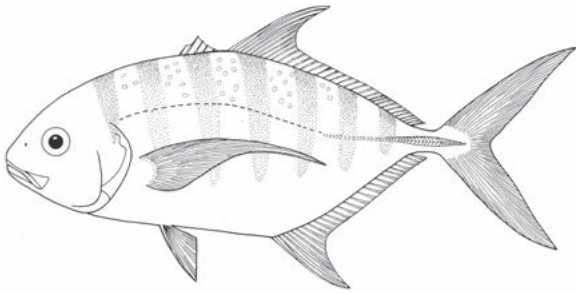
Blue trevally

PLATE 7

Scomber ferdau Forsskål in Niebuhr 1775: 55, xii (Jeddah, Saudi Arabia, Red Sea).
Caranx ferdau: Day 1876; Smith & Smith 1963*, 1969*.
Carangoides ferdau: Williams 1958*; Smith 1972*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.10*; Van der Elst 1988*; Debelius 1993 [photograph is of *Gnathanodon speciosus*]; Randall 1995*; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 26–34 rays; anal fin 2 + 1 spines, 21–26 rays. GR 7–10/17–20. Breast naked to pelvic-fin origins, and naked area laterally separated from naked pectoral-fin bases by broad band of scales; straight part of LL with 10–30 scales, 21–37 small scutes, and curved part of line only weakly arched.

Adults generally silvery blue-green dorsally, paler below; sides usually with 5 or 6 dusky bands, inconspicuous golden spots sometimes present; no dark spot on edge of opercle. Attains 70 cm TL.



Carangoides ferdau, 30 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman, Pakistan, India to Sri Lanka, Red Sea to South Africa (Algoa Bay), Madagascar, Seychelles and Mascarenes; elsewhere to Philippines, southern Japan, New Guinea, Australia, New Caledonia, Rapa Iti, Line Is., Fiji, Tonga, Samoa and Hawaii.

REMARKS Inhabits coastal waters adjacent to sandy beaches and reef habitats, to ~60 m deep. South African angling record 6 kg; IGFA world record 2.26 kg, Midway Atoll, Pacific Ocean, May 2001.

Carangoides fulvoguttatus (Forsskål 1775)

Yellowspotted trevally

PLATE 8

Scomber fulvoguttatus Forsskål in Niebuhr 1775: 56, xii [Red Sea].

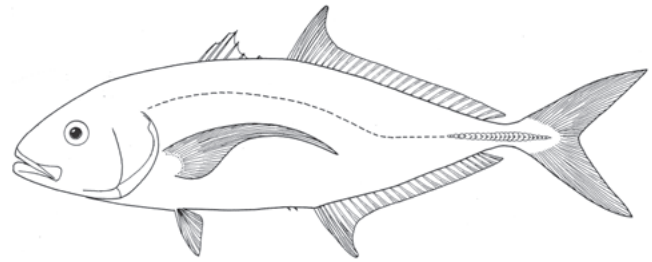
Caranx bleekeri Klunzinger 1871: 461 (Al-Qusayr, Egypt, Red Sea).

Caranx fulvoguttatus: Smith & Smith 1963*, 1969*.

Carangoides fulvoguttatus: Williams 1958*; Smith 1972*; Kyushin *et al.* 1977*; Randall 1983*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.11*; Van der Elst 1988*; Debelius 1993*; Randall 1995*; Khalaf & Disi 1997*; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 25–30 rays; anal fin 2 + 1 spines, 21–26 rays. Adults with mouth cleft distinctly below level of lower margin of eye. GR 6–8/17–21. Breast naked to behind pelvic-fin origins and variable laterally, extending uninterrupted to pectoral-fin base or separated by band of scales; straight part of LL with 18–27 scales, 15–21 scutes.

Body blue-green dorsally, silvery below, usually with many small brassy spots on sides; large adults often with 3 black blotches in row on flanks. Attains 103 cm TL (~18 kg).



Carangoides fulvoguttatus, 74 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific (widespread). WIO: Gulf of Oman, Pakistan and India to Sri Lanka, Red Sea to South Africa (KwaZulu-Natal), Madagascar, Aldabra, Seychelles and Mascarenes; elsewhere to Indonesia, southern Japan, Palau, Australia, New Caledonia, Vanuatu and Tonga.

REMARKS Inhabits rocky coasts, reefs and offshore banks, to ~100 m deep. A favourite species of spearfishers and anglers. IGFA world record 13.75 kg, Sodwana Bay, South Africa, May 2010.

Carangoides gymnostethus (Cuvier 1833)

Bludger

PLATE 8

Caranx gymnostethus Cuvier in Cuv. & Val. 1833: 73 (Seychelles); Smith & Smith 1969*.

Carangoides gymnostethoides Bleeker 1851: 364 (Jakarta, Java, Indonesia); Williams 1958*; Kyushin *et al.* 1977*.

Caranx gymnostethoides: Day 1876*; Smith & Smith 1963*.

Carangoides gymnostethus: Smith 1972*; Masuda *et al.* 1984*;

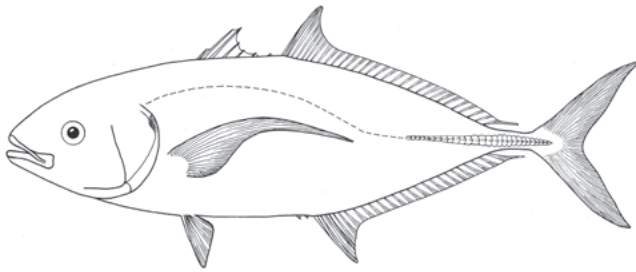
Smith-Vaniz 1984*, 1999*; SSF No. 210.12*; Van der Elst 1988*;

Randall 1995*; Heemstra & Heemstra 2004; Psomadakis *et al.* 2015*.

Seriola lalandi (*non* Valenciennes 1833): Debelius 1993* [photograph of schooling fish is *C. gymnostethus*].

Dorsal fins 8 spines + 1 spine, 28–32 rays; anal fin 2 + 1 spines, 24–26 rays. GR 7–9/19–22). Adults with mouth cleft at level of lower margin of eye. Breast naked to behind pelvic-fin origins and laterally to pectoral-fin bases; straight part of LL with 14–25 scales, 20–31 scutes.

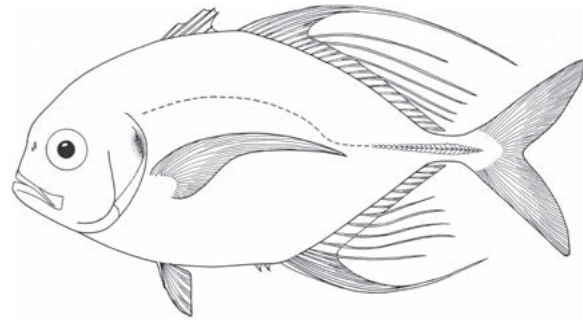
Body olive-green dorsally, silvery white below; a few brown or golden spots sometimes present midlaterally; opercular spot dusky and usually inconspicuous. Attains 90 cm TL.



Carangoides gymnostethus, 52 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO (widespread): Oman, Pakistan to India and Sri Lanka, Kenya to South Africa (Algoa Bay), Maldives, Seychelles and Mascarenes; elsewhere to Indonesia, southern Japan, Kapingamarangi Atoll (Pohnpei), Marshall Is., Australia, New Caledonia and Tonga.

REMARKS Most common over slightly deeper offshore reefs; larger individuals usually solitary, juveniles form small schools. IGFA world record 9.7 kg, Bartolomeu Dias, Inhambane Province, Mozambique, June 1997.



Carangoides hedlandensis, 20 cm FL, male. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Pakistan, Kenya to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Réunion, India and Sri Lanka; elsewhere to Andaman Sea, Philippines, Taiwan, Indonesia, southern Japan, Australia, New Caledonia, Fiji, Tonga and Samoa.

REMARKS Coastal, demersal. Literature records of *Atropus atropus* from South Africa are based on misidentified juveniles of *Carangoides hedlandensis*.

Carangoides hedlandensis (Whitley 1934)

Bumpnose trevally

PLATE 8

Olistus hedlandensis Whitley 1934: 156, Fig. 2 (Port Hedland, Western Australia).

Olistus malabaricus Cuvier in Cuv. & Val. 1833: 137, Pl. 251 (Malabar, India) [name preoccupied by *Scomber malabaricus* Bloch & Schneider 1801].

Atropus atropus (*non* Bloch & Schneider 1801): Smith 1961; SFSA No. 505*.

Carangoides hedlandensis: Williams *et al.* 1980*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.13*; Van der Elst 1988*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 20–22 rays; anal fin 2 + 1 spines, 16–18 rays. Adults with distinct bulge in interorbital region; soft-rayed dorsal-fin lobe longer than HL; adult males with middle 3–8 dorsal- and anal-fin rays filamentous. GR 6–11/14–17. Breast naked to behind pelvic-fin origins and laterally to pectoral-fin bases; straight part of LL with 17–29 weak scutes.

Body greenish blue dorsally, silvery grey below; blackish blotch on upper edge of opercle; pelvic fins blackish in young, pale in adults; caudal fin yellowish. Attains 35 cm TL.

Carangoides malabaricus (Bloch & Schneider 1801)

Malabar trevally

PLATE 8

Scomber malabaricus Bloch & Schneider 1801: 31 (Tharangambadi, India). *Caranx malabaricus*: Day 1876*; Smith & Smith 1969*; Kuronuma & Abe 1986*.

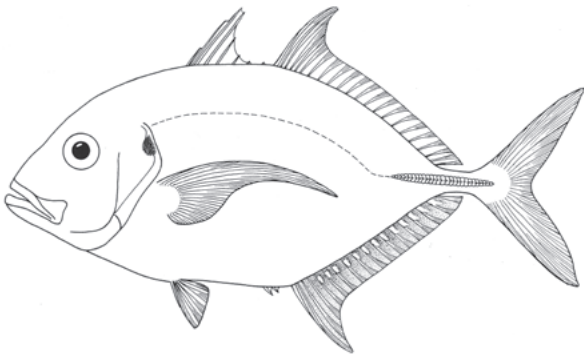
Caranx (*Carangoides*) *impudicus* Klunzinger 1884: 99 (Jeddah, Saudi Arabia, Red Sea).

Carangoides rectipinnus Williams 1958: 401, Pl. 10, Fig. 13 (fish market at Zanzibar, Tanzania).

Carangoides malabaricus: Williams 1958*; Smith 1967*, 1972*; Williams & Venkataramani 1978*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.14*; Van der Elst 1988*; Randall 1995*; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 20–23 rays; anal fin 2 + 1 spines, 17–19 rays. Soft-rayed dorsal fin only slightly falcate, shorter than HL. GR 8–12/21–27. Breast naked to behind pelvic-fin origins and laterally to pectoral-fin bases, including small area anteriorly just above fins; straight part of LL with 19–36 weak scutes.

Body generally silvery bluish grey dorsally; small white spot often at base of anal fin rays; small dusky spot on upper edge of opercle; in life, tongue brown to greyish brown. Attains 60 cm TL.



Carangoides malabaricus, 25 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman, Pakistan to India and Sri Lanka, and Red Sea to South Africa (KwaZulu-Natal) and Madagascar; elsewhere to east coast of India, Philippines, Japan, New Guinea, Australia and New Caledonia.

REMARKS Benthic and schooling in tropical coastal waters. Adults found over continental shelf near rocks and coral reefs, juveniles in sandy bays. Feeds on crustaceans, small squids and fishes. Marketed fresh, may be dried-salted.

Carangoides oblongus (Cuvier 1833)

Coachwhip trevally

PLATE 8

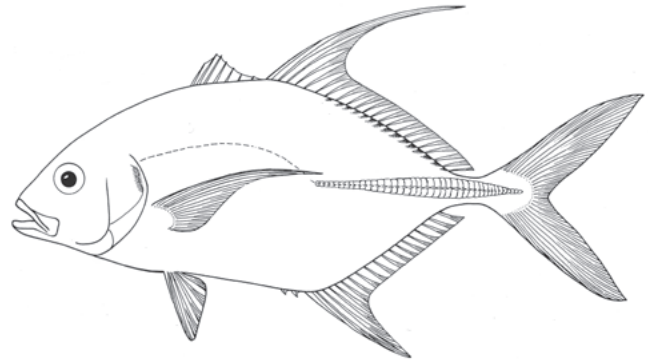
Caranx oblongus Cuvier in Cuv. & Val. 1833: 128 (Vanikoro I., Santa Cruz Is.); Day 1876*; Smith & Smith 1969*.

Carangoides oblongus: Williams 1958; Smith 1972*; Smith-Vaniz 1984*, 1999*; SSF No. 210.15*; Debelius 1993*; Fricke *et al.* 2009.

Carangichthys oblongus: Masuda *et al.* 1984*.

Dorsal fins 8 spines + 1 spine, 20–22 rays; anal fin 2 + 1 spines, 18 or 19 rays. GR 7–9/17–21. Lateral line straight part, with 0–2 scales, 37–45 scutes, and curved part slightly shorter than straight part; breast naked to pelvic-fin origins, and naked area laterally separated from naked pectoral-fin bases by broad band of scales.

Body bluish green dorsally, silvery below; small dark blotches on back between bases of dorsal fin rays. Attains 46 cm TL.



Carangoides oblongus, 28 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Gulf of Aden to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes and to India; elsewhere to Thailand, Indonesia, Philippines, southern Japan, Solomon Is., Australia, Fiji and Tonga.

REMARKS Adults inhabit coastal waters, near coral reefs or on sand/rubble bottom, usually in small schools.

Carangoides orthogrammus

(Jordan & Gilbert 1882)

Island trevally

PLATE 9

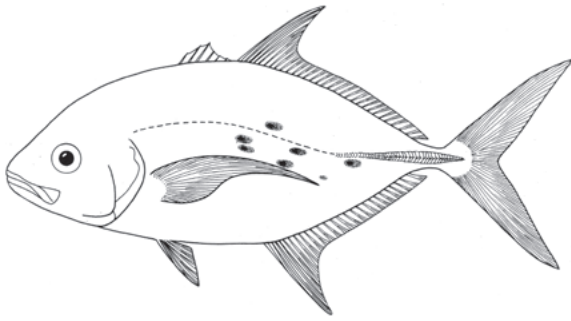
Caranx orthogrammus Jordan & Gilbert 1882: 226 (Clarión I., Revillagigedo Is.); Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; Winterbottom *et al.* 1989*; Debelius 1993*; Fricke *et al.* 2009.

Carangoides nitidus Smith in Smith 1972: 236, Pl. 30b (Shimoni, Kenya).

Carangoides ferdau (*non* Forsskål 1775): Kyushin *et al.* 1977*.

Dorsal fins 8 spines + 1 spine, 28–31 rays; anal fin 2 + 1 spines, 24–26 rays. GR 8–10/20–23. Breast naked to pelvic-fin origins (occasionally with small patch of pre-pelvic scales), naked area laterally separated from naked pectoral-fin bases by broad band of scales; straight part of LL with 21–34 scales, 19–31 scutes, and curved part only weakly arched.

Body brassy to bluish dorsally, paler below; sides of adults with several large elliptical yellow spots, often with dark centres, irregularly placed above and below lateral line. Attains 70 cm TL.



Carangoides orthogrammus, 27 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific to eastern Pacific (widespread). WIO: Kenya, Mozambique, Aldabra, Seychelles, Réunion and Chagos; elsewhere to southern Japan, Australia, New Caledonia, Fiji, Tonga, Tahiti, Hawaii and Revillagigedo Is.

REMARKS Adults pelagic and primarily restricted to offshore reefs and oceanic islands; may be encountered solitary, in pairs or in small schools which frequent sandy river basins, sandy channels of lagoons and seaward reefs. Feeds on small crustaceans in the sand. Marketed fresh and dried-salted. IGFA world record 4.1 kg, Farquhar, Seychelles, March 2013.

Carangoides plagiotaenia Bleeker 1857

Barcheek trevally

PLATE 9

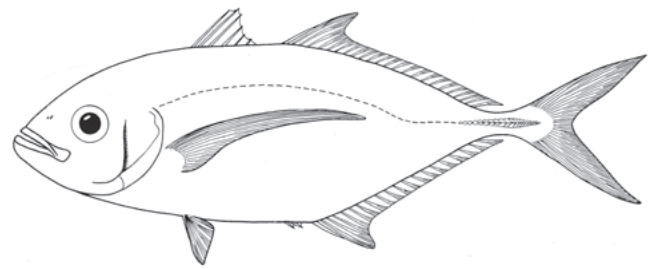
Carangoides plagiotaenia Bleeker 1857: 59 (Ambon I., Moluccas, Indonesia); Smith 1972; Masuda *et al.* 1984*; Winterbottom *et al.* 1989; Smith-Vaniz 1984*, 1999*; SSF No. 210.16*; Psomadakis *et al.* 2015*.

Caranx vomerinus Playfair in Playfair & Günther 1867: 59, Pl. 10, Fig. 1 (Seychelles).

Caranx compressus Day 1871: 689 [13] (Andaman Is.); Day 1876*, 1878*; Smith & Smith 1963, 1969*; SFSA No. 514*; Kyushin *et al.* 1977*.

Dorsal fins 8 spines + 1 spine, 22–24 rays; anal fin 2 + 1 spines, 18–20 rays. Adults with lower jaw somewhat enlarged and projecting beyond upper jaw. GR 8–14/19–27. Lateral line straight part, with 20–26 scales, 11–18 scutes; breast completely scaly.

Body generally silvery, sometimes with 6 or 7 dusky oblique bars; adults with rear margin of preopercle distinctly dark or black; no dark spot on edge of opercle. Attains 50 cm TL.



Carangoides plagiotaenia, 30 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Pakistan, Red Sea, Gulf of Aden to South Africa (KwaZulu-Natal), Seychelles, Mauritius, Chagos and India to Sri Lanka; elsewhere to Andaman Is., Indonesia, Ryukyu Is., Marshall Is., New Guinea, Australia, New Caledonia, Fiji, Tonga and Samoa.

REMARKS Adults occur singly or in groups, in shallow water along edges of steep outer-reef and lagoon slopes. Usually caught while bottom fishing.

Carangoides praeustus (Anonymous [Bennett] 1830)

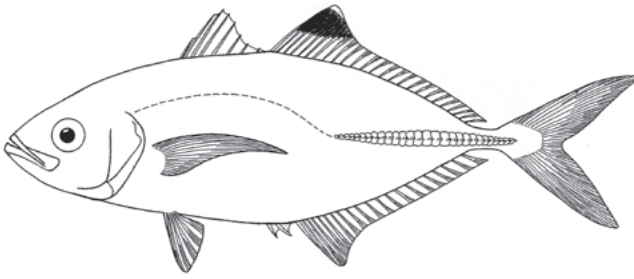
Brownback trevally

PLATE 9

Caranx praeustus Anonymous [Bennett] 1830: 689 (Sumatra, Indonesia).
Caranx ire Cuvier in Cuv. & Val. 1833: 57 (Puducherry, India); Day 1876*.
Caranx melanostethos Day 1865: 23 (Kochi, India).
Caranx brevicarinatus Klunzinger 1871: 461 (Al-Qusayr, Egypt, Red Sea).
Carangoides praeustus: Smith-Vaniz 1984*, 1999*; Randall 1995*; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 22–25 rays; anal fin 2 + 1 spines, 18–21 rays. Spinous dorsal fin high, nearly equal to height of soft-rayed lobe. GR 11–15/28–32. Lateral line straight part, with 4–12 scales, 24–34 scutes; breast naked ventrally but frequently with small patch of pre-pelvic scales, and naked area laterally separated from naked pectoral-fin bases by broad band of scales.

Body bluish grey dorsally, silvery white below; distal half of soft-rayed dorsal-fin lobe abruptly black, sometimes with narrow white leading edge or tip; no dark spot on edge of opercle. Attains 22 cm TL.



Carangoides praeustus, 14 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Gulf of Aden (one confirmed record), Persian/Arabian Gulf, Gulf of Oman, Pakistan to India and Sri Lanka; elsewhere to Bay of Bengal, Gulf of Thailand, Indonesia and Philippines.

REMARKS Found inshore. The smallest species of *Carangoides*; WIO specimens typically have more gill rakers and a less scaly breast than fish from elsewhere.

Carangoides talamparoides Bleeker 1852

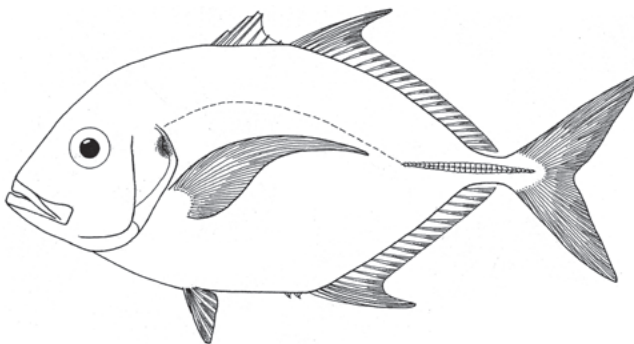
Imposter trevally

PLATE 9

Carangoides talamparoides Bleeker 1852: 91 (Sumatra, Indonesia); Williams & Venkataramani 1978*; Smith-Vaniz 1984*, 1999*; Randall 1995*; Psomadakis *et al.* 2015.

Dorsal fins 8 spines + 1 spine, 20–23 rays; anal fin 2 + 1 spines, 17–19 rays. Soft-rayed dorsal fin only slightly falcate, shorter than HL. GR 6–9/19–22. Breast naked to behind pelvic-fin origins and laterally to pectoral-fin bases, including small area anteriorly just above fins; straight part of LL with 20–30 weak scutes.

Body generally silvery bluish grey dorsally; small blackish spot on upper edge of opercle; in life, tongue white to pale grey. Attains 50 cm TL.



Carangoides talamparoides, 26 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Gulf of Oman, Pakistan to India and Sri Lanka; elsewhere to Gulf of Thailand, Indonesia, Philippines, Guam and Australia.

REMARKS Benthic, schooling, in tropical coastal waters.

GENUS *Caranx* Lacepède 1801

Body oblong to robust, becoming more elongate with growth, and slightly compressed; upper jaw with outer series of moderate to strong canines and inner band of fine teeth; lower jaw with single row of teeth, plus 1 or 2 pairs of canines at symphysis in adults. The generic limits of *Caranx* are not well-established, but here defined by dentition pattern. Breast squamation variable in *C. heberi* (which will key out under both couplet 1a and 1b). All species are voracious piscivores and highly valued by anglers. Fourteen species, 7 in WIO.

KEY TO SPECIES

- | | | |
|----|--|----------------------|
| 1a | Breast completely scaly | 2 |
| 1b | Breast naked ventrally, but frequently with small patch of pre-pelvic scales | 6 |
| 2a | Soft-rayed dorsal-fin lobe relatively long, 2.3–5.3 in FL; in life, body essentially uniformly dark grey to brown; head profile relatively steep and angular | <i>C. lugubris</i> |
| 2b | Soft-rayed dorsal-fin lobe 4.2–8.8 in FL; body colour not as above; head profile not noticeably steep and angular | 3 |
| | | |
| 3a | Small black spots on head and body (forming at ~16–22 cm FL); snout length 9.2–12.7 in FL; GR 25–29 (including rudiments); total dorsal-fin + anal-fin soft rays 39–44 | <i>C. melampygus</i> |
| 3b | No small black spots on head and body; snout length 13.1–18.4 in FL; GR 22–25 (including rudiments), except GR 23–27 in <i>C. heberi</i> which has 34–38 total dorsal-fin + anal-fin soft rays | 4 |
| 4a | No small black spot on upper edge of opercle; caudal-fin upper lobe frequently with noticeably dark or black distal half, especially in juveniles; adipose eyelid of adults poorly developed | <i>C. heberi</i> |

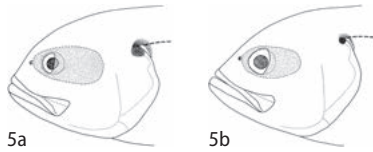
Continued ...

KEY TO SPECIES

4b Small black spot on upper edge of opercle; caudal-fin upper lobe usually uniformly pigmented; adipose eyelid of adults well-developed, especially posteriorly 5

5a Head profile strongly convex; adults with black spot on upper edge of opercle at least half pupil diameter, and soft-rayed dorsal-fin lobe without white tip; vertebrae 10 + 14 *C. tille*

5b Head profile moderately convex; adults with black spot on upper edge of opercle no larger than half pupil diameter, and dorsal-fin lobe with white tip; vertebrae 10 + 15 *C. sexfasciatus*



6a Total GR 20–24 (including rudiments); body silvery to black; body depth 2.5–3.2 in FL (fish > 15 cm FL) *C. ignobilis*

6b Total GR 23–30 (rarely 23) (including rudiments); body bronze to yellow-green; body depth 2.7–3.8 in FL (fish > 15 cm FL) ... 7

7a Total dorsal-fin + anal-fin rays 34–38 (rarely 38); caudal-fin upper lobe frequently with distal half noticeably dark or black (especially in juveniles), and rear margin of lower lobe without narrow white border; no pale spot on shoulder just behind upper edge of opercle; adults without small black spots *C. heberi*

7b Total dorsal-fin + anal-fin rays 37–41 (rarely 37); caudal-fin upper lobe usually uniformly pigmented, and rear margin of lower lobe with narrow white border; in life, conspicuous pale spot (about pupil diameter) on shoulder just behind upper edge of opercle; adults with small black spots on body (forming at ~25 cm FL) *C. papuensis*

Caranx heberi (Bennett 1830)

Blacktip trevally

PLATE 9

Scomber heberi Bennett 1830: no page number, Pl. 26 (south coast of Sri Lanka).

Caranx sem Cuvier in Cuv. & Val. 1833: 105 (Puducherry, India); Smith-Vaniz 1984*; SSF No. 210. 21*; Van der Elst 1988*.

Caranx sansun (non Fabricius 1775): Williams 1958*.

Caranx williamsi Smith 1968: 180, Pl. 38 (Durban, KwaZulu-Natal, South Africa).

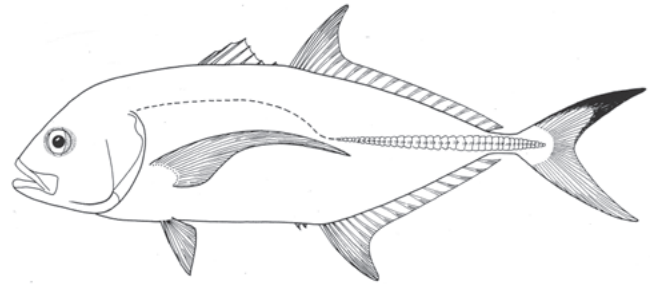
Caranx sexfasciatus (non Quoy & Gaimard 1825): Kyushin *et al.* 1977*.

Caranx heberi: Debelius 1993*; Randall 1995*; Smith-Vaniz 1999*; Khalaf & Krupp 2003; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 19–21 rays; anal fin 2 + 1 spines, 15–17 rays; soft-rayed dorsal + anal fins 1 spine, 34–38 rays.

GR 6–8/17–19. Breast either completely scaly (least common) to naked ventrally but typically with patch of pre-pelvic scales; straight part of LL with 30–40 strong scutes.

Adults dark bronze to yellow-green dorsally, silvery bronze to yellowish below; caudal fin bright yellow to dusky, frequently with distal half of upper lobe noticeably darker to black; other fins bright yellow to dusky without any yellow hue. Attains at least 100 cm TL (~14 kg).



Caranx heberi, 55 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Pakistan, Red Sea, Tanzania (Zanzibar) to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Réunion, India and Sri Lanka; elsewhere to southern Japan, northern Australia and Fiji.

REMARKS Prefers clear coastal waters; adults usually found in small aggregations over rocky reefs, seldom in turbid water or estuaries. The most common jack inshore on the southern coast of Oman. IGFA world record 8.2 kg, Bazaruto I., Mozambique May 2008.

Caranx ignobilis (Forsskål 1775)

Giant trevally

PLATE 10

Scomber ignobilis Forsskål in Niebuhr 1775: 55, xii (Jeddah, Saudi Arabia, Red Sea).

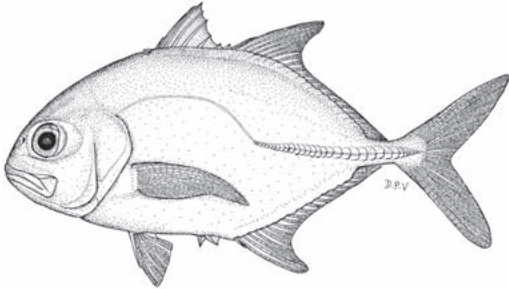
Caranx ekala Cuvier in Cuv. & Val. 1833: 117 (Visakhapatnam and Mumbai, India); Day 1865.

Caranx carangus (non Bloch 1793): ?Day 1876*.

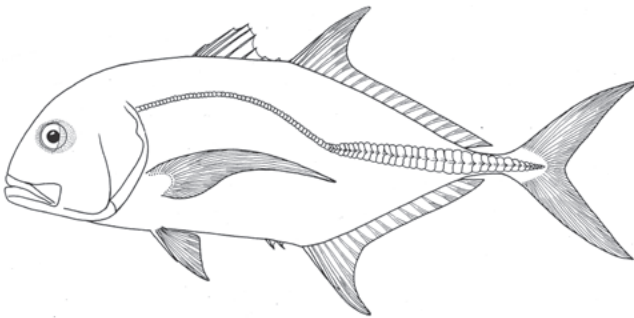
Caranx ignobilis: Williams 1958*, 1965; Smith & Smith 1963*, 1969*; Smith 1972*; Randall 1983*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.17*; Van der Elst 1988*; Winterbottom *et al.* 1989*; Debelius 1993*; Randall 1995*; Khalaf & Disi 1997*; Whitefield 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 18–21 rays; anal fin 2 + 1 spines, 15–17 rays; soft-rayed dorsal + anal fins 1 spine, 34–38 rays. GR 5–7/15–17. Breast naked ventrally, but typically with small patch of pre-pelvic scales; straight part of LL with 26–38 strong scutes.

Adults mainly silvery grey to black dorsally, usually paler below; fins usually uniformly grey to black, except fish from turbid coastal waters often with yellow fins; no dark spot at upper end of opercle. Attains 170 cm TL (commonly ~100 cm TL).



Caranx ignobilis, 9 cm SL. Source: Whitfield 1998



Caranx ignobilis, 60 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific (widespread). WIO: Gulf of Oman to Pakistan and India, Red Sea to South Africa (Algoa Bay), Madagascar, Seychelles and Mascarenes; elsewhere to east coast of India, southern Japan, Australia, New Caledonia, Fiji, Tonga, Rapa Iti, Marquesas Is., Line Is. and Hawaii.

REMARKS Adults occur singly in clear lagoons and seaward reefs, juveniles in estuaries. Spawns on shallow seaward reefs and offshore banks. Feeds at night on crustaceans (crabs and spiny lobsters) and fishes. Large individuals may be ciguatoxic. Sold mostly fresh and dried-salted. IGFA world record 72.8 kg, Tokara, Kagoshima, Japan, May 2006.

Caranx lugubris Poey 1860

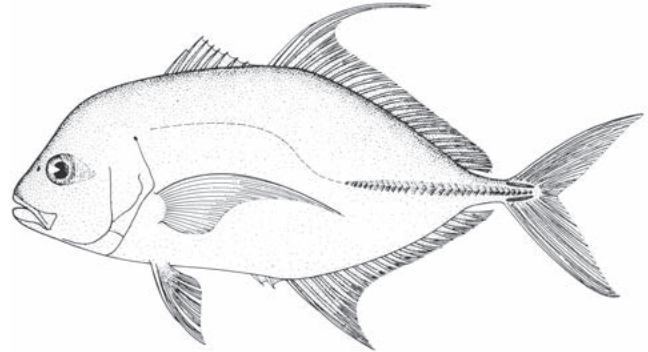
Black trevally

PLATE 10

Caranx ascensionis Cuvier in Cuv. & Val. 1833: 102, Pl. 249 (Ascension I.) [name unavailable; see Smith-Vaniz & Randall 1994 and Opinion 1841].
Caranx lugubris Poey 1860: 222 (Cuba); Kyushin *et al.* 1977*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.18*; Winterbottom *et al.* 1989; Randall 1995*; Heemstra & Heemstra 2004; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 20–22 rays; anal fin 2 + 1 spines, 16–19 rays; soft-rayed dorsal + anal fins 1 spine, 37–41 rays. GR 6–8/17–22. Breast completely scaly; straight part of LL with 26–32 strong scutes.

Body and fins mostly uniformly grey to black; scutes often black; small dark spot at upper end of opercle. Attains ~100 cm TL.



Caranx lugubris, 64 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Circumtropical in warm to temperate seas. WIO: Gulf of Oman to South Africa (Eastern Cape), Mozambique Channel, Seychelles, Réunion, Mauritius, Chagos, Lakshadweep and Sri Lanka; elsewhere to northwestern Australia.

REMARKS Confined to clear offshore waters, usually in 25–65 m; early life history unknown. IGFA world record 18.8 kg, Hurricane Bank, Mexico, May 2013.

Caranx melampygus Cuvier 1833

Bluefin trevally

PLATE 10

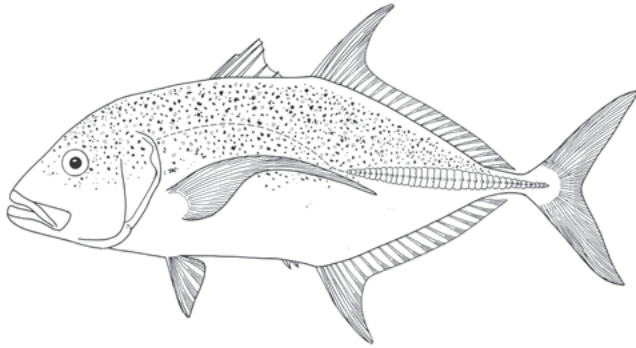
Caranx melampygus Cuvier in Cuv. & Val. 1833: 116 (Waigeo I. and Moluccas, Indonesia; Rawak I., Bismarck Archipelago; Vanikoro I., Santa Cruz Is.; Mauritius, Mascarenes); Day 1876*; Williams 1958*, 1965; Smith & Smith 1963*, 1969*; Kyushin *et al.* 1977*; Randall 1983*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.19*; Van der Elst 1988*; Winterbottom *et al.* 1989*; Debelius 1993*; Randall 1995*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Caranx stellatus: SFSA No. 512*.

Dorsal fins 8 spines + 1 spine, 21–24 rays; anal fin 2 + 1 spines, 17–20 rays; soft-rayed dorsal + anal fins 1 spine, 39–44 rays. GR 5–9/17–20. Breast completely scaly; straight part of LL with 27–42 strong scutes.

Adults with head and upper half of body brassy, suffused with blue and covered with small blue-black spots (forming at ~20 cm TL and more numerous with size); 2nd dorsal fin, anal

fin and caudal fin bright blue; head and body of juveniles and young adults without spots, and fins pale to dark dusky, except pectoral fins yellow. Attains ~115 cm TL.



Caranx melampygus, 50 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Tropical Indo-Pacific to eastern Pacific (widespread). WIO: Pakistan, Red Sea to South Africa (Eastern Cape), Mozambique Channel, Madagascar, Seychelles and Mascarenes to India; elsewhere to Indonesia, southern Japan, New Guinea, Australia, Solomon Is., New Caledonia, Fiji, Tonga, Pitcairn Is., Hawaii and Mexico to Ecuador.

REMARKS Found on reefs, most commonly in offshore areas. IGFA world record 13.24 kg, Clipperton Atoll, Mexico, April 2012.

Caranx papuensis Alleyne & Macleay 1877

Brassy trevally

PLATE 10

Caranx papuensis Alleyne & Macleay 1877: 325, Pl. 10, Fig. 3 (Hall Sound, Papua New Guinea); Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.20*; Van der Elst 1988*; Whitefield 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Fricke *et al.* 2009.

Caranx jarra (non Cuvier 1833): Day 1876.

Caranx regularis Garman 1903: 232 (Suva, Viti Levu, Fiji).

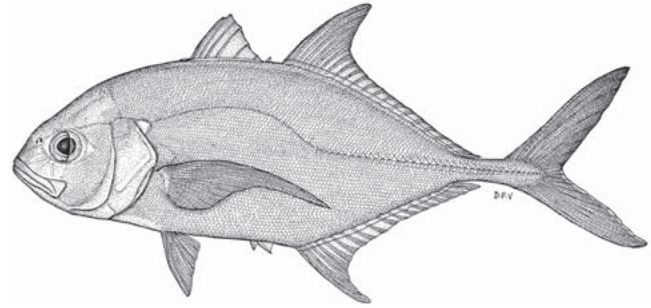
Caranx celetus Smith 1968: 182, Pl. 39, Figs. A–B (Zanzibar, Tanzania); Smith & Smith 1969*.

Carangoides gymnostethus (non Cuvier 1833): Debelius 1993*.

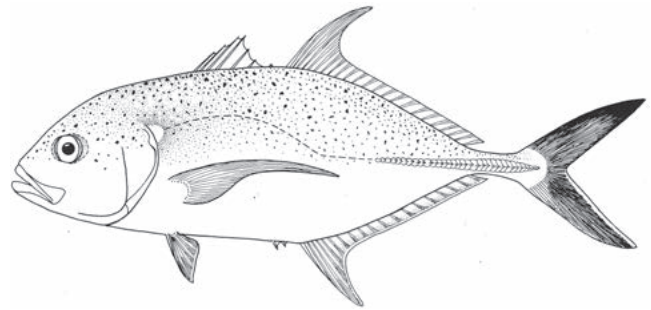
Dorsal fins 8 spines + 1 spine, 21–23 rays; anal fin 2 + 1 spines, 16–19 rays; soft-rayed dorsal + anal fins 1 spine, 37–41 rays. GR 7–9/18–21. Breast naked ventrally, but usually with patch of pre-pelvic scales; straight part of LL with 31–39 strong scutes.

Adults brassy to yellowish green dorsally, silvery below; conspicuous pale spot on shoulder just behind upper edge of opercle; small black spots scattered on head and body above lateral line (forming at ~30 cm TL and more numerous with

size); caudal-fin upper lobe uniformly dark, lower lobe dusky to yellow with narrow white distal margin. Attains 88 cm TL.



Caranx papuensis, 16 cm SL. Source: Whitfield 1998



Caranx papuensis, 39 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Tanzania (Zanzibar) to South Africa (Eastern Cape), Madagascar, Seychelles, Mascarenes and Sri Lanka; elsewhere to Ryukyu Is., Marshall Is., New Guinea, Australia, New Caledonia, Fiji, Tonga, Samoa and Marquesas Is.

REMARKS Found predominantly on seaward reefs, although juveniles taken in estuaries; rare in offshore areas. IGFA world record 10.9 kg, Shark Bay, Western Australia, September 2019.

Caranx sexfasciatus Quoy & Gaimard 1825

Bigeye trevally

PLATE 10

Caranx sexfasciatus Quoy & Gaimard 1825: 358, Pl. 65, Fig. 4 (Waigeo I., Indonesia); Smith & Smith 1966*; Randall 1983*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.22*; Van der Elst 1988*; Winterbottom *et al.* 1989*; Debelius 1993*; Randall 1995*; Whitfield 1998*; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Caranx forsteri Cuvier in Cuv. & Val. 1833: 107 (Mauritius, Mascarenes); Smith & Smith 1969*.

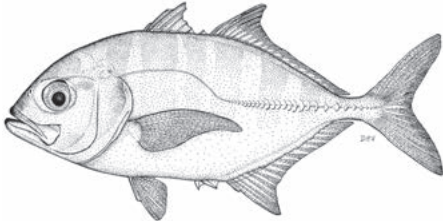
Caranx hippos (non Linnaeus 1766): Day 1865, 1876.

Caranx elacate: Williams 1958*, 1965; Kyushin *et al.* 1977*.

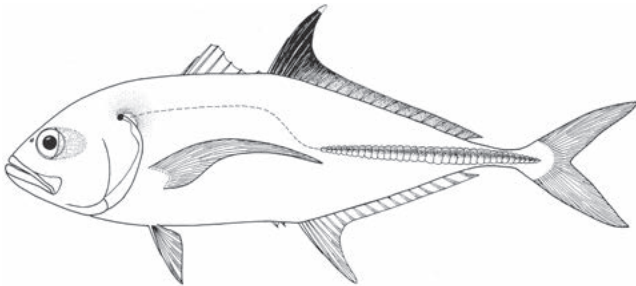
Dorsal fins 8 spines + 1 spine, 19–22 rays; anal fin 2 + 1 spines, 14–17 rays; soft-rayed dorsal + anal fins 1 spine, 33–39 rays.

GR 6–8/15–19. Breast completely scaly; straight part of LL with 27–36 strong scutes.

Adults iridescent blue-green dorsally, silvery white below; small blackish spot near upper end of opercle (absent in young); soft-rayed dorsal-fin lobe with white tip; caudal fin yellowish to black; LL scutes dark to black. Attains 120 cm TL.



Caranx sexfasciatus, 9 cm FL, juvenile. Source: Whitfield 1998



Caranx sexfasciatus, 62 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Tropical Indo-Pacific to eastern Pacific (widespread). WIO: Oman to Pakistan and India, Red Sea to South Africa (Algoa Bay, Eastern Cape), Seychelles, Mascarenes and Chagos; elsewhere to Indonesia, southern Japan, Australia, New Caledonia, Fiji, Tonga, Hawaii, Galápagos Is. and Mexico to Ecuador.

REMARKS The most abundant *Caranx* species in WIO. Associated with reefs, but juveniles may occur in estuaries. IGFA world record 14.3 kg, Poivre I., Seychelles, April 1997.

Caranx tille Cuvier 1833

Tille trevally

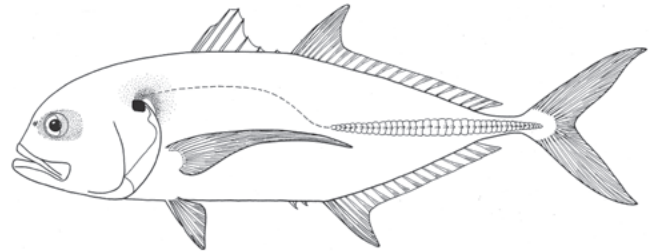
PLATE 11

Caranx tille Cuvier in Cuv. & Val. 1833: 124 (Puducherry, India); Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.23*; Heemstra & Heemstra 2004; Psomadakis *et al.* 2015*.

Caranx sexfasciatus (*non* Quoy & Gaimard 1825): Williams 1958*.

Dorsal fins 8 spines + 1 spine, 20–22 rays; anal fin 2 + 1 spines, 16–18 rays; soft-rayed dorsal + anal fins 1 spine, 36–40 rays. GR 6–8/15–17. Breast completely scaly; straight part of LL with 33–42 strong scutes.

Adults dark olive-green to bluish grey dorsally, shading to silvery white below; blackish spot, at least half pupil diameter, on upper end of opercle (absent in young); soft-rayed dorsal-fin lobe olive-grey to blackish; LL scutes grey, darker on peduncle. Attains at least 80 cm TL (~5.5 kg).



Caranx tille, 43 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Pakistan to India and Sri Lanka, East Africa to South Africa (KwaZulu-Natal), Tanzania (Zanzibar), Mozambique Channel and Madagascar; elsewhere to east coast of India, southern Japan, Mariana Is., New Guinea, Australia, New Caledonia and Fiji.

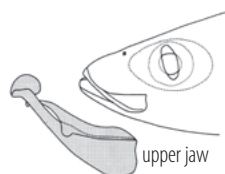
REMARKS Prefers inshore waters. Australian National Sportfishing Association record 5.46 kg, Double Island Wreck, Queensland, Australia, March 2004.

GENUS *Decapterus* Bleeker 1851

Body elongate, cylindrical; dorsal and anal fins each with single detached finlet at rear; shoulder-girdle (cleithrum) margin with 2 blunt papillae, lower one slightly larger; lateral line with long low curve anteriorly. About 10 species, 6 in WIO.

KEY TO SPECIES

- 1a Rear end of upper jaw concave above, rounded and produced below; tip of adpressed pectoral fin falling well short of vertical at 2nd dorsal-fin origin *D. macrosoma*

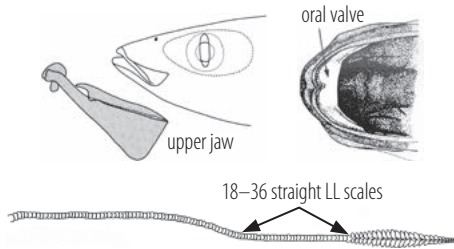


- 1b Rear end of upper jaw not shaped as above; tip of adpressed pectoral fin extending to or nearly to vertical at 2nd dorsal-fin origin (except shorter in *D. macarellus*) 2

Continued...

KEY TO SPECIES

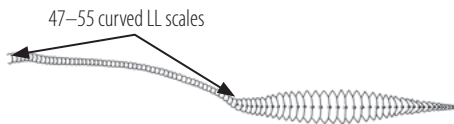
- 2a Rear end of upper jaw moderately rounded and slanted anteroventrally; tip of adpressed pectoral fin falling well short of vertical at 2nd dorsal-fin origin; upper-jaw oral valve (membrane) at symphysis conspicuously white; straight part of LL with 18–36 scales anteriorly *D. macarellus*
- 2b Rear end of upper jaw not as above; tip of adpressed pectoral fin usually extending to or nearly to vertical at 2nd dorsal-fin origin; upper-jaw oral valve (membrane) at symphysis dusky or transparent (except white in *D. muroadsi*); straight part of LL with 0–14 scales anteriorly 3



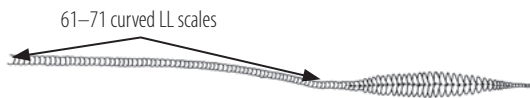
Valve drawing reproduced with permission, Food and Agriculture Organization of the United Nations, Original Scientific Illustrations Archive.

- 3a In life, caudal-fin upper lobe greenish yellow, and lower lobe grey; upper-jaw oral valve (membrane) at symphysis conspicuously white in adults; lower GR 36–42 *D. muroadsi*
- 3b In life, caudal-fin upper and lower lobes both hyaline, brownish or red; upper-jaw oral valve (membrane) at symphysis transparent to dusky; lower GR 26–33 (except GR 30–39 in *D. russelli*) 4
- 4a In life, caudal fin hyaline to dusky yellow; lower GR usually 32–39 *D. russelli*
- 4b In life, caudal fin red; lower GR 26–33 5

- 5a Opercle margin smooth; curved part of LL with 47–55 scales, straight part without scales anteriorly *D. kurroides*



- 5b Opercle margin with minute serrations; curved part of LL with 61–71 scales, straight part with 4–14 scales anteriorly ... *D. tabl*



Decapterus kurroides Bleeker 1855

Redtail scad

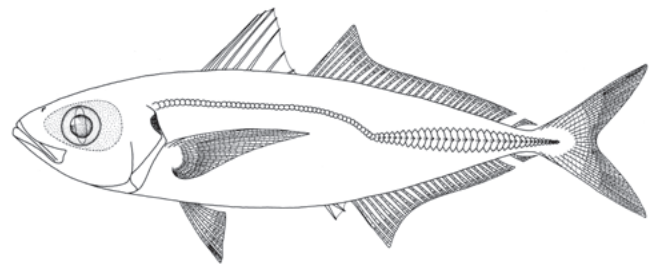
PLATE 11

Decapterus kurroides Bleeker 1855: 420 (Ambon I., Moluccas, Indonesia); Smith-Vaniz 1984*, 1999*; SSF No. 210.25*; Fricke *et al.* 2009; Kimura *et al.* 2013.

Decapterus russelli (*non* Rüppell 1830): Khalaf & Disi 1997*.

Dorsal fins 8 spines + 1 spine, 28–31 rays + 1 finlet; anal fin 2 + 1 spines, 22–25 rays + 1 finlet. Tip of adpressed pectoral fin usually extending to or slightly beyond vertical at 2nd dorsal-fin origin. Opercle margin smooth. GR 10–12/26–31. Curved LL with 47–55 scales, 0–2 scutes; straight part of LL with 31–36 scutes; total LL scales + scutes 80–86.

Body bluish green dorsally, silvery white below; dorsal-fin lobe dark distally, sometimes with pale tip; caudal fin red; black spot on edge of opercle; oral valve of upper jaw transparent to dusky. Attains 45 cm TL.



Decapterus kurroides, 24 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya, Tanzania and Réunion; elsewhere to Andaman Sea, Indonesia, Philippines, southern Japan, Australia and Fiji.

REMARKS Schooling; caught in trawls at ~100–300 m (usually >150 m).

Decapterus macarellus (Cuvier 1833)

Mackerel scad

PLATE 11

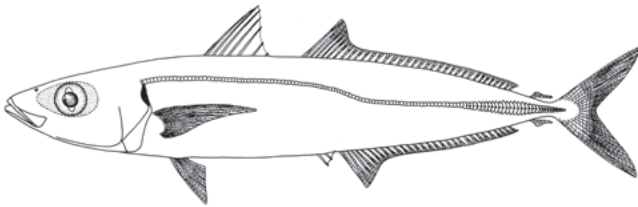
Caranx macarellus Cuvier in Cuv. & Val. 1833: 40 (Martinique, western Atlantic).

Decapterus macarellus: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.26*; Randall 1995*; Khalaf & Disi 1997*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 31–36 rays + 1 finlet; anal fin 2 + 1 spines, 27–30 rays + 1 finlet. Rear end of upper jaw moderately rounded and slanted anteroventrally. Tip of adpressed pectoral fin falling considerably short of vertical at 2nd dorsal-fin origin. Opercle margin smooth. GR 10–13/

34–38. Curved lateral line with 58–75 scales, no scutes; straight part of LL with 14–29 scales, 24–40 scutes; total LL scales + scutes 110–138.

Body bluish green dorsally, silvery below; dorsal-fin lobe sometimes dark distally; caudal fin yellow-green; small black blotch on edge of opercle; oral valve of upper jaw conspicuously white in adults. Attains 46 cm TL.



Decapterus macarellus, 20 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Circumtropical, including in Mediterranean Sea and Red Sea. WIO: Pakistan to South Africa (Knysna) and to India; not known from Persian/Arabian Gulf.

REMARKS Pelagic and schooling, mostly in open water and commonly in insular habitats; sometimes at surface, but usually at 40–200 m. IGFA world record 0.55 kg, Hachijo I., Tokyo, Japan, August 2005.

Decapterus macrosoma Bleeker 1851

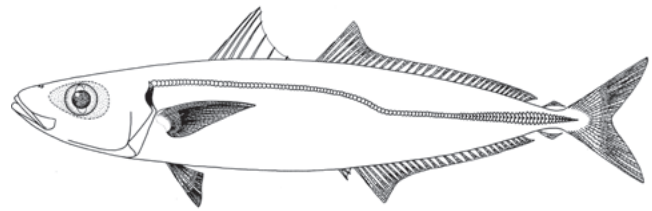
Shortfin scad

PLATE 11

Decapterus macrosoma Bleeker 1851: 358 (Jakarta, Java, Indonesia); Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.27*; Van der Elst 1988* [photograph is of *D. russelli*]; Randall 1995*; Carpenter *et al.* 1997; Khalaf & Disi 1997*; Psomadakis *et al.* 2015*.
Decapterus lajang (*non* Bleeker 1855): Smith & Smith 1963*.

Dorsal fins 8 spines + 1 spine, 33–38 rays + 1 finlet; anal fin 2 + 1 spines, 27–30 rays + 1 finlet. Rear end of upper jaw concave above, rounded and produced below. Tip of adpressed pectoral fin falling well short of vertical at 2nd dorsal-fin origin. Opercle margin smooth. GR 10–12/34–38. Curved LL with 58–72 scales, no scutes; straight part of LL with 14–29 scales, 24–40 scutes; total LL scales + scutes 110–126.

Body blue to greenish dorsally, silvery below; caudal fin hyaline to dusky; small black spot on upper edge of opercle; oral valve of upper jaw transparent to dusky. Attains 35 cm TL.



Decapterus macrosoma, 21 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific to tropical eastern Pacific. WIO: Persian/Arabian Gulf, Oman, Red Sea, East Africa to South Africa (Knysna), Seychelles and to India; elsewhere to Indonesia, southern Japan, Australia, New Caledonia, Tonga, Line Is., Hawaii, Galápagos Is. and Mexico to Peru.

REMARKS Pelagic and schooling; usually taken by trawl, in 30–170 m. IGFA world record 1 kg, Niijima, Tokyo, Japan, June 2014.

Decapterus muroadsi (Temminck & Schlegel 1844)

Amberstripe scad

PLATE 11

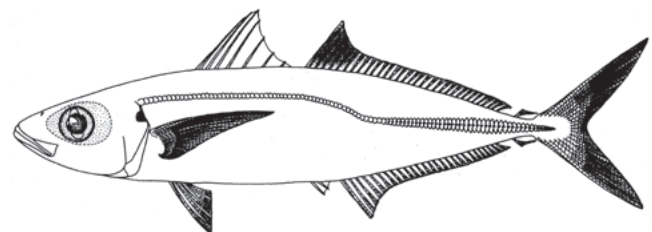
Caranx muroadsi Temminck & Schlegel 1844: 108, Pl. 58, Fig. 1 (Nagasaki, Japan).

Decapterus leptosomus Ogilby 1898: 760 (Port Jackson, New South Wales, Australia).

Decapterus muroadsi: Smith 1961; SFSA No. 533; Smith-Vaniz 1999*; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 29–33 rays + 1 finlet; anal fin 2 + 1 spines, 25–28 rays + 1 finlet. Tip of adpressed pectoral fin usually slightly short of vertical at 2nd dorsal-fin origin. Opercle margin smooth. GR 13–15/36–42. Curved LL with 54–76 scales, no scutes; straight part of LL with 5–15 scales, 32–42 scutes; total LL scales + scutes 102–121.

Body bluish green dorsally, silvery below; amber stripe often present on sides; dorsal-fin lobe dark distally, often with white tip; caudal fin upper lobe greenish yellow, lower lobe dusky; small black spot on upper edge of opercle; oral valve of upper jaw conspicuously white in adults. Attains 52 cm TL.



Decapterus muroadsi, 34 cm FL. Source: Smith-Vaniz 1999

DISTRIBUTION Antitropical in southeastern Atlantic (St Helena I.), Indo-Pacific (including Japan, Australia, New Zealand, Kermadec Is., Hawaii), and eastern Pacific (Easter I., Galápagos Is., Gulf of California and its offshore islands). WIO: Pakistan and South Africa (Cape Point, Western Cape, to KwaZulu-Natal).

REMARKS Pelagic and schooling, from near surface to ~180 m deep. IGFA world record 1.13 kg, Kona, Hawaii, December 2008.

Decapterus russelli (Rüppell 1830)

Indian scad

PLATE 11

Caranx russelli Rüppell 1830: 99 (El Tur, Sinai coast, Egypt, Red Sea).

Caranx kiliche Cuvier in Cuv. & Val. 1833: 43 (Puducherry, India).

Caranx kurra Cuvier in Cuv. & Val. 1833: 44 (Coromandel, India);

Day 1865, 1876*.

Decapterus lajang Bleeker 1855: 302 (Ternate, Moluccas, Indonesia);

Smith & Smith 1969*.

Decapterus russelli: Smith & Smith 1969 [as *russellii*]; Masuda *et al.*

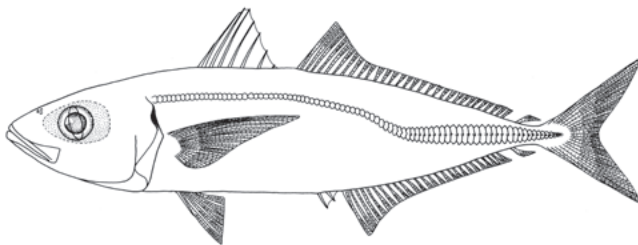
1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.29*; Van der Elst

1988* [identified as *D. macrosoma* but photograph is of *D. russelli*];

Randall 1995*; Carpenter *et al.* 1997*; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine, 28–33 rays + 1 finlet; anal fin 2 + 1 spines, 25–29 rays + 1 finlet. Tip of adpressed pectoral fin usually slightly short of vertical at 2nd dorsal-fin origin. Opercle margin smooth. GR 10–14/30–39. Curved LL with 42–62 scales, 0–4 scutes; straight part of LL with 0–4 scales, 30–40 scutes; total LL scales + scutes 77–102.

Body bluish green dorsally, silvery below; dorsal fin dusky distally, sometimes with pale tip; caudal fin hyaline to dusky yellow; small black spot on upper edge of opercle; oral valve of upper jaw transparent to dusky. Attains 39 cm TL.



Decapterus russelli, 21 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Pakistan to Oman, Red Sea and Lessepsian migrant to Mediterranean Sea, East Africa to South Africa (KwaZulu-

Natal), Seychelles, Mauritius and Sri Lanka; elsewhere to east coast of India, Indonesia, Philippines, southern Japan, Australia and New Caledonia.

REMARKS Pelagic and schooling, in 30–250 m. Matures during first year of life, at ~12 cm TL. Fish from coastal localities typically have a more robust body, larger scutes, fewer LL scales in curved part, and more gill rakers than do fish from insular areas (the *lajang* form), but because some morphologically intermediate specimens exist both forms are here recognised as conspecific.

Decapterus tabl Berry 1968

Roughear scad

PLATE 11

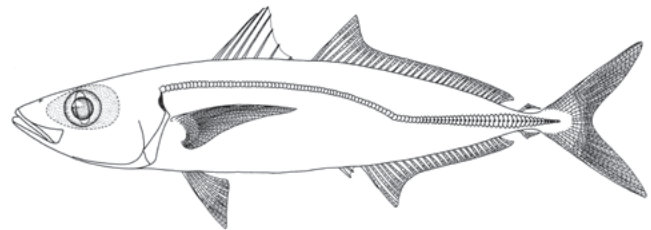
Decapterus tabl Berry 1968: 152, Fig. 1 (off Colombia, Caribbean Sea);

Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.30*;

Kimura *et al.* 2013.

Dorsal fins 8 spines + 1 spine, 30–33 rays + 1 finlet; anal fin 2 + 1 spines, 24 or 25 rays + 1 finlet. Tip of adpressed pectoral fin usually slightly short of vertical at 2nd dorsal-fin origin. Opercle margin with minute serrations. GR 10–12/30–33. Curved LL with 61–73 scales, no scutes; straight part of LL with 4–12 scales, 30–40 scutes; total LL scales + scutes 103–118.

Body bluish green dorsally, silvery below; dorsal-fin lobe sometimes red distally; caudal fin red; small black spot on upper edge of opercle. Attains 50 cm TL.



Decapterus tabl, 36 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific, western Atlantic (Bermuda, Gulf of Mexico and Caribbean Sea) and St Helena I. WIO: records from Kenya, Mozambique and Madagascar, but probably more widely distributed; elsewhere, Indonesia, Japan, Australia, Tonga and Hawaii.

REMARKS Schooling; usually trawled in 200–380 m. Submersible observations at Hawaii at depths of 125–530 m.

GENUS *Elagatis* Bennett 1840

Body elongate, cylindrical; no scutes in lateral line; dorsal and anal fins with single 2-rayed finlet at rear. One species.

Elagatis bipinnulata (Quoy & Gaimard 1825)

Rainbow runner

PLATE 11

Seriola bipinnulata Quoy & Gaimard 1825: 363, Pl. 61, Fig. 3
(Cocos [Keeling] Is.; New Guinea).

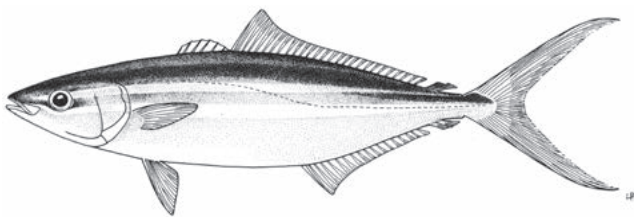
Seriolichthys bipinnulatus: Day 1876*.

Elagatis bipinnulatus: Williams 1958; Smith & Smith 1969*;
Van der Elst 1988*.

Elagatis bipinnulata: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*;
SSF No. 210.31*; Winterbottom *et al.* 1989*; Debelius 1993*;
Randall 1995*; Khalaf & Disi 1997*; Heemstra & Heemstra 2004*;
Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Diagnosis as for genus. Dorsal fins 6 spines + 1 spine, 25–28 rays + 2-rayed finlet; anal fin 1 embedded spine + 1 spine, 18–20 rays + 2-rayed finlet. End of upper jaw ends distinctly before eye (but to below front margin of eye in young); anal-fin base relatively short, ~1.5 in soft-rayed dorsal-fin base. Peduncle with grooves dorsally and ventrally.

Body dark olive-green or blue dorsally, white below; 2 narrow pale blue or bluish white stripes along sides, with broader olive or yellowish stripe between them; fins with olive or yellow tint. Attains 120 cm TL (commonly 80 cm TL).



Elagatis bipinnulata, 32 cm FL. © Food and Agriculture Organization of the United Nations, Original Scientific Illustrations Archive; reproduced with permission

DISTRIBUTION Circumglobal in tropical to subtropical seas, including strays to Mediterranean Sea, but apparently rare in eastern Atlantic. WIO (widespread): Red Sea, Pakistan and Oman to South Africa (KwaZulu-Natal), Seychelles, Mascarenes, Chagos, Maldives and India.

REMARKS Pelagic, usually at or near the surface over reefs, but sometimes far offshore and often around floating debris. An excellent food fish with superb fighting abilities. IGFA world record 17.05 kg, Revillagigedo Is., Mexico, November 1991.

GENUS *Gnathanodon* Bleeker 1851

Body oblong, compressed; adults with highly protractile mouth, no teeth on jaws, and lips thick and fleshy. One species.

Gnathanodon speciosus (Forsskål 1775)

Golden trevally

PLATE 12

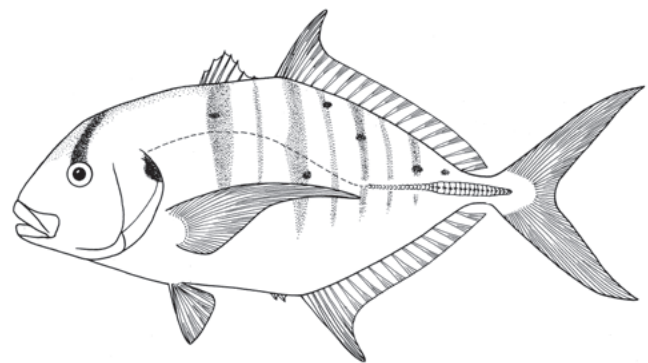
Scomber speciosus Forsskål in Niebuhr 1775: 54, xii (Jeddah, Saudi Arabia, Red Sea).

Caranx speciosus: Day 1865, 1876.

Gnathanodon speciosus: Williams 1958*; Smith & Smith 1969*;
Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.32*;
Van der Elst 1988*; Winterbottom *et al.* 1989*; Debelius 1993*;
Randall 1995*; Khalaf & Disi 1997*; Heemstra & Heemstra 2004*;
Bogorodsky *et al.* 2014; Psomadakis *et al.* 2015*.

Diagnosis as for genus. Dorsal fins 7 spines + 1 spine, 18–20 rays; anal fin 2 + 1 spines, 15–17 rays. Young with a few feeble teeth in lower jaw. GR 19–22/27–30. Breast completely scaly.

Young and small adults silvery yellow, with 7–11 narrow, blackish, vertical bars (usually alternately narrow and thin); all fins tinged yellow; caudal-fin tips black. Adults with a few black spots or blotches on sides, and vertical bars faint or absent. Attains 120 cm TL (~15 kg).



Gnathanodon speciosus, 50 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific to eastern Pacific. WIO: Persian/Arabian Gulf, Pakistan to Oman, Red Sea to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes, Chagos and Sri Lanka; elsewhere to southern Japan, Australia, Tonga, Hawaii, Austral Is. and Mexico to Ecuador.

REMARKS A bottom feeder that uses its highly protractile mouth to root for crustaceans, molluscs and small fishes. Young especially display piloting behaviour by swimming closely with sharks and other large fishes. Mahadevan & Nayar (1965) report a remarkable case of presumed protective

mimicry, with closely matching colouration, between small juveniles (≤ 5 cm TL) and sea snakes (?*Hydrophis cyanocinctus*), in the Gulf of Mannar. IGFA world record 14.75 kg, Point Samson, Western Australia, November 2002.

GENUS *Lichia* Cuvier 1816

Body elongate, moderately deep and compressed; dorsal profile of head almost straight; pectoral fins short; lateral line irregular and sinuous, following a convex curve above and a concave curve behind pectoral fin; no LL scutes; scales small and partially embedded, those on breast oval to lanceolate. One species.

Lichia amia (Linnaeus 1758)

Leerfish

PLATE 12

Scomber amia Linnaeus 1758: 229 [no locality given = Europe].

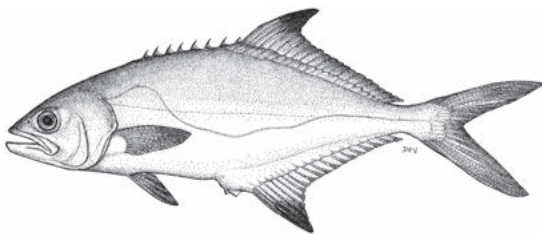
Hypacanthus amia: Smith & Smith 1966*; Smith-Vaniz & Staiger 1973*.

Lichia amia: Smith-Vaniz 1984*; SSF No. 210.33*; Van der Elst 1988*;

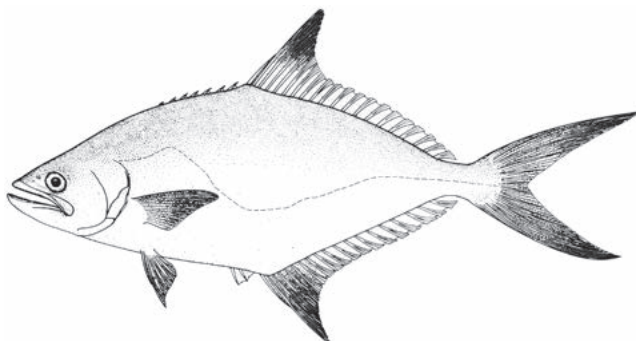
Whitfield 1998*; Heemstra & Heemstra 2004*.

Diagnosis as for genus. Dorsal fins 7 separate spines + 1 spine, 19–21 rays; anal fin 2 + 1 spines, 17–21 rays. GR 2–5/7–11.

Adults brownish dorsally, silvery white below lateral line (fish from estuarine habitats sometimes yellowish), and dorsal- and anal-fin lobes black distally; juveniles with irregular brownish black bars on sides. Attains possibly 200 cm TL (commonly 100 cm TL) and 50 kg.



Lichia amia, 18 cm FL (South Africa). Source: Whitfield 1998



Lichia amia, 85 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Mediterranean Sea, eastern Atlantic (West Africa to Cape of Good Hope), and southwestern Indian Ocean (South Africa to Mozambique).

REMARKS Found in estuaries and inshore, from surface to at least 50 m deep. Mature at ~55 cm TL. A highly esteemed gamefish; prefers live or moving bait, and often seen in pursuit of mullet at the surface. South African angling record 32 kg; IGFA world record 27.8 kg, L'Ampolla, Spain, April 2000.

GENUS *Megalaspis* Bleeker 1851

Body fusiform; pectoral fins very long; straight part of lateral line with very large scutes (height exceeding eye diameter); rear 7–10 rays of dorsal and anal fins forming separate finlets; shoulder-girdle margin smooth. One species.

Megalaspis cordyla (Linnaeus 1758)

Torpedo scad

PLATE 12

Scomber cordyla Linnaeus 1758: 298 [no locality given].

Caranx rotterli: Day 1865, 1876.

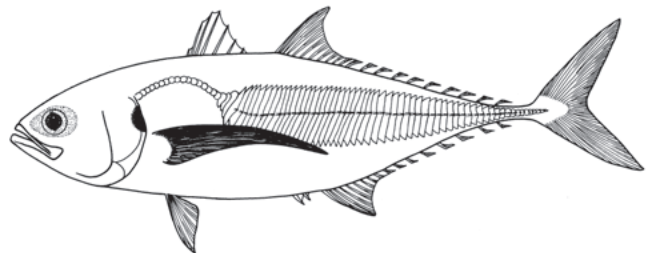
Megalaspis cordyla: Williams 1958; Smith & Smith 1969*; Masuda *et al.*

1984*; Smith-Vaniz 1984*, 1999*; SSF No. 120.34*; Van der Elst 1988*;

Randall 1995*; Psomadakis *et al.* 2015*.

Diagnosis as for genus. Dorsal fins 8 spines + 1 spine, 18–20 rays, last 7–9 rays as separate finlets; anal fin 2 + 1 spines, 16 or 17 rays, last 8–10 rays as separate finlets. Adipose eyelid covering eyes except for vertical slit centred on pupil. GR 8–11/18–22. Straight part of LL with 51–59 large scutes.

Body bluish grey to green dorsally, silvery below; pectoral fins dark; large black spot on upper edge of opercle. Attains 80 cm TL (~4 kg).



Megalaspis cordyla, 28 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Pakistan and Oman to South Africa (Thukela Bank), India and Sri Lanka; elsewhere to Indonesia, Japan, Marshall Is., Australia, New Caledonia, Fiji and Tonga.

REMARKS Adults primarily oceanic, pelagic and schooling; found near the surface coastally but intolerant of turbid water. Feeds on fishes.

GENUS *Naucrates* Rafinesque 1810

Diagnosis as for the single species.

Naucrates ductor (Linnaeus 1758)

Pilotfish

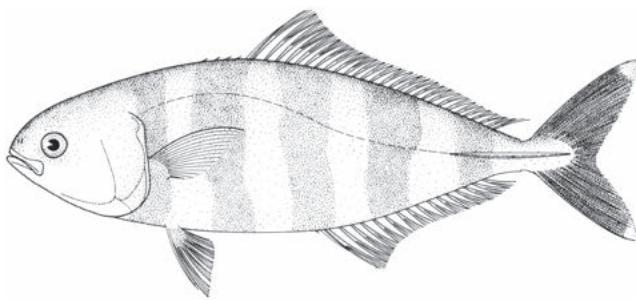
PLATE 12

Gasterosteus ductor Linnaeus 1758: 295 (pelagic, Ocean).

Naucrates ductor: Day 1865, 1876*; Smith & Smith 1966*, 1969*; Kyushin *et al.* 1977*; Masuda *et al.* 1984*; Smith-Vaniz 1984*; SSF No. 210.35*; Van der Elst 1988*; Winterbottom *et al.* 1989; Debelius 1993*; Goren & Dor 1994; Randall 1995*; Khalaf & Disi 1997*; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Body elongate and slender, not strongly compressed. Dorsal fins 4 or 5 short, partially embedded spines + 1 spine, 25–29 rays; anal fin 2 + 1 spines, 15–17 rays, and fin base 1.6–1.9 in length of 2nd dorsal-fin base. End of upper jaw relatively narrow, terminating below front margin of eye. Peduncle with well-developed fleshy keel laterally, and grooves dorsally and ventrally. GR 6 or 7/15–20. No scutes in lateral line.

Head and body pale bluish to dark blue, with 6 or 7 broad dark bars (rear 3 bars extending onto dorsal fin); caudal-fin lobes with distal third dark, and prominent white tips; smaller white tips on 2nd dorsal- and anal-fin lobes. Attains 70 cm TL (commonly <40 cm TL).



Naucrates ductor, 37 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Circumglobal in tropical to warm-temperate seas, including Mediterranean Sea, Black Sea and Red Sea; common throughout WIO.

REMARKS Pelagic and oceanic; has a semi-obligate commensal relationship with sharks, rays, other large fishes and turtles. Sometimes rides the bow wave of ships or large fishes, hence its common name.

GENUS *Parastromateus* Bleeker 1864

Deep-bodied, nearly orbicular, and strongly compressed; profile of soft-rayed dorsal and anal fins alike, with elevated, broadly rounded anterior lobes; no pelvic fins in adults, but present in young and positioned distinctly in front of vertical at pectoral-fin bases; dorsal and anal fins almost completely scaly. *Apolectus* Cuvier 1832 and *Formio* Whitley 1929 are synonyms. One species; previously classified in its own family, the Apolectidae (or Formionidae) (Smith-Vaniz 1984).

Parastromateus niger (Bloch 1795)

Black pomfret

PLATES 12 & 13

Stromateus niger Bloch 1795: 93, Pl. 422 (Tharangambadi, India); Day 1865, 1876*.

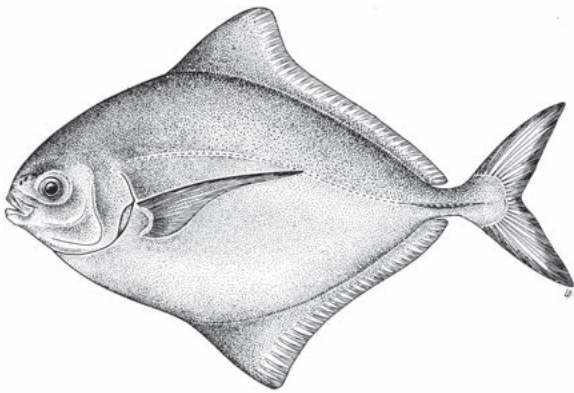
Apolectus niger: Smith & Smith 1963*, 1969*; Witzell 1978*.

Parastromateus niger: Kyushin *et al.* 1977*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.36*; Randall 1995*; Carpenter *et al.* 1997; Fricke *et al.* 2009; Bogorodsky *et al.* 2014; Psomadakis *et al.* 2015*.

Formio niger: Kuronuma & Abe 1986*.

Diagnosis as for genus. Dorsal fins 4 or 5 embedded spines + 1 spine, 41–44 rays; anal fin 2 embedded spines + 1 spine, 35–39 rays. Straight part of LL largely on peduncle, with 8–19 weak scutes forming slight keel.

Body bluish brown dorsally, silvery grey ventrally; fins with dark edges, paired fins yellowish; dark blotch on opercle margin opposite pectoral fins; young with dark vertical bars on body, including 1 on head through eye, and black (jugular) pelvic fins. Attains 75 cm TL.



Parastromateus niger, 28 cm FL. © Food and Agriculture Organization of the United Nations, Original Scientific Illustrations Archive; reproduced with permission

DISTRIBUTION Indo-Pacific. WIO (widespread): Persian/Arabian Gulf, Red Sea, Pakistan and Oman to South Africa (KwaZulu-Natal), Seychelles, Mascarenes, India and Sri Lanka; elsewhere to Indonesia, Philippines, southern Japan and northern Australia.

REMARKS Pelagic, often in large schools, at 15–40 m; generally over muddy bottom during daytime and near surface at night, frequently swimming on its side; also enters estuaries. An excellent food fish, but only rarely takes bait.

GENUS *Pseudocaranx* Bleeker 1863

Body somewhat elongate and compressed, dorsal and ventral profiles similar; both jaws with single row of blunt conical teeth; adults with thick fleshy lips; spinous dorsal fin slightly higher than soft-rayed lobe. At least 4 species (species limits unresolved), 1 in WIO.

Pseudocaranx dentex (Bloch & Schneider 1801)

White trevally

PLATE 13

Scomber dentex Bloch & Schneider 1801: 30 (Rio de Janeiro, Brazil).

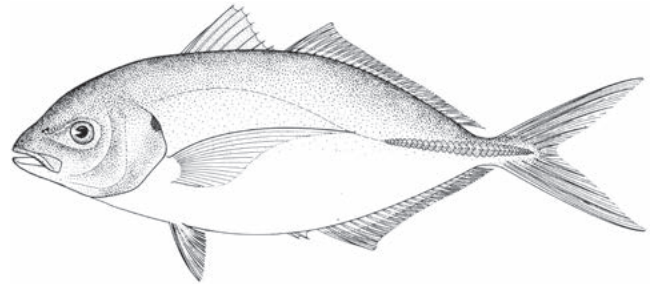
Caranx natalensis Gilchrist & Thompson 1911: 39 (Umhloti, KwaZulu-Natal, South Africa).

Caranx adscensionis: SFSA No. 507; Smith & Smith 1966*.

Pseudocaranx dentex: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.37*; Fricke *et al.* 2009.

Dorsal fins 8 spines + 1 spine, 25 or 26 rays; anal fin 2 + 1 spines, 21 or 22 rays. GR 11–13/24–27. Breast completely scaly; straight part of LL with 7–16 scales, 25–31 scutes.

Body greenish blue dorsally, silvery white below; yellow stripe usually present along midsides; small, distinct blackish spot on upper edge of opercle. Attains 90 cm TL.



Pseudocaranx dentex, 39 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Antitropical in western and eastern Atlantic, Mediterranean Sea and Indo-Pacific, not eastern Pacific. WIO: South Africa (KwaZulu-Natal and southwards); elsewhere to Japan, southern Australia, New Zealand, Easter I. and Hawaii.

REMARKS An opportunistic bottom feeder; found mainly on banks and continental-slope habitats, in 80–200 m, but may occasionally occur inshore. IGFA world record 15.2 kg, Tokyo, Japan, July 1998.

GENUS *Scomberoides* Lacepède 1801

Body fusiform, compressed; several rear rays of soft-rayed dorsal fin and anal fin forming separate semi-detached finlets; no scutes in lateral line. Halstead *et al.* (1972) described the venom glands associated with the dorsal- and anal-fin spines of *Scomberoides lysan*; the anal-fin spines are the most venomous and can produce painful stings. Similar morphology suggests that these spines are likely venomous in other species of *Scomberoides* as well. Adults feed primarily on fishes; juveniles use specialised dentition (otherwise absent in adults) to aggressively remove scales and epidermal tissue from other fishes. Because of a strong superficial resemblance, *Scomberoides* species are frequently misidentified as scombrids. Four species, all in WIO.

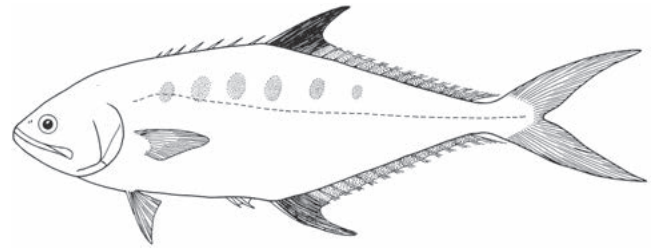
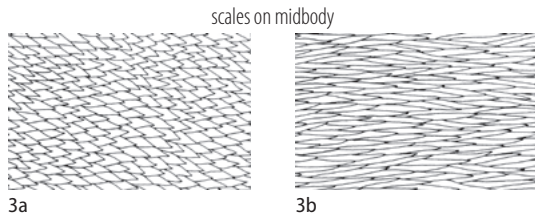
KEY TO SPECIES

- 1a Dorsal-fin lobe uniformly pigmented; GR 8–15; scales on midbody below lateral line oval or bluntly lanceolate 2
- 1b Distal half of dorsal-fin lobe abruptly and heavily pigmented; GR 21–27; scales on midbody below lateral line sharply lanceolate or needle-like 3

Continued ...

KEY TO SPECIES

- 2a In life, large, dull grey, oval blotches above or touching lateral line; maxilla extends distinctly behind eye; in adults, teeth subequal in inner and outer rows of lower jaw *S. commersonianus*
- 2b In life, vertically elongate blotches intersect lateral line; maxilla extends only slightly behind eye; in adults, teeth distinctly larger in inner row of lower jaw than in outer row *S. tala*
- 3a Scales on midbody below lateral line lanceolate; in adults, maxilla extends to or slightly beyond rear margin of eye; in life, double series of 6–8 dusky roundish blotches above and below lateral line (blotches occasionally narrowly connected) *S. lysan*
- 3b Scales on midbody below lateral line slender, needle-like; in adults, maxilla does not extend to rear margin of eye; in life, dark blotches on sides oval or vertically oblong, with first 4 or 5 intersecting lateral line *S. tol*



Scomberoides commersonianus, 47 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Red Sea, Pakistan and Oman to South Africa (Algoa Bay), Madagascar, and Mascarenes to India and Sri Lanka; elsewhere to Philippines, Taiwan, southern Japan, New Guinea, Australia and New Caledonia.

REMARKS Swims in small groups and usually frequents reefs and offshore islands; generally intolerant of low salinities and turbid water. IGFA world record 17.9 kg, Umkomaas, KwaZulu-Natal, South Africa, May 2010.

Scomberoides lysan (Fabricius 1775)

Doublespotted queenfish

PLATE 13

Scomber lysan Fabricius in Niebuhr (ex Forsskål) 1775: 54, xii (Jeddah, Saudi Arabia, or Al-Luhayya, Yemen, Red Sea).
Chorinemus sanctipetri Cuvier in Cuv. & Val. 1832: 379, Pl. 236 (Malabar coast, India); Day 1865, 1876; Williams 1958*.
Chorinemus tolooparah: Smith & Smith 1969*; Smith 1970*.
Scomberoides lysan: Smith-Vaniz & Staiger 1973*; Randall 1983*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.39*; Winterbottom *et al.* 1989*; Debelius 1993*; Randall 1995*; Khalaf & Disi 1997*; Whitfield 1998 [illustration is of *S. tol*]; Heemstra & Heemstra 2004; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 6 or 7 spines + 1 spine, 19–21 rays; anal fin 2 + 1 spines, 17–19 rays. Venom glands associated with dorsal- and anal-fin spines. Maxilla extends to or slightly beyond rear margin of eye in adults. GR 3–8/15–20. Scales on midbody below lateral line lanceolate.

Body silvery; adults with double series of 6–8 dusky roundish blotches above and below lateral line; distal half of dorsal-fin lobe abruptly and heavily pigmented. Attains 80 cm TL.

Scomberoides commersonianus

Lacepède 1801

Talag queenfish

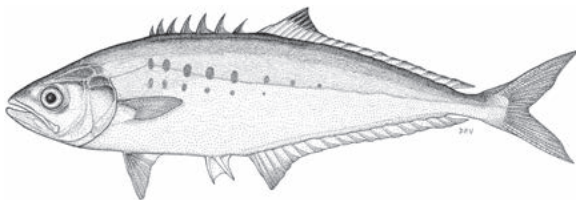
PLATE 13

Scomberoides commersonianus Lacepède (ex Commerson) 1801: 50, 53 (Fort Dauphin, Madagascar); Smith-Vaniz & Staiger 1973 [as *commersonianus*]; Kyushin *et al.* 1977* [as *commersonianus*]; Smith-Vaniz 1984*, 1999*; SSF No. 210.38*; Van der Elst 1988*; Randall 1995* [as *commersonianus*]; Heemstra & Heemstra 2004*; Fricke *et al.* 2009 [as *commersonianus*]; Psomadakis *et al.* 2015*.

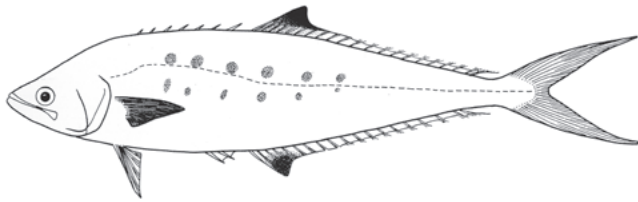
Chorinemus lysan (non Fabricius 1775): Day 1865, 1876; Williams 1958*; Smith 1970*; Kuronuma & Abe 1986*.

Dorsal fins 6 or 7 spines + 1 spine, 19–21 rays; anal fin 2 + 1 spines, 16–19 rays. Maxilla extends well beyond eye in adults. GR 0–3/7–12. Scales on midbody oval.

Body silvery grey; adults with 5–8 large purplish grey blotches above or touching lateral line, first 2 may intersect lateral line; dorsal-fin lobe uniformly dusky or dark. Attains possibly 120 cm TL.



Scomberoides lysan, 16 cm SL (South Africa). Source: Whitfield 1998



Scomberoides lysan, 52 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Tropical Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Red Sea, Pakistan and Oman to South Africa (KwaZulu-Natal), Seychelles, Mascarenes, Chagos and India to Sri Lanka; elsewhere to southern Japan, New Guinea, Australia, New Caledonia, Tonga, Rapa Iti and Hawaii.

REMARKS The most common *Scomberoides* species in the Indian Ocean, found in shallow lagoons to offshore areas, from surface to ~100 m deep. Adults feed on small fishes and crustaceans; juveniles feed on scales and epidermal tissues torn from other schooling fishes. IGFA world record 3.3 kg, Benguerra I., Mozambique, June 2008.

Scomberoides tala (Cuvier 1832)

Barred queenfish

PLATE 13

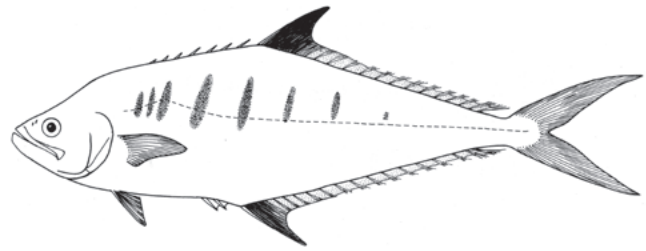
Chorinemus tala Cuvier in Cuv. & Val. 1832: 377 (Malabar, India); Day 1865, 1876.

Chorinemus toloo Cuvier in Cuv. & Val. 1832: 377 (Malabar, India); Day 1865, 1876*.

Scomberoides tala: Smith-Vaniz & Staiger 1973*; Smith-Vaniz 1984*, 1999*; Manilo & Bogorodsky 2003; Psomadakis *et al.* 2015*.

Dorsal fins 6 or 7 spines + 1 spine, 19–21 rays; anal fin 2 + 1 spines, 16–19 rays. Maxilla extends slightly beyond rear margin of eye in adults. GR 1–3/7–11. Scales on midbody bluntly lanceolate.

Body silvery, brownish dorsally; adults with series of 4 to 8 dusky vertically elongate blotches, most intersecting lateral line; dorsal-fin lobe uniformly dusky to dark. Attains 80 cm TL.



Scomberoides tala, 47 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Pakistan to Oman and East Africa, and to India and Sri Lanka; elsewhere to Andaman Is., Gulf of Thailand, Philippines, southern Japan, Australia and Solomon Is.

REMARKS Adults inhabit warm inshore waters; usually seen swimming solitary in surface waters. Feeds mainly on fishes.

Scomberoides tol (Cuvier 1832)

Needlescaled queenfish

PLATE 13

Chorinemus tol Cuvier in Cuv. & Val. 1832: 385 (Malabar coast, India); Day 1865.

Chorinemus moadetta (non Cuvier 1831): Day 1876*.

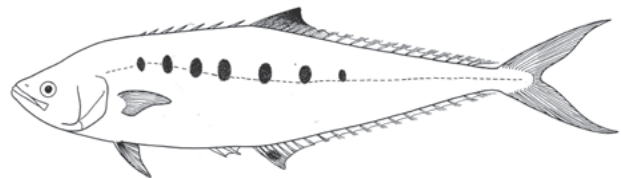
Chorinemus tala (non Cuvier 1832): Smith 1970*.

Scomberoides tol: Smith-Vaniz & Staiger 1973*; Kyushin *et al.* 1977*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.40*; Van der Elst 1988*; Randall 1995*; Heemstra & Heemstra 2004; Psomadakis *et al.* 2015*.

Scomberoides lysan (non Fabricius 1775): Whitfield 1998* [illustration is of *S. tol*].

Dorsal fins 6 or 7 spines + 1 spine, 19–21 rays; anal fin 2 + 1 spines, 18–20 rays. Maxilla extends to rear margin of pupil in adults. GR 4–7/17–20. Scales on midbody below lateral line slender, needle-like.

Body silvery, greyish brown dorsally; adults with 5–8 oval or vertically oblong black blotches, first 4 or 5 intersecting lateral line; distal half of dorsal-fin lobe abruptly and heavily pigmented. Attains 60 cm TL.



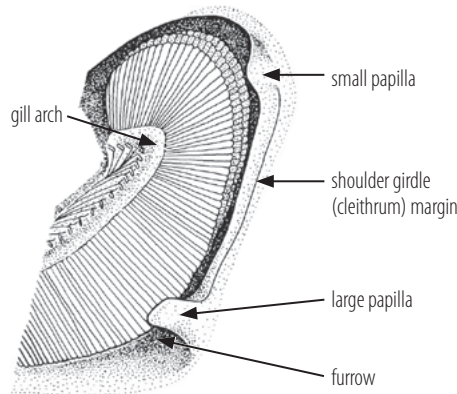
Scomberoides tol, 45 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Pakistan and Oman, Red Sea to South Africa (Mngazana, Eastern Cape), Madagascar and India to Sri Lanka; elsewhere to Indonesia, Philippines, southern Japan, Australia, Fiji, Tonga and Marquesas Is.

REMARKS Usually found in small schools near surface in coastal waters. IGFA world record 1.02 kg, Bazaruto Archipelago, Mozambique, March 2008.

GENUS *Selar* Bleeker 1851

Body fusiform, compressed; 2nd dorsal fin and anal fin without detached finlets at rear; shoulder-girdle (cleithrum) margin with furrow ventrally, and a large papilla immediately above it and a smaller papilla near upper edge. Two species, 1 in WIO.



Gill chamber of *Selar* with opercle raised.

Selar crumenophthalmus (Bloch 1793)

Bigeye scad

PLATE 14

Scomber crumenophthalmus Bloch 1793: 77, Pl. 343 (Accra, Ghana, Gulf of Guinea).

Caranx crumenophthalmus: Day 1876*.

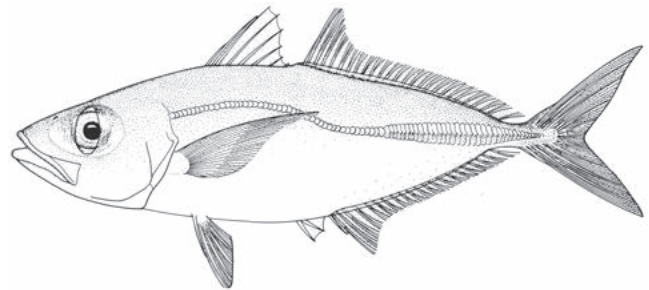
Selar crumenophthalmus: Williams 1958*; Smith & Smith 1963*, 1969*; Kyushin *et al.* 1977*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.41*; Winterbottom *et al.* 1989*; Randall 1995*; Heemstra *et al.* 2004; Fricke *et al.* 2009; Bogorodsky *et al.* 2014; Psomadakis *et al.* 2015*.

Decapterus tabl (*non* Berry 1968): Debelius 1993*.

Dorsal fins 8 spines + 1 spine, 24–27 rays; anal fin 2 + 1 spines, 21–23 rays. Adipose eyelid covering eyes except for broad oval slit centred on pupil. GR 9–12/27–31. Straight part of LL with 0–11 scales, 29–42 scutes.

Head and body metallic blue to bluish green dorsally, silvery white below; yellow stripe usually present from opercle to

upper part of peduncle; small dusky spot on edge of opercle. Attains 60 cm TL.



Selar crumenophthalmus, 27 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Circumglobal. WIO: Persian/Arabian Gulf, Red Sea, Pakistan and Oman to South Africa (KwaZulu-Natal), Seychelles, Mascarenes, Chagos, and India to Sri Lanka; elsewhere to Australia.

REMARKS Adults prefer neritic waters to clear oceanic waters around islands, to ~170 m deep. Individuals travel in compact groups of hundreds to thousands of fish. Mainly nocturnal, they disperse at night to feed on small shrimps, benthic invertebrates and foraminifera when inshore, and zooplankton and fish larvae when offshore.

GENUS *Selaroides* Bleeker 1851

Body fusiform, compressed; upper jaw strongly protractile; no teeth on upper jaw; adipose eyelid well-developed only on rear half of eye; dorsal and anal fins without detached finlets at rear. One species.

Selaroides leptolepis (Cuvier 1833)

Yellowstripe scad

PLATE 14

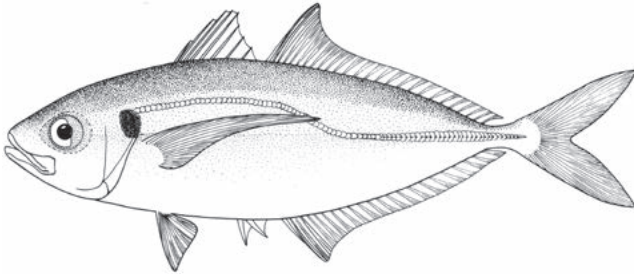
Caranx leptolepis Cuvier (ex Kuhl & Van Hasselt) *in* Cuv. & Val. 1833: 63 (Java, Indonesia); Day 1876*; Kuronuma & Abe 1986*.

Caranx bidii Day 1873: 237 (Chennai, India).

Selaroides leptolepis: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; Randall 1995*; Psomadakis *et al.* 2015*.

Diagnosis as for species. Dorsal fins 8 spines + 1 spine, 24–26 rays; anal fin 2 + 1 spines, 21–23 rays. Rear end of upper jaw concave above, rounded and produced below. Lower jaw with single series of minute teeth. Cleithrum margin smooth, without papillae. GR 10–14/27–32. Straight part of LL with 13–25 scales, 24–29 small scutes.

Body pale grey-blue dorsally, silvery white below; broad yellow stripe from upper margin of eye to peduncle; large black spot on upper edge of opercle encroaching onto shoulder. Attains ~25 cm TL.



Selaroides leptolepis, 19 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman to Pakistan, India and Sri Lanka; elsewhere to Bay of Bengal, Gulf of Thailand, Indonesia, Philippines, southern Japan, New Guinea and northern Australia.

REMARKS Adults occur inshore on continental shelf, forming large demersal schools over soft bottom, in <50 m. Occasionally enters freshwater (such as the freshwater tidal zone of the Mekong Delta). Uses a highly protractile mouth to feed on zooplankton; ostracods, gastropods and euphausiids are common prey but small fishes are also taken.

GENUS *Seriola* Cuvier 1816

Body fusiform, somewhat elongated, compressed; pectoral fins short; peduncle with grooves dorsally and ventrally; upper jaw extends to below front or middle of eye; gill rakers mostly well-developed; no scutes in lateral line. About 10 species, 3 in WIO.

KEY TO SPECIES

- 1a Upper jaw moderately slender at end, with slender supramaxilla; caudal fin yellowish; adults with moderate lateral keel on peduncle; vertebrae 11 + 14 *S. lalandi*
- 1b Upper jaw relatively broad at end, with broad supramaxilla; caudal fin dark to dusky, with paler margin; in adults, fleshy keel on peduncle absent to weakly developed; vertebrae 10 + 14 **2**

Continued ...

KEY TO SPECIES

- 2a Head often with oblique dark bar from eyes to nape; in adults, height of dorsal-fin lobe ~1.3–1.6 times greater than pectoral-fin length, 18–22% FL; GR 22–26 (excluding rudiments) (fish >20 cm FL) *S. rivoliana*
- 2b No dark bar from eyes to dorsal-fin origin; in adults, height of dorsal-fin lobe subequal to or slightly greater than pectoral-fin length, 13–18% FL; GR 11–19 (excluding rudiments) (fish >20 cm FL) *S. dumerili*

Seriola dumerili (Risso 1810)

Greater amberjack

PLATE 14

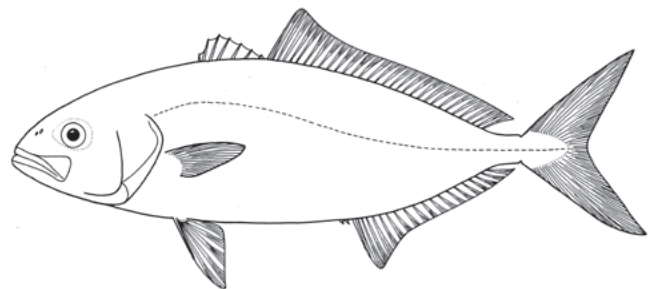
Caranx dumerili Risso 1810: 175, Pl. 6, Fig. 20 (Nice, France, Mediterranean Sea).

Seriola rhombica Smith 1959: 259, Fig. 5 (Algoa Bay, Eastern Cape, South Africa).

Seriola dumerili: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.43*; Debelius 1993*; Randall 1995*; Khalaf & Disi 1997*; Heemstra & Heemstra 2004; Psomadakis *et al.* 2015*.

Dorsal fins 7 spines (first spine minute or embedded in large adults) + 1 spine, 29–35 rays; anal fin 2 + 1 spines, 18–22 rays. In adults, height of dorsal-fin lobe equal to or slightly greater than pectoral-fin length; anal-fin base 1.4–1.7 in soft-rayed dorsal-fin base; upper jaw reaches below about middle of eye. GR 5–7/14–16 = 20–23 in juveniles; total GR 11–19 (excluding rudiments) in adults.

Body bluish grey or olive dorsally, silvery white below; midside often with amber stripe; fins mostly dusky, except pelvic fins pale, and in juveniles all fins may be yellow, olive or amber. Attains 190 cm TL (80.6 kg) (commonly 100 cm TL).



Seriola dumerili, 29 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Nearly circumglobal in tropical to warm-temperate seas, including Mediterranean Sea, but not eastern Pacific. WIO: Persian/Arabian Gulf, Oman and Pakistan to India, Red Sea to South Africa (Algoa Bay).

REMARKS Adults usually in 20–70 m, often on reefs or at deep offshore holes, solitary or in small to moderate schools. IGFA world record 74 kg, Tokyo, Japan, June 2015.

Seriola lalandi Valenciennes 1833

Yellowtail amberjack

PLATE 14

Seriola lalandi Valenciennes in Cuv. & Val. 1833: 208 (Brazil);

Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.44*;

Van der Elst 1988*; Debelius 1993* [only insert photograph is of *S. lalandi*; schooling fish are *Carangoides gymnostethus*]; Heemstra & Heemstra 2004*; Fricke *et al.* 2009.

Lichia pappei Bleeker (ex Castelnau) 1859: 65 (Kalk Bay, near Cape Town, South Africa).

Seriola banisteri Smith 1959: 256, Fig. 2 (off Hibberdene, KwaZulu-Natal, South Africa).

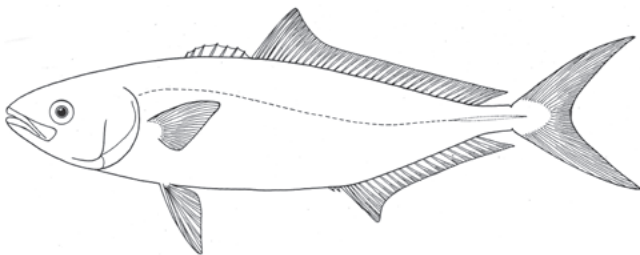
Seriola pappei: Smith 1959*; Smith & Smith 1966*.

Seriola (Regificola) pappei: Smith 1961.

Seriola (Regificola) banisteri: Smith 1961.

Dorsal fins 7 spines (first spine minute or embedded in large adults) + 1 spine, 30–35 rays; anal fin 2 + 1 spines, 19–22 rays. Upper jaw reaches below front margin of pupil. In adults, height of dorsal-fin lobe subequal or slightly less than pectoral-fin length; anal-fin base 1.6–1.8 in soft-rayed dorsal-fin base. GR 7–10/15–20 = 22–29 (excluding rudiments).

Body blue to olive dorsally, silvery white below; sometimes with narrow bronze stripe along midsides; caudal fin olive-yellow. Attains 193 cm TL, ~58 kg (commonly 100 cm TL).



Seriola lalandi, 38 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Circumglobal in subtropical to temperate seas, as a series of disjunct populations, some of which are considered to represent distinct species (Martinez-Takeshita *et al.* 2015). WIO: South Africa (Cape Point, Western Cape, to KwaZulu-Natal), Mascarenes and Walters Shoals.

REMARKS Usually found in large shoals, to ~50 m deep. Most common in Atlantic waters off Cape Peninsula, but each winter follows the pilchard migrations northward to Transkei region and KwaZulu-Natal, South Africa. A highly esteemed gamefish. South African angling record 58.5 kg; IGFA world

record 52 kg, Tauranga, New Zealand, February 1984, and White Island, New Zealand, January 1987.

Seriola rivoliana Valenciennes 1833

Almaco jack or longfin yellowtail

PLATE 14

Seriola rivoliana Valenciennes in Cuv. & Val. 1833: 207 [Greek

Archipelago]; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*;

SSF No. 210.45*; Van der Elst 1988*; Winterbottom *et al.* 1989;

Debelius 1993*; Randall 1995*; Heemstra *et al.* 2004; Heemstra &

Heemstra 2004*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Seriola songoro Smith 1959: 258, Fig. 3 (Knysna, South Africa);

Smith & Smith 1966*, 1969*; Kyushin *et al.* 1977*.

Seriola (Bupthalmus) bovinoculata Smith 1959: 259, Fig. 4 (Pinda,

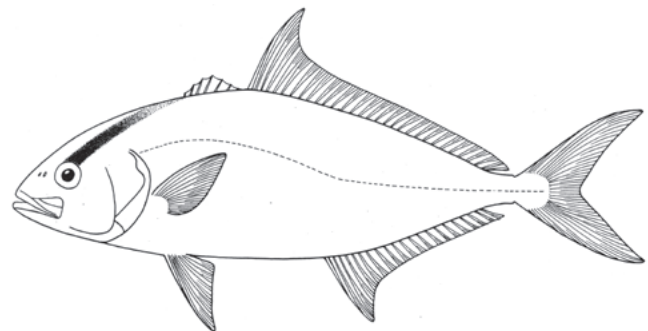
Mozambique); Smith & Smith 1969*.

Seriola (Bupthalmus) songoro: Smith 1961.

Seriola bonariensis: Smith & Smith 1966*.

Dorsal fins 7 spines (first spine minute or embedded in large adults) + 1 spine, 27–33 rays; anal fin 2 + 1 spines, 18–22 rays. Upper jaw reaches below midpoint of pupil. In adults, height of dorsal-fin lobe 1.3–1.6 times greater than pectoral-fin length; anal-fin base 1.5–1.6 in soft-rayed dorsal-fin base. GR 6–9/17–20 = 24–29 in juveniles, GR 22–26 (excluding rudiments) in adults.

Body olive to bluish green dorsally, sides and belly paler, and sometimes with brassy or lavender reflections; oblique dark bar from eyes to nape; faint amber stripe frequently present along midsides; fins mostly dark, except pelvic-fin membranes pale. Attains 160 cm TL.



Seriola rivoliana, 39 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Circumglobal and widespread in tropical to warm-temperate seas, including Mediterranean Sea. WIO: Pakistan to India and Sri Lanka, Gulf of Oman, Kenya to South Africa (Knysna), Mascarenes, Chagos, and likely at Seychelles.

REMARKS Adults pelagic and epibenthic, usually in 30–35 m, and rarely caught in inshore waters. IGFA world record 59.9 kg, La Paz, Baja California, Mexico, July 1964.

GENUS *Seriolina* Wakiya 1924

Body elongate, moderately shallow and slightly compressed, with blunt snout; peduncle with grooves dorsally and ventrally; rear end of maxilla broadly rounded and reaching to below rear margin of eye; no scutes in lateral line. One species.

Seriolina nigrofasciata (Rüppell 1829)

Blackbanded trevally

PLATE 14

Nomeus nigrofasciatus Rüppell 1829: 92, Pl. 24, Fig. 2 (Massawa, Eritrea, Red Sea).

Seriola nigrofasciata: Day 1876*.

Zonichthys nigrofasciata: Williams 1958; Kyushin *et al.* 1977*.

Seriolina nigrofasciata: Smith 1959*, 1961; Smith & Smith 1969;

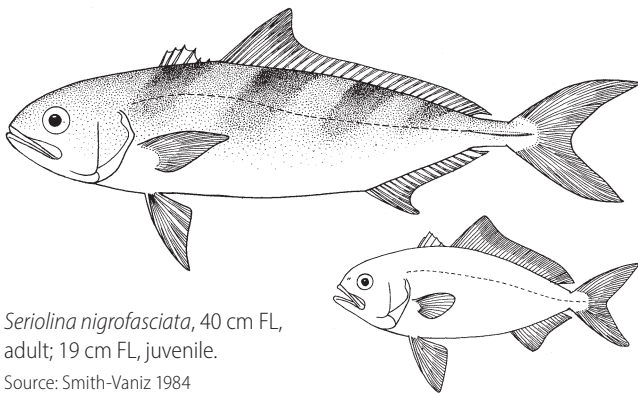
Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.46*;

Van der Elst 1988*; Randall 1995*; Khalaf & Disi 1997*; Fricke *et al.*

2009; Bogorodsky *et al.* 2014; Psomadakis *et al.* 2015*.

Diagnosis as for genus. Dorsal fins 7 or 8 spines (rear spines minute or embedded in large adults) + 1 spine, 30–37 rays; anal fin 1 (usually embedded) + 1 spine, 15–18 rays. In adults, height of dorsal-fin lobe slightly greater than pectoral-fin length; anal-fin base 2.1–2.3 in soft-rayed dorsal-fin base. GR 1 or 2/5–8 (mostly rudiments).

Body bluish grey to black dorsally, dusky to white below; spinous dorsal fin black, soft-rayed dorsal and anal fins dusky brown, lobe tips white; pelvic fins and caudal fin yellowish brown to black; young with 5–7 dark, oblique blotches or broken bands on upper body, fading with age. Attains 70 cm TL.



Seriolina nigrofasciata, 40 cm FL, adult; 19 cm FL, juvenile.

Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Pakistan to India and Sri Lanka, Red Sea, Oman to South Africa (Algoa Bay), Seychelles and Mascarenes; elsewhere to Philippines, southern Japan, New Guinea and Australia.

REMARKS Generally solitary, preferring offshore reefs. An excellent food fish. South African angling record 5.2 kg.

GENUS *Trachinotus* Lacepède 1801

Body ovate to elongated and compressed, snout blunt to broadly rounded; bases of anal-fin and soft-rayed dorsal-fin subequal; teeth, if present, in narrow band on both jaws; no scutes in lateral line. About 20 species, 5 in WIO.

KEY TO SPECIES

- 1a One to 5 dark spots in row on or near lateral line (no spots in fish <10–13 cm FL); dorsal fin 21–25 rays 2
- 1b No spots on body; dorsal fin 18–20 rays (except 21–24 rays in *T. africanus*) 3
- 2a In adults, anterior 2 spots on sides larger than eye, and most spots above lateral line; lower GR 11–15 (fish >25 cm FL); pelvic fins 1.5–1.7 in pectoral-fin length; dorsal-fin lobe subequal to or longer than anal-fin lobe *T. botla*
- 2b In adults, all spots equal to or smaller than eye, and about half the spots below lateral line; lower GR 15–19 (fish >25 cm FL); pelvic fins 1.9–2.3 in pectoral-fin length; dorsal-fin lobe consistently shorter than anal-fin lobe *T. baillonii*
- 3a Dorsal fin 21–24 rays; anal fin 19–21 rays; black oval-shaped blotch in pectoral-fin axil *T. africanus*
- 3b Dorsal fin 18–20 rays; anal fin 16–18 rays; no black blotch in pectoral-fin axil 4
- 4a Anal-fin lobe dusky orange, with brown leading edge; in adults, supraoccipital bone (on dorsal midline of skull) thin and blade-like; in adults 1st supraneural bone (below midline of nape) oval or inverted tear-shaped *T. blochii*
- 4b Anal-fin lobe yellow; in adults, supraoccipital bone (on dorsal midline of skull) broad and sausage-shaped; in adults, shape of 1st supraneural bone not as above *T. mookalee*

Trachinotus africanus Smith 1967

African pompano

PLATES 14 & 15

Trachinotus africanus Smith 1967: 160, Pls. 34–35 (Knysna, South Africa);

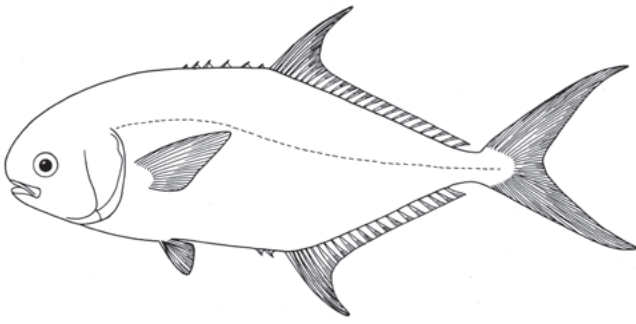
Van der Elst 1988*; Heemstra & Heemstra 2004*; Psomadakis *et al.* 2015*.

Trachinotus blochii (non Lacepède 1801): Smith & Smith 1966*; Smith-Vaniz

1984*, 1999*; SSF No. 210.47*; Van der Elst 1988*; Randall 1995*.

Dorsal fins 4 spines + 1 spine, 21–24 rays; anal fin 2 + 1 spines, 19–21 rays. Tongue with narrow patch of teeth (absent in large adults). First 2 supraneural bones similarly shaped; in adults, supraoccipital bone (on dorsal midline of skull) thin and blade-like. GR 7–10/11–14.

Adults bluish silvery dorsally, silvery white below; anal-fin lobe yellow; caudal fin and paired fins yellowish. Attains 90 cm TL (~9 kg).



Trachinotus africanus, 61 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indian Ocean. WIO: Pakistan, Gulf of Oman, Gulf of Aden, Mozambique (Maputo Bay) to South Africa (Knysna); elsewhere, western Indonesia (Bali: one record).

REMARKS Found in shallow coastal areas, usually around reefs or rocky outcrops, in 20–50 m; young in sheltered bays. Its disjunct distribution may reflect limited availability of preferred habitat. Durban Aquarium fish reported to have exceeded 25 kg. IGFA world record 6.23 kg, Karachi, Pakistan, February 2004.

Trachinotus baillonii (Lacepède 1801)

Smallspotted pompano

PLATE 15

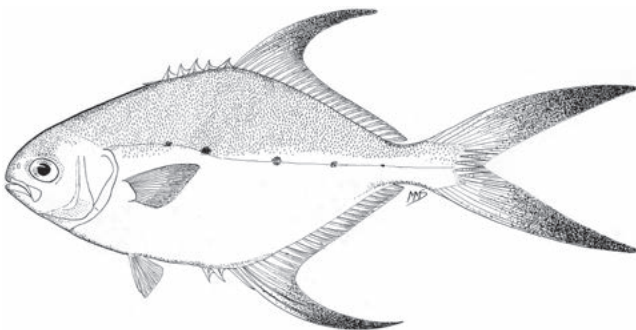
Caesiomorus baillonii Lacepède (ex Commerson) 1801: 92, 93, Pl. 3, Fig. 1 [Fort Dauphin, Madagascar].

Trachynotus baillonii: Day 1865, 1876*.

Trachinotus baillonii: Williams 1958*; Smith 1967*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.48*; Winterbottom *et al.* 1989*; Debelius 1993*; Randall 1995*; Heemstra & Heemstra 2004; Fricke *et al.* 2009; Hussain & Jawad 2014; Psomadakis *et al.* 2015*.

Dorsal fins 6 spines + 1 spine, 20–24 rays; anal fin 2 + 1 spines, 20–24 rays. GR 7–13/15–19.

Adults silvery blue to grey dorsally, silvery white below; sides with 1–5 small black spots in longitudinal row on or near lateral line, spots equal to or smaller than eye diameter (no spots in fish <15 cm TL, number of spots generally increasing with age); median fins grey to black, lobes usually darkest. Attains 75 cm TL (~3 kg).



Trachinotus baillonii, 31 cm TL (WIO). Source: SFSA

DISTRIBUTION Indo-Pacific. WIO (widespread): Persian/Arabian Gulf, Pakistan and India to Sri Lanka, Red Sea to East Africa, Madagascar, Mascarenes, Seychelles and Chagos; elsewhere to southern Japan, Marshall Is., Australia, Tonga, Rapa Iti and Line Is.

REMARKS Inhabits coastal waters; usually found in surge zone along sandy beaches.

Trachinotus blochii (Lacepède 1801)

Snubnose pompano

PLATE 15

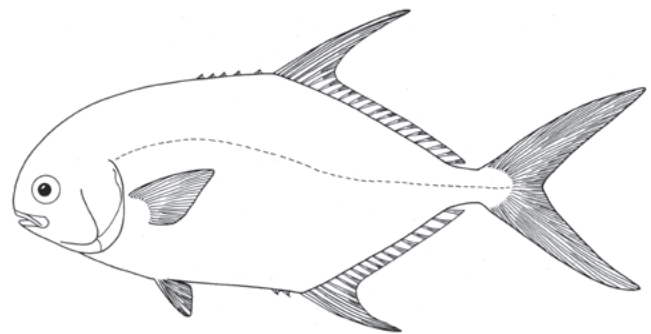
Caesiomorus blochii Lacepède (ex Commerson) 1801: 92, Pl. 3, Fig. 2 (locality not stated [Fort Dauphin, Madagascar]).

Trachinotus ovatus (non Linnaeus 1755): Day 1865, 1876*.

Trachinotus blochii: Williams 1958*; Smith 1967*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; SSF No. 210.49*; Van der Elst 1988*; Debelius 1993*; Randall 1995*; Heemstra & Heemstra 2004; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 6 spines + 1 spine, 18–20 rays; anal fin 2 + 1 spines, 16–18 rays. No teeth on tongue. First predorsal bone oval or inverted tear-shaped; in adults, supraorbital bone (on dorsal midline of skull) thin and blade-like. GR 5–8/8–10.

Body generally silvery, paler ventrally; large adults sometimes golden orange, especially on lower half of body; anal fin dusky to orange, leading edge brownish; pelvic fins white to dusky orange; pectoral fins and caudal fin dark or orangish. Attains 70 cm TL (~5 kg).



Trachinotus blochii, 69 cm TL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Pakistan and India to Sri Lanka, Red Sea, Oman to South Africa (KwaZulu-Natal), Madagascar, Seychelles and throughout Indian Ocean; elsewhere to Taiwan, southern Japan, Mariana Is., Marshall Is., Solomon Is., Australia, New Caledonia, Norfolk I., Fiji, and Tonga.

REMARKS Australian National Sportfishing Association record 6.8 kg, Cleveland Bay, Townsville, Australia, July 2011; IGFA world record 5.05 kg, Shimajiri, Okinawa, Japan, October 2014.

Trachinotus botla (Shaw 1803)

Largespotted pompano

PLATE 15

Scomber botla Shaw 1803: 591 (Visakhapatnam, India) [composite species based primarily on Russell's Fig. 142 of 'botla-parah'].

Trachinotus russelii Cuvier 1832: 436 (Puducherry, India [based on Russell's fig. of 'botla-parah']); Williams 1958*; Smith 1967*; Smith-Vaniz 1984*.

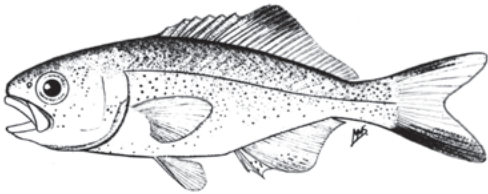
Trachinotus russelii: Day 1876*.

Palinurichthys umhlangae Smith 1949: 304, Fig. 849b (Umhlanga, KwaZulu-Natal, South Africa).

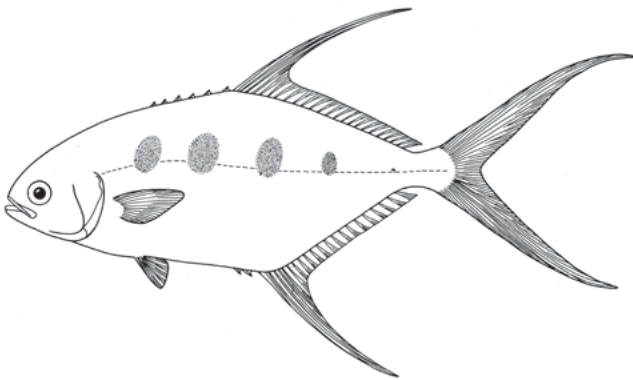
Trachinotus botla: SSF No. 210.50*; Van der Elst 1988*; Randall 1995*; Smith-Vaniz 1999*; Heemstra & Heemstra 2004*; Psomadakis *et al.* 2015*.

Dorsal fins 6 spines + 1 spine, 22–24 rays; anal fin 2 + 1 spines, 19–22 rays. GR 6–9/11–15.

Adults silvery bluish black dorsally, silvery below; sides with 1–5 large purplish grey spots along or near lateral line, 2 anterior spots larger than eye (no spots on fish <15 cm TL, the number of spots generally increasing with age); median fins dusky to blue-black, lobes usually darker. Attains 75 cm TL.



Trachinotus botla, 4 cm TL, juvenile holotype of *Palinurichthys umhlangae* (South Africa). Source: Smith 1949



Trachinotus botla, ~35 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indian Ocean. WIO: Pakistan, Kenya to South Africa (Algoa Bay, Eastern Cape), Madagascar, Seychelles, India and Sri Lanka; elsewhere to Western Australia.

REMARKS Inhabits coastal waters, often preferring the rough surge zone along sandy beaches. The eastern Australian *Trachinotus coppingeri* Günther 1884 is a closely related endemic species. Validation and priority of *Scomber botla* is based on the action of Day (1876: 233) who as first reviser listed it as a synonym of *Trachinotus russelii*.

Trachinotus mookalee Cuvier 1832

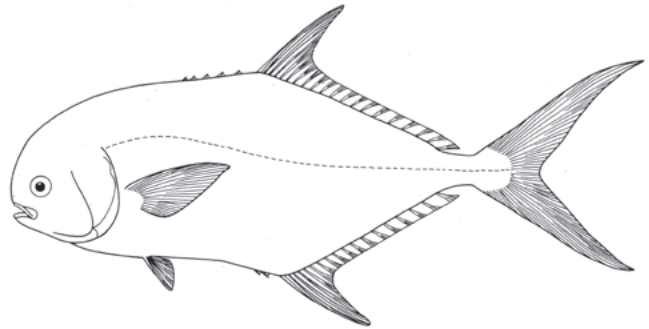
Indian pompano

PLATE 16

Trachinotus mookalee Cuvier in Cuv. & Val. 1832: 423 (Malabar coast, India); Smith-Vaniz 1984*, 1999*; Randall 1995*; Psomadakis *et al.* 2015*.

Dorsal fins 6 spines + 1 spine, 18–20 rays; anal fin 2 + 1 spines, 16–18 rays. In adults, supraoccipital bone (on dorsal midline of skull) broad and sausage-shaped in profile; 1st predorsal bone shaped as inverted 'L' with the arm projecting anteriorly. Tongue with narrow band of teeth (except absent in large adults). GR 5–8/8–10.

Body generally silvery, paler ventrally; large adults sometimes mostly golden orange, especially on lower half of body; anal fin dusky to bright yellow; pelvic fins pale yellow to white; pectoral fins and caudal fin dusky or yellow. Attains 90 cm TL (~8 kg).



Trachinotus mookalee, 59 cm FL. Source: Smith-Vaniz 1984

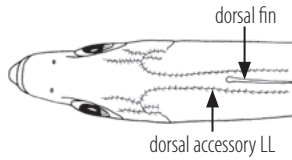
DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf to Pakistan, India and Sri Lanka; elsewhere to Gulf of Thailand and South China Sea.

GENUS *Trachurus* Rafinesque 1810

Body fusiform, moderately elongate, compressed; scales in curved part of lateral line scute-like, expanded dorsoventrally; cleithrum margin smooth. Twelve species, 3 in WIO.

KEY TO SPECIES

- 1a Dorsal accessory lateral line ends below dorsal-fin ray 16–30;
GR 64–74 *T. trachurus*



- 1b Dorsal accessory lateral line ends below dorsal-fin spine 5–9;
GR 53–63 2

- 2a First scute of lateral line below vertical at dorsal-fin ray 3–6 (rarely at 6th); dorsal accessory lateral line ends below dorsal-fin spine 5–9; scales and scutes in inflection area of lateral line not noticeably smaller than those in curved part *T. delagoa*

- 2b First scute of lateral line below vertical at dorsal-fin ray 7–11; dorsal accessory lateral line ends below dorsal-fin spine 7–9 (typically at 9th); scales and scutes in inflection area of lateral line noticeably smaller than those in curved part *T. indicus*

Trachurus delagoa Nekrasov 1970

African scad

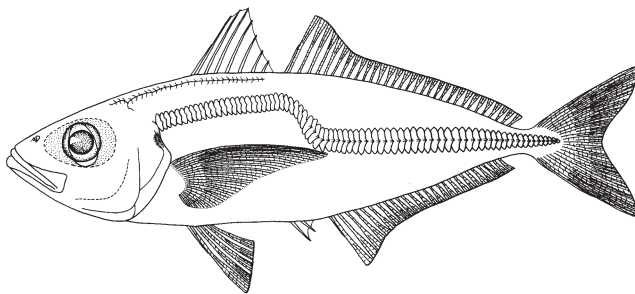
PLATE 16

Trachurus delagoa Nekrasov 1970: 96, Fig. (Maputo Bay, Mozambique; Madagascar; Durban, KwaZulu-Natal, South Africa; Saya de Malha Bank); Nekrasov 1978; Smith-Vaniz 1984*; SSF No. 210.51*; Heemstra & Heemstra 2004.

Trachurus margaritae Berry & Cohen 1974: 191, Fig. 2 (Durban, KwaZulu-Natal, South Africa).

Dorsal fins 8 spines + 1 spine, 28–32 rays; anal fin 2 + 1 spines, 24–28 rays. GR 13–16/39–45. Dorsal accessory lateral line ends below dorsal-fin spine 5–9; curved LL with 28–34 enlarged scute-like scales (in large adults, may become obscured by overgrowth of smaller body scales); straight LL with 35–41 scutes.

Body dark blue dorsally, silvery below; anal fin and pectoral fins pale yellow; pelvic fins white or hyaline; caudal fin dark grey; black spot on upper edge of opercle. Attains 35 cm TL.



Trachurus delagoa, 17 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION WIO: Mozambique (Beira) to South Africa (south coast), Saya de Malha Bank, Madagascar and Walters Shoals.

REMARKS Demersal on sandy bottom, from nearshore to ~400 m deep; migrates to surface at night.

Trachurus indicus Nekrasov 1966

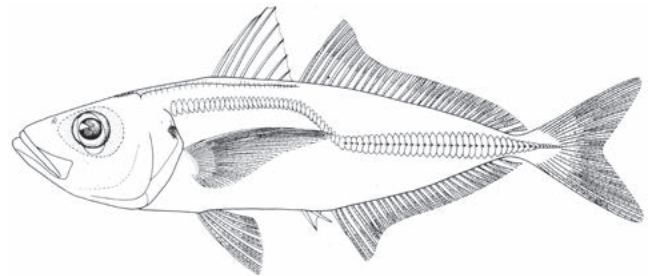
Indian scad

PLATE 16

Trachurus mediterraneus indicus Nekrasov 1966: 141, Fig. (Gulf of Aden).

Trachurus indicus: Nekrasov 1978; Smith-Vaniz 1984*; Randall 1995*; Carpenter *et al.* 1997; Khalaf & Disi 1997*; Psomadakis *et al.* 2015*.

Dorsal fin 8 spines + 1 spine, 28–35 rays; anal fin 2 + 1 spines, 24–30 rays. GR 13–17/39–47. Dorsal accessory lateral line ends below dorsal-fin spine 7–9 (usually at 9th); curved lateral line with enlarged scute-like scales (in large adults, may become obscured by overgrowth of smaller body scales); curved LL with 33–41 scales and scutes, straight LL with 33–40 scutes. Body bluish green to nearly black above, silvery to white below; black spot on edge of opercle. Attains 35 cm TL.



Trachurus indicus, 13 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION WIO: Persian/Arabian Gulf, Pakistan and Oman, Gulf of Aden and Red Sea (including Gulf of Suez and Gulf of Aqaba), Somalia and Saya de Malha Bank.

REMARKS Demersal on continental shelf, in 200–400 m; occurs in waters where oxygen saturation is >30% and temperature is >20 °C. Mature at 1 year, ~10 cm TL. Recent anti-Lessepsian migrant into the Red Sea via the Suez Canal.

Trachurus trachurus (Linnaeus 1758)

European horse mackerel

PLATE 16

Scomber trachurus Linnaeus 1758: 298 (Mediterranean Sea).

Trachurus capensis Castelnau 1861: 43 (Cape of Good Hope, South Africa); Van der Elst 1981*.

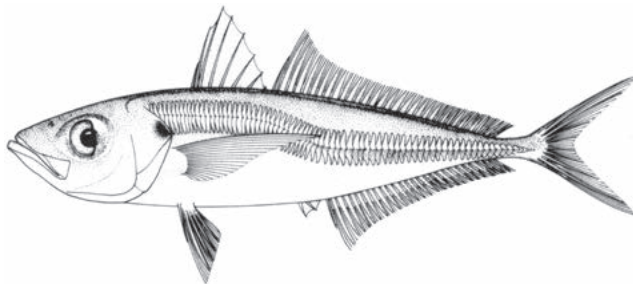
Selar tabulae Barnard 1927: 538 (Table Bay, South Africa).

Trachurus trachurus: Smith & Smith 1966*; SSF No. 210.52*; Van der Elst 1988*; Heemstra & Heemstra 2004*.

Trachurus trachurus capensis: Nekrasov 1978; Hecht 1990.

Dorsal fins 8 spines + 1 spine, 30–36 rays; anal fin 2 + 1 spines, 24–32 rays. GR 16–20/47–55. Dorsal accessory lateral line ends below dorsal-fin ray 16–30; curved LL with 30–39 enlarged scute-like scales (in large adults, may become obscured by overgrowth of smaller body scales); straight part of LL with 32–39 scutes (South African specimens).

Body bluish green, grey or nearly black dorsally, silvery white below; black spot on edge of opercle. Attains 70 cm TL.



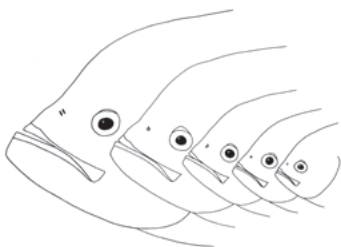
Trachurus trachurus, 34 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Eastern Atlantic (Norway to Cape of Good Hope, South Africa) to southwestern Indian Ocean (South Africa to southern Mozambique), and Baltic Sea, North Sea, Mediterranean Sea and Black Sea. IUCN Red List conservation status Vulnerable globally.

REMARKS Of significant importance to the trawl fishery in southern Africa, particularly on the west coast; also considered excellent bait for larger gamefish. Mature at ~20 cm TL, 3 years. Feeds almost entirely on zooplankton, primarily euphausiids. Some authors (e.g., Cárdenas *et al.* 2005) consider the South African population to be a separate species, *T. capensis*, based on molecular data, but more research is required to support that conclusion.

GENUS *Ulua* Jordan & Snyder 1908

Body orbicular, to slightly elongate posteriorly, and strongly compressed; gill rakers extremely long (projecting into mouth alongside tongue) and numerous, lower GR 51–61; lower jaw becomes thick and prominent in large adults. Two species recognised; *Citula aurochs* Ogilby (1915) from the western Pacific is considered congeneric.



Change of head profile of *Ulua mentalis* with growth. Source: Smith-Vaniz 1984

Ulua mentalis (Cuvier 1833)

Longrakered trevally

PLATE 16

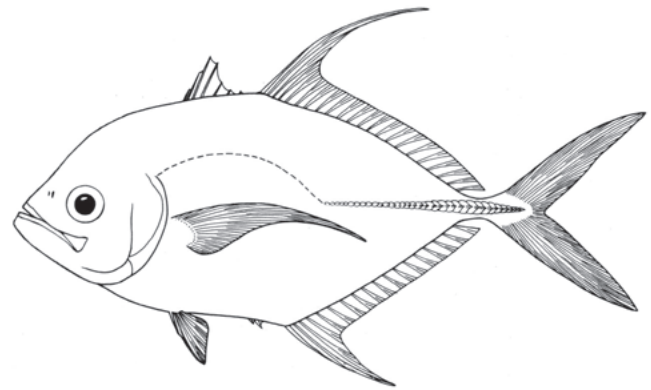
Caranx mentalis Cuvier (ex Ehrenberg) in Cuv. & Val. 1833: 124 (Massawa, Eritrea, Red Sea).

Ulua mandibularis: Williams 1958; Smith & Smith 1969*.

Ulua mentalis: Smith 1972*; Smith-Vaniz 1984*, 1999*; SSF No. 210.53*; Randall 1995*.

Dorsal fins 8 spines + 1 spine, 21 or 22 rays; anal fin 2 + 1 spines, 17 or 18 rays. Lower jaw becomes very prominent in large adults; dorsal-fin lobe very long in juveniles, extending to tip of caudal-fin upper lobe. GR 23–27/51–61. Breast naked to behind pelvic-fin origins and laterally to pectoral-fin bases; straight part of LL with 0–5 scales, 26–38 scutes.

Body bluish green dorsally, silvery below. Attains 100 cm TL.



Ulua mentalis, 27 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea, Oman to East Africa and Madagascar, and eastwards to India and Sri Lanka; elsewhere to Indonesia, Philippines, Taiwan, Japan and northern Australia.

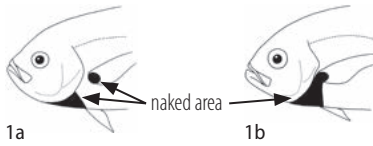
REMARKS Adults found in shallow coastal waters near reefs. Juveniles feed on benthic crustaceans; adults feed on crustaceans and fishes.

GENUS *Uraspis* Bleeker 1855

Body oblong and compressed; tongue, roof and floor of mouth white, the rest of mouth dark. Two or 3 species, at least 2 in WIO.

KEY TO SPECIES

- 1a Naked area of breast separated from naked pectoral-fin bases by broad band of scales *U. helvola*
 1b Breast entirely naked to pelvic-fin origins and to pectoral-fin bases *U. uraspis*

*Uraspis helvola* (Foster 1801)

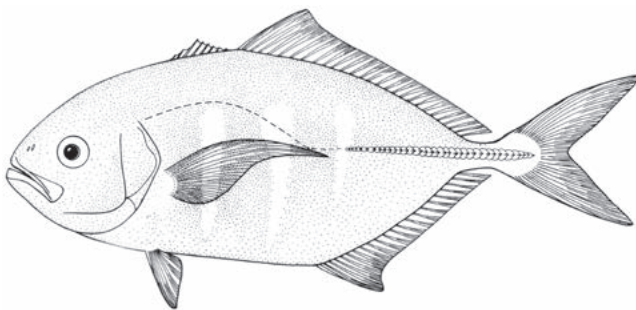
Whitetongue jack

PLATE 16

- Scomber helvolus* Foster in Bloch & Schneider 1801: 35 (Ascension I.).
Caranx micropterus Rüppell 1836: 46, Pl. 13, Fig. 1 (Jeddah, Saudi Arabia, Red Sea).
 ?*Caranx secundus* Poey 1860: 223 (Cuba, western Atlantic); Smith-Vaniz 1986*.
 ?*Uraspis wakiyai* Williams 1961: 66, Fig. 1, Pl. 4 (off Tanzania).
Uraspis helvola: Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*;
 Randall 1995*; Carpenter *et al.* 1997*; Bogorodsky *et al.* 2014;
 Psomadakis *et al.* 2015*.

Dorsal fins 8 spines (several spines embedded and not apparent in all but very young fish) + 1 spine, 25–30 rays; anal fin 2 + 1 spines (first 2 spines embedded in all but very young fish), 19–22 rays. GR 5–8/13–17. Breast naked to pelvic-fin origins, laterally separated from naked pectoral-fin bases by broad band of scales; straight part of LL with spines of some scutes directly anteriorly (antrorse) in juveniles and small adults.

Adults uniformly dark grey to bluish black, juveniles with 6 or 7 wide dark bars with pale interspaces; pelvic fins black in fish <10 cm FL, becoming whitish at larger sizes; tongue, roof and floor of mouth white or cream coloured, rest of mouth blue-black. Attains 58 cm TL.



Uraspis helvola, 29 cm FL. Source: Smith-Vaniz 1984

DISTRIBUTION Possibly nearly circumglobal in tropical to subtropical seas, including offshore islands of Atlantic and eastern Pacific. WIO: Persian/Arabian Gulf, Red Sea, Pakistan and Oman to South Africa (Algoa Bay, Eastern Cape), and India to Sri Lanka.

REMARKS Oceanic and pelagic; found at surface and also benthic, usually in small schools. Some records of *U. helvola* might actually refer to *U. secunda* (Poey 1860). If the very similar *U. secunda* is not a separate species, distribution includes both sides of the Atlantic and widely scattered Indo-Pacific localities, including Japan, Australia, Tonga and Hawaii.

Uraspis uraspis (Günther 1860)

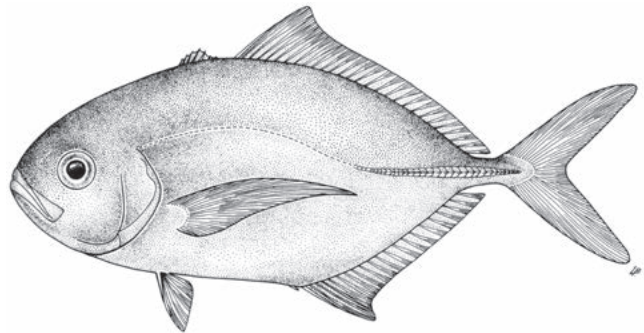
Whitemouth jack

PLATE 17

- Caranx uraspis* Günther 1860: 444 (Ambon I., Moluccas, Indonesia) [replacement name for *Uraspis carangoides* Bleeker 1855].
Caranx gupta Chaudhuri 1909: 141, Fig. 1 (off Elephant Point, Bangladesh).
Uraspis uraspis: Smith 1962*; Masuda *et al.* 1984*; Smith-Vaniz 1984*, 1999*; Fricke *et al.* 2009; Psomadakis *et al.* 2015*.

Dorsal fins 8 spines + 1 spine (several spines embedded and not apparent in all but very young), 25–30 rays; anal fin 2 + 1 spines (first 2 embedded in all but very young), 17–22 rays. GR 5–7/13–16. Breast entirely naked to pelvic-fin origins and laterally to pectoral-fin bases; straight part of LL with spines of some scutes directly anteriorly (antrorse) in juveniles and small adults.

Adults uniformly dark grey to bluish black; juveniles with 6 or 7 wide dark bands with pale interspaces; pelvic fins whitish with distal third black (in fish ~13 cm FL), becoming entirely pale at larger sizes; tongue, roof and floor of mouth white or cream coloured, rest of mouth blue-black. Attains at least 40 cm TL.



Uraspis uraspis, 23 cm FL. © Food and Agriculture Organization of the United Nations, Original Scientific Illustrations Archive; reproduced with permission

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Persian/Arabian Gulf, Pakistan, India and Sri Lanka, and Réunion; elsewhere to Bay of Bengal, Indonesia, Philippines, Thailand, southern Japan, northern Australia and Hawaii.

REMARKS Adults occur in schools over continental shelf, at 50–130 m. Feeds on epibenthic crustaceans and cephalopods.

GLOSSARY

- congeneric** – of the same genus.
conspecific – of the same species.

FAMILY CORYPHAENIDAE

Dorado or dolphinfishes

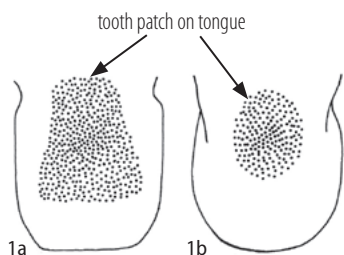
Phillip C Heemstra

Body elongate and compressed; dorsal fin long and continuous, with 48–66 rays, anterior rays twice length of posterior rays, fin origin on head; anal fin with 24–30 rays, anal-fin base about half dorsal-fin base; pectoral fins shorter than HL; caudal fin deeply forked. Adult males have bony crest on head, with head profile very steep and head depth greater than head length. Mouth terminal, with lower jaw protruding slightly, upper jaw reaching to below eye; bands of villiform teeth on jaws, vomer, palatines and tongue. Nostrils small, close-set, halfway between eyes and front of snout. Body covered with minute, thin, cycloid scales.

Dorado are true epipelagic fishes, at home in the open ocean, and rarely venture near land. Valuable food fishes, much esteemed by anglers and spearfishers. One genus, *Coryphaena* Linnaeus 1758, with 2 species, both in WIO.

KEY TO SPECIES

- 1a Body depth >25% SL; pectoral fins ~½ HL; tooth patch on tongue squarish *C. equiselis*
 1b Body depth <25% SL; pectoral fins >½ HL; tooth patch on tongue oval *C. hippurus*



Coryphaena equiselis Linnaeus 1758

Pompano dolphinfish

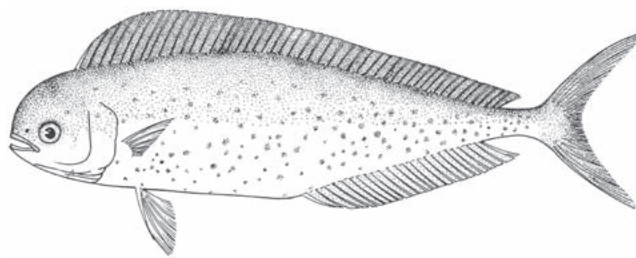
PLATE 17

Coryphaena equiselis Linnaeus 1758: 261 (open ocean); Gibbs & Collette 1959*; Shcherbachev 1973; Palko *et al.* 1982; SSF No. 211.1*; Winterbottom *et al.* 1989; Randall 1995*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004.

Dorsal fin 52–59 rays; anal fin 23–29 rays, fin margin straight or convex; pectoral fins 18–21 rays. Body depth greatest at anus, 3.4–3.9 in SL (adults); HL 4.5–5.3 in SL; pectoral fins distinctly shorter than pelvic fins, 12–13% FL. Jaws, vomer and palatines with band of villiform teeth; tongue with broad trapezoidal

patch of teeth, anterior width of tooth patch >½ width of tongue. GR 0–2/8–11. LL scales 155–210. Vertebrae 33.

Adults brilliant blue-green dorsally, sides silvery with golden sheen, and numerous small dark spots; dorsal fin uniformly dark; juveniles uniformly dark or dark and mottled with vertical series of silvery blotches and spots. Attains 75 cm FL.



Coryphaena equiselis, 50 cm TL. © Food and Agriculture Organization of the United Nations, Original Scientific Illustrations Archive; reproduced with permission

DISTRIBUTION Circumglobal in tropical oceanic waters but may enter coastal waters. WIO: Red Sea to Tanzania, northern Madagascar, Mascarenes, Chagos, Maldives and Sri Lanka.

REMARKS Less important to commercial fisheries than *C. hippurus*.

Coryphaena hippurus Linnaeus 1758

Dorado or common dolphinfish

PLATE 17

Coryphaena hippurus Linnaeus 1758: 261 (open ocean); Gibbs & Collette 1959*; Shcherbachev 1973; Palko *et al.* 1982; SSF No. 211.2*; Winterbottom *et al.* 1989; Randall 1995*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

Dorsal fin 58–66 rays; anal fin 25–30 rays; pectoral fins 18–21 rays. Body depth greatest just behind head, tapering gradually towards peduncle, 4.2–4.8 in FL (adults); HL 4.5–5 in FL; front half of anal-fin margin concave; pectoral fins subequal to pelvic fins, 15–18% FL. Jaws, vomer and palatines with band of villiform teeth; tongue with small oval patch of teeth, width of tooth patch <½ width of tongue. GR 0–2/7–12. LL scales 215–300. Vertebrae 31.

Head and body iridescent blue-green dorsally, golden yellow below, with numerous small blue-green spots; dorsal fin blackish, with pale blue spots; small juveniles (<15 cm SL) dark, with ~15 black bars that extend onto dorsal and anal fins. The live adult fish is incredibly beautiful, with waves of colour coursing over the head, body and fins; after death, the colours fade to a dull silvery blue-green and yellow. Attains at least 2 m TL (180 cm FL), ~46 kg.



Coryphaena hippurus, 92 cm TL (South Africa). Source: SSF

DISTRIBUTION Circumglobal in tropical to warm-temperate seas, including Mediterranean Sea and Red Sea; recorded from continental localities and oceanic islands generally between 30° N and 30° S. WIO: Oman to South Africa (False Bay), all WIO islands, India and Sri Lanka.

REMARKS Epipelagic and schooling in open ocean; adults and juveniles often associated with drifting seaweed and other floating objects. Fast-swimming predators that feed on a variety of fishes (flying fishes, snake mackerels [*Nealotus tripes*], frigate mackerel, carangids, triggerfishes, filefishes, pufferfishes, etc.) and squid. Much of the prey are small fishes located under *Sargassum* seaweed and other drifting objects; occasionally visits reefs in deep water to prey on triggerfishes, wrasses, damselfishes and other reef fishes. Most feeding is during the day but may also occur on bright moonlit nights. Spawns in pairs throughout the year, with a peak in summer. Fast-growing, with mature one-year-old females 65–70 cm FL, and one-year-old males 75–80 cm FL; short-lived, to ~4 years. A highly commercial species, valued as a sport and food fish. IUCN Red List conservation status Least Concern.

FAMILY RACHYCENTRIDAE

Cobia

Phillip C Heemstra

Body elongate, subcylindrical; head depressed, broad, interorbital width much greater than eye diameter; upper jaw not protrusile, lower jaw protruding slightly. Dorsal fin with 7–9 short, stout, isolated spines, each with separate membrane, followed by 1 spine and 26–33 rays; anal fin with 1 or 2 weak embedded spines, 22–28 rays; pectoral fins pointed, asymmetric, shorter than head, with 19 or 20 rays, upper rays longest; caudal fin lunate in adults, truncate to rounded in juveniles. Bands of

villiform teeth on jaws, vomer, palatines and tongue. No spines on opercle or preopercle. Branchiostegal rays 7, membranes separate and free from isthmus. Lateral line complete but inconspicuous. Scales minute, embedded in thick skin.

Monotypic genus *Rachycentron* Kaup 1826.

Rachycentron canadum (Linnaeus 1766)

Prodigal son or cobia

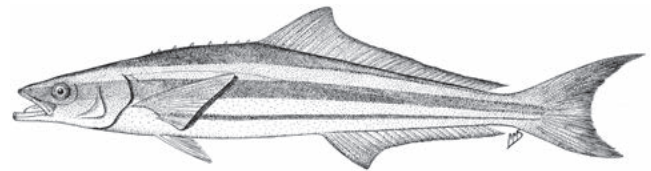
PLATE 17

Gasterosteus canadus Linnaeus (ex Garden) 1766: 491
(South Carolina, USA).

Rachycentron canadum: Smith 1980; Van der Elst 1981*; SSF No. 212.1*; Heemstra & Heemstra 2004*.

Body depth less than HL, 5–6 in SL; GR 2/8–10; LL scales >300. Vertebrae 12 + 13.

Body dark brownish, pale ventrally, with silvery band from head to caudal fin (2 bands in juveniles); outer edges of caudal fin occasionally white. Attains 2 m FL, ~68 kg.



Rachycentron canadum, 120 cm TL (South Africa). Source: SSF

DISTRIBUTION Circumglobal, but mainly continental, in tropical to temperate seas, except eastern Pacific; including Persian/Arabian Gulf, Red Sea and strays to Mediterranean Sea.

REMARKS Caught offshore over continental shelf, often near reefs and wrecks; occasionally seen swimming near whale sharks with remoras of similar appearance. Eggs planktonic; in WIO, adults migrate to South Africa mainly during summer, occasionally reaching False Bay. Eats crustaceans (mainly swimming crabs, prawns and stomatopods) and squid. Although parasitic worms are often found in the stomach, it is a good food fish. A highly esteemed sportfish that fights gamely. Females grow larger than males, and are mature at 85–110 cm FL, age 2 years; males mature in one year, at 52–60 cm FL.

FAMILY ECHENEIDAE

Remoras

Phillip C Heemstra

Body robust, fusiform to slender, and much elongated; head flattened on top, with a laminated sucking disc by which the remora attaches to a host (sharks, batoids, bony fishes, turtles, cetaceans, ships, etc.); the peculiar cephalic sucking disc is homologous with and represents a greatly modified spinous dorsal fin. Dorsal and anal fins long-based, opposite one another on rear half of body; pectoral-fin bases midlateral or higher; caudal-fin margin convex to forked.

Although remoras feed on the ectoparasites (mainly parasitic copepods and amphipods) of their hosts, they also take any small available prey and scraps left by the feeding activities of their hosts. *Remora remora* is also known to feed on salps, with their copepod associates. The remora–host relationship benefits the remora by providing some food and a ride that creates an energy-free respiratory current for the remora, which needs only to open its mouth to take in the water current generated by the swimming host. The host may suffer some damage from skin abrasion by the rough surface of a remora’s disc laminae. Some species appear to prefer a certain kind of host, but others will attach to a variety of animals. The Latin word *remora* means ‘delay’ or ‘hindrance’ and was applied to these fishes because they were thought to slow a ship’s progress when they attached to the hull.

Family included in a molecular phylogeny by Gray *et al.* 2009. Three genera and 8 species, 7 in WIO.

KEY TO GENERA OR SPECIES

- 1a Body long and slender, depth 10–14 in SL; base of dorsal and anal fins long, 2–3 times HL; pectoral fins pointed 2
- 1b Body robust, depth 5–8 in SL; base of dorsal- and anal-fin each less than twice HL; pectoral fins rounded *Remora*

Continued ...

KEY TO GENERA OR SPECIES

- 2a Disc large, laminae 21–28 *Echeneis naucrates*
- 2b Disc small, laminae 9–11 *Phtheichthys lineatus*

GENUS *Echeneis* Linnaeus 1758

Diagnosis as for the single species.

***Echeneis naucrates* Linnaeus 1758**

Shark remora

PLATE 18

Echeneis naucrates Linnaeus 1758: 261 (Indian Ocean).

Echeneis naucrates: SFSA No. 949*; Cressey & Lachner 1970;

Lachner 1986*; SSF No. 213.1*; Winterbottom *et al.* 1989; Randall 1995*;

Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Gray *et al.* 2009.

Body elongate, body depth at rear edge of disc 8–14 in SL; disc large, with 21–28 laminae; peduncle depth ~1/3 dorsal-fin height. Dorsal fin 34–42 rays; anal fin 32–38 rays; pectoral fins 21–24 rays; caudal fin lanceolate in juveniles (middle rays elongate), and convex to almost truncate in adults. Lower GR 11–16, excluding rudiments. Vertebrae 14 + 16.

Body brown to black, with pale bands. Attains 90 cm SL.

DISTRIBUTION Circumglobal in tropical to subtropical seas, including Black Sea, Mediterranean Sea, Red Sea and Persian/Arabian Gulf.

REMARKS Found on a variety of hosts, usually large sharks, but also manta rays, yellowfin tuna, white marlin, molid *Masturus lanceolatus* and sea turtles; often seen swimming free. Feeds mainly on parasitic copepods attached to host and also plankton.



Echeneis naucrates, 75 cm TL (South Africa). Source: SSF



Phtheirichthys lineatus, 56 cm TL, with dorsal view of head to show sucking disc (S Mozambique). Source: SSF

GENUS *Phtheirichthys* Gill 1862

Diagnosis as for the single species.

Phtheirichthys lineatus (Menzies 1791)

Slender remora

PLATE 18

Echeneis lineata Menzies 1791: 187, Pl. 17, Fig. 1 (Pacific Ocean).

Phtheirichthys lineatus: SFSA No. 945*; Strasburg 1967; Cressey & Lachner 1970; Lachner 1986*; SSF No. 213.2*; Heemstra & Heemstra 2004; Gray *et al.* 2009.

Body elongate, slender, depth at dorsal-fin origin ~14 in SL; disc small, not reaching past pectoral-fin tips, with 9–11 laminae. Dorsal fin 31–38 rays; anal fin 31–38 rays; pectoral fins 17–21 rays; caudal-fin margin convex. Lower GR 14–17. Vertebrae 39–41.

Body bluish black dorsally, white below; 3 stripes along sides: upper pale blue, middle black, lower silvery. Attains 56 cm TL.

DISTRIBUTION Circumglobal in tropical to subtropical seas.

REMARKS Rare. Found on a variety of slow-swimming hosts, most often barracuda (*Sphyraena* spp.); sometimes enters the host's gill chamber.

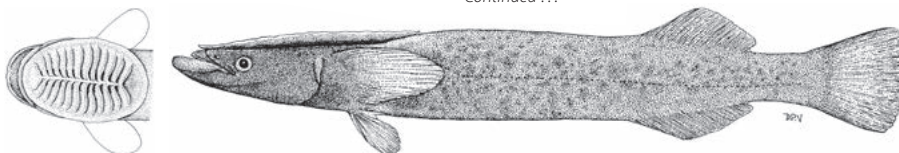
GENUS *Remora* Gill 1862

Disc laminae 13–28; inner rays of pelvic fins broadly attached to abdomen; caudal fin emarginate, rear edge notched; dentition mainly stout canines. Five species, all in WIO.

KEY TO SPECIES

- 1a Disc long, 47–59% SL, reaching well past pectoral-fin tips; disc laminae 25–28; pectoral fins 22–24 unbranched rays *R. australis*

Continued ...



Remora albescens, 13 cm TL, with dorsal view of head to show sucking disc (South Africa). Source: SSF

KEY TO SPECIES

- 1b Disc short, <42% SL; disc laminae 13 or 14; pectoral fins 18–21 rays *R. albescens*
- 1c Disc 33–49% SL; disc laminae 15–20; pectoral fins 20–24 rays 2
- 2a Dorsal- and anal-fin bases longer than disc; pectoral fins reach past rear edge of disc *R. brachyptera*
- 2b Disc length ~½ SL, longer than bases of dorsal and anal fins; pectoral fins not reaching past rear edge of disc 3
- 3a Pectoral fins 25–32 rays; disc length 34–42% SL *R. remora*
- 3b Pectoral fins 20–24 rays; disc length 37–49% SL *R. osteochir*

Remora albescens (Temminck & Schlegel 1850)

White suckerfish

PLATE 18

Echeneis albescens Temminck & Schlegel 1850: no page number, Pl. 120, Fig. 3 (Nagasaki, Japan).

Echeneis clypeata Günther 1860: 401 (Cape Seas, South Africa).

Remora albescens: SFSA No. 946; Gray *et al.* 2009.

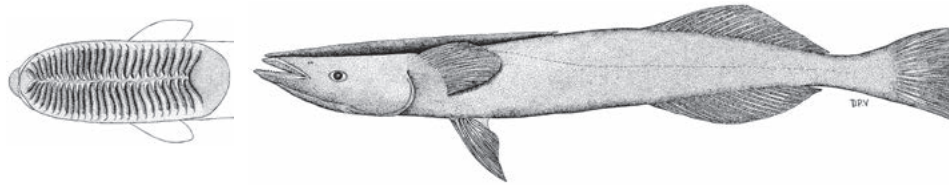
Remorina albescens: Cressey & Lachner 1970; Lachner 1973*, 1986*; SSF No. 213.6*.

Disc short and wide, not reaching past pectoral-fin tips; disc laminae 13 or 14. Dorsal fin 18–23 rays; anal fin 18–24 rays; pectoral fins 18–21 rays. Jaws broad, with many large, stout canine teeth. Lower GR ~10, including rudiments.

Body pale grey to white. Attains 30 cm SL.

DISTRIBUTION Circumglobal in tropical to warm-temperate seas, including Red Sea.

REMARKS Usually found offshore. Prefers attaching to manta rays (Mobulidae), near the mouth or in mouth cavity or gill chamber, but will also attach to sharks. Small-sized; females mature at ~20 cm SL.



Remora australis, 38 cm TL, with dorsal view of head to show sucking disc (South Africa). Source: SSF

Remora australis (Bennett 1840)

Whale remora

PLATE 18

Echeneis australis Bennett 1840: 273 [no locality given].

Remilegia australis: Smith 1953*.

Remora australis: Cressey & Lachner 1970; SSF No. 213.3*;
Fricke *et al.* 2009; Gray *et al.* 2009.

Disc length 47–59% SL; disc laminae 25–28. Dorsal fin 22–26 rays; anal fin 21–26 rays; pectoral fins 21–24 rays. Lower GR 13–19. Vertebrae 12 + 15.

Head and body dark blue to slate grey; fins with white edges. Attains 51 cm TL.

DISTRIBUTION Circumglobal in tropical to warm-temperate seas, including Mediterranean Sea.

REMARKS Attaches only to cetaceans.

Disc laminae 15–18. Dorsal fin 27–34 rays; anal fin 25–34 rays; pectoral fins 23–27 rays. Lower GR 12–14, including rudiments. Vertebrae 12 + 15.

Body pale brownish. Attains 27 cm SL.

DISTRIBUTION Circumglobal in tropical to temperate seas, including Red Sea.

REMARKS Prefers billfishes (Istiophoridae and Xiphiidae), attaching to body or gill cavity of host, but also reported from the molid *Masturus lanceolatus*. Feeds on copepod parasites of the host.

Remora brachyptera (Lowe 1839)

Spearfish remora

PLATE 18

Echeneis brachyptera Lowe 1839: 89 (Madeira).

Remora brachyptera: SFSA No. 948; Cressey & Lachner 1970;
Lachner 1973, 1986*; SSF No. 213.4*; Fricke *et al.* 2009; Gray *et al.* 2009.

Remora osteochir (Cuvier 1829)

Marlin sucker

PLATE 18

Echeneis osteochir Cuvier 1829: 348 (Martinique I., West Indies).

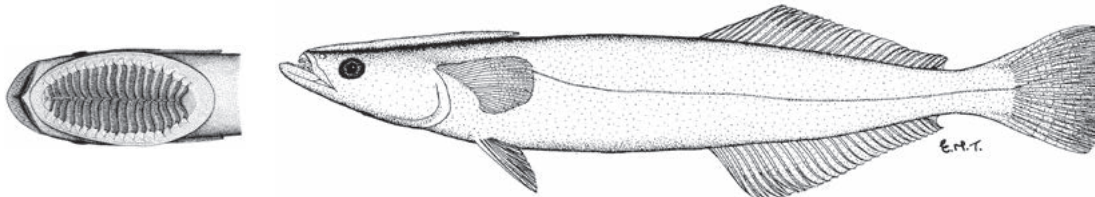
Remora osteochir: Lachner 1986*; Gray *et al.* 2009.

Disc length 37–49% SL, extending well past pectoral-fin tips; disc laminae 15–19. Dorsal fin 20–26 rays; anal fin 20–25 rays; pectoral fins 20–24 rays. Lower GR 12 or 13.

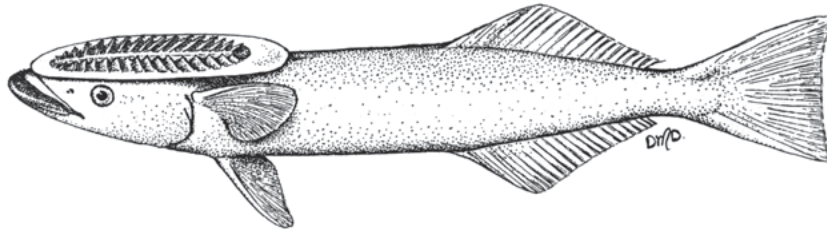
Body dark greyish black. Attains 40 cm SL.

DISTRIBUTION Circumglobal in tropical to subtropical seas, including Mediterranean Sea.

REMARKS Primarily attaches to billfishes.



Remora brachyptera, 12 cm TL, with dorsal view of head to show sucking disc (South Africa). Source: SSF



Remora remora, 23 cm TL (South Africa). Source: SSF

Remora remora (Linnaeus 1758)

Remora

PLATE 18

Echeneis remora Linnaeus 1758: 260 (Indian Ocean).

Remora remora: SFSA No. 947*; Smith & Smith 1966*; Cressey & Lachner 1970; Lachner 1973, 1986*; SSF No. 213.5*; Randall 1995*; Heemstra & Heemstra 2004; Fricke *et al.* 2009; Gray *et al.* 2009.

Disc laminae 16–20. Dorsal fin 21–27 rays; anal fin 22–24 rays; pectoral fins 26–30 rays. Lower GR 26–28, including 1 or 2 rudiments.

Body dark brownish grey. Attains 80 cm TL.

DISTRIBUTION Circumglobal in tropical to temperate seas, including North Sea, Baltic Sea, Mediterranean Sea and Red Sea.

REMARKS Common. Sharks are the preferred host, with remoras often found in their gill chambers.

GLOSSARY

ectoparasites – parasites on outside of body.

homologous – the same structure as; e.g., a bird's wing is homologous with a foreleg or arm or bat's wing.

salp – a pelagic, barrel-shaped tunicate.

FAMILY CIRRHITIDAE

Hawkfishes

Terry J Donaldson and John E Randall

Small- to medium-sized (mostly <30 cm TL, one species to 60 cm TL), dorsal fin continuous and notched between spinous and soft-rayed parts, with 10 spines, 11–17 rays; anal fin 3 spines, 5–7 rays; pectoral fins 14 rays, lower 5–7 rays unbranched and membranes deeply incised; pelvic fins

inserted well behind pectoral fins, with 1 spine, 5 rays; caudal fin 15 rays. One to several cirri on rear edge of anterior nostrils and at tips of interspinous dorsal-fin membranes. Small incurved canine teeth present in outer row (longest anteriorly) on upper jaw, and 2–4 midway back in the series of teeth on each side of lower jaw (canines reduced in *Oxycirrhites*); broad band of villiform teeth medial to canines at front of lower jaw; vomer with narrow V-shaped band of small teeth; palatine teeth present or absent. Opercle with 2 flattened spines; preopercle margin serrate, usually on upper half, with number of serrae increasing with age. Branchiostegal rays 6; gill membranes broadly joined with free fold across isthmus. Scales cycloid, with 3–5 rows of large scales above lateral line at midbody. No swimbladder in adults. Larvae have a swimbladder and specialised chin barbel (Leis & Rennis 2000). Vertebrae 26.

Benthic on relatively shallow coral and rocky reefs, some species to 30–100 m. Use their thickened lower pectoral-fin rays to perch or wedge themselves in place, either in coral heads, on rocks, in wave-swept habitats such as the spur and groove zone of coral reefs, or in deeper tidepools and reef fronts of rocky reefs. The monotypic genera *Neocirrhites* and *Oxycirrhites* are obligate coral-dwellers (Donaldson 1989). The monotypic *Cyprinocirrhites* hovers above the substrate but seeks shelter in holes, either alone or in small groups. Carnivorous ambush predators that feed mainly on benthic or free-swimming crustaceans and small fishes, except *Cyprinocirrhites* and *Oxycirrhites* feed on zooplankton in the water column, and the latter also forages for small crustaceans on gorgonians and sea fans. Likely all hawkfishes are harem protogynous hermaphrodites that change sex from female to male (Kobayashi & Suzuki 1992; Sadovy & Donaldson 1995), although bidirectional sex change has been reported for *Cirrhichthys aureus* held in aquaria (Kobayashi & Suzuki 1992). Spawning is pelagic near the surface, and larvae are also pelagic.

Occur in tropical and subtropical waters of the Atlantic and Indo-Pacific. Twelve genera and 34 species (Gaither & Randall 2013); 8 genera and 16 species in WIO. Family reviewed by Randall (1963); Randall & Heemstra (1978) removed

Serranocirrhitis latus Watanabe 1949 from the Cirrhitidae and assigned it to the Anthiadidae (previously Anthiinae), and transferred *Isobuna japonica* (Steindachner 1883) to the genus *Plectranthias* of the Anthiadidae. Randall (2001) revised the genera and created 3 additional genera: *Cristacirrhitis*, *Notocirrhitis* and *Itycirrhitis*.

KEY TO GENERA

- 1a Snout not elongate, length 2.8–4.1 in HL; body not slender, depth 2–3.4 in SL; canine teeth in jaws longer than inner villiform teeth, those at front of upper jaw and sides of lower jaw enlarged 2
- 1b Snout elongate, length 1.9–2 in HL; body slender, depth 4.4–4.6 in SL; canine teeth in jaws only slightly longer than inner villiform teeth and approximately uniform in size *Oxycirrhites*

- 2a Caudal fin either rounded, truncate or slightly emarginate; dorsal fin 11–15 rays; snout length 2.7–3.8 in HL 3
- 2b Caudal fin lunate; dorsal fin 16 or 17 rays; snout length 3.6–4.1 in HL *Cyprinocirrhites*

- 3a Cheeks with ≥12 rows of small scales 5
- 3b Cheeks with 4–6 rows of large scales, and usually some small scales also present; ≥40 cirri on rear flap of anterior nostrils, in 2 series; lower 7 pectoral-fin rays unbranched and thickened; first 2 supraneural bones in space before 2nd neural spine ... 4

- 4a Supraorbital ridge high, continuing >½ eye diameter beyond orbit; interorbital space without scales; lower opercular spine acute and forming ≤45° angle; pectoral fins reaching somewhat beyond vertical at pelvic-fin tips; body depth 3.1–3.4 in SL *Cristacirrhitis*
- 4b Supraorbital ridge low, not continuing beyond eye; V-shaped band of scales in rear half of interorbital space; lower opercular spine forming 90° angle; pectoral fins short and not reaching vertical at pelvic-fin tips; body depth 2.6–3.1 in SL *Cirrhitis*

- 5a Scale rows above lateral line 5; membrane near tip of each dorsal-fin spine with single cirrus; membranes between longest dorsal-fin spines extending to four-fifths or more distance from base to tips of spines; no palatine teeth *Paracirrhites*
- 5b Scale rows above lateral line 3 or 4; dorsal spines with tuft of cirri from base to tips; dorsal-fin spines with deeply incised membranes, membranes between longest spines extending less than two-thirds of distance from base to tips of spines; palatine teeth present or absent 6

Continued...

KEY TO GENERA

- 6a Dorsal fin 14 or (rarely) 15 rays; first 2 pectoral-fin rays unbranched; dorsal profile convex from interorbital to upper lip; snout not pointed; interorbital region naked *Cirrhitops*
- 6b Dorsal fin 11–13 (rarely 13) rays; 1st ray of pectoral fins unbranched, 2nd ray branched; dorsal profile straight; snout pointed; interorbital region scaly or naked 7

- 7a Preopercular margin finely serrate; preorbital bone without free rear margin; interorbital area scaly; first 2 supraneural bones in space before 2nd neural spine; 1st dorsal-fin ray without filament; lower 5 (rarely 6) pectoral-fin rays unbranched *Amblycirrhitis*
- 7b Preopercular margin coarsely serrate; preorbital bone with free hind margin for ¼–½ distance from lower edge to eye; interorbital area naked; all 3 supraneural bones in space before 2nd neural spine; 1st dorsal-fin ray usually with filament *Cirrhitchthys*

GENUS *Amblycirrhitis* Gill 1862

Dorsal fin 10 spines (longest spine 2.3–3.2 in body depth), 11 or 12 rays (1st ray not produced into filament); anal fin 3 spines, 6 rays; pectoral fin 14 rays, with upper 1 or 2 rays and lower 5 (rarely 6) rays unbranched, upper branched rays shorter than lower unbranched rays, and uppermost unbranched ray usually longest. Dorsal-fin interspinous membranes moderately to deeply incised, and fin notched between 5th and 6th spines more than three-tenths length of spines; tuft of cirri on membrane near tip of each spine. Pectoral fins long, extending to anus or anal-fin origin. Caudal fin truncate. Preopercle with finely serrate upper margin; preorbital bone without free hind margin. Palatine teeth present. Body depth 2.3–3.2 in SL; snout length 3.1–3.8 in HL, snout pointed, profile from interorbital region to upper lip nearly straight. Interorbital area scaly; cheeks with large scales in 4 or 5 rows; large scales above lateral line at midbody in 3 or 4 rows. Five species, 1 in WIO.

Amblycirrhitis bimacula (Jenkins 1903)

Twospot hawkfish

PLATES 19 & 20

Cirrhitoidea bimacula Jenkins 1903: 459 (Honolulu, Oahu I., Hawaii).

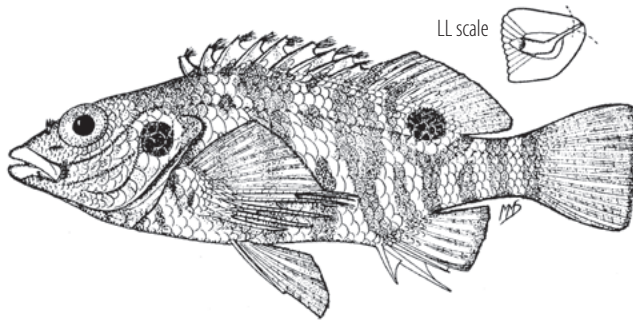
Amblycirrhitis bimacula: Randall 1963*; SSF No. 214.1*;

Winterbottom *et al.* 1989*; Heemstra *et al.* 2004, Fricke *et al.* 2008;

Fricke *et al.* 2013.

Dorsal fin 12 rays; pectoral fins with uppermost ray and lower 5 rays unbranched. Body depth 2.8–3 in SL. GR 3–5/11 or 12. LL scales 40–42; scale rows above lateral line 3.

Body whitish, with 10 slightly irregular orange to reddish brown bars, some broken into large spots; 2 narrow, diagonal bars on cheek; large ocellated black spot on opercle, and another on body at base of dorsal-fin rays. Attains 8.5 cm SL.



Amblycirrhitus bimaculata, 6 cm TL (Mozambique). Source: Smith 1956

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles, Mascarenes and St Brandon Shoals; not known from Red Sea and Persian/Arabian Gulf; elsewhere to Tuamotu Is. and Hawaii.

REMARKS Found on coral and rocky reefs and rocky bottom; secretive, hiding within spur and groove zone of reefs and occasionally seen in branches of *Pocillopora* coral heads. Observed singly and in pairs; may have a protogynous harem mating system (Donaldson 1990). Feeds mainly on small benthic crustaceans.

GENUS *Cirrhitichthys* Bleeker 1856

Dorsal fin 10 spines (longest spine 1.5–2.6 in body depth), 12 or 13 rays (1st ray a single filament, except not in *C. falco* and *C. guichenoti*); anal fin 3 spines, 6 or 7 rays; pectoral fins 14 rays, with upper 1 or 2 rays and lower 6 or 7 rays unbranched. Dorsal-fin interspinous membranes moderately to deeply incised, but fin not notched between 5th and 6th spines for more than three-tenths length of spines; tuft of cirri on membranes at spine tips. Pectoral fins long, extending nearly to or beyond anal-fin origin; pelvic-fin tips extend to or beyond anus (except in *C. bleekeri* and Red Sea specimens of *C. oxycephalus*). Caudal fin emarginate to truncate. Preopercle upper margin coarse and usually with spinous serrations, and lower margin either smooth or serrate; preorbital bone with free hind margin for $\frac{1}{4}$ – $\frac{3}{4}$ distance from lower edge to eye, and with small spine-like serrations in some species. Palatine teeth present. Body depth 2.2–3 in SL; snout length 2.9–3.8 in HL, snout pointed, profile nearly straight from interorbital region

to upper lip. Cheeks with large scales in 3.5–4 rows; large scales above lateral line at midbody in 3 or 4 rows. All species appear to be bottom-dwelling, although some are facultative on branching corals or soft corals. Eight species, 7 in WIO.

KEY TO SPECIES

[Modified from Randall 1963]

- 1a LL scales 40–47; scale rows above lateral line 3; dorsal fin 12 (rarely 13) rays; anal fin 6 (rarely 7) rays; snout length 3.2–3.8 in HL 2
- 1b LL scales 52; scale rows above lateral line 4; dorsal fin 13 rays; anal fin 7 rays; snout length ~3 in HL *C. guichenoti*
- 2a Longest dorsal-fin spine 1.7–2.2 in body depth; body depth 2.4–3 in SL; lower 6 pectoral-fin rays unbranched 3
- 2b Longest dorsal-fin spine 2.2–2.6 in body depth; body depth 2.2–2.5 in SL; lower 7 (occasionally 6) pectoral-fin rays unbranched 6
- 3a Body depth 2.4–2.7 in SL; bony interorbital width of adults ~1.7 in eye diameter; free rear edge of preorbital bone with one to a few small spines; spinous serrations of preopercle 17–22 in specimens ~4.5 cm SL; 6 dark or darkish bars on body, alternating with dark spots along lateral line, all with pale interspaces *C. aprinus*
- 3b Fourth or 4th and 5th dorsal-fin spines longest 4
- 4a Fourth dorsal spine longest; rear end of maxillary slightly in front of vertical at front of eye; cluster of small dark brown spots forming 2 or 3 triangular bars beneath dorsal fin (anteriormost from nape to opercle; the darkest and broadest beneath dorsal-fin origin), and these superimposed on vertical series of larger orangish blotches *C. falco*
- 4b Fourth and 5th dorsal spines longest 5
- 5a Body depth ~2.6 in SL; bony interorbital space narrow and slightly concave in adults; dorsal profile almost straight, snout ~ $\frac{1}{3}$ eye diameter; 5 large scales between maxilla and preopercle; 3 large scales between the maxilla and rear margin of eye *C. randalli*
- 5b Body depth 2.8–3 in SL; rear edge of maxillary reaches to or behind vertical at front of eye; 1st dorsal-fin ray longer than more posterior rays in specimens ≥ 3.5 cm SL; groups of dark round spots forming vertical series (dorsalmost spots largest) *C. oxycephalus*
- 6a Pelvic fins reach to anus; body orangish, peduncle dark brown; caudal fin whitish or pale yellowish, with sparse black spots and broad dark margin *C. calliurus*
- 6b Pelvic fins not reaching to anus; body colour rosy or brown, darker dorsoposteriorly, and with pale longitudinal lines, and dark blotch behind upper edge of preopercle *C. bleekeri*

Cirrhitichthys aprinus (Cuvier 1829)

Paletail or threadfin hawkfish

PLATES 19 & 20

Cirrhites aprinus Cuvier in Cuv. & Val. 1829: 76 (Timor I., Malay Archipelago).
Cirrhitichthys aprinus: Bleeker 1876; Randall 1963*; Heemstra & Heemstra 2004.

Dorsal fin 12 rays; anal fin 6 rays; pectoral fins with lower 5 rays unbranched. Body depth 2.4–2.7 in SL. GR 4 or 5/9–11. LL scales 41–43; scale rows above lateral line 3.

Body and dorsal fin with large reddish brown spots that may form irregular bars, all with pale interspaces; ocellated black spot on opercle; 3–5 narrow diagonal, reddish brown bars on head below eye. Attains 13 cm SL.



Cirrhitichthys aprinus, 9 cm SL (South Africa). AD Connell © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Mozambique and South Africa (Cape Vidal; photographed at Umhlanga and Aliwal Shoal), Mascarene Shoals, Mauritius and Saya de Malha Bank; elsewhere to Indonesia, Philippines, Japan, New Guinea, Great Barrier Reef and Solomon Is.

REMARKS Inhabits coral and rocky reefs, at 17–59 m. Feeds on small benthic crustaceans; juveniles observed plucking zooplankton from the water column above hard or soft corals. Mating system is protogynous and harem.

Cirrhitichthys bleekeri Day 1873

Bleeker's hawkfish

PLATES 19 & 20

Cirrhitichthys bleekeri Day 1873: 705 (Chennai, India); Randall 1963*; Manilo & Bogorodsky 2003.
Cirrhitichthys aureus (non Temminck & Schlegel 1843): Day 1875.

Dorsal fin 12 or 13 rays, 1st ray elongate; anal fin 6 or 7 rays; pectoral fins with lower 6 or 7 rays unbranched; pelvic fins not reaching anus; caudal fin slightly emarginate. Body depth ~2.4 in SL; head profile with marked indentation above eyes; maxilla reaches to below anterior third of eye. LL scales 43; scale rows above lateral line 3.

Body rosy or brownish, darker brown dorsoposteriorly, and with pale longitudinal lines; some specimens with additional dark bars beneath spinous portion of dorsal fin; small dark spot behind upper edge of preopercle; spinous portion of dorsal fin paler than soft-rayed portion and without pale distal edge; dorsal fin and caudal fin somewhat banded; caudal fin with red spots. Attains 10 cm SL.

DISTRIBUTION Indian Ocean: Sri Lanka and India (Chennai).

REMARKS Poorly known. Randall (1963) considered this species as closely related to *C. aureus* and *C. calliurus*, but their relationships need to be resolved.

Cirrhitichthys calliurus Regan 1905

Spottedtail hawkfish

PLATE 20

Cirrhitichthys calliurus Regan 1905: 322 (Muscat, Oman, Gulf of Oman); Randall 1963*; Goren & Dor 1994; Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 12 rays, 1st ray elongate; anal fin 6 rays; pectoral fins with lower 7 rays unbranched; caudal fin slightly emarginate to truncate. Body depth ~2.4 in SL; longest dorsal-fin spine ~2.3 in body depth. GR 3 or 4/10–12. LL scales 42; scale rows above lateral line 3; scale rows on cheek 4.

Body orange with dusky blotches, darker posteriorly; peduncle dark brown or blackish; caudal fin white, with small blackish spots and dark margin. Attains 12 cm SL.

DISTRIBUTION WIO: Gulf of Oman, Gulf of Aden and Seychelles.

REMARKS Found on rocky and coral reefs, in 15–30 m. Feeds on small benthic crustaceans. Mating system likely protogynous and harem.

Cirrhitichthys falco Randall 1963

Dwarf hawkfish

PLATES 19 & 20

Cirrhitichthys falco Randall 1963: 435, Pl. 13, Fig. 28 (Davao Gulf, Mindanao I., Philippines).

Dorsal fin 12 rays; anal fin 6 rays; pectoral fins with lower 6 rays unbranched; caudal fin slightly emarginate. Body depth 2.9–3.4 in SL; bony interorbital space narrow, ~2.2 in eye diameter; maxilla not reaching vertical at front of eye. GR 4/1/9. LL scales 42–44; scale rows above lateral line 3.

Body white, with small red and brown spots forming 2 or 3 broad triangular bars anteriorly, darkest spots nearly black and

centred below dorsal-fin origin, and these clusters superimposed on vertical series of larger orangish blotches (present from rear of head onto caudal fin); 2 narrow reddish bars extend downwards from eye; dark reddish dorsomedian band on head; dorsal-fin tips red with white cirri. Attains 7 cm SL.

DISTRIBUTION Indo-Pacific. WIO: Maldives; elsewhere to Philippines, Indonesia, southern Japan, Australia, Great Barrier Reef, New Caledonia, Micronesia and Samoa.

REMARKS Feeds on small benthic crustaceans. The mating system is protogynous and harem (Donaldson 1986, 1990).

Cirrhichthys guichenoti (Sauvage 1880)

Humpback hawkfish PLATES 19 & 20

Cirrhites guichenoti Sauvage 1880: 221 (Réunion, Mascarenes).

Cirrhites grandimaculatus Liénard in Sauvage 1891: 211 (Mauritius, Mascarenes).

Cirrhichthys guichenoti: Randall 1963*, 1980; Fricke 1999; Heemstra & Heemstra 2004; Fricke *et al.* 2006.

Dorsal fin 13 rays, 1st ray elongate; anal fin 7 rays; pectoral fins with lower 6 rays unbranched; caudal fin emarginate. Body depth 2.7–3.2 in SL; 2nd spine of anal fin long, ~1.5 in HL. Preopercle margin coarsely serrate, with 15–19 serrae. GR 5/1/11. LL scales 52 or 53; scale rows above lateral line 4.

Body pale orange, with large brown spots with blackish centre and reddish edge; median fins with similar but smaller reddish brown or red spots; interorbital region with small dark brown spots; lower half of head whitish or pale blue, with irregular orangish yellow and red markings. Attains 11 cm SL.



Cirrhichthys guichenoti (South Africa). © P Timm

DISTRIBUTION Indian Ocean. WIO: Mozambique, South Africa (Sodwana Bay and Aliwal Shoal), Madagascar, Comoros, Réunion and Mauritius; elsewhere, western Indonesia.

REMARKS Poorly known. Found on deeper reefs in 27–60 m. Probably feeds on small benthic crustaceans.

Mating system likely protogynous and harem. Possibly endangered at Réunion because of its rarity and sensitivity to human activities (Fricke *et al.* 2009).

Cirrhichthys oxycephalus (Bleeker 1855)

Pixie hawkfish

PLATE 19

Cirrhichthys oxycephalus Bleeker 1855: 408 (Ambon I., Moluccas,

Indonesia); Randall 1963*; SSF No. 214.2*; Winterbottom *et al.* 1989*;

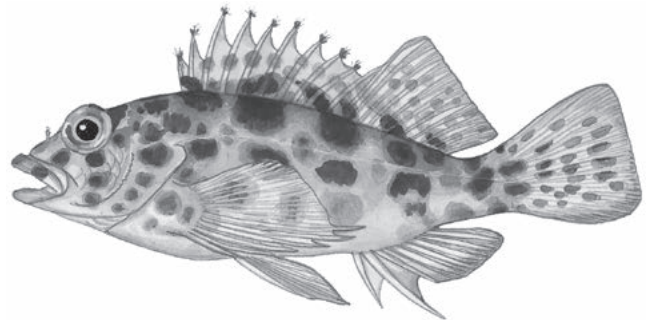
Goren & Dor 1994; Manilo & Bogorodsky 2003; Heemstra & Heemstra

2004*; Fricke *et al.* 2013.

Cirrhites grandimaculatus Liénard in Sauvage 1891: 211 (Mauritius, Mascarenes).

Dorsal fin 12 or 13 rays, 1st ray elongate in larger individuals (>3.5 cm SL); anal fin 6 rays; pectoral fins with lower 6 rays unbranched; caudal fin slightly rounded to slightly emarginate. Body depth 2.8–3 in SL; bony interorbital space ~½ eye diameter; maxilla extending behind vertical at front edge of eye; 5th spine of dorsal fin longest, 1.7–2.2 in body depth. GR 4–6/10. LL scales 40–44; scale rows above lateral line 3.

Body whitish with 3 or 4 rows of large, red-edged, dark brown or reddish brown spots (decreasing in size and colour ventrally); head with scattered small dark spots, densest dorsally, and in 2 bands on lower part; caudal fin with small reddish spots. Attains 9.5 cm SL.



Cirrhichthys oxycephalus, 5 cm TL (South Africa). Source: CFSA

DISTRIBUTION Indo-Pacific to eastern Pacific. WIO: Gulf of Oman, Red Sea to South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles, Mascarenes, Saya de Malha Bank, Chagos and Maldives; elsewhere to Indonesia, Mariana Is., New Caledonia, Marquesas Is., Galápagos Is., Mexico and Colombia.

REMARKS Found in clear lagoons and on rocky and coral reefs, at 6–47 m; facultatively associated with branching *Pocillopora* corals. Feeds on small benthic crustaceans. Mating system is protogynous and harem (Thresher 1984; Donaldson 1990).

Cirrhichthys randalli Kotthaus 1976

Randall's hawkfish

Cirrhichthys randalli Kotthaus 1976: 56, Fig. 386 (off Somalia);
Manilo & Bogorodsky 2003.

Dorsal fin 12 rays; anal fin 7 rays; pectoral fins with uppermost ray and lower 6 rays unbranched. Body depth ~2.6 in SL. GR 3/1/8. LL scales 38 or 39; scale rows above lateral line 5.

Body golden orange, with small dark brown spots along the anterior upper edge of opercle, and brownish black elliptic spot between outer margin of 8th and 10th dorsal spines with scattered smaller brown spots on the dorsal spines anteriorly to this spot. Attains ~9 cm SL.

DISTRIBUTION WIO: Somalia.

REMARKS Holotype collected from 55–65 m. Resembles *C. falco* (Kotthaus 1976).

GENUS *Cirrhitops* Smith 1951

Dorsal fin 10 spines (longest ~2.3 in body depth), 14 (rarely 15) rays (1st ray not produced); anal fin 3 spines, 6 rays; pectoral fins 14 rays, with lower 6 rays and uppermost 2 rays unbranched, longest ray reaching to or just beyond anal-fin origin. Dorsal-fin interspinous membranes moderately incised, and fin notched between 5th and 6th spines ~ $\frac{1}{3}$ length of spines; tuft of cirri on membrane near tip of each spine. Pelvic fins reach anus. Caudal fin truncate or slightly emarginate. Body depth ~2.8 in SL; snout length ~3.5 in HL, snout not pointed, profile convex from interorbital region to upper lip. Preopercle margin finely serrate on free upper three-fifths, lower two-fifths smooth; preorbital bone without free hind edge. Palatines with a few small teeth anteriorly. Interorbital region naked; cheeks with large scales in 5 rows; large scales above lateral line at midbody in 4 rows. Three species, 1 in WIO.

Cirrhitops mascarenensis Randall & Schultz 2008

Mascarene hawkfish

PLATES 19 & 20

Cirrhites cinctus [in part]: Günther 1860.

Cirrhitops fasciatus (non Bennett 1828): Randall 1963*.

Cirrhitops fasciatus: Fricke *et al.* 2009.

Cirrhitops mascarenensis Randall & Schultz 2008: 17, Figs. 1–2 (Mauritius, Mascarenes); Gaither & Randall 2012.

Dorsal fin 14 rays; pectoral fins 14 (rarely 15) rays, lower 6 rays unbranched; caudal fin slightly emarginate. Body depth 2.9–3.3 in SL. Preopercle margin with 14–24 serrae (number increasing with growth). GR 4 or 5/13 or 14. LL scales 49–52; scale rows above lateral line 4.

Body red dorsally and white ventrally, with 5 slightly oblique, reddish brown bars on upper half of body below dorsal fin (interspaces red-orange dorsally, white ventrally), and small brownish red blotches (eye-sized or smaller) on lower half of body; peduncle with large oblong black spot anteriorly; smaller dark brown spot on opercle. Attains 8 cm SL.



Cirrhitops mascarenensis, 6 cm SL, holotype (Mauritius).

Source: Randall & Schultz 2008

DISTRIBUTION WIO: Madagascar, Réunion, Mauritius, and expected at Rodrigues.

REMARKS Inhabits coral and rocky reefs, in 4–61 m. Allopatric sister species of *Cirrhitops fasciatus* (Bennett 1828), which occurs at Japan and Hawaii (Randall & Schultz 2008). Considered endangered at Réunion because of sensitivity to human activities (Fricke *et al.* 2009).

GENUS *Cirrhitus* Lacepède 1803

Dorsal fin 10 spines (longest spine 2.2–3 in body depth), 11 or 12 rays; anal fin 3 spines, 6 rays; pectoral fins 14 rays, uppermost ray and lower 7 rays unbranched. Preopercle upper margin smooth or finely serrate; preorbital without free hind edge. Cheeks with small scales; large scales above lateral line at midbody in 4 rows. Dorsal-fin interspinous membranes not deeply incised, and fin notched between 5th and 6th spines <math><\frac{1}{3}</math> length of spines; tuft of cirri on membranes near tip of each spine. Pectoral fins not reaching anal-fin origin; pelvic fins nearly reaching anus. Caudal fin slightly emarginate to slightly rounded. Body depth 2.6–3.4 in SL; snout length 2.7–3.8 in HL. Palatine teeth present.

Five species, 2 in WIO, one of which is wide-ranging in the Indo-Pacific with two subspecies. There is considerable overlap in both meristic and morphometric characters between *Cirrhitis pinnulatus pinnulatus* and *C. spilotoceps*, but with 5–12% divergence in 2 mitochondrial markers supporting separate species status (Gaither & Randall 2013).

KEY TO SPECIES

- 1a LL scales 39–42 (usually 40); large, irregular dark blotches and streaks on head *C. pinnulatus pinnulatus*
 1b LL scales 41–43 (usually 42); numerous dark brown spots on head (smaller and denser anteriorly) *C. spilotoceps*

Cirrhitis pinnulatus pinnulatus (Schneider 1801)

Marbled hawkfish PLATES 20 & 21

Labrus pinnulatus Schneider in Bloch & Schneider 1801: 264 (Tahiti, Society Is.).

Labrus marmoratus Lacepède 1802: 438 (Indo-Pacific).

Cirrhitis maculatus Lacepède 1803: 2 (Mauritius, Mascarenes).

Cirrhitis spilotoceps [in part]: Schultz 1950.

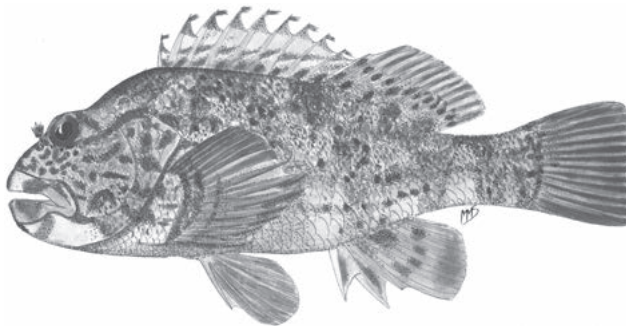
Cirrhitis pinnulatus: Randall 1963*; SFSA No. 394*; SSF No. 214.3*; Winterbottom *et al.* 1989*; Goren & Dor 1994; Randall 1995*;

Fricke *et al.* 2009; Fricke *et al.* 2013.

Cirrhitis pinnulatus pinnulatus: Gaither & Randall 2013.

Dorsal fin 11 rays; pectoral fins with lower 7 rays unbranched. Body robust, depth 2.6–2.9 in SL. Preopercle margin finely serrate. GR 5–7/11–13. LL scales 39–42; scale rows above lateral line 4.

Body brown to olive, becoming white ventrally, with scattered large white blotches and many small red or reddish brown spots overall; median fins with small red spots. Attains 22 cm SL.



Cirrhitis pinnulatus pinnulatus (WIO). Source: SFSA

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to South Africa (Eastern Cape), Madagascar, Mascarenes, Comoros, Chagos and Maldives; elsewhere replaced by subspecies *C. pinnulatus maculosus* from Indonesia to Hawaii and Society Is.

REMARKS Found on rocky and coral reefs, in 1–10 m, often near lower reef margin and in spur and groove zone on pavement or in holes; facultatively associated with branching *Pocillopora* corals. Feeds on small benthic crustaceans, small fishes, sea urchins and brittle stars. Mating system is protogynous and harem.

Cirrhitis spilotoceps Schultz 1950

Stocky hawkfish

PLATE 21

Cirrhitis spilotoceps Schultz 1950: [548] 551, Pl. 13c (Red Sea); Gaither & Randall 2013.

Dorsal fin 10 or 11 rays; pectoral fins short, not reaching vertical at pelvic-fin tips, lower 7 rays unbranched and thickened; caudal fin slightly rounded. Body depth ~2.7–3 in SL; snout short and blunt. Dorsal-fin interspinous membranes incised, with tuft of cirri near each spine tip. Palatine teeth present. Preopercle margin finely serrate. GR 6 or 7/12 or 13. Cheeks with small scales in ≥12 rows; LL scales 41–43 (usually 42); scale rows above lateral line 4.

Body dark olive-green, with each scale nearly covered by dark green to black spot, grading to white ventrally; 3 or 4 longitudinal rows of irregular (some squarish) white spots, and many dark brown spots (about pupil-sized); head with dark brown to black spots, smaller and denser anteriorly; spinous part of dorsal fin with large dark brown spots, mainly on membranes; other fins with dark spots on rays. Attains 28 cm TL.



Cirrhitis spilotoceps (Red Sea). © SV Bogorodsky

DISTRIBUTION WIO: Red Sea and Gulf of Oman.

REMARKS Collected from reef margin and spur and groove zone of seaward reef, in 0.3–3 m. Feeds on small benthic fishes, crustaceans and sea urchins. Mating system is likely protogynous and harem.

GENUS **Cristacirrhites** Randall 2001

Diagnosis as for the single species.

Cristacirrhites punctatus (Cuvier 1829)

Blackspotted hawkfish PLATES 20 & 21

Cirrhites punctatus Cuvier in Cuv. & Val. 1829: 70 (Madagascar);

Randall 1963*; SSF No. 214.4*; Fricke 1999.

Cirrhites punctatus: Bleeker 1866.

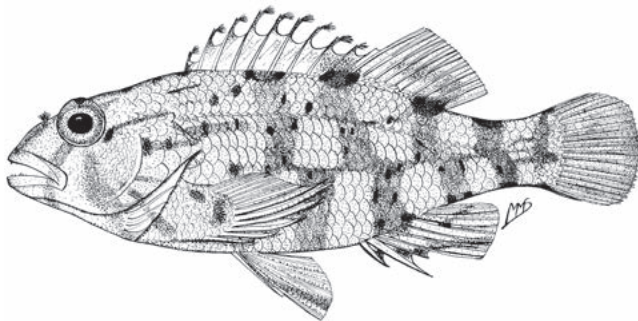
Cirrhites nigropunctatus Schultz 1950: [547] 549, Pl. 13b (Mauritius, Mascarenes).

Cirrhites mossambicus Smith 1951: 629, Fig. 1 (Mozambique).

Cristacirrhites punctatus: Randall 2001; Fricke *et al.* 2009.

Dorsal fin 10 spines, 11 rays; anal fin 3 spines, 6 rays; pectoral fins 14 rays, uppermost ray and lower 7 rays unbranched. Body depth 3.1–3.4 in SL. Palatine teeth present. GR 6 or 7/11 or 12. LL scales 40–43; scale rows above lateral line 4.

Body mottled with large irregular brown and pale brown blotches, and numerous black dots on upper two-thirds of head and body; black line curving back from eye. Attains 17 cm SL.



Cristacirrhites punctatus, 5 cm TL, holotype of *Cirrhites mossambicus* (Mozambique). Source: SSF

DISTRIBUTION WIO: Mozambique (Pinda) to South Africa (Sodwana Bay, KwaZulu-Natal), Madagascar, Réunion and Mauritius.

REMARKS Found on coral and rocky reefs. Mating system is likely protogynous and harem.

GENUS **Cyprinocirrhites** Tanaka 1917

Diagnosis as for the single species.

Cyprinocirrhites polyactis (Bleeker 1875)

Swallowtail hawkfish PLATES 20 & 21

Cirrhichthys polyactis Bleeker 1875: 16 (Ambon I., Moluccas, Indonesia).

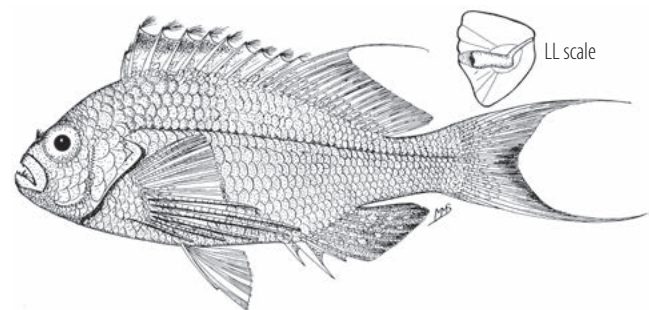
Cyprinocirrhites polyactis: Smith 1961, 1965; Randall 1963*;

Winterbottom 1978; Fricke 1999; Manilo & Bogorodsky 2003;

Heemstra & Heemstra 2004*; Fricke *et al.* 2009.

Dorsal fin 10 spines, 16 or 17 rays (1st ray elongate); anal fin 3 spines, 6 or 7 rays; pectoral fins 14 rays, uppermost ray and lower 6 rays unbranched; caudal fin lunate. Body depth 2.7–2.8 in SL. Palatine teeth present. GR 3 or 4/10–13. LL scales 45–49, scale rows above lateral line 3.

Body pale yellowish pink to orange-brown, and distal half of dorsal fin slightly dusky; juveniles bright orangish gold. Attains 14 cm SL.



Cyprinocirrhites polyactis, 14 cm TL (Madagascar). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Algoa Bay), Madagascar, Mauritius and Réunion; elsewhere to Indonesia, Philippines, southern Japan, Palau, Australia, Great Barrier Reef, New Caledonia and northern New Zealand.

REMARKS Found on coral and rocky reefs, in 10–132 m (usually at ~20 m). Hovers and feeds on zooplankton in the water column, but seeks shelter in holes in the coral pavement which may be shared by members of the same social group. Reported to mimic fairy basslets (Anthiadidae). Mating system appears to be protogynous and harem.

GENUS **Oxycirrhites** Bleeker 1857

Diagnosis as for the single species.

Oxycirrhites typus Bleeker 1857

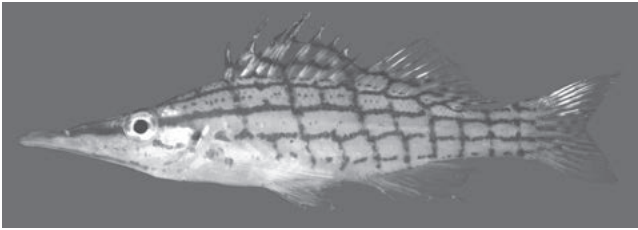
Longnose hawkfish PLATES 20 & 21

Oxycirrhites typus Bleeker 1857: 40 (Ambon I., Moluccas, Indonesia);

Randall 1963*; Winterbottom *et al.* 1989; Goren & Dor 1994;

Fricke 1999; Fricke *et al.* 2009.

Dorsal fin 10 spines, 13 rays; anal fin 3 spines, 7 rays. Body depth 4.4–4.5 in SL. No palatine teeth. GR 5/1/11 or 12. LL scales 51–53; scale rows above lateral line 4. Body white, with red to reddish brown stripes and bars in crosshatch pattern. Attains 13 cm SL.



Oxycirrhites typus, 6 cm SL (Comoros). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific to eastern Pacific. WIO: Red Sea to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Réunion, Mauritius, Chagos and Maldives; elsewhere to Indonesia, southern Japan, Australia, New Caledonia, Tonga, Hawaii, Baja California, Mexico and Colombia.

REMARKS Found on coral and rocky reefs, at 10–100 m; obligate inhabitant of gorgonians and sea fans. Feeds on small benthic and pelagic crustaceans. Mating system is protogynous and facultatively monogamous because of limited suitable microhabitat, but harem if suitably sized gorgonians or sea fans are in close proximity to one another (Donaldson 1989).

GENUS *Paracirrhites* Bleeker 1875

Dorsal fin 10 spines (longest spine 2.8–3.8 in body depth), 11 rays; anal fin 3 spines, 6 rays; pectoral fins with upper 1 or 2 rays and lower 6 or 7 rays unbranched. Dorsal-fin interspinous membranes not deeply incised; fin notched between 5th and 6th spines less than one-fifth length of spines; tuft of cirri on membranes near spine tips. Pectoral fins short, ~1.5–2 in HL, and not reaching pelvic-fin tips; unbranched pectoral-fin rays slightly longer than branched rays. Caudal fin truncate to rounded. Body depth 2.4–3.2 in SL; snout length 2.7–3.6 in HL. Preopercle upper margin smooth or finely serrate; preorbital without free hind edge; suprascapular with reduced serration. Cheeks with large scales in 5 or 6 rows; large scales above lateral line to spinous portion of dorsal fin in 5 rows. No palatine teeth. Six species, 2 in WIO.

KEY TO SPECIES

- 1a Second ray of pectoral fins unbranched; no scales on snout before nostrils; U-shaped mark extending back and diagonally upwards from eyes *P. arcatus*

Continued...

KEY TO SPECIES

- 1b Second ray of pectoral fins branched; snout almost entirely scaly; no U-shaped mark behind eyes *P. forsteri*

Paracirrhites arcatus (Cuvier 1829)

Horseshoe or arc-eye hawkfish

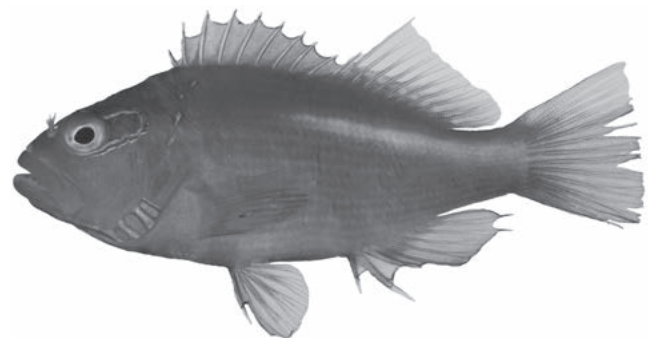
PLATES 20 & 21

Cirrhites arcatus Cuvier in Cuv. & Val. 1829: 74 (Mauritius, Mascarenes; Tahiti, Society Is.).

Paracirrhites arcatus: Randall 1963*; SFSA No. 396; Winterbottom 1978; SSF No. 214.6*; Winterbottom *et al.* 1989*; Fricke 1999; Heemstra *et al.* 2004; Fricke *et al.* 2009; Fricke *et al.* 2013.

Pectoral fins with upper 2 rays and lower 6 or 7 rays unbranched. Body depth ~2.6 in SL. GR 4 or 5/12 or 13. LL scales 45–50; scale rows above lateral line 5.

Basic colour pattern for many individuals is common, but polychromatic for some, with colour variation not determined by geography: either pale greyish brown, pinkish brown or olive-brown; white stripe on upper sides from below 7th dorsal-fin spine to caudal fin (stripe present or absent in olive-brown colour morphs); large and distinctive U-shaped area behind eyes enclosed by border of orange, dark brown and pale blue. Attains 14 cm SL.



Paracirrhites arcatus, 6 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to South Africa (Transkei region), Madagascar, Comoros, Aldabra, Seychelles, Mascarenes, Chagos and Maldives; elsewhere to southern Japan, Australia, Great Barrier Reef, New Caledonia, Pitcairn Is., Marshall Is. and Hawaii.

REMARKS Benthic, mainly on coral reefs, where it dwells facultatively on *Pocillopora* and *Acropora* corals. Typically resident in 2–25 m, but reportedly to 91 m (Chave & Mundy 1994). Feeds on shrimps, fishes, crabs, other crustaceans and fish eggs. Mating system is protogynous and harem. Considered endangered at Réunion because of sensitivity to human activities (Fricke *et al.* 2009).

Paracirrhites forsteri (Schneider 1801)

Freckled or blackside hawkfish

PLATES 20 & 21

Grammistes forsteri Schneider in Bloch & Schneider 1801: 191
(Marquesas Is.).

Gerranus tankervilleae Bennett 1834: no page number, Pl. 27 (Sri Lanka).

Paracirrhites forsteri: Randall 1963*; SFSA No. 395; SSF No. 214.7*;
Winterbottom *et al.* 1989*; Randall 1995*; Fricke 1999; Manilo &
Bogorodsky 2003; Fricke *et al.* 2009; Fricke *et al.* 2013.

Pectoral fins with uppermost ray and lower 7 rays unbranched. Body depth 2.6–2.9 in SL. GR 5 or 6/10–12. LL scales 45–49; scale rows above lateral line 5 or 6.

Body polychromatic without apparent geographical variation; head and anterior part of body with many small red to dark reddish brown or black spots; upper half of body typically grey-brown, with broad dark brown stripe from eyes to upper part of peduncle (stripe often shading to black posteriorly, and sometimes broken into large blotches); several other colour morphs have been photographed or observed. Juveniles usually with 2 distinct colour morphs, either red or golden green dorsally and white ventrally; the red morph also with white band along lateral line for about two-thirds of body, but the band rarely present in the green morph. Attains 23 cm SL.



Paracirrhites forsteri, 8 cm SL (Seychelles). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Oman to South Africa (Sodwana Bay), Madagascar, Comoros, Aldabra, Seychelles, Réunion, Mauritius, St Brandon Shoals, Chagos, Maldives and Sri Lanka; elsewhere to southern Japan, Guam, Australia, Lord Howe I., Norfolk I., Pitcairn Is., Marquesas Is. and Hawaii.

REMARKS Found on coral and rocky reefs, to >30 m (usually in <25 m); facultative inhabitant of *Pocillopora*, larger *Acropora*, or other corals. Feeds on small benthic fishes and crustaceans. Mating system is protogynous and harem. Considered endangered at Réunion because of sensitivity to human activities (Fricke *et al.* 2009).

GLOSSARY

facultatively monogamous – a mating system in which a male is not fully committed to one female, but chooses to stay with that female because there are no other mating opportunities available.

harem mating system – a single male with a ‘harem’ of several females.

protogynous hermaphrodite – an individual that functions first as a female and then changes to a male.

spur and groove zone – a zone of finger-like projections of coral (the spurs) in a fringing reef that grow out towards oncoming waves, with ‘valleys’ or grooves in between, which together serve to break the energy of incoming waves.

FAMILY CHEILODACTYLIDAE

Fingerfins

Phillip C Heemstra

Body oblong, slightly compressed, head pointed. Dorsal fin single, with 17–20 stout heteracanth spines, 19–25 rays, fin base extending from above gill opening to peduncle; anal fin angular, with 3 short slender spines, 9–11 rays; pectoral fins fan-shaped, lower 4 or 5 rays elongated, thickened and projecting beyond fin membrane; pelvic fins 1 spine, 5 branched rays, fin origin well behind pectoral-fin base; caudal fin shallowly notched, with 13 branched rays. Mouth small, terminal to subterminal, with bands of villiform teeth, no canines, and no teeth on vomer and palatines; upper jaw slightly protrusile, large adults with thick lips; 2 nostrils on each side of snout. Preopercle smooth; no spines on opercle. Branchiostegal rays 6, membranes united and forming a fold over isthmus; gill arches 4, with a slit behind 4th arch. Scales small to moderate, weakly ctenoid. No swimbladder. Vertebrae 13 or 14 + 21; supraneurals 3: 0/0+0/2+1/1/1/1/.

Cheilodactylids lack the distinctive, highly compressed, transforming larval stage known as the paperfish stage found in the family Latridae. Adult cheilodactylids are sedentary, demersal, often solitary, and associated with rocky reefs in temperate areas. They feed on benthic crustaceans, molluscs, worms, brittlestars, crinoids and small fishes.

Genetic studies by BurrIDGE & Smoleski (2004) showed that two South African species, *Cheilodactylus fasciatus* and *C. pixi*, were divergent from other members of the genus and family, and what was previously Cheilodactylidae was polyphyletic. A single genus with 2 species endemic to South Africa (Kimura *et al.* 2018).

GENUS *Cheilodactylus* Lacepède 1803

Body oblong, depth 2.6–3.7 in SL; dorsal fin 19–25 rays; soft-rayed dorsal-fin base 1.4–2.1 in spinous base; scales small: postcleithrum, interorbital, snout, cheek and opercle entirely scaly, LL scales 78–85, scaly sheath at dorsal-fin base with 6 scale rows, anal-fin sheath with 3 or 4 scale rows. Two species, both in WIO.

KEY TO SPECIES

- 1a Body pale, with 5 or 6 continuous dark bars; caudal fin uniformly pale; dorsal fin 19–23 rays; margin of body scales rough with skin flaps *C. pixi*
- 1b Body variegated, pale orange, with irregular dark spots and upper dark bars offset from lower part; caudal fin pale with 10–12 oblique sepia stripes; dorsal fin 23–25 rays; body scales with smooth margin *C. fasciatus*

Cheilodactylus fasciatus Lacepède 1803

Redfingers

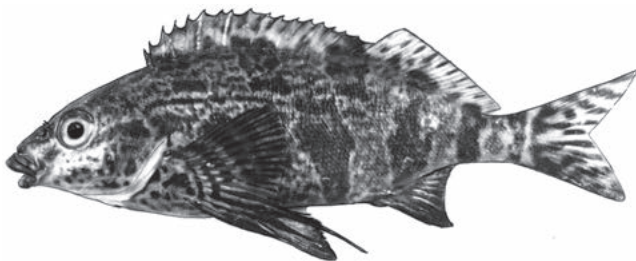
PLATE 22

Cheilodactylus fasciatus Lacepède 1803: 6, Pl. 1 [no locality given]; Smith 1980*; SSF No. 215.1*; Heemstra & Heemstra 2004*; Ludt *et al.* 2019*.

Cheilodactylus multiradiatus Castelnau 1861: 12 (Cape of Good Hope, South Africa).

Dorsal fin 17–19 spines, 23–25 rays; anal fin 3 spines, 9–11 rays; pectoral fins 14 or 15 rays, lower 4 or 5 rays unbranched, thickened and extending beyond membrane. Body depth at dorsal-fin origin 3.2–3.7 in SL; HL 2.7–3.5 in SL. GR 5 or 6/14–16. LL scales ~80. Vertebrae 14 + 21.

Body and head with reddish orange to brown markings, including 7 dark brown bars offset and broken up anteriorly to form variegated pattern; caudal fin pale yellowish with 10–12 irregularly oblique sepia stripes. Attains 30 cm TL.



Cheilodactylus fasciatus, 16 cm TL (South Africa). Source: Smith 1980

DISTRIBUTION Southern Africa: Namibia (Swakopmund) in southeastern Atlantic, to South Africa (Durban, KwaZulu-Natal) in WIO.

REMARKS Found on rocky shores, to ~25 m.

Cheilodactylus pixi Smith 1980

Barred fingerfin

PLATE 22

Cheilodactylus pixi Smith 1980: 2, Pl. 1 (off Port Alfred, Eastern Cape, South Africa); SSF No. 215.2*; Ludt *et al.* 2019.

Dorsal fin 18–20 spines, 19–23 rays; anal fin 3 spines, 9–11 rays; pectoral fins 13 or 14 rays, lower 4 or 5 rays undivided, thickened and elongated past fin membrane.

Body depth at dorsal-fin origin 2.6–3.3 in SL; HL 3–3.5 in SL. GR 4–6/13–16. LL scales 78–85. Vertebrae 13 + 21.

Head and body buff, paler below, with 6 dark brown, broad, oblique bars (first on nape, last at caudal-fin base or sometimes absent), bars extending onto dorsal fin; snout and front of head darker; vermilion mottling on body scales of adults; caudal and pectoral fins yellowish, other fins whitish. Attains 18 cm TL.



Cheilodactylus pixi, 16 cm TL, paratype (South Africa). Source: Smith 1980

DISTRIBUTION WIO: endemic to southeastern South Africa (False Bay, Western Cape, to Aliwal Shoal, KwaZulu-Natal).

REMARKS Found from shore to 101 m (rarely seen in <10 m).

GLOSSARY

heteracanth (spines) – asymmetrical dorsal-fin spines, with either the right or left side thickened.

FAMILY LATRIDAE

Trumpeters

Phillip C Heemstra

Body oblong to elongate, slightly compressed, head pointed. Dorsal fin single, with 15–25 stout heteracanth spines, 22–44 rays, fin base extending from above gill opening to peduncle; anal fin angular or pointed, with 3 short slender spines, 7–37 rays; pectoral fins fan-shaped, lower fin-rays elongated, thickened and projecting beyond fin membrane; pelvic fins 1 spine, 5 branched rays, fin origin well behind pectoral-fin base; caudal fin emarginate, with 13 branched rays. Mouth small, with bands of villiform teeth, no canines, and no teeth on vomer and palatines; upper jaw slightly protrusile, large adults with thick lips; 2 nostrils on each side of snout. Preopercle smooth; no spines on opercle. Branchiostegal rays 6, membranes united and forming a fold over isthmus; gill arches 4, with a slit behind 4th arch. Scales small to moderate, weakly ctenoid. Swimbladder present. Vertebrae 13 or 14 + 21; supraneurals 2 (except for *Mendosoma*): 0+0/2+1/1+1/1/1/1/.

Latridae is the only family in Cirrhitidae with a distinctive, highly compressed, transforming larval stage known as the paperfish stage. This pelagic stage grows to ~8 cm TL in 8–12 months and then begins to transform to the juvenile stage. Paperfish occur in the open ocean in association with flotsam and rafts of *Sargassum* seaweed and are also found in tidepools and washed up on beaches. Adults are sedentary, demersal, often solitary, and associated with rocky reefs in temperate areas. They feed on benthic crustaceans, molluscs, worms, brittlestars, crinoids and small fishes.

Earlier classification of the families Latridae and Cheilodactylidae was uncertain, with genera being synonymised and family limits changing. A comprehensive revision was done by Ludt *et al.* (2019), and is used as a basis for these families in this book. Latridae has 9 genera and 30 species, distributed mainly in the Southern Hemisphere (South America, southern Africa, Australia and New Zealand) and a few species in Japan, Taiwan and Hawaii; 2 genera and 4 species in WIO.

KEY TO GENERA

- 1a No naked groove at base of soft-rayed dorsal fin; pectoral fins with 1 middle ray elongated beyond fin membrane *Nemadactylus*
- 1b Naked groove below scaly sheath of dorsal-fin base; at least 2 enlarged pectoral-fin rays project beyond rest of fin *Chirodactylus*

GENUS *Chirodactylus* Gill 1862

Body depth 2.6–3, HL 2.5–3.5 in SL; dorsal fin 17 or 18 spines, 22–31 rays; soft-rayed dorsal-fin base 0.8–1 in spinous base; scales moderate, LL scales 46–55; postcleithrum naked; scaly sheath at dorsal-fin base with 1–3 scale rows; 1 scale row along anal-fin base. Five species: 1 in SE Pacific (Chile to Peru), 3 in southern Africa and 1 from SE Australia, Tasmania and New Zealand.

KEY TO SPECIES

- 1a Body uniformly pale reddish brown, scale margins dark reddish brown; dorsal fin 22–24 rays; soft-rayed dorsal-fin base subequal to spinous base *C. grandis*
- 1b Colour not as above; dorsal fin 26–31 rays; soft-rayed dorsal-fin base longer than spinous base 2
- 2a Body entirely orange-brown, silvery underwater, with dark red or black spot at pectoral-fin bases; scales above lateral line with dark centre, scales below lateral line with pale centre; dorsal fin scaly sheath with dark brown edges; dorsal fin 26 or 27 rays; anal fin 7 or 8 rays *C. jessicalenorum*
- 2b Body mostly bronze-brown and head two-tone: reddish brown above eyes and abruptly white below eyes; dorsal fin 28–31 rays; anal fin 8–10 rays *C. brachydactylus*

Chirodactylus brachydactylus (Cuvier 1830)

Twotone fingerfin

PLATE 22

Cheilodactylus brachydactylus Cuvier in Cuv. & Val. 1830: 361 (Cape of Good Hope, South Africa).

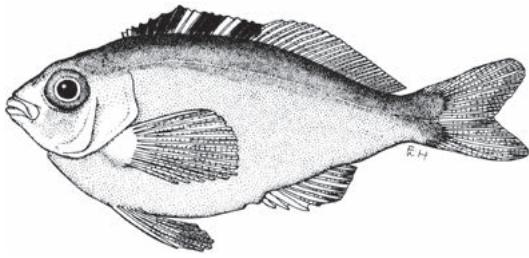
Chilodactylus brevispinis Regan 1921: 416 (15–20 miles off Umvoti River mouth, KwaZulu-Natal, South Africa).

Palunolepis brachydactylus: SFSA No. 398*; Smith & Smith 1966*.

Chirodactylus brachydactylus: Smith 1980*; Van der Elst 1981*; SSF No. 215.3*; Ludt *et al.* 2019*.

Dorsal fin 17 or 18 spines, 28–31 rays; anal fin 3 spines, 8–10 rays; pectoral fins 14 rays, lower 6 rays thickened and elongate, longest subequal to HL and not reaching past anus. Body depth 2.6–3 in SL; HL 2.9–3.3 in SL. GR 6/14 or 15. LL scales 46–55.

Body bronze-brown, paler ventrally; head with white blaze from snout, below eyes to above pectoral-fin bases, and red-brown above and on lips; 4 or 5 small white spots just above lateral line, above which dorsum and dorsal fin with ~10 faint alternating dark and pale brown semi-bars (caudal-fin upper lobe may be similarly barred); pectoral fins reddish brown; pelvic fins and anal fin whitish brown. Attains 40 cm TL.



Chirodactylus brachydactylus, 4 cm SL, juvenile (South Africa).



Chirodactylus brachydactylus, 18 cm TL, adult (South Africa).

DISTRIBUTION Southern Africa: Namibia (Walvis Bay) in southeastern Atlantic, to Mozambique (Maputo Bay) in WIO.

REMARKS One of the most common fishes along southern African rocky shores, to ~240 m deep, but rarely caught on hook and line. In South Africa, juveniles common in tidepools of Western Cape.

Chirodactylus grandis (Günther 1860)

Bank steenbras

PLATE 22

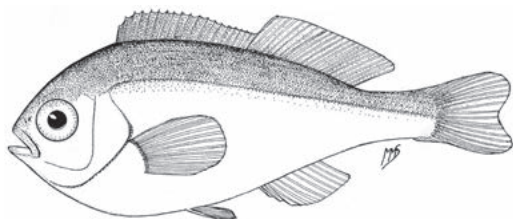
Chilodactylus grandis Günther 1860: 79 (Cape Seas, South Africa).

Palunolepis grandis: SFSA No. 399*; Smith & Smith 1966*.

Chirodactylus grandis: Smith 1980; Van der Elst 1981* [in part: figure shows *C. jessicalenorum*]; SSF No. 215.4*; Ludt *et al.* 2019.

Dorsal fin 17 or 18 spines, 22–24 rays; anal fin 3 spines, 8 rays; pectoral fins 14 rays, lower 6 rays thickened and elongate, longest ray not reaching past anus. Body depth 2.7–2.9 in SL; HL 2.9–3.2 in SL. GR 6 or 7/14. LL scales 47–50.

Body and head dark grey, paler ventrally. The largest species in family, attains at least 100 cm TL.



Chirodactylus grandis, 5 cm TL, juvenile (South Africa). Source: SSF



Chirodactylus grandis, 46 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Southern Africa: Namibia (Walvis Bay) in southeastern Atlantic, to South Africa (Park Rynie, KwaZulu-Natal) in WIO; more northerly records from KwaZulu-Natal are likely to be *C. jessicalenorum*.

REMARKS Known from ~20 m in False Bay to 200 m off Park Rynie. Caught by trawlers and occasionally by line boats using fish bait; easy to spear and flesh greatly esteemed.

Chirodactylus jessicalenorum Smith 1980

Natal fingerfin

PLATES 22 & 23

Chirodactylus jessicalenorum Smith 1980: 7, Pl. 2, Fig. B (off Durban, KwaZulu-Natal, South Africa).

Chirodactylus grandis: Van der Elst 1981: 154* [in part: figure only]; SSF No. 215.5*; Ludt *et al.* 2019.

Dorsal fin 17 or 18 spines, 26 or 27 rays; anal fin 3 spines, 7 or 8 rays; pectoral fins 14 rays, lower 6 rays thickened and elongate, longest ray reaches beyond anal-fin origin, nearly twice length of upper rays. Body depth 2.6–2.8 in SL; HL 2.5–3.5 in SL. GR 6 or 7/14–16. LL scales 46–54.

Head orange-brown dorsally, paler below; body pale reddish orange; scales below lateral line with pale centres, those above lateral line with dark centres; shiny red and blackish blotch at pectoral-fin base. Attains at least 50 cm TL.



Chirodactylus jessicalenorum, 18 cm SL (South Africa).

PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: endemic to east coast of South Africa (Sodwana Bay, KwaZulu-Natal, to Algoa Bay, Eastern Cape).

REMARKS Found in 3–30 m. Easy to spear; rarely caught on hook and line.

GENUS *Nemadactylus* Richardson 1839

Body oblong, compressed; dorsal-fin 16–18 spines, 24–31 rays; anal fin 3 spines, 11–19 rays; pectoral fin 14–16 rays, with one elongate ray reaching past anal-fin origin. Eight species, 1 in WIO.

Nemadactylus monodactylus (Carmichael 1819)

Fivefingers PLATE 23

Chaetodon monodactylus Carmichael 1819: 500, Pl. 24 (Tristan da Cunha, South Atlantic).

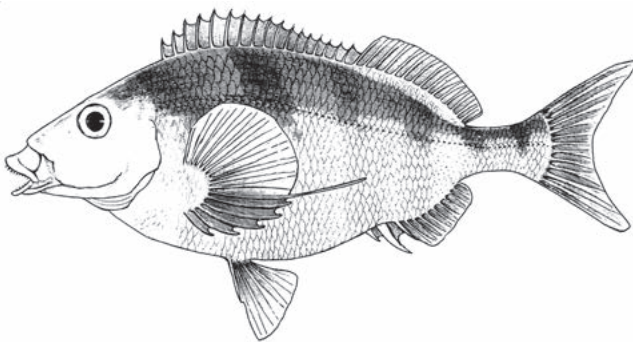
Cheilodactylus carmichaelis Cuvier in Cuv. & Val. 1830: 360 [objective synonym of *Chaetodon monodactylus* Carmichael].

Acantholatris monodactylus: Gill 1883; Collette & Parin 1991; Andrew & Hecht 1992; Andrew *et al.* 1995*.

Nemadactylus monodactylus: Ludt *et al.* 2019.

Dorsal fin 24–27 rays; anal fin 11 or 12 rays; pectoral fins 14 or 15 rays, with 1 ray elongated. Body depth at pelvic-fin origins 2.2–2.6 in SL; HL 2.9–3.6 in SL. GR 5–7/16–18. LL scales 50–54.

Body silvery or bronze to orange, with 5 or 6 poorly defined, dark brown to black bars dorsally; body and head also overlain with small, irregular brown spots. Caudal fin with faint dark marks. Attains 65 cm TL (age 25+ years).



Nemadactylus monodactylus, 45 cm TL, holotype (Tristan da Cunha). Source: Carmichael 1819

DISTRIBUTION Known from seamounts and islands of southern Atlantic and Indian oceans, including: Tristan da Cunha, Gough I., Vema Seamount, Saint-Paul and Amsterdam Is., Austral Seamount and Walters Shoals.

REMARKS Found in 1.5–150 m and usually within 10 m of the seabed at Tristan da Cunha (Andrew & Hecht 1992).

FAMILY POLYNEMIDAE

Threadfins

Hiroyuki Motomura

Body elongate to moderately deep, compressed posteriorly; snout obtusely conical, overhanging mouth. Mouth large, inferior and nearly horizontal; maxilla extending beyond eye; no supramaxilla; lip on front of upper jaw absent or poorly developed. Teeth villiform, in bands on jaws, palatines and ectopterygoids, and present or absent on vomer. Adipose eyelid covering eyes. Two well-separated dorsal fins: 1st dorsal fin 8 spines (except two species of *Polynemus* with 7 spines), and 2nd dorsal fin 1 spine, 11–18 rays; anal fin 3 spines, 10–18 rays (except two species of *Polynemus* with 2 spines, and *Pentanemus* with 24–30 rays); pectoral fins divided into upper part with 12–19 rays joined by membrane, and lower part with 3–16 separate rays or pectoral filaments; pelvic fins 1 spine, 5 rays; caudal fin deeply forked. Lateral line extending from upper end of gill opening to caudal-fin margin. Swimbladder present or absent. Vertebrae 10 + 14, or 10 + 15 in *Eleutheronema* and *Polynemus*; supraneural bones 0–3. Occur in tropical to subtropical waters of all oceans. Epibenthic, mostly coastal and in estuaries, but *Polydactylus macrophthalmus* and some species of *Polynemus* inhabit entirely freshwater rivers. Generally occur on sandy or muddy bottom, at <150 m, and juveniles often found in seagrass beds and tidepools; the pectoral filaments are used to detect prey. Of considerable importance in commercial fisheries worldwide, and in the sport fishery off Australia and West Africa. A few species (such as *Polydactylus sexfilis*) are used in aquaculture; some freshwater species (e.g., *Polynemus aquilonaris* and *P. multifilis*) are traded as aquarium fishes.

Eight genera and 43 species; 5 genera and 11 species in WIO.

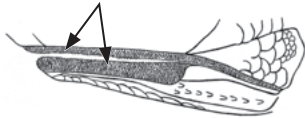
KEY TO GENERA

- 1a Pectoral-fin insertions near midline of body, pectoral filaments greater than TL; eye diameter ≥ 1.3 in snout length ... ***Polynemus***
- 1b Pectoral-fin insertions well below midline of body; pectoral filaments less than TL; eye diameter variable but ≤ 1.3 in snout length **2**

Continued...

KEY TO GENERA

- 2a Premaxillary diastema 2–3 times width of tooth band; basisphenoid not in contact with prootic *Filimanus*
- 2b Premaxillary diastema less than width of tooth band; basisphenoid in contact with prootic 3
- 3a Caudal-fin lobe tips filamentous; sphenotics exposed dorsally; swimbladder with many appendages inserted into lateral walls of abdominal cavity *Leptomelanosoma*
- 3b Caudal-fin lobe tips not filamentous in adults; sphenotics not exposed dorsally; swimbladder absent or present but without appendages 4
- 4a Front of lower jaw with small teeth extending onto lateral surface, and no adjacent lip; anal fin 3 spines, 14–16 rays *Eleutheronema*
small teeth extending onto lateral surface
- 4b Lip present at front of lower jaw; anal fin 3 spines, 11–13 rays *Polydactylus*

GENUS *Eleutheronema* Bleeker 1862

Head and body elongate. Adipose eyelid well-developed; eye diameter greater than snout length. Front of lower jaw with small teeth extending onto lateral surface, no adjacent lip; maxilla extends well beyond eye. Teeth villiform, in broad bands on jaws, vomer, palatines and ectopterygoids; width of tooth band on both jaws greater than space (on symphysis) separating tooth bands on opposing premaxillae. Preopercle rear margin serrate. Basisphenoid in contact with prootic; sphenotics not visible dorsally between anterior margins of parietal and pterotic. First dorsal fin 8 spines; 2nd dorsal fin 1 spine, 13–15 rays; anal fin 3 spines, 14–16 rays, and fin base less than HL; pectoral fins 15–19 rays, all unbranched, fin insertions well below midline of body, and width of fin base (including base of pectoral filaments) less than upper jaw length; pectoral filaments 3 or 4, not extending beyond pelvic-fin tips; caudal-fin lobes not filamentous. Gill rakers on front of upper and lower limbs replaced during fish growth by tooth plates with villiform teeth (gill rakers becoming shorter with growth). No swimbladder. Vertebrae 25; supraneural bones 0–2. Three species, 1 in WIO.

Eleutheronema tetradactylum (Shaw 1804)

Fourfinger threadfin

PLATE 23

Polynemus tetradactylus Shaw 1804: 155 (Gariahat, Kolkata, India) [based on literature sources, especially Russell 1803: Fig. 183].

Polynemus teria Hamilton 1822: 224, 381 (Ganges River estuaries, India).

Eleutheronema tetradactylum: De Bruin *et al.* 1994*; Motomura *et al.* 2002*.

Pectoral filaments 4. In SL: body depth 3.7–4.4, HL 3.2–3.6, upper jaw length 5.9–7.1, postorbital length 4.8–5.6, pectoral fins 4.4–5, and longest pectoral filament 3.6–6.7. In HL: snout length 5.6–7.8, orbit diameter 4–5.2. Pectoral-fin rays unbranched, and fin tip just short of pelvic-fin tip; 4th pectoral filament longest, extending at most slightly beyond pectoral-fin tip. Vomer with deciduous tooth plates on both sides, except in juveniles (<7 cm SL); ectopterygoids and 2 deciduous tooth plates becoming wider and larger, respectively, with growth. GR 3–8/3–10. Lateral line extending to upper end of caudal-fin lower lobe, or bifurcating at fin base and upper branch extending to lower end of upper lobe and lower branch secondarily bifurcating on middle of lower lobe; LL scales 71–80; scale rows above lateral line 9–12, below lateral line 13–15. Vertebrae 10 + 15; supraneural bones 1 or 2.

Body silvery, without stripes or spots; pectoral fins vivid yellow in young, becoming dusky yellow in fish >35 cm SL. Attains 200 cm TL.



Eleutheronema tetradactylum, 30 cm SL (Kuwait). H Motomura © KAUM

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Pakistan, India and Sri Lanka; not known from Red Sea and East Africa; elsewhere to northern Australia and New Guinea.

GENUS *Filimanus* Myers 1936

Body oblong to moderately deep. Adipose eyelid well-developed; eye diameter greater than snout length. Maxilla extends beyond eye. Lip on lower jaw well-developed; dentary teeth restricted to dorsal surface. Teeth villiform, in narrow bands on jaws, palatines and ectopterygoids; vomer with inconspicuous tooth plate; width of tooth band on both jaws less than space (on symphysis) separating tooth bands on

opposing premaxillae; tooth plates on palatines shorter than those on ectopterygoids. Preopercle rear margin serrate. Basisphenoid not in contact with prootic; sphenotics not visible dorsally between anterior margins of parietal and pterotic. First dorsal fin, 8 spines; 2nd dorsal fin 1 spine, 11–13 rays; anal fin 3 spines, 10–15 rays, and fin base less than HL; pectoral fins 13–16 rays, all unbranched, fin insertions well below midline of body, and width of fin base (including base of pectoral filaments) less than upper jaw length; pectoral filaments 5–8, not extending beyond caudal-fin tips; caudal-fin lobes not filamentous. Vertebrae 24; supraneural bones 2 or 3. Six species, 1 in WIO.

Filimanus similis Feltes 1991

Sevenfinger threadfin

PLATE 23

Filimanus similis Feltes 1991: 318, Fig. 12 (Beruwala, Sri Lanka); Manilo & Bogorodsky 2003.

Anal fin 3 spines, 10–12 rays; pectoral fins 14–16 rays; pectoral filaments 7. In SL: body depth 2.9–3.3, HL 2.9–3.5, upper jaw length 5.9–7.7, postorbital length 4.9–6.4, pectoral fins 3.2–4.2, and longest pectoral filament 2.1–4. In HL: snout length 4.1–7, orbit diameter 3.8–5. Snout pointed, occipital profile nearly straight; depth of rear end of maxilla less than eye diameter. Pectoral-fin rays unbranched, and fin tip just short of pelvic-fin tip; 3rd and 4th pectoral filaments usually longest, reaching to or slightly beyond anal-fin origin. GR 40–49. Lateral line extends to caudal-fin fork; LL scales 45–49; scale rows above lateral line 5–7, below lateral line 9–11. Vertebrae 10 + 14; supraneural bones 3.

Body silvery or golden, without stripes or spots. Attains 27 cm TL.



Filimanus similis, 10 cm SL (India). H Motomura © KAUM

DISTRIBUTION Indian Ocean. WIO: Pakistan, India and Sri Lanka; not known from Persian/Arabian Gulf, Red Sea or East Africa; elsewhere to Andaman Sea.

GENUS *Leptomelanosoma*

Motomura & Iwatsuki 2001

Diagnosis as for the single species.

Leptomelanosoma indicum (Shaw 1804)

Indian threadfin

PLATE 23

Polynemus indicus Shaw 1804: 155 (Visakhapatnam, India) [based on drawing in Russell 1803: 68, Fig. 184].

Polynemus sele Hamilton 1822: 226, 381 (Ganges River estuaries, India).

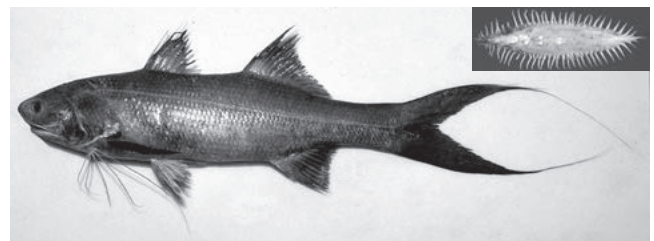
Polynemus uronemus Cuvier 1829: 385 (Puducherry, India, and mouth of Adrian-Coupang River).

Polynemus gelatinosus McClelland 1843: 181, Pl. 6 (West Bengal, India) [unneeded new name for *Polynemus sele* Hamilton 1822].

Leptomelanosoma indicum: Motomura & Iwatsuki 2001*.

First dorsal fin 8 spines; 2nd dorsal fin 1 spine, 12 or 13 rays; anal fin 3 spines, 10 or 11 rays; pectoral fins 12–14 rays; pectoral filaments 5. In SL: body depth 4–4.6, HL 2.9–3.3, upper jaw length 6.7–7.1, postorbital length 4.4–4.8, pectoral fins 4.6–5.3, and longest pectoral filament 2.2–3.6. In HL: snout length 4.3–6.8, orbit diameter 5–8.5. Pectoral fins not reaching pelvic-fin tips; 5th pectoral filament longest, extending well beyond pelvic-fin tip; caudal-fin lobes long, tips filamentous. Anterior third of lower jaw with small teeth extending onto lateral surface, adjacent lip poorly developed; tooth plates on palatines longer than those on ectopterygoids. Sphenotics visible dorsally between anterior margins of parietal and pterotic. GR 8 or 9/10–12. Lateral line extends to end of caudal-fin lower lobe; LL scales 69–72; scale rows above lateral line 7 or 8, below lateral line 9–12. Swimbladder with many appendages inserted into lateral walls of abdominal cavity. Vertebrae 10 + 14; supraneural bones 2.

Body greyish black or dark brownish dorsally, paler silvery below, with faint longitudinal stripes. Attains 140 cm TL.



Leptomelanosoma indicum, 26 cm SL, and swimbladder (India). H Motomura © KAUM

DISTRIBUTION Indo-Pacific. WIO: Pakistan, India and Sri Lanka; not known from Persian/Arabian Gulf and Red Sea; elsewhere to Myanmar, Indonesia and New Guinea.

REMARKS Found on soft bottom, from shore to ~60 m deep. Specimens from southeastern Africa previously reported as *Polydactylus indicus* are *Polydactylus plebeius*.

GENUS *Polydactylus* Lacepède 1803

Body oblong to moderately deep. Adipose eyelid well-developed; eye diameter greater than snout length. Maxilla either just short of, reaching to, or extending beyond eye. Lip on lower jaw well-developed; dentary teeth restricted to dorsal surface except in adults of *Polydactylus opercularis*. Teeth villiform, in broad bands on jaws, palatines and ectopterygoids; no teeth on vomer in some species; width of tooth band on both jaws greater than space (on symphysis) separating tooth bands on opposing premaxillae. Preopercle rear margin serrate. Basisphenoid in contact with prootic; sphenotics not visible dorsally between anterior margins of parietal and pterotic. First dorsal fin 8 spines; 2nd dorsal fin 1 spine, 11–15 rays; anal fin 3 spines, 10–18 rays, and anal-fin base less than HL; pectoral fins 12–18 rays, fin insertions well below midline of body, and fin base (including base of pectoral filaments) less than upper jaw length; pectoral filaments 4–9, not extending beyond caudal fin; caudal-fin lobes not filamentous. Swimbladder well-developed. Vertebrae 10 + 14 = 24; supraneural bones 2 or 3. Twenty-one species, with ~15 in Indo-Pacific; possibly 7 species in WIO, but *P. microstomus* is recorded only from southeastern India and Sri Lanka and eastwards.

KEY TO SPECIES

- 1a No large black spot anteriorly on lateral line; vomer with teeth; all pectoral-fin rays unbranched 2
 1b Large black spot anteriorly on lateral line; no teeth on vomer; pectoral-fin rays branched, except 1 or 2 upper rays 3
- 2a Pectoral filaments 5, fins rays 15–18; GR 24–32 *P. plebeius*
 2b Pectoral filaments 6, fin rays 15 or 16; GR 27–31 *P. sexfilis*
- 3a Pectoral filaments 5; body and fins tinged yellowish silvery *P. microstomus* [eastern Indian Ocean]
 3b Pectoral filaments 6 or 7; body and fins tinged silvery 4
- 4a Pectoral filaments 7; 2nd spine of 1st dorsal fin more robust than other spines *P. mullani*
 4b Pectoral filaments 6; all spines of 1st dorsal fin of similar thickness 5
- 5a GR 25–30; swimbladder atrophied *P. sextarius*
 5b GR 29–35; swimbladder well-developed 6

Continued ...

KEY TO SPECIES

- 6a Pectoral fins 14 rays; scale rows below lateral line 10 (rarely 9); front end of palatines turned medially; pectoral fins long (~24% SL); pectoral filaments short (~29% SL) *P. malagasyensis*
 6b Pectoral fins 12–14 rays; scale rows below lateral line 8 or 9; palatines straight anteriorly; pectoral fins short (~19% SL); pectoral filaments long (~32% SL) *P. persicus*

Polydactylus malagasyensis

Motomura & Iwatsuki 2001

African blackspot threadfin

PLATE 23

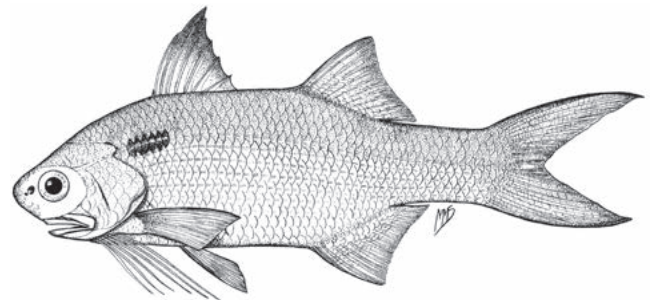
Polydactylus malagasyensis Motomura & Iwatsuki 2001: 338, Figs. 1, 7a, 8a (estuary of Mananjary River, ~100 m from sea, eastern Madagascar); Motomura 2002*; Heemstra & Heemstra 2004.

Second dorsal fin 1 spine, 12 or 13 rays; anal fin 3 spines, 12 rays; pectoral fins 14 rays; pectoral filaments 6. In SL: body depth 2.9–3.2, HL 2.9–3.2, upper jaw length 7.1–7.7, postorbital length 5–5.6, pectoral fins 3.9–4.8, and longest pectoral filament 3.2–3.7. In HL: snout length 4.4–7, orbit diameter 2.8–4.4. Pectoral-fin rays unbranched, except upper 1 or 2 rays, and fin tip not reaching pelvic-fin tip; 6th pectoral filament longest, extending just short of or slightly beyond pectoral-fin tip. No teeth on vomer. GR 12–16/17–19. LL scales 46–51; scale rows above lateral line 5 or 6, below lateral line 9 or 10. Swimbladder well-developed. Supraneural bones 3.

Body mainly silvery, golden olive dorsally; large black spot anteriorly on lateral line. Attains 21 cm TL.



Polydactylus malagasyensis, holotype, 13 cm SL (Madagascar). H Motomura © KAUM



Polydactylus malagasyensis, 22 cm SL (S Mozambique). Source: SSF

DISTRIBUTION WIO: Kenya to South Africa (Algoa Bay, Eastern Cape) and Madagascar.

REMARKS Occurs in estuaries and offshore, at 6–62 m.

Polydactylus mullani (Hora 1926)

Arabian blackspot threadfin

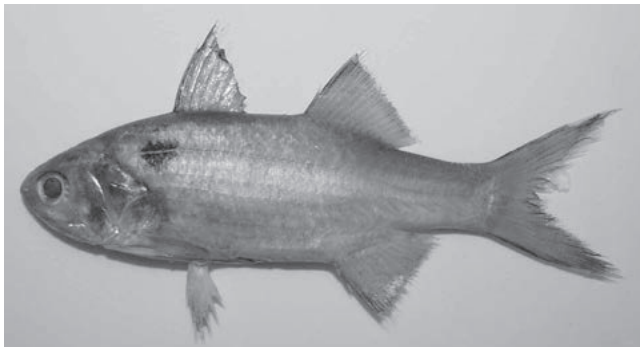
PLATE 23

Polynemus sextarius var. *mullani* Hora 1926: 453, Fig. 1 (Mumbai, India).

Polydactylus mullani: Motomura & Iwatsuki 2001*; Motomura 2002*.

Second dorsal fin 1 spine, 12 or 13 rays; anal fin 3 spines, 11 or 12 rays; pectoral fins 13 or 14 rays; pectoral filaments 7 (rarely asymmetrically 6 and 7). In SL: body depth 2.9–3.6, HL 2.7–3, upper jaw length 5.9–7.1, postorbital length 4.6–5.3, pectoral fins 4.6–5.3, and longest pectoral filament 2.2–3.6. In HL: snout length 4.7–9.3, orbit diameter 3–4.1. Second spine of 1st dorsal fin more robust than other spines; pectoral-fin rays unbranched, except upper 1 or 2, and fin tip not reaching pelvic-fin tip; 7th pectoral filament longest, extending well past pectoral-fin tip, and reaching anal-fin origin in juveniles (<6 cm SL). No teeth on vomer; anterior end of palatines turned medially. GR 13–16/18–21. LL scales 46–50; scale rows above lateral line 5–7, below lateral line 9 or 10. Swimbladder well-developed. Supraneural bones 3.

Head and upper body dark silvery, paler silvery below; large black spot anteriorly on lateral line. Attains 30 cm TL.



Polydactylus mullani, 13 cm SL (India). H Motomura © KAUM

DISTRIBUTION WIO: northern Arabian Sea (Oman to India).

REMARKS Relatively common; taken in 14–115 m.

Polydactylus persicus Motomura & Iwatsuki 2001

Persian blackspot threadfin

PLATES 23 & 24

Polydactylus persicus Motomura & Iwatsuki 2001: 347, Figs. 5, 7d, 8b (Kuwait Bay, Kuwait, Persian/Arabian Gulf); Motomura 2002*.

Second dorsal fin 1 spine, 12 or 13 rays; anal fin 3 spines, 12 rays; pectoral fins 12 or 13 rays; pectoral filaments 6. In SL: body depth 2.9–3, HL 2.9–3.2, upper jaw length 6.7–7.7, postorbital length 5–5.6, pectoral fins 5–5.6, and longest pectoral filament 2.8–3.9. In HL: snout length 6.2–8.5, orbit diameter 3.1–4.3. Pectoral-fin rays unbranched, except upper 1 or 2, and fin tip not reaching pelvic-fin tip; 6th pectoral filament longest, reaching well beyond pectoral-fin tip. No teeth on vomer; palatines straight anteriorly. GR 12–16/17–20. LL scales 46–49; scale rows above lateral line 5 or 6, below lateral line 8 or 9. Swimbladder well-developed. Supraneural bones 3.

Body silvery, darker dorsally; large black spot anteriorly on lateral line. Attains 25 cm TL.



Polydactylus persicus, 15 cm SL (Kuwait). H Motomura © KAUM

DISTRIBUTION WIO: Persian/Arabian Gulf.

REMARKS Known from shallow water, <10 m deep.

Polydactylus plebeius (Broussonet 1782)

Striped threadfin

PLATE 24

Polynemus plebeius Broussonet 1782: [35], Pl. [8] (Tahiti, Society Is. [French Polynesia]).

Polynemus lineatus Lacepède (ex Commerson) 1803: 410, 412, Pl. 13, Fig. 2 (Tahiti, Society Is. [evidently Réunion, Mascarenes]).

Polynemus niloticus Shaw 1804: 151 (Nile River [in error]) [based on literature sources].

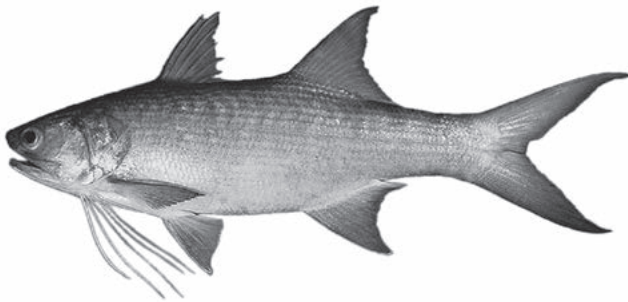
Polynemus commersonii Shaw 1804: 156 (Indian seas) [unnecessary replacement name for *Polynemus lineatus* Lacepède 1803].

Polydactylus plebeius: Randall & Anderson 1993; Motomura *et al.* 2001*; Motomura *et al.* 2002; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

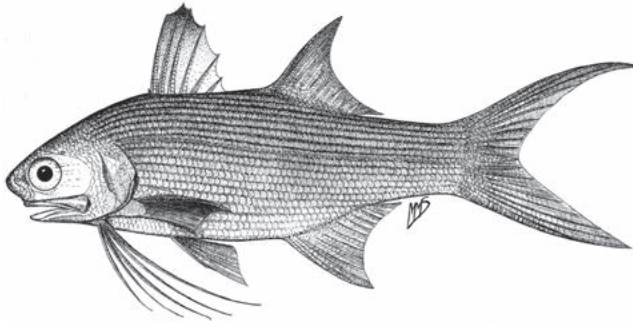
Second dorsal fin 1 spine, 12 or 13 rays; anal fin 3 spines, 11 or 12 rays; pectoral fins 15–18 rays; pectoral filaments 5. In SL: body depth 3.1–4, HL 2.9–4, upper jaw length 6.3–7.7, postorbital length 5–6.7, pectoral fins 3.6–5.9, and longest

pectoral filament 2.5–4.6. In HL: snout length 2.8–6.8, orbit diameter 2.3–4.9. Pectoral-fin rays unbranched, and fin tip not reaching pelvic-fin tip; 5th pectoral filament longest, reaching to or beyond pelvic-fin tip. Teeth present on vomer. GR 9–14/13–18. LL scales 60–68; scale rows above lateral line 8 or 9, below lateral line 12 or 13. Swimbladder well-developed. Supraneural bones 3.

Body golden silvery, with 7 or 8 prominent darker longitudinal stripes along scale rows above lateral line, and 7–9 faint stripes below lateral line. Attains 55 cm TL.



Polydactylus plebeius (Indonesia). © JE Randall, Bishop Museum



Polydactylus plebeius, 21 cm TL (South Africa). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Knysna), Madagascar and Mascarenes; not known from Red Sea and Persian/Arabian Gulf; elsewhere to Philippines, southern Japan, Australia, New Caledonia and French Polynesia.

REMARKS Occurs on soft bottom, in estuaries and from shore to at least 122 m deep.

Polydactylus sexfilis (Valenciennes 1831)

Sixfinger threadfin

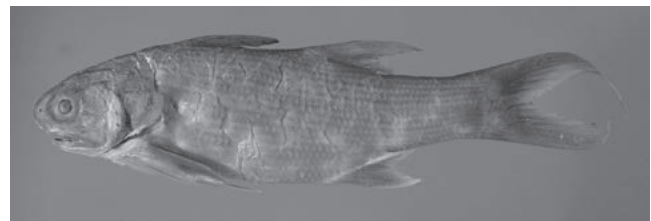
PLATE 24

Polynemus sexfilis Valenciennes in Cuv. & Val. 1831: 515 (Mauritius, Mascarenes).

Polydactylus sexfilis: Randall & Anderson 1993; Motomura *et al.* 2000*; Motomura *et al.* 2001*; Motomura 2002*; Motomura & Senou 2002*.

Second dorsal fin 1 spine, 12 or 13 rays; anal fin 3 spines, 11 or 12 rays; pectoral fins 15 or 16 rays; pectoral filaments 6. In SL: body depth 3.1–3.9, HL 2.9–3.7, upper jaw length 6.7–7.7, postorbital length 5–6.7, pectoral fins 4.4–5, and longest pectoral filament 2.4–3.6. In HL: snout length 3.4–6.8, orbit diameter 2.5–4.3. Pectoral-fin tips not reaching pelvic-fin tips; pectoral-fin rays unbranched except in large adults, 3rd ray bifurcate at tip, 4th and 5th rays trifurcate at tip, remaining rays unbranched; 6th pectoral filament longest, but not reaching pelvic-fin tip. Teeth present on vomer. GR 11–14/15–18. LL scales 60–67; scale rows above lateral line 8–10, below lateral line 12–14. Swimbladder well-developed. Supraneural bones 3.

Body silvery or golden, occasionally with 7–9 dark longitudinal stripes along scale rows above lateral line, and 1–12 faint stripes below lateral line (juveniles especially without stripes). Attains 60 cm TL.



Polydactylus sexfilis, 27 cm SL, lectotype (Mauritius). H Motomura © KAUM

DISTRIBUTION Indo-Pacific. WIO: Kenya, Seychelles, Mauritius and Maldives; elsewhere widespread to Indonesia, Ryukyu Is., New Caledonia, Society Is., Pitcairn Is. and Hawaii; not known from Red Sea, Persian/Arabian Gulf, northern Arabian Sea, Thailand and Australia.

REMARKS Occurs in shallow coastal waters (<50 m deep), along sandy and rocky beaches, in lagoons and near reefs at oceanic islands, and frequently in turbulent zones. Relatively common around oceanic islands and less dependent on large freshwater rivers than other polynemids.

Polydactylus sextarius (Bloch & Schneider 1801)

Blackspot threadfin

PLATE 24

Polynemus sextarius Bloch & Schneider 1801: 18, Pl. 4

(Tharangambadi, India).

Polydactylus sextarius: Motomura & Iwatsuki 2001; Motomura 2002*.

Second dorsal fin 1 spine, 12 or 13 rays; anal fin 3 spines, 11–13 rays; pectoral fins 13–15 rays; pectoral filaments 6. In SL: body depth 2.8–3.5, HL 2.9–3.3, upper jaw length 7.1–8.3, postorbital length 4.8–5.9, pectoral fins 4–5.3, and longest pectoral filament 3.5–5. In HL: snout length 4.3–8.8, orbit diameter 3–4.4. Pectoral-fin rays unbranched, except

upper 1 or 2 rays, and fin tip not reaching pelvic-fin tip; 6th pectoral filament longest, but not reaching pectoral-fin tip. No teeth on vomer; anterior end of palatines turned medially. GR 10–14/14–18. LL scales 45–51; scale rows above lateral line 5 or 6, below lateral line 8–11. Swimbladder atrophied, resembling a fine string. Supraneural bones 3.

Body silvery, with large black spot anteriorly on lateral line. Attains at least 25 cm TL.



Polydactylus sextarius, 13 cm SL, holotype (India). H Motomura © KAUM

DISTRIBUTION Indo-Pacific. WIO: southwestern India; elsewhere to Philippines, southern Japan and New Guinea.

REMARKS Uncommon; found on sand and mud bottom, at 16–73 m.

GENUS *Polynemus* Linnaeus 1758

Head and body elongate. Adipose eyelid poorly developed; eye diameter less than snout length. Maxilla extends well beyond eye. Lip on lower jaw well-developed; dentary teeth restricted to dorsal surface. Teeth villiform, in broad bands on jaws, palatines and ectopterygoids; no teeth on vomer in some species; width of tooth band on both jaws greater than space (on symphysis) separating tooth bands on opposing premaxillae. Preopercle rear margin serrate. Basisphenoid absent; sphenotics not visible dorsally between anterior margins of parietal and pterotic. First dorsal fin 7 or 8 spines; 2nd dorsal fin 1 spine, 13–18 rays; anal fin 2 or 3 spines, 10–14 rays, and anal-fin base less than HL; pectoral fins 14–19 rays, all unbranched, fins inserted near midline of body, and width of fin base (including base of pectoral filaments) less than upper jaw length; pectoral filaments 7–16, extending beyond caudal fin; caudal-fin lobes not filamentous. Vertebrae 10 + 15 = 25; supraneural bones 2. Nine species or subspecies, 1 in WIO.

Polynemus paradiseus Linnaeus 1758

Paradise threadfin

PLATE 24

Polynemus paradiseus Linnaeus 1758: 317 (Gariahat, Kolkata, India); Motomura *et al.* 2002*.

Polynemus risua Hamilton 1822: 228 (vicinity of Lukhipur, India).

Polynemus aureus Hamilton 1822: 232, 381 (Kolkata, India).

Polynemus toposui Hamilton 1822: 232, 381 (Ganges River estuaries, India).

Polynemus longifilis Cuvier in Cuv. & Val. 1829: 365 (Puducherry and Ganges River mouth, India; Manila, Philippines [probably erroneous]).

First dorsal fin 8 spines; 2nd dorsal fin 1 spine, 14 or 15 rays; anal fin 2 spines, 11–13 rays; pectoral fins 15–18 rays; pectoral filaments 7. In SL: body depth 3.6–5, HL 3.7–4.2, upper jaw length 6.7–7.7, postorbital length 5.3–5.9, pectoral fins 2.9–3.3, and longest pectoral filament 0.4–0.6. In HL: snout length 3.4–4.5, orbit diameter 8–13.5. Pectoral-fin rays unbranched, and fin tips reaching to or just short of anal-fin origin, or extending slightly beyond in juveniles (<10 cm SL); 5th–7th pectoral filaments longer than TL, 6th filament longest. Teeth present on vomer. GR 12–14/17–20. LL scales 66–71; scale rows above lateral line 6 or 7, below lateral line 10–12. No swimbladder.

Body golden, dusky dorsally, without stripes or spots. Attains 28 cm TL.



Polynemus paradiseus (India). H Motomura © KAUM

DISTRIBUTION Indo-Pacific. WIO (rare): west coast of India; elsewhere to north-east coast of India and Thailand.

REMARKS Occurs in both estuarine and coastal waters, from shore to at least 27 m deep; often enters freshwater for breeding.

GLOSSARY

adipose eyelid – more or less transparent tissue that partially covers the eye.

premaxillary diastema – space between the premaxillary bones.

FAMILY PEMPHERIDAE

Sweepers

John E Randall and Benjamin C Victor

Body compressed, of variable depth, with large eyes and very short snout; mouth strongly oblique; jaws with tiny, conical to recurved teeth, and smaller curved teeth on vomer and palatines. Dorsal fin single, its height greater than its length, with 6 slender spines, 9 (rarely 10) rays; anal fin long and low, with 3 spines and numerous rays; caudal fin slightly to moderately forked. Branchiostegal rays 7; GR 24–34. Scales ctenoid or cycloid, both types present in all species (with their location on the body important in classification); LL pored scales 43–75 for WIO species. Vertebrae 10 + 15.

Sweepers typically form aggregations in caves or below ledges in coral or rocky reefs by day; a single spacious cave may harbour aggregations of more than one species (a single collection from southern Mozambique in 1995 resulted in 126 specimens of *Parapriacanthus*: 78 of *P. argenteus* and 48 of *P. punctulatus*). They emerge from shelter at night to feed near the surface on zooplankton, for which their large eyes and short snout are well-adapted. Two adjacent aggregations of different species of *Pempheris* may maintain the integrity of their school while leaving a cave to spawn, but there is also the chance that the sperm of one species will fertilise the ova of another in an adjacent spawning aggregation. Randall & Victor (2015) described the hybrid *Pempheris malabarica* × *P. russellii*, from a reef off Karachi, Pakistan. Species of *Parapriacanthus* are unique in possessing luminescent organs in the anal region (Haneda & Johnson 1958); although no explanation has been given for the function of these organs, they might facilitate schooling at night.

Pempherids attain sexual maturity at a surprisingly small size; routine sex determination of individual fish (by dissecting the abdomen) has revealed an unusually high percentage of mature or nearly mature gonads, indicating frequent and probable year-round spawning. Larvae settle out at <6 mm SL, indicating a probable short larval life (Leis & Carson-Ewart 2000), an obvious limitation to attaining a broad distribution in the sea.

The usual mode of swimming is sculling with the pectoral fins, the apparent origin of the common name sweeper. We propose that species of *Parapriacanthus* be given the common name pygmy sweepers, in reference to their smaller size on

average than species of *Pempheris*. The family is represented in all tropical and subtropical seas, except the eastern Pacific; one species, *Pempheris rhomboidea*, has colonised the Mediterranean Sea via the Suez Canal.

Analyses of the mtDNA sequences of *Pempheris* species in WIO have revealed a number of new species with clearly divergent lineages, but also many species sharing mtDNA haplotypes, usually allopatric but in some cases in sympatry (Randall & Victor 2015). In general, taxa that share mtDNA sequences necessitate a more thorough evaluation to establish their validity. It may be that sweepers exhibit unexpectedly high morphological variation that would bridge some of the putative species differences recently described. Since many of the recently described pempherid species are based on one or a few specimens and show only subtle differences from other members of their complex, the total may fall to only a dozen valid species if intraspecific morphological and colour variation is shown to account for the differences.

Two genera and about 80 species; both genera and about 54 nominal species in WIO.

KEY TO GENERA

- 1a Body dorsoventrally symmetrical: a line from snout tip to mid-caudal-fin base divides body into approximately equal halves; HL greater than body depth; chest broadly rounded ventrally; anal fin ≤ 28 rays *Parapriacanthus*
- 1b Body dorsoventrally asymmetrical: a line from snout tip to mid-caudal-fin base divides body into narrow dorsal part and much broader ventral part; chest with distinct median ventral ridge; anal fin ≥ 35 rays *Pempheris*

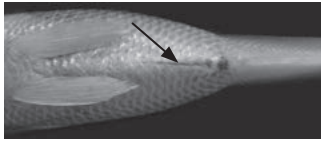
GENUS *Parapriacanthus* Steindachner 1870

Body more or less symmetrical above and below a line from snout to midbase of caudal fin. Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 20–23 rays; pectoral fins 15–18 rays. GR 23–27. Scales small, nearly all ctenoid (with ctenii only on outer margin of scales), adherent, and in only one layer; LL scales 63–74 (except 24–26 in *Pa. rahah*). Twelve species in Indo-Pacific, with 7 in WIO, and several others still to be described.

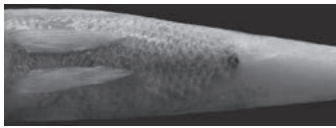
KEY TO SPECIES

1a Black pin-like mark present midventrally, ~½ length of pelvic fins, within white band encircling head of pin, just anterior to anus (not present in juveniles) 2

1b No black pin-like mark midventrally, anterior to anus 4



1a



1b

2a Pectoral-fin length 3.3–3.5 in SL; preanal length 1.5–1.6 in SL; dorsal profile of head and nape nearly straight; iris silvery white in preservative *Pa. argenteus*

2b Pectoral-fin length 3.1–3.3 in SL; preanal length 1.6–1.7 in SL; dorsal profile of head and nape moderately convex; iris golden or dark bluish grey in preservative 3

3a Preanal length ~1.6 in SL; predorsal length 2.5–2.6 in SL; eyes relatively large, orbit diameter 6.3–7 in SL (4 specimens 40–47 mm SL); iris golden in preservative; pectoral fins usually 16 rays *Pa. guentheri*

3b Preanal length ~1.7 in SL; predorsal length 2.3–2.5 in SL; eyes relatively small, orbit diameter 7.8–8 in SL (4 specimens 37–41.5 mm SL); iris dark bluish grey in preservative; pectoral fins usually 17 rays *Pa. kwazulu*

4a Predorsal length 2.3–2.4 in SL; body depth 3.2–3.4 in SL; iris dark bluish grey in preservative, sometimes with faint pale grey ring; dark dots on scales from below lateral line to peduncle *Pa. punctulatus*

4b Predorsal length 2.4–2.5 in SL; body depth 3.1–3.2 in SL; iris golden or black in preservative; dark dots on scales below lateral line, but not as far as peduncle 5

5a Pectoral-fin length 3.5–3.6 in SL; orbit diameter 7.5–7.8 in SL; iris mainly golden (fresh and in preservative) *Pa. rahah*

5b Pectoral-fin length 3.1–3.4 in SL; orbit diameter 6.7–6.9 in SL; iris black in preservative 6

6a Peduncle depth ~8.4 in SL; body width ~2 in body depth; anal fin 21 rays; LL scales 71 (1 specimen) *Pa. darros*

6b Peduncle depth 9.5–10.1 in SL; body width 2.2–2.4 in body depth; anal fin 22 or 23 rays; LL scales 64–68 *Pa. sharm*

Parapriacanthus argenteus (Von Bonde 1923)

Yellowhead sweeper

PLATE 25

Parapempheris argenteus Von Bonde 1923: 11, Pl. 2, Fig. 2 (KwaZulu-Natal, South Africa [Ponta Malongane, Mozambique]).

Parapriacanthus guentheri (non Klunzinger 1871): Smith 1949.

Parapriacanthus ransonneti (non Steindachner 1870): SSF No. 216.1*; Heemstra & Heemstra 2004*; King & Fraser 2014*.

Parapriacanthus argenteus: Winterbottom 1976; Randall & Bogorodsky 2016*.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 20–23 rays; pectoral fins 16–18 rays. Head profile nearly straight, except rounded at front of snout. Body depth 3–3.2 in SL, body width 2.1–2.3 in body depth. In SL: peduncle depth 9.3–9.8, HL 2.8–2.9, snout length 11.3–12.2, orbit diameter 7.6–8.2 (eyes relatively small), predorsal length 2.3–2.4, 1st (longest) ray of dorsal fin 4.5–5.4, and pectoral-fin length 3.3–3.5. Teeth in upper jaw sharply conical, in 2 irregular rows: those of outer row forward-projecting, those of inner row strongly recurved; similar smaller teeth in lower jaw, well-spaced, in single row; vomer and palatines with minute, incurved, sharply conical teeth in single irregular row; lips thin, densely covered with papillae; tongue broadly triangular, with small, rounded, flexible terminal flap. GR 24–27. LL scales 64–74.

In life, body translucent dull violet-pink; head, nape and chest yellowish green; iris mainly green. Preserved specimens with purplish brown head, nape and chest, grading to greenish on abdomen, with vertically oriented black flecks on these areas, and posterior half of body beige; caudal fin with dark vertical line at base, and each lobe with short blackish streak near tip; pin-like black line anterior to anus; iris pale grey to white. Attains 7 cm SL.



Parapriacanthus argenteus, 7 cm SL, neotype (S Mozambique).

© HA Randall, Bishop Museum

DISTRIBUTION WIO: southern Oman, and southern Mozambique to South Africa (KwaZulu-Natal: 32° S).

REMARKS The first specimens trawled in 1922 were lost; a neotype was described from specimens collected in 1956. A disjunct Pleistocene relict population survives to the north off the southern Oman coast, the result of an upwelling created by monsoon winds driving surface waters offshore.

Parapriacanthus darros Randall & Bogorodsky 2016

D'Arros sweeper

PLATE 25

Parapriacanthus ransonneti (non Steindachner 1870): Randall & Van Egmond 1994.

Parapriacanthus darros Randall & Bogorodsky 2016: 8, Figs. 6–7 (D'Arros I., Amirante Is., Seychelles).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 21 rays; pectoral fins 16 rays; caudal fin moderately forked. Body depth 3.1 in SL, body width 2 in body depth. In SL: peduncle depth 8.35, HL 2.8, orbit diameter 6.9 (eyes relatively large), predorsal length 2.5, 1st (longest) ray of dorsal fin 5, pectoral-fin length 3.3, and pre-pelvic length 2.7. Teeth at front of upper jaw in 2 close-set rows: those of outer row small and nodular, those of inner row large, broadly spaced, nearly straight, and strongly inward-projecting. GR 26. LL scales 71; scale rows 5½ between lateral line and dorsal-fin base.

In life, pale green on head and abdomen, rest of body translucent pale pink. Preserved specimen pale tan, and nape and abdomen finely speckled; no dark markings on posterior part of body, on fins or fin bases; no pin-like dark line anterior to anus; iris black. Attains at least 5 cm SL.



Parapriacanthus darros, 5 cm SL, male holotype (Seychelles).

© HA Randall, Bishop Museum

DISTRIBUTION Known only from the holotype collected from the Seychelles.

REMARKS Trawled from outer reef in 50–55 m. An aggregation of fish (estimated average size 60 mm TL) was photographed at nearby St Joseph Atoll, and are probably *P. darros*.

Parapriacanthus guentheri (Klunzinger 1871)

Egyptian sweeper

PLATE 25

Pempherichthys guentheri Klunzinger 1871: 470 (Al-Qusayr, Egypt, Red Sea).

Parapriacanthus guentheri: Klunzinger 1884.

Parapriacanthus guentheri: Randall 1983*; Dor 1984; Shpigel & Fishelson 1991; Shpigel 1997*; Field & Field 1998*; Golani & Bogorodsky 2010*; Randall & Bogorodsky 2016*.

Parapriacanthus ransonneti (non Steindachner 1870): Goren & Dor 1994 [as *ransonmari*]; Lieske & Myers 2004*.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 21–23 rays; pectoral fins 16 or 17 (usually 16) rays. Body depth 3.1–3.3 in SL, body width 2.2–2.3 in body depth. In SL: peduncle depth 8.9–9.6, HL 2.6–2.7, snout length 10.5–11.7, orbit diameter 6.3–7.4 (eyes relatively large), predorsal length 2.5–2.6, 1st (longest) ray of dorsal fin 4–4.6, pectoral-fin length 3.2–3.3, and preanal length ~1.6. Teeth in upper jaw sharply conical, recurved, and in 2 irregular rows: those of outer row more forward-projecting, those of inner row more strongly recurved; similar smaller teeth in lower jaw, well-spaced, in single row; vomer and palatines with minute, incurved, sharply conical teeth in single irregular row; lips thin, covered with closely adjacent papillae; tongue broadly triangular, with small, rounded, flexible terminal flap. GR 24 or (usually) 25. LL scales 65–73; scale rows 5½ between lateral line and dorsal-fin base.

In life, body yellowish green, with silvery reflections on snout, eyes and operculum, grey-green on chest and abdomen, and rest of body translucent pink, variously overlaid with greenish grey; iris gold. Preserved specimens pale brown, with fine speckling on head, nape and abdomen; caudal fin with dark vertical line at base and dark spots at tips of upper and lower lobes; other fins unmarked; iris gold. Pin-like dark line anterior to anus. Attains 5.5 cm SL.

DISTRIBUTION WIO: Red Sea.

Parapriacanthus kwazulu

Randall & Bogorodsky 2016

Kwazulu sweeper

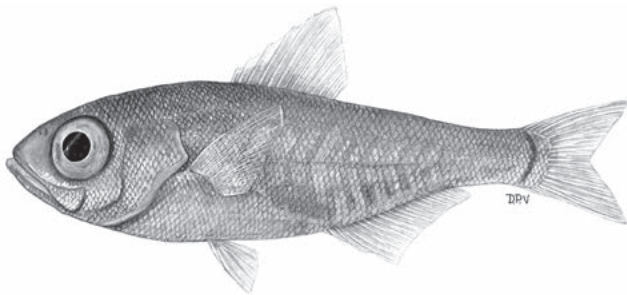
PLATE 25

Parapriacanthus kwazulu Randall & Bogorodsky 2016: 13, Fig. 12 (Park Rynie, KwaZulu-Natal, South Africa).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 20–22 rays; pectoral fins 16 or 17 rays. Body depth 3.1–3.2 in SL, body width 2–2.2 in body depth. In SL: HL 2.7–2.9, snout length 11.5–13, orbit diameter 7.8–8 (eyes relatively small), pectoral-fin length 3.1–3.2, predorsal length 2.3–2.5, 1st (longest) ray of dorsal fin 4–4.7, peduncle depth 9.3–9.8, and preanal length ~1.7. Teeth in upper jaw slender, sharply conical, recurved and well-spaced: those of outer row more forward-projecting, those of inner row more strongly recurved; similar smaller teeth in lower jaw; vomer and palatines with minute, incurved, sharply conical teeth in single irregular row; lips thin, covered with small greenish spots and scattered with larger, low purple papillae; tongue broadly triangular, slightly indented near tip. GR 24–27. LL scales 64–71; scale rows 5½ between lateral line and dorsal-fin base.

In life, head dull greenish yellow with black dots on nape; operculum edge silvery; chest and abdomen silvery grey; rest

of body translucent greenish yellow, except bright pink area above and behind pectoral-fin bases, and series of curving red bands at edge of myomeres, bands progressively smaller nearly to caudal-fin base; blackish pigment overlaying red, white and blue bands at pectoral-fin bases; bright red internal band at anal-fin base; iris yellow. Preserved specimens pale brown, with fine speckling on head, nape and abdomen; caudal fin with dark vertical line at base, and dark spot near tips of upper and lower lobes; other fins unmarked; iris black. No pin-like dark line anterior to anus. Attains at least 7 cm TL.



Parapriacanthus kwazulu, 7 cm TL (South Africa). Source: SSF

DISTRIBUTION Known only from nine subadults collected from South Africa.

REMARKS Type specimens (27.5–42 mm SL) discovered in a cave at ~38 m. Previously all Indo-Pacific populations were identified as *P. ransonneti*, but Randall & Bogorodsky (2016) established that the true *P. ransonneti* from Japan is not present in the Indian Ocean.

Parapriacanthus punctulatus

Randall & Bogorodsky 2016

Dotted sweeper

PLATE 25

Parapriacanthus punctulatus Randall & Bogorodsky 2016: 14, Figs. 2b, 13–16 (Ponta Malongane, Mozambique).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 20–23 rays; pectoral fins 15–17 (usually 16). Body depth 3.2–3.4 in SL, body width 2–2.2 in body depth. In SL: HL 2.8–3, snout length 11.4–13, orbit diameter 6.3–7.4 (eyes relatively large), predorsal length 2.3–2.4, 1st (longest) ray of dorsal fin 4.7–5.4, pectoral-fin length 3.3–3.6, peduncle depth 8.9–10.4, and preanal length 1.5–1.6. Teeth in upper jaw sharply conical, recurved, in 2 irregular rows: those of upper row more forward-projecting, those of inner row more strongly recurved; similar smaller teeth in lower jaw, well-spaced, in single row; vomer and palatines with minute, incurved, sharply conical teeth in single irregular row; lips thin, covered with closely adjacent papillae;

tongue broadly triangular, indented on sides near tip, forming small, half-round, flexible flap. GR 23–26. LL scales 63–72; scale rows 5½ between lateral line and dorsal-fin base.

In life, body translucent pinkish orange, except for yellowish green on snout tip and chin, and in large patch encompassing area below eye and onto opercle, chest and abdomen; series of small dark brown spots basally on posterior half of anal fin present or absent; iris yellow. Preserved specimens tan; head, nape and abdomen finely speckled; numerous dark spots on sides of body below lateral line and extending onto peduncle; caudal fin with dark vertical line at base, and dark spots at tips of upper and lower lobes; other fins unmarked; iris black. No pin-like dark line anterior to anus. Attains at least 7 cm SL.

DISTRIBUTION WIO: Mozambique, South Africa (KwaZulu-Natal), northern Madagascar, Comoros, Seychelles, Réunion and Mascarene Ridge.

REMARKS Named *punctulatus* for the numerous dark brown dots below the lateral line, extending well posterior to the anal-fin origin.

Parapriacanthus rahah Randall & Bogorodsky 2016

Rahah sweeper

PLATE 25

Parapriacanthus rahah Randall & Bogorodsky 2016: 17,

Fig. 17 (cave of drop-off at Rahah Bay, Oman).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 20–22 rays; pectoral fins 15 or (usually) 16 rays. Body depth 3.1–3.2 in SL, body width 2–2.2 in body depth. In SL: HL 2.9–3, snout length 12.2–12.9, orbit diameter 7.5–7.8 (eyes relatively large), predorsal length 2.4–2.5, 1st (longest) ray of dorsal fin 4.4–4.7, pectoral-fin length 3.5–3.6, peduncle depth 9.5–10.2, and preanal length 1.5–1.6. Teeth in upper jaw slender, recurved, in 2 irregular rows, projecting downward and becoming progressively smaller towards end of jaw; lower jaw with 2 medial rows of strongly recurved and inward-projecting teeth, soon reduced to single row for most of jaw; vomer and palatines with small, recurved, sharply conical teeth in single irregular row; upper lip thin, densely covered with dark purple papillae; lower lip with smaller, more widely spaced papillae; tongue broadly triangular, slightly indented on sides anteriorly, forming small rounded tip. LL scales 24–26 (usually 25).

Freshly dead fish tan-orange, except whitish and green on cheek and operculum (possibly because of damage); chest and abdomen mixed blue-green and white; iris gold and green. Preserved specimens pale brown, with fine speckling on head, nape and abdomen; caudal fin with dark vertical line at base, and dark spots at tips of upper and lower lobes; other fins

unmarked; iris gold. No pin-like dark line anterior to anus. Attains at least 5 cm SL.

DISTRIBUTION Presently known only from southern Oman.

REMARKS Collected at ~14 m. First identified as *P. ransonneti*, type locality Japan, which it closely resembles, but differs from in lacking the pin-like mark before the anus and having a predorsal length of 2.4–2.5 in SL (~2.3 in SL for *P. ransonneti*). Also similar to *P. guentheri* from the Red Sea, but which differs in having the black pin-like mark, as well as larger eyes and a shorter predorsal length.

Parapriacanthus sharm Randall & Bogorodsky 2016

Sharm sweeper

PLATE 26

Parapriacanthus sharm Randall & Bogorodsky 2016: 18, Figs. 18–19 (boat pier at Sharm el-Sheikh, Egypt, Sinai Peninsula, Gulf of Aqaba, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 22 or 23 rays; pectoral fins 16 or (usually) 17 rays. Lower jaw slightly protruding when mouth fully closed. Body depth 3.1–3.2 in SL, body width 2.2–2.4 in body depth. In SL: HL 2.8–2.9, snout length 12–13.2, orbit diameter 6.7–6.9 (eyes relatively large), 1st (longest) ray of dorsal fin 4.7–4.8, pectoral-fin length 3.1–3.4, and preanal length 1.5–1.6. Teeth in upper jaw primarily slender, recurved, in 2 irregular rows: those of outer row in same plane as surface of upper lip anteriorly, then sharply curved inwardly and posteriorly, inner row more sharply recurved; teeth of 2 rows progressively smaller nearly to end of jaw, then reduced to single row. Teeth in lower jaw slightly smaller, strongly recurved, slender, in single row. Vomer with small, incurved, sharply conical teeth in single irregular V-shaped row, and palatines with row of similar teeth. Lips thin, with tiny, well-spaced, dark purple papillae; tongue broadly triangular, slightly indented on sides anteriorly to form small, rounded, thickened tip. GR 25 or 26. LL scales 64–68; scale rows 5½ between lateral line and dorsal-fin origin.

In life, body translucent pale blue, with yellow tinge over front of snout and chin; no dark markings on fins, except dotted blackish vertical line at caudal-fin base; narrow internal red band at anal-fin base; iris blue-green, with dorsal arc of yellow and white on upper half of pupil. Preserved specimens pale brown, with dark vertical line at caudal-fin base, other fins unmarked; iris black. No pin-like dark line anterior to anus. Attains at least 6.2 cm SL (holotype).

DISTRIBUTION WIO: northern Red Sea.

GENUS *Pempheris* Cuvier 1829

Body dorsoventrally asymmetrical (much more body mass below lateral midline), tapering rapidly to very narrow caudal peduncle. Dorsal fin 6 spines, 9 or 10 soft rays; anal fin 3 spines, 35–48 soft rays; pectoral fin rays 17–19 (rarely 16); LL scales 43–75; GR 24–34. Colour highly variable: brownish, reddish, sometimes greenish, often silvery. More than 75 nominal species worldwide (about 35 probably valid); about 50 nominal species in WIO (probably a dozen valid).

Note: We do not follow the elaborate key of Randall & Victor (2015). Additional series of mtDNA-sequenced collections with fresh photographs reveal that colours, markings, and morphometrics are much more variable within species than we presumed in 2015. Length information has not been included for some species due to the doubt about their taxonomic status. Many of the recent species described are likely junior synonyms; those are indicated in Remarks sections. At present, only 11 species in the WIO are reliably distinct (true *P. schwenkii* is added to the list from 2015).

KEY TO SPECIES

- | | | |
|----|--|---|
| 1a | Overall orange, leading edge of dorsal fin orange; bands on flank made up of rows of orange scale centres; LL scales 65–75..... | <i>P. malabarica</i> |
| 1b | Overall not orange; dorsal fin with dark leading edge and/or apical dark spot; LL scales <65 | 2 |
| 2a | No dark bands on flank (in life); prominent black band along anal-fin base, none along margin; dorsal fin with dark leading edge with or without dark apical spot | 25 spp.
[of schwenkioid complex (3 genetic groupings: <i>P. schwenkii/tominagai</i> , <i>P. ibo</i> and <i>P. connelli</i> complex)] |
| 2b | Dark bands on flank made up of rows of dark scale centres (in life) and/or black margin on anal fin; no dark leading margin on dorsal fin (only apical spot) | 3 |
| 3a | Dark bands on flank made up of rows of dark scale centres (in life); iris not bright yellow; anal fin usually without full-length black margin (infrequent exceptions, including dark or red margin in <i>P. mangula</i>); pectoral-fin base with no mark or a dark crescent, usually not a full black oval | 16 spp.
[of banded-flank complex, i.e., <i>P. nesogallica/rhomboides</i> group] |
| 3b | No dark bands on flank (in life); iris bright yellow or brownish; anal fin with full-length obvious black margin; usually a full black oval at pectoral-fin base | 4 |

Continued...

KEY TO SPECIES

- 4a Iris not bright yellow in life; yellow dorsal fin with narrow distal black margin, less than pupil width, extending linearly down to last rays; in life, basal band along anal fin also prominent; LL scales 56–65 *P. bexillon*
- 4b Iris bright yellow in life; dorsal fin not fully yellow, dark apical oval spot, wider than pupil width, not extending down to last rays; in life, basal band along anal fin not prominent; LL scales 53–60 *P. flavicycla*

Pempheris andilana Randall & Victor 2015

Andilana sweeper

PLATE 26

Pempheris andilana Randall & Victor 2015: 17, Fig. 2 (off Andilana Beach, Nosy Be, Madagascar).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37–41 rays; pectoral fins 17 or (usually) 18 rays. Body depth 2.2–2.3 in SL, body width 2.8–2.9 in body depth. In SL: HL 3.2–3.4, orbit diameter 7.3–8 (eyes moderate), predorsal length 2.4–2.6, and pectoral-fin length 3–3.2. Teeth in upper jaw in 3 irregular rows medially, narrowing laterally to 2 rows, and then to 1 row of minute but still pointed teeth in posterior fifth of jaw; teeth in lower jaw minute, densely spaced, in band of ~4–6 rows where broadest medially, and progressively more retrorse and more inwardly pointing, innermost teeth largest (and larger in males than in females) and nearly horizontal. GR 26–29. Scales cycloid on nape, below dorsal fin, and on sides of chest except ctenoid on ventroanterior fourth of chest; scales ctenoid on dorsal surface of peduncle to one scale row above lateral line, and then cycloid below lateral line except for midventrally; LL scales 52–58.

Colour in life unknown. Preserved specimens pale brown, chest paler; many scales with thin pale yellowish edges, becoming darker above lateral line and much darker on nape; fins yellowish; blackish line centred on upper part of pectoral-fin bases; dorsal fin with black line on leading edge, not becoming broader at tip; dark brown band at anal-fin base almost as broad as outer yellowish part of fin anteriorly but narrower posteriorly; caudal fin with wide blackish margins, broadest at posterior margin. Attains at least 103 mm SL.

DISTRIBUTION Known only from type specimens collected from northeastern Madagascar.

REMARKS One of several recently described schwenkioid species without robust diagnostic characters or mtDNA sequences. It may be a junior synonym of *P. tominagai*, or possibly in the *P. connelli* lineage.

Pempheris argyrea Randall & Victor 2015

Seychelles silver sweeper

PLATE 26

Pempheris oualensis (non Cuvier) Allen & Steene 1987:100, Pl. 7 (Seychelles).

Pempheris argyrea Randall & Victor 2015: 18, Figs. 3–4 (rocky shore at north point of La Digue, Seychelles).

Pempheris schwenkii (non Bleeker 1855): Randall & Bineesh 2014.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–40 rays; pectoral fins 16–18 (usually 17) rays. Head profile strongly convex. Body depth 2.3–2.5 in SL, body width 2.6–2.7 in body depth. In SL: HL 3.1–3.3, orbit diameter 6.9–7.8, predorsal length 2.6–2.7, pectoral-fin length 3.1–3.3, pre-pelvic length 2.4–2.5, and pelvic-fin length 5.8–6.6. Teeth at front of upper jaw in 3 close-set, irregular rows; teeth in lower jaw minute, densely spaced, in band of 4 or 5 irregular rows. GR 26–30. Scales cycloid on nape, below dorsal fin, and on sides of chest except ctenoid on ventroanterior quarter and peduncle only dorsally and ventrally; LL scales 50–57.

When fresh, body silvery, with dark band along anal-fin base. Preserved specimens pale; dorsal fin with broad brown margin anteriorly, expanding to spot distally; anal fin with broad dark brown band. Attains at least 102 mm SL.

DISTRIBUTION WIO: Seychelles.

REMARKS One of several recently described schwenkioid species without robust diagnostic characters or mtDNA sequences. It may be a junior synonym of *P. tominagai*, or possibly in the *P. connelli* lineage. *Pempheris ternay*, also described from Seychelles, differs by having a red caudal fin (but colour may be an unreliable character); it shares a DNA lineage with *P. tominagai*.

Pempheris bexillon Mooi & Randall 2014

Yellowfin sweeper

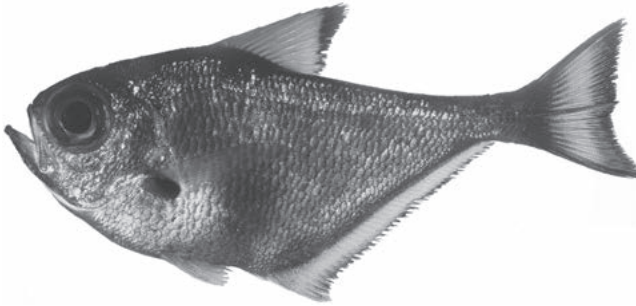
PLATE 26

Pempheris bexillon Mooi & Randall 2014: 391, Figs. 1–2 (Grand Comore I., Comoros); Randall & Victor 2015*; Pinheiro *et al.* 2016.

Dorsal fin 6 spines, usually 9 (rarely 10) rays; anal fin 3 spines, 38–45 rays; pectoral fins 16–19 (usually 18) rays. Head profile smoothly convex. Body depth 2.2–2.4 in SL, body width 3.1–3.3 in body depth. In SL: peduncle depth 9.2–11.2, HL 3.5–3.6, orbit diameter 8.2–8.8, predorsal length 2.6–2.7, pre-pelvic length 2.7–2.8, preanal length 1.9–2, pectoral-fin length 3.3–3.8, and pelvic-fin length 5.4–5.6. Teeth in upper jaw strongly recurved, in 3 irregular rows on anterior three-quarters and visible when mouth closed; teeth in lower jaw minute,

close-set, in broad band medially, increasing from 3 or 4 rows to 7 or 8 rows with growth, and outer 2 or 3 tooth rows of adults exposed when mouth fully closed. GR 31–35. Scales mixed ctenoid and cycloid on nape and below dorsal fin, ctenoid on peduncle and on three-quarters of chest; LL scales 56–65.

In life, head mainly greyish brown, suffused with red ventrally; body pale grey on sides, with scale edges dark grey-brown, and pale greenish yellow along 3 scale rows above lateral line, with scale edges dark green, uppermost scales darkest; pectoral fins with reddish brown rays, and a prominent oval black spot at base and in axil; dorsal fin bright yellow, outer fourth or fifth of anterior rays and membranes black, pigmented area narrow (less than pupil width), linear and progressively narrower posteriorly along margin reaching to last ray; anal fin yellowish, with dark brown band at base and black margin; caudal fin with broad black posterior margin, and narrowly dark upper and lower margins; iris not yellow. Attains at least 155 mm SL.



Pempheris bexillon, 14 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Comoros, Mozambique Channel, Mascarenes and St Brandon Shoals.

REMARKS A SWIO regional species with a deeply divergent, exclusive mtDNA lineage. A large species without bands on flank, a distinctly linear marking on its prominently yellow dorsal fin, and dark bands along the base as well as margin of the anal fin.

Pempheris bineeshi Randall & Victor 2015

Tuticorin sweeper

PLATE 26

Pempheris bineeshi Randall & Victor 2015: 20, Figs. 5–6 (Tuticorin, India).
Pempheris schwenkii (*non* Bleeker 1855): Randall & Bineesh 2014.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38–41 rays; pectoral fins 17 or (usually) 18 rays. Head profile curving slightly at snout tip, then nearly straight to nape. Body depth 2.5–2.7 in SL, body width 2.6–2.7 in body depth. In SL: HL 3.2–3.4, orbit diameter 7.5–7.9, predorsal length 2.8–2.9, and pectoral-fin

length 3.1–3.3. Teeth in upper jaw in 2 rows on medial two-thirds: those of outer row forward-projecting and slightly recurved, those of inner row larger and strongly recurved; teeth in lower jaw minute, densely spaced, in band of 4 or 5 rows where broadest medially. GR 25–27. LL scales 49–54 [other scales almost entirely lost on all type specimens].

When fresh, silvery, caudal fin reddish-orange; dorsal fin with dusky leading margin and apical dark spot; caudal fin with wide dark posterior margin; anal fin with dark band along base of fin; dark crescent at pectoral-fin base. Preserved fish brownish with same markings.



Pempheris bineeshi, 10 cm SL, female holotype (SW India).
KK Bineesh © CMFRI

DISTRIBUTION Indian Ocean: Tuticorin, southern India.

REMARKS A species without clear distinction from *P. schwenkii* and with identical mtDNA sequences to true *P. schwenkii* from Maldives to Indonesia. Likely a junior synonym of *P. schwenkii*.

Pempheris bruggemanni Randall & Victor 2015

Mascarene sweeper

PLATES 26 & 27

Pempheris tominagai (*non* Koeda, Yoshino, Imai & Tachihara 2014):

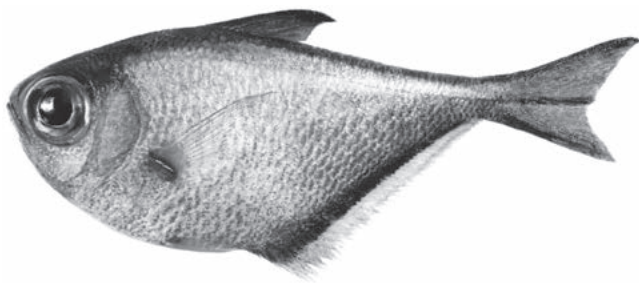
Koeda *et al.* 2014 [in part] (Mauritius).

Pempheris bruggemanni Randall & Victor 2015: 22, Figs. 7–9 (west side of Réunion, Mascarenes).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 40–42 rays; pectoral fins 17 or 18 rays. Body depth 2.3–2.4 in SL, body width 2.9–3 in body depth. In SL: peduncle depth 9.9–10.3, HL 3.1–3.2, orbit diameter 7.2–7.3, preanal length 1.8–1.9, predorsal length 2.5–2.6, and pectoral-fin length 3–3.1. Teeth in upper jaw, in 2 rows medially, narrowing posteriorly to single row; teeth in lower jaw minute, in 3 or 4 irregular rows medially; lips smooth. GR 28 or 29. Scales ctenoid on nape, below dorsal fin, and on ventroanterior two-thirds of sides of chest, but scales cycloid on remainder of chest; scales ctenoid

on peduncle only dorsally and ventrally; LL scales 58–63.

Live photographs underwater show pale grey to brownish fish with some showing a yellow blush on flanks. Fresh photographs show brownish to silvery bodies with variable orange tinge and some with yellow flanks. Preserved fish plain brownish. Dorsal fin with dark leading edge, variably expanded at apex (last few rays not dark); caudal fin with dusky upper and lower margins, only infrequently darker at posterior margin; anal fin with black band along base (sometimes a dusky margin as well); pectoral fin with or without dark crescent at base. Attains at least 120 mm SL.



Pempheris bruggemanni, 11 cm SL, male holotype (Réunion).
© H Bruggemann, ANR-BIOTAS

DISTRIBUTION WIO: Réunion and Mauritius.

REMARKS An endemic schwenkioid species from the Mascarenes with a well-diverged mtDNA lineage, 6.5% from the *P. connelli* lineage in Oman down to South Africa. Distinctive features are higher lateral-line scale counts and yellowish flanks in life, but the yellow is present only on some individuals in schools in underwater photographs and on some fresh DNA-sampled specimens.

Pempheris connelli Randall & Victor 2015

Natal sweeper

PLATE 27

Pempheris connelli Randall & Victor 2015: 24, Figs. 10–11 (Aliwal Shoal, KwaZulu-Natal, South Africa).

Pempheris tominagai (non Koeda, Yoshino, Imai & Tachihara 2014): Koeda *et al.* 2014 [in part].

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37–43 rays; pectoral fins 17–19 rays. Body depth 2–2.3 in SL, body width 2.8–3 in body depth. In SL: HL 3.2–3.3, orbit diameter 7.1–7.6 (specimens 95–117 mm SL) (eyes moderately large), predorsal length 2.6–2.7, pre-pelvic length 2.4–2.5, and pectoral-fin length 3–3.2. Teeth at front of upper jaw close-set, in 2 rows, about equally recurved; teeth at front of lower jaw much smaller, close-set, nodular to recurved, in 3–5 rows, the

innermost largest and most strongly recurved. GR 29–32.

Scales ctenoid on nape, below dorsal fin, ventroanteriorly and adjacent to operculum; scales cycloid on three-quarters of sides of chest and on sides of peduncle; LL scales 50–58.

In life coppery to silvery to greenish; dorsal fin with dark leading edge with or without oval apical spot; caudal fin with dark upper and lower margins, posterior margin usually not darkened; anal fin with dark band along base of fin; dark axil of pectoral fin, no dark markings on outer aspect. Attains at least 130 mm SL.

DISTRIBUTION WIO: South Africa (KwaZulu-Natal).

REMARKS The most common South African schwenkioid species, it has the same mtDNA sequence as *P. hollemani* (Madagascar) and *P. rochai* (Oman), likely representing a single WIO species. Apparently wider-bodied than specimens of the two other schwenkioid mtDNA lineages in the WIO, but morphology does overlap. *Pempheris ibo* co-occurs in southern Africa, but has many fewer LL scales. Otherwise, diagnostic characters remain to be documented to separate *P. connelli* from the *P. tominagai* species-complex, which occurs north of South Africa and is more than 10% divergent in mtDNA sequences.

Pempheris convexa Randall & Victor 2014

Convex sweeper

PLATE 27

Pempheris vanicolensis (non Cuvier in Cuvier & Valenciennes 1831): Randall 1995*: 244, Fig. 637.

Pempheris convexa Randall & Victor 2014: 64, Figs. 1–2 (Sawda I., Oman).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 39 or 40 rays; pectoral fins 17–19 rays. Head profile strongly convex. Body depth 2–2.1 in SL, body width 3.1–3.3 in body depth. In SL: peduncle depth 8.9–10.5, HL 3.3–3.5, orbit diameter 8–8.5 (specimens 115–118 mm SL) (eyes relatively small), pectoral-fin length 3.3–3.4, predorsal length 2.5–2.6, and preanal length ~1.8. Teeth in upper jaw small, strongly recurved, close-set, in 2 rows medially; teeth at front of lower jaw minute, in 4 to 6 irregular rows, progressively more recurved inwardly. GR 29–31. Scales ctenoid on nape, sides of chest, and on body below dorsal fin as far as the scale row above lateral line; LL scales 52–56.

The fresh holotype is greenish silvery with only a dark apical spot on the dorsal fin and a dark crescent at the base of the pectoral fin.

DISTRIBUTION WIO: Oman and Maldives.

REMARKS Described from three specimens; their only distinctive feature is the fully convex head profile and a small eye; no mtDNA is available to confirm their taxonomic status.

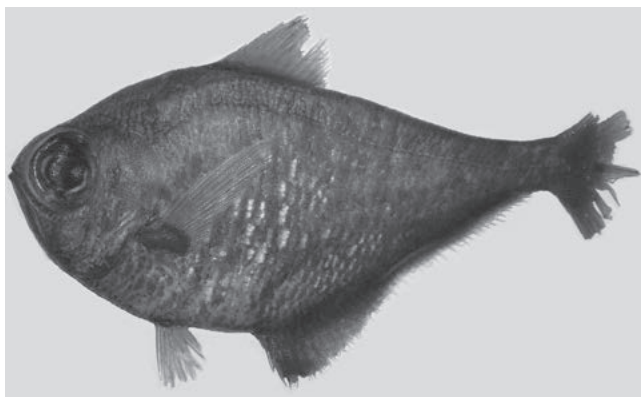
Pempheris cuprea Randall & Victor 2014

Mozambique sweeper

Pempheris cuprea Randall & Victor 2014: 68, Fig. 3 (Mozambique).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 39 or 41 rays; pectoral fins 16–17 rays. Head and snout short, snout length 4–4.5 in HL; dorsal profile a slight sinusoidal curve. Body depth 2.1–2.2 in SL, body width 3–3.1 in body depth. In SL: peduncle depth 9.6–10.3, HL 3.4–3.5, orbit diameter 7.4–7.6 (eyes small), pectoral-fin length ~3.15, predorsal length 2.5–2.6, pre-pelvic length 2.6–2.7, and preanal length 1.9–2. Teeth in upper jaw minute, sharp, incurved, in 2 irregular rows anteriorly; teeth in lower jaw in patch on each side of symphysis, minute, recurved, in up to 6 rows; about half the teeth of tooth patches at front of lower jaw and all of teeth of upper jaw exposed when mouth fully closed. GR 26–28. Scales ctenoid on nape, below dorsal fin and on entire chest; scales cycloid on sides of peduncle; LL scales 54–57 [both sides counted].

Preserved specimens bronzy brown; many scales over pectoral region, abdomen, and above anterior part of anal fin with vertically elongate coppery spot.



Pempheris cuprea, 14 cm SL, female holotype (N Mozambique).

© JE Randall, Bishop Museum

DISTRIBUTION Known only from type specimens collected from Mozambique.

REMARKS A poorly defined species, described from two old museum specimens in poor condition and without DNA sequences. Its taxonomic status is questionable.

Pempheris darvelli Randall & Victor 2014

Jissah sweeper

PLATE 27

Pempheris darvelli Randall & Victor 2014: 71, Figs. 4–7 (Jissah I., Gulf of Oman, Oman).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 41–43 rays; pectoral fins 18 or 19 rays. Head profile a slight sinuous curve; snout short, 4.3–4.6 in HL. Body depth ~2.1 in SL, body width ~3.4 in body depth. Peduncle length 3.8–4 in HL, peduncle depth 9.9–10.2 in SL. In SL: HL 3–3.1, orbit diameter 7.5–7.7, pectoral-fin length 3.1–3.2, predorsal length ~2.6, pre-pelvic length ~2.7, and preanal length ~2. Teeth at front of upper jaw very small, sharp, strongly recurved, in 2 irregular rows, soon narrowing to single row on sides of jaw; teeth on each side of symphysis of lower jaw minute, in 4 or 5 close-set, irregular rows, those of outer row nodular, those of inner rows strongly recurved with very short pointed tips. GR 30–32. Scales ctenoid on anteroventral 90% of chest; LL scales 56–58.

In life, body bronzy brown to coppery, with dark lateral bands made up of darkened scale centres; black on fins limited to apical spot on dorsal fin and tips of first few anal-fin rays and membranes. Preserved specimens dark red-brown, scale edges broadly translucent grey; pectoral fins yellowish grey, with dark red-brown spot on base and axil; pelvic fins dusky yellowish; dorsal fin pale yellowish, distal half of first 6 rays and adjacent membranes black; anal-fin base and adjacent body dark brown, fin more translucent yellow distally; caudal fin dusky yellowish, but darker brown at base and broadly around edges and posterior margin.

DISTRIBUTION Known only from two type specimens collected in the Gulf of Oman.

REMARKS Described from two types without mtDNA sequences. In all aspects, apparently indistinguishable from Red Sea *P. rhomboidea* and likely a junior synonym of *P. nesogallica*.

Pempheris eatoni Randall & Victor 2014

Durban sweeper

PLATE 27

Pempheris eatoni Randall & Victor 2014: 76, Figs. 10–14 (KwaZulu-Natal, South Africa).

Pempheris moluca [error for *molucca*] (*non* Cuvier 1829): Smith 1949*.

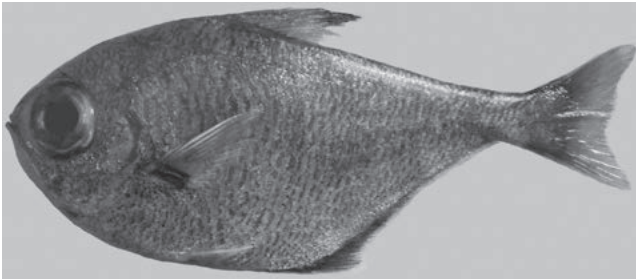
Pempheris adusta (*non* Bleeker 1877): SSF No. 216.2*.

Pempheris onalensis [error for *oualensis*] (*non* Cuvier 1831):

Van der Elst 1988*.

Dorsal fin 6 spines, 9 or 10 (usually 9) rays; anal fin 3 spines, 38–44 rays; pectoral fins 17–19 rays. Head profile slightly convex. Body depth 2.1–2.4 in SL, body width 2.7–3.2 in body depth. In SL: peduncle depth 9.5–10.1, HL 3.3–3.4, orbit diameter 7.2–7.7, pectoral-fin length 3.3–3.6, predorsal length 2.6–2.7, pre-pelvic length 2.5–2.6, and preanal length 2–2.1. Teeth at front of upper jaw very small, sharp, strongly recurved, in 2 irregular rows, and fully exposed when mouth firmly closed; teeth in lower jaw slender and slightly protruding when mouth fully closed, but minute teeth on each side of nodular symphysis in 3 or 4 irregular rows and none exposed when jaw firmly closed. GR 28–33. Scales ctenoid on predorsal area and on entire chest; scales cycloid below dorsal fin; LL scales 53–60.

In life, brownish to silvery with with dark bands along the flank made up of the darkened centres of scales; dorsal fin with dark apical spot. Preserved fish with apical spot and a dark bar at pectoral-fin base. Attains at least 140 mm SL.



Pempheris eatoni, 13 cm SL, female holotype (South Africa).
AD Connell © NRF-SAIAB

DISTRIBUTION WIO: northern Mozambique (Ibo) to South Africa (at least to KwaZulu-Natal).

REMARKS The South African population of the *P. nesogallica/rhomboidea* complex; it shares mtDNA sequences with the other WIO species of that complex and has no distinctive features. Likely a junior synonym of *P. nesogallica*.

Pempheris ellipse Randall & Victor 2015

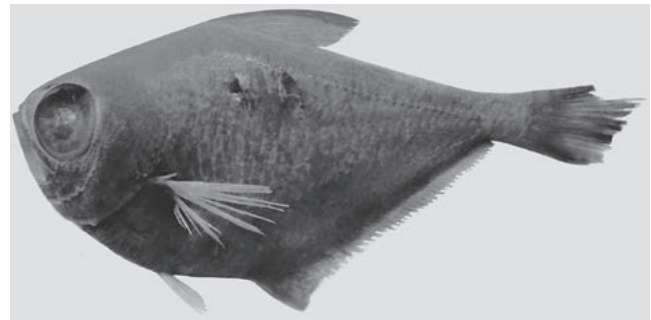
Elliptical sweeper

Pempheris ellipse Randall & Victor 2015: 26, Figs. 12–13
(Rahah Bay, Oman).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–40 rays; pectoral fins 17–19 (usually 18) rays. Body moderately thick, its depth ~2.1 in SL, width ~3 in depth. In SL: peduncle depth ~11.7, HL ~3.4, orbit diameter ~7.5 (eyes forming vertical ellipse: orbit width 12.2 mm; bony orbit height 13.9 mm), predorsal length ~2.8, pre-pelvic length ~2.5, preanal

length ~2, and pectoral-fin length ~3.3. Teeth in upper jaw close-set, small, recurved, sharply conical, in 2 rows, and progressively smaller laterally; lower jaw with tooth band medially, crossed by 4–6 irregular rows of minute recurved teeth. GR 26–30. Scales ctenoid on nape, below dorsal fin, and on ventroanterior third of sides of chest, scales cycloid on remainder of chest; LL scales 50–57.

Preserved specimens mostly brown, dorsal fin with black leading edge; caudal-fin margins dark; anal-fin base with a broad black band.



Pempheris ellipse, 9 cm SL, female holotype (Oman).
© HA Randall, Bishop Museum

DISTRIBUTION Known from the holotype and juvenile specimens collected from Oman.

REMARKS A schwenkioid fish from Oman, singled out only for the elliptical eye. Eye shape is variable and the holotype of *P. tominagai* shows a similarly elliptical eye. Likely a junior synonym of *P. tominagai*.

Pempheris flavicycla

Randall, Satapoomin & Alpermann 2014

Goldeneye sweeper

PLATE 28

Pempheris oualensis (non Cuvier 1831): Jones & Kumaran 1980*;
Debelius 1999*.

Pempheris vanicolensis (non Cuvier 1831): Talwar & Kacker 1984;
Allen & Steene 1987*: 100, Pls. 5 & 6 (Red Sea & Seychelles);
Winterbottom *et al.* 1989*; Randall & Anderson 1993; Field & Field
1998*; Kuiter 1998*; Lieske & Myers 2004*; Imamura 2009*;
Taquet & Diringer 2012*.

Pempheris adusta (non Bleeker 1877): Koeda *et al.* 2014*.

Pempheris flavicycla flavicycla Randall, Satapoomin & Alpermann *in*
Randall, Bogorodsky, Alpermann, Satapoomin, Moori & Mal 2014: 4,
Figs. 3–6 (Oman; Tanzania); Randall & Bineesh 2014*.

Pempheris flavicycla marisrubri Randall, Bogorodsky & Alpermann *in*
Randall, Bogorodsky, Alpermann, Satapoomin, Moori & Mal 2014: 9,
Figs. 7–9 (Rabigh, Saudi Arabia, Red Sea); Azzurro *et al.* 2015.

Dorsal fin 6 spines, 9 (rarely 10) rays; anal fin 3 spines, 38–44 rays; pectoral fins 16–19 rays (16 rays only [and 39–44 anal-fin rays] in Red Sea subspecies; usually 17 rays in WIO fish and usually 18 rays elsewhere in Indian Ocean). In SL: body depth 2.3–2.6, peduncle depth 10.9–12.2, HL 3.3–3.6, orbit diameter 7.9–8.6, and pectoral-fin length 3.6–3.8. Teeth in upper jaw small, sharp, recurved, in 2 irregular rows anteriorly; patch of small teeth anteriorly in lower jaw exposed when mouth closed. GR 29–33. Scales cycloid on nape, below dorsal fin, on sides of peduncle and on dorsoanterior three-quarters of chest; LL scales 53–61.

In life, from reddish orange to light or dark copper to brown; no bands across flanks; bright yellow iris; dorsal fin with large oval dark apical spot, wider than pupil diameter, typically not extending down to last few rays (exceptions in Kenya); caudal fin typically with broad dark posterior margin; anal fin with a full-length black margin, usually no prominent black band along base of fin (unless preserved); pectoral-fin base usually with large dark oval spot. Attains at least 140 mm SL.

DISTRIBUTION Indian Ocean: two subspecies, *Pempheris flavicycla marisrubri*, native to the Red Sea, and *P. flavicycla flavicycla*, wide-ranging from Oman to East Africa, Seychelles, Chagos and Maldives to India and Thailand. Replaced by *P. adusta* in the Pacific Ocean.

REMARKS A wide-ranging Indian Ocean species with a bright yellow iris. Genetically distant from all other Indian Ocean species, and about 2.5% divergent from its Pacific sister species, *Pempheris adusta* Bleeker 1877 (without the black anal-fin margin). Koeda *et al.* (2014) mistakenly combine the species (see Randall *et al.* 2014). Not a synonym of *Pempheris erythraea* Kossman & Räuber 1877, which is *P. rhomboidea* (37 anal-fin soft rays). *Pempheris flavicycla* is often misidentified as *P. vanicolensis* Cuvier 1831 (an eastern Indian Ocean and Pacific species without any dark pectoral-fin base spot).

Pempheris hadra Randall & Victor 2015

Maldives sweeper

PLATE 28

Pempheris hadra Randall & Victor 2015: 27, Fig. 14 (Maldives).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38 rays; pectoral fins 17 rays. Body stout, width 2.2 in body depth, body depth 2.5 in SL. In SL: peduncle depth 10.9, HL 3.5, orbit diameter 8.4, predorsal length 2.7, pre-pelvic length 2.6, preanal length 1.8, and pectoral-fin length 3.3. Teeth in upper jaw in 2 well-separated rows medially, narrowing to single row; teeth in lower jaw conical medially, in 4 or 5 rows,

those of outer row nearly erect. GR 26. Scales cycloid on nape, below dorsal fin, and on three-fifths of chest; scales ctenoid on ventroanterior two-fifths of chest, along edge of operculum, and on peduncle; LL scales 49.

Freshly dead specimen coppery, with iridescence on head and dorsally on body; scales on sides yellowish green, with brown speckles and dark brown edges; pectoral fins translucent yellowish with reddish rays, and narrow curving dark brown band at base of rays; anal fin pale, and dark brown band along base (3 times broader anteriorly); caudal fin reddish, with broad dark brown band along base and blackish margin. Preserved specimen dark orangish brown, scale edges narrowly pale yellow; fins mostly yellowish; leading edge of dorsal fin blackish, expanding into large black apical spot; no black spot on base or axil of pectoral fins, but curving dark brown line following base of rays; anal fin with dark brown band along base; caudal fin with broad blackish posterior margin, upper and lower edges slightly darker.

DISTRIBUTION Known only from the holotype collected from the Maldives.

REMARKS A species without a clear distinction from *P. schwenkii* and with identical mtDNA sequences to true *P. schwenkii* from India and Indonesia. Likely a junior synonym of *P. schwenkii*.

Pempheris heemstraorum Randall & Victor 2015

Greater sweeper

PLATE 28

Pempheris heemstraorum Randall & Victor 2015: 29, Fig. 15 (Rodrigues, Mascarenes).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37 rays; pectoral fins 18 rays. Body depth 2.2 in SL, body width 3.4 in body depth. In SL: peduncle depth 11.1, HL 3.1, orbit diameter 8.5 (eyes relatively small), predorsal length 2.7, pre-pelvic length 2.5, preanal length 1.8, longest dorsal-fin ray 3.9, and pectoral-fin length 3 (fins relatively long). Teeth anteriorly in upper jaw recurved, in 2 rows medially, reduced to irregular single row of progressively smaller teeth about one-third back in jaw; teeth in lower jaw minute, conical and recurved, in dense band of 5 or 6 rows medially. GR 31. [Holotype missing outer layer of scales on nape, sides of chest, and peduncle.] LL scales 59; lateral line highly arched anteriorly, rising more than half eye diameter above level of its origin.

Freshly dead fish grey-brown, with irregular white markings on scales, and lateral line dark brown; pectoral fins with pale orange-red rays, transparent membranes, and large dark brown spot in axil; leading edge of dorsal fin dark

brown, progressively broader and darker distally to form large elliptical black spot; anal fin with dark band along base; caudal fin with dark upper and lower margins and no posterior dark margin.

DISTRIBUTION Known only from Rodrigues.

REMARKS One of several recently described schwenkioid species without robust diagnostic characters or mtDNA sequences. It has fewer anal-fin rays than *P. bruggemanni*, the other Mascarene schwenkioid species. It could be part of either the *P. tominagai* or *P. connelli* complexes; the taxonomic status is presently unresolved.

Pempheris hollemani Randall & Victor 2015

Madagascar sweeper

PLATE 28

Pempheris hollemani Randall & Victor 2015: 30, Fig. 16 (Libanona Beach, Fort Dauphin, Madagascar).

Pempheris tominagai (non Koeda, Yoshino, Imai & Tachihara 2014): Koeda *et al.* 2014 [in part].

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38–40 rays; pectoral fins 17 or 18 rays. Body depth 2.2–2.3 in SL, body width 2.6–2.7 in body depth. In SL: peduncle depth ~10.5, HL 3.5–3.6, orbit diameter 7.7–7.9 (eyes relatively small), predorsal length ~2.7, pre-pelvic length ~2.5, preanal length ~1.7, and pectoral-fin length ~3.2. Teeth in upper jaw small, slender, in 2 rows anteriorly; teeth anteriorly in lower jaw minute, in dense band. GR 26 or 27. Scales cycloid, except ctenoid on nape, below and posterior to dorsal fin, and below line from mid-edge of opercle to pelvic-fin bases; LL scales 55–58.

Freshly dead fish silvery and slightly reddish brown on dorsal part of head and on body above lateral line, scale edges blackish; scales of body posterior to pectoral fins pale grey and pale brown; lateral line blackish to end of caudal fin; chest and belly pale grey and white; pectoral fins pale pink, with dark brown spot in axil, and dark line only on outer base of rays; pelvic fins pale yellowish orange; dorsal fin with dark leading edge and dark oval apical spot; caudal fin with narrow upper and lower dark margins, wide dark posterior margin; anal-fin base with black band, diffuse in fresh fish and dark in preserved specimen.

DISTRIBUTION Known only from southwestern Madagascar.

REMARKS A species without a clear distinction from other schwenkioid species and with identical mtDNA sequences to *P. connelli* from South Africa and *P. rocha* from Oman. Likely a junior synonym of *P. connelli*.

Pempheris ibo Randall & Victor 2015

Ibo sweeper

PLATE 28

Pempheris ibo Randall & Victor 2015: 31, Figs. 17–18 (Ibo I., Mozambique).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 35–39 rays; pectoral fins 17 or (usually) 18 rays. Body moderately compressed, its depth 2.2–2.5 in SL, width 2.8–3 in depth. In SL: peduncle depth 10.3–12.2, HL 3.2–3.3, orbit diameter 7.3–8, predorsal length 2.7–2.8, pre-pelvic length 2.5–2.6, preanal length 1.8–1.9, and pectoral-fin length 3–3.1. Dentition typical of most species of the genus. GR 27–30. Scales ctenoid on nape, below dorsal fin, and on ventroanterior three-quarters of sides of chest (remaining chest scales cycloid), and on peduncle, except for scale row above and below lateral line; LL scales 43–49; lateral line rising from origin steeply and straight (to a level ~ $\frac{2}{3}$ orbit diameter above origin), then often forming distinct sharp angle with remaining lateral line.

In life, body silvery iridescent pink above lateral line, and with dorsal dark band extending somewhat onto caudal peduncle; body below lateral line varying from golden yellow (and scale edges brown) to silvery blue-green and yellow (and scale edges pale grey); leading edge of dorsal fin dark brown, sometimes expanding to become black distal spot. Preserved specimens orangish brown; anal-fin base with wide dark brown band; caudal fin with dark upper and lower margins (posterior margin not dark). Attains at least 93 mm SL.



Pempheris ibo, 9 cm SL, female holotype (Mozambique).

© HA Randall, Bishop Museum

DISTRIBUTION WIO: South Africa (KwaZulu-Natal), Mozambique and Madagascar.

REMARKS A small schwenkioid species with a deeply divergent exclusive mtDNA lineage. Other than the low range of LL scale counts, the appearance is much the same as other schwenkioid species. It co-occurs with *P. connelli* in the same schools of fish in South Africa and is difficult to distinguish visually, although generally *P. connelli* tends to be wider-bodied.

Pempheris kruppi Randall, Victor & Aideed 2015

Aden sweeper

PLATES 28 & 29

Pempheris sp.: Zajonz *et al.* 2000 (Socotra Archipelago).*Pempheris kruppi* Randall, Victor & Aideed in Randall & Victor 2015: 33, Figs. 19–20 (Balhaf, Yemen, Gulf of Aden).

Dorsal fin 6 spines, 9 (rarely 10) rays; anal fin 3 spines, 37–41 rays; pectoral fins 18 (rarely 17) rays; caudal fin moderately forked, caudal concavity ~4–5 in HL. Body depth 2.2–2.3 in SL, body width 2.6–2.7 in body depth. In SL: HL 3.1–3.4, orbit diameter 7.2–7.5, interorbital width 10.7–11, predorsal length 2.6–2.7, pre-pelvic length 2.5–2.6, preanal length 1.7–1.8, longest dorsal-fin ray 3.8–4, pectoral-fin length 3.2–3.4, and pelvic-fin length 6–6.7. Teeth in upper jaw minute, slender, conical and recurved, in double row in medial third, continuing as single row to end of jaw; teeth in lower jaw slender, conical and recurved, in narrow band of 4 or 5 rows medially, decreasing to single row; upper lip densely covered in moderately sized papillae; tongue triangular, straight-sided and pointed. GR 29–32. Scales ctenoid on nape and chest, mixed cycloid and ctenoid below dorsal fin, and cycloid on sides of peduncle; LL scales 55–64.

In life, body dark brown, with prominent lateral dark bands made up of rows of dark scale centres; fins yellowish to orange; dorsal fin with distinct oval apical spot; anal fin with dark-tipped membranes on first few rays. Preserved specimens dark brown, scale edges silvery grey; paired fins mostly yellowish; pectoral-fin bases with narrow dark brown band, axils black; dorsal fin yellowish grey, with distal black spot on first 6 rays; basal half of anal fin reddish brown, middle zone brownish, and outer zone translucent; caudal fin grey-brown but progressively paler posteriorly, and with blackish margin present or absent; iris brassy brownish. Attains at least 125 mm SL.

DISTRIBUTION WIO: Gulf of Aden (Yemen) and Socotra.

REMARKS The Yemeni population of the *P. nesogallica/rhomboidea* complex; it shares mtDNA sequences with the other WIO species of that complex and has no distinctive features. Likely a junior synonym of *P. nesogallica*.

Pempheris kuriamuria Randall & Victor 2015

Oman sweeper

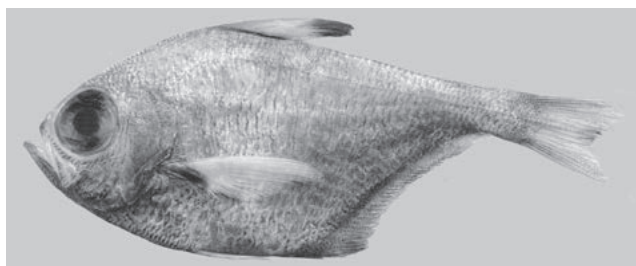
PLATE 29

Pempheris kuriamuria Randall & Victor 2015: 35, Figs. 21–22 (Ras Hamar, Oman).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38–40 rays; pectoral fins 18 or 19 rays. Body depth 2.2 in SL, body width 2.9–3 in body depth. In SL: HL 3.3–3.4, peduncle depth 11.2,

orbit diameter 7.3–7.5, predorsal length 2.5–2.6, preanal length 1.9, and pectoral-fin length 2.9–3. Teeth in upper jaw small, slender, conical and recurved, in 2 close-set rows to below nostrils, continuing as single row to end of jaw; teeth in lower jaw in narrow band, crossed where broadest by 6 or 7 rows of minute, conical, recurved teeth that are progressively more retrorse posteriorly. GR 30. Scales ctenoid on nape and sides of chest, mixed cycloid and ctenoid below dorsal fin, and cycloid on sides of peduncle; LL scales 59–61.

In life, body reddish brown, with dark lateral bands made up of rows of dark scale centres; fins mostly reddish grey; dorsal fin with large black apical spot; anal fin with dark-tipped membranes on first few rays, and narrow dark brown band at base. Preserved specimens pale brown, scale edges broadly silvery; fins yellowish, with dark markings as in life; pectoral fins with semicircular dark brown band at base; anal fin yellowish, first few rays blackish to tips, and narrow brown band at base.



Pempheris kuriamuria, 11 cm SL, female holotype (Oman).
© HA Randall, Bishop Museum

DISTRIBUTION WIO: southern Oman.

REMARKS The southern Oman population of the *P. nesogallica/rhomboidea* complex; it shares mtDNA sequences with the other WIO species of that complex and has no distinctive features. Likely a junior synonym of *P. nesogallica*.

Pempheris leiolepis Randall & Victor 2015

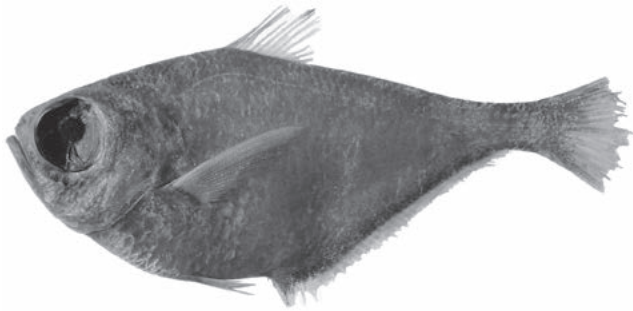
Smoothscale sweeper

Pempheris leiolepis Randall & Victor 2015: 37, Fig. 23 (Chumbe I., Zanzibar, Tanzania).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37 rays; pectoral fins 18 rays. Head profile nearly straight; tip of lower jaw expanded to small knob that projects slightly forward when mouth firmly closed. Body moderately compressed, its depth 2.4 in SL, width 2.6 in depth. In SL: peduncle depth 11.8, HL 3, eye diameter 7.8, predorsal length 2.5, pre-pelvic length 2.5, preanal length 1.8, and pectoral-fin length 3.2. Teeth in upper jaw small, conical, in 3 or 4 irregular rows, progressively larger and more recurved

inward; teeth in lower jaw smaller and more densely packed, in up to ~6 rows. GR 28. Scales cycloid on nape, below dorsal fin, on sides of peduncle, and on sides of chest; 2 or 3 ctenoid scales below and adjacent to operculum; LL scales 53.

Preserved holotype brownish with only a dark band along anal-fin base and a thin dark crescent at pectoral-fin base.



Pempheris leiolepis, 10 cm SL, male holotype (Tanzania).

© HA Randall, Bishop Museum

DISTRIBUTION Known only from the holotype collected in Tanzania (Zanzibar).

REMARKS One of several recently described schwenkioid species, without DNA sequences, based on a single old specimen in poor condition. Likely a junior synonym of *P. tominagai* or *P. connelli*.

Pempheris malabarica Cuvier 1831

Orange sweeper

PLATE 29

Pempheris malabarica Cuvier in Cuv. & Val. 1831: 308 (Mahé and Malabar coast, India); Bauchot 1963; Randall & Bineesh 2014*; Psomadakis *et al.* 2015.

Pempheris mangula (non Cuvier 1829): Day 1875*.

Pempheris molucca (non Cuvier 1829): Talwar & Kacker 1984*.

Pempheris sp.: Randall 1995.

Pempheris adusta (non Bleeker 1877): Sarang *et al.* 2011.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 42–48 rays; pectoral fins 17–19 rays. Tip of lower jaw often with anteriorly projecting knob. In SL: body depth 2.3–2.5, HL 3.1–3.4, orbit diameter 7.9–9.1 (specimens 107–134 mm SL) (eyes relatively small), predorsal length 2.4–2.5, pre-pelvic length 2.6–2.7, preanal length 1.9–2, and pectoral-fin length 3.5–4.1 (fins relatively short). Teeth in upper jaw of females large for genus, but otherwise typical of dentition of most species, and fully exposed when mouth closed; teeth anteriorly in lower jaw small, in band broadened medially to form semicircular patch, partly exposed when mouth fully closed; outer row of teeth in patch erect in females, enlarged and forward-projecting in

males. GR 25–28. Scales ctenoid on nape, below dorsal fin, and on entire chest and peduncle; scale rows 6 or 7 between lateral line and dorsal-fin origin; LL scales 65–75.

In life, a bright metallic orange fish with prominent dark orange lateral bands on flanks formed from rows of the darker scale centres; dorsal fin orange with dark tinge at apex; caudal fin orange with a thin dark posterior rim; anal fin dark orange sometimes with a dark rim on first few rays; often darker patch on distal maxilla. Attains at least 140 mm SL.

DISTRIBUTION Indo-Pacific. WIO: Oman to Pakistan, India and Sri Lanka; elsewhere to Thailand and Indonesia.

REMARKS A distinctive appearing species with an exclusive mtDNA lineage distant from all other *Pempheris* species. It shares the prominent bands on the flanks with the *P. nesogallica/rhomboidea* complex, but is not related.

Pempheris mangula Cuvier 1829

Indian sweeper

PLATE 29

Pempheris mangula Cuvier 1829: 195 (Visakhapatnam, India)

[available from footnote; after Russell 1803: 114]; Cuvier in Cuv. & Val. 1831; Randall & Bineesh 2014*.

Pempheris molucca (non Cuvier 1829): Day 1876.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38–41 rays; pectoral fins 17–19 rays. Body depth 2.1–2.3 in SL, body width 3.1–3.6 in body depth. In SL: HL 3.3–3.5, peduncle depth 10.8–11.4, orbit diameter 7.3–8.4, pectoral-fin length 3.5–3.7, predorsal length 2.5–2.6, pre-pelvic length 2.7–2.8, and preanal length 1.9–2. Teeth at front of upper jaw in 2 rows, outer row forward-projecting and slightly recurved, inner row strongly recurved; teeth anteriorly in lower jaw small, in paired patches. GR 27–30. Scales cycloid on nape, below dorsal fin, on peduncle, and on dorsoposterior three-quarters of chest; LL scales 54–59.

Fresh specimens from type location overall reddish orange to brownish with bright red-orange fins, to silvery when dead, with lateral bands made up of rows of darkened scale centres; dorsal fin reddish orange with dark oval apical spot; caudal fin bright orange-red with wide dark posterior margin; anal fin dark orange with broad dusky band along base of fin and dark red to dusky band along margin of fin; pectoral fin with dark crescent at base and large dark axil spot; iris dull yellow. Preserved specimens with similar markings, maintaining dark anal-fin margin to varying degrees. Attains at least 150 mm SL.

DISTRIBUTION Indian Ocean: Bay of Bengal, south to Kerala and Sri Lanka and east to Indonesia.

REMARKS A question remains whether *P. mangula* is a separate species from the WIO *P. nesogallica/rhomboidea* entity. It was originally illustrated in 1803 as having a full-length dark anal-fin margin, and the neotypes from that specific collection location, Visakhapatnam in the Bay of Bengal, have a prominent wide dark reddish band along the anal-fin margin (locally commonly sold as “mangula kutti”). Virtually all WIO members of the *P. nesogallica/rhomboidea* complex have no band at the margin, or, at most, on the first few rays or rarely a faint dusky rim. Based on this difference and a 1% divergence in the mtDNA lineage for type-location *P. mangula* (and to Bali, Indonesia), we consider these as two distinct entities. Koeda *et al.* (2014) considered them the same (with *P. mangula* the senior synonym).

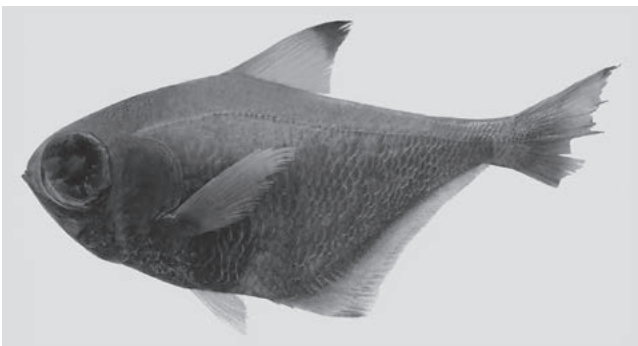
Pempheris megalops Randall & Victor 2015

Bigeye sweeper

Pempheris megalops Randall & Victor 2015: 38, Fig. 24 (north point of La Digue, Seychelles).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 42 rays; pectoral fins 17 rays. Body depth 2.4 in SL, body width 2.9 in body depth. In SL: peduncle depth 11.2, HL 3, orbit diameter 6.2 (eyes huge), interorbital width 11, predorsal length 2.4, pre-pelvic length 2.6, preanal length 2, and pectoral-fin length 3. Upper jaw with narrow symphyseal gap, largest teeth sharply conical and recurved, mainly in 2 irregular rows, those of outer row more jutting, and minute recurved teeth above and interspersed among larger teeth; lower jaw with band of minute, nodular, recurved teeth, in 4 or 5 irregular rows medially where broadest. GR 31. Scales ctenoid on ventroanterior half of sides of chest, and cycloid on remaining half of chest; LL scales 58. [Specimen missing outer layer of scales on nape and sides of peduncle.]

Preserved specimens uniformly pale brown; no dark spot at base or axil of pectoral fins; dorsal fin with black apical spot; first few anal-fin rays blackish; caudal-fin margin broadly blackish.



Pempheris megalops, 12 cm SL, female holotype (Seychelles).

© HA Randall, Bishop Museum

DISTRIBUTION Known only from the holotype collected from the Seychelles.

REMARKS A poorly defined species, without mtDNA sequences, based on a single old holotype distinguished only by the large eye. Its taxonomic status is questionable.

Pempheris micromma Randall & Victor 2015

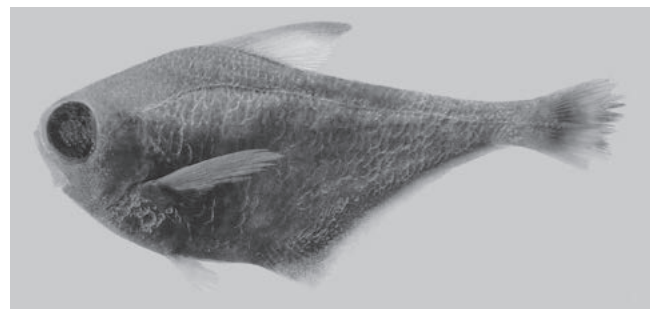
Smalleye sweeper

PLATE 29

Pempheris micromma Randall & Victor 2015: 39, Figs. 25–26 (Rahah Bay, Oman).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 43 rays; pectoral fins 18 rays. Body strongly compressed, its depth 2.4 in SL, width 3.1 in depth. In SL: peduncle depth 11.9, HL 3.6, orbit diameter 9.5 (eyes very small), predorsal length 2.8, pre-pelvic length 2.9, preanal length 2.1, and pectoral-fin length 3.3. Teeth in upper jaw in 2 rows anteriorly, typical of most species of genus; teeth in lower jaw in band, where broadest medially crossed by 4 or 5 rows of minute conical teeth, progressively more recurved inwardly. GR 30. Scales cycloid on nape and below dorsal fin; scales ctenoid on peduncle and on at least ventroanterior two-thirds of chest [specimen missing rest of chest scales]; LL scales 56.

Preserved specimen (holotype) mostly brown, with reflections from scale edges, and greenish grey zone from pectoral-fin bases to abdomen above pelvic fins; paired fins mostly pale yellowish; pectoral-fin bases with narrow dark brown band; dorsal fin with blackish band on leading edge expanding to moderately sized black distal spot; anal fin with broad band at base slightly darker brown than body; caudal-fin margin broadly blackish (no dark pigment on upper and lower edges).



Pempheris micromma, 12 cm SL, female holotype (Oman).

© HA Randall, Bishop Museum

DISTRIBUTION Known only from the holotype collected from Oman.

REMARKS A poorly defined species, without mtDNA sequences, based on a single old holotype distinguished only by the small eye. Its taxonomic status is questionable.

Pempheris muscat Randall & Victor 2015

Muscat sweeper

Pempheris muscat Randall & Victor 2015: 40, Fig. 27 (Cat I., Oman, Gulf of Oman).

Dorsal fin 6 spines, 9 rays (rarely 10 rays); anal fin 3 spines, 37–40 rays; pectoral fins 17–19 rays. Body depth 2.2–2.4 in SL, body width 2.9–3.5 in body depth. In SL: HL 3.1–3.3, orbit diameter 6.8–7.4 (eyes relatively large), predorsal length 2.5–2.6, and pectoral-fin length 3.2. Teeth in upper jaw similar to dentition typical of lower jaw in other species of the genus, with band of 3–5 irregular rows of minute, recurved, sharply conical teeth; lower jaw teeth more widely spaced. GR 30–32. Scales ctenoid on about ventroanterior half of sides of chest, remainder cycloid [specimens missing outer layer of scales on nape and sides of peduncle]; LL scales 54–59.

Preserved specimen (holotype) with grey-brown body scales, each with vertically elongate orange-brown bar; paired fins mostly pale orangish; pectoral fins with faint narrow dark bar across base of rays; dorsal fin with apical black spot (leading edge not dark); anal fin dark only at first few rays; caudal-fin margin blackish.



Pempheris muscat, 13 cm SL, male holotype (Oman).
© HA Randall, Bishop Museum

DISTRIBUTION WIO: Gulf of Oman.

REMARKS A poorly defined species, without mtDNA sequences, based on old specimens. It does not have any distinguishing features from a number of other species: its taxonomic status is questionable.

Pempheris nesogallica Cuvier 1831

African sweeper

PLATE 29

Pempheris nesogallica Cuvier in Cuv. & Val. 1831: 306 (Mauritius, Mascarenes); Heemstra & Heemstra 2004; Koeda *et al.* 2014 [lectotype]; Randall & Victor 2015*.

Pempheris mangula (*non* Cuvier 1829): Smith & Heemstra 1986*.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38–44 rays; pectoral fins 17–19 (usually 18) rays. Body compressed, its depth 2.1–2.3 in SL, width 3–3.4 in depth. In SL: peduncle depth 10.5–11.1, HL 3.2–3.4, orbit diameter 7.4–7.8, predorsal length 2.5–2.6, preanal length 1.8–1.9, and pectoral-fin length 3.3–3.5. Teeth anteriorly in upper jaw strongly recurved, in 3 irregular close-set rows; teeth in lower jaw in band, where broadest medially crossed by 4 or 5 rows of minute conical teeth, progressively more recurved inwardly; tongue triangular and straight-sided, except slightly indented near tip. GR 32–34. Scales ctenoid on nape, below dorsal fin, and on chest; scales cycloid on sides of peduncle; LL scales 57–60.

A photograph of a fresh fish specifically from Mauritius shows a brownish specimen with dark bands along flanks formed by dark scale centres; fins with reddish tint; dorsal fin with black oval apical spot, caudal fin with broad dark distal band; anal fin with diffuse dusky band along base, some black tips on first few rays; pectoral-fin base with dark crescent at base; iris brownish. On Randall's post-mortem photograph from Mauritius, bands on flanks obscured.

DISTRIBUTION WIO: Mauritius and Réunion.

REMARKS Photographs of fish in Mauritius appear identical to other banded-flank fish from many sites in the WIO. Nothing in the description differs from other members of the complex. Note that published descriptions and listings of the species include non-Mascarene specimens (e.g., Koeda *et al.* [2014], who also key out *P. nesogallica* as not having bands on flanks, but bands are lost on preserved specimens). All sampled species thus far of the banded-flank complex in the WIO have the same mtDNA sequence. They are all likely the same species, and then *P. nesogallica* would be the senior synonym (but see remarks under *P. mangula*). We have not synonymised all the various WIO species pending confirmation with mtDNA sequences specifically from Mauritius.

Pempheris orbis Randall & Victor 2015

Sinai sweeper

Pempheris orbis Randall & Victor 2015: 42, Fig. 28 (Dahab, Egypt, Gulf of Aqaba, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38 or 39 rays; pectoral fins 17 or 18 rays. Head profile slightly convex. Body depth 2.3–2.7 in SL, body width 2.6–2.7 in body depth. In SL: peduncle depth 11.1–12, HL 3.2–3.3, orbit diameter 7.4–7.7 (specimens 74–85 mm SL), predorsal length 2.5–2.6, pre-pelvic length 2.4–2.5, and preanal length 1.9–2. Teeth small, conical and recurved, those medially in upper jaw in 3 or 4 irregular rows; teeth in lower jaw in band of 4 or 5 irregular close-set rows, and medially smaller and more nodular, innermost teeth largest and nearly horizontal; lips brown with distinct, well-spaced papillae; tongue triangular and slightly indented near tip. GR 30 or 31. Scales cycloid on nape, below dorsal fin, and on sides of chest; LL scales 58–64.

Preserved specimen (holotype) brown above lateral line, scales below lateral line with silvery grey centres and orange edges; dorsal fin with dark brown leading edge, and black membranes distally between last 3 spines and first 4 rays; anal fin with dark brown band at base; caudal-fin margin dark brown.



Pempheris orbis, 9 cm SL, female holotype (Red Sea).
© HA Randall, Bishop Museum

DISTRIBUTION WIO: northern Red Sea (Gulf of Aqaba).

REMARKS One of several poorly defined schwenkoid species described from the Red Sea, without mtDNA sequences. It differs from *P. tominagai* by a higher range of LL scales. It is uncertain if the distinction will persist with additional sampling.

Pempheris pathirana Randall & Victor 2015

Trincomalee sweeper

Pempheris pathirana Randall & Victor 2015: 43, Fig. 29 (Koddiyar Pattu, Trincomalee, Sri Lanka).

Dorsal fin 6 spines, 9 (rarely 10) rays; anal fin 3 spines, 38–43 rays; pectoral fins 17–19 (usually 18) rays. Body depth 2.1–2.3 in SL, body width 2.7–3 in body depth. In SL: peduncle depth 10.2–11.8, HL 3.1–3.3, orbit diameter 7–7.9 (specimens 104–140 mm SL) (eyes moderate), predorsal length 2.6–2.7, pre-pelvic length 2.6–2.7, preanal length ~1.8, pectoral-fin length 3.2–3.3, and pelvic-fin length 5.2–5.5 (fins relatively long). Upper jaw to each side of symphyseal gap with single row of slender recurved teeth within narrow zone of very small nodular teeth, and main row of teeth smaller laterally, in irregular row (in nearly 2 rows in places); small slender teeth at front of lower jaw in 3–5 irregular rows, progressively more recurved inwardly; upper lip with scattered, tiny papillae. GR 29 or 30. Scales ctenoid on nape, entire chest and peduncle; scales cycloid below dorsal fin; LL scales 56–62.

Preserved specimens pale brownish, only dark marking is oval dark apical spot on dorsal fin.



Pempheris pathirana, 13 cm SL, male holotype (Sri Lanka). © S O'Hara

DISTRIBUTION WIO: Trincomalee, Sri Lanka.

REMARKS A poorly defined member of the banded-flank complex, described from old bleached specimens, without mtDNA sequences. Likely a synonym of *P. nesogallica*, or *P. mangula* (based on location), but taxonomic status questionable.

Pempheris peza Randall & Victor 2015

Ponta sweeper

PLATE 29

Pempheris peza Randall & Victor 2015: 44, Fig. 30 (Ponta do Ouro, Mozambique).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–40 rays; pectoral fins 17 or 18 rays. Body compressed, its depth 2.2–2.4 in SL, width 2.9–3.2 in depth. In SL: peduncle depth 10.4–11.5, HL 3.2–3.4, orbit diameter 7.2–8.1 (specimens 75–113 mm SL), predorsal length 2.6–2.7, preanal length 1.7–1.8, and pectoral-fin length 3–3.3. Teeth in upper jaw sharply conical, recurved, in 3 close-set rows anteriorly, then progressively smaller; lower jaw

teeth in narrow band of 3 or 4 rows anteriorly. GR 28–30. Scales ctenoid on nape, below dorsal fin, and as 2 or 3 ventroanterior scales on chest; scales cycloid on most of chest and on sides of peduncle; LL scales 50–59.

Preserved types brownish, dorsal fin with dark apical spot; caudal fin dark-edged; anal fin with broad black basal band; unmarked pectoral-fin base.

DISTRIBUTION Known only from Mozambique.

REMARKS A poorly defined schwenkioid species from a single collection, without DNA sequences. Since there are no distinguishing features separating it from sympatric *P. connelli*, it is likely a synonym.

Pempheris rhomboidea Kossmann & Räuber 1877

Dusky sweeper PLATE 30

- Pempheris mangula* (non Cuvier 1829): Rüppell 1836: 36 (Red Sea), Klunzinger 1871: 469; 1884; Dor 1984; Koeda *et al.* 2014 (Red Sea only).
Pempheris erythraea Kossmann & Räuber 1877: 398; Golani & Fricke 2018: 105.
Pempheris rhomboidea Kossmann & Räuber 1877: 398, Pl. 3 (Red Sea); Koeda *et al.* 2014; Azzurro *et al.* 2015 (64 Red Sea/Mediterranean specimens).
Pempheris oualensis (non Cuvier): Fishelson *et al.* 1971 (Red Sea).
Pempheris vanicolensis (non Cuvier): Randall 1983; Golani & Diamant 1991.
Pempheris nesogallica (non Cuvier): Koeda *et al.* 2014 (Red Sea only).

Dorsal fin 6 spines, 9 (rarely 10) rays; anal fin 3 spines, 32–39 (from Red Sea counts) rays; pectoral fins 17–19 rays. Body depth 2.1–2.4 in SL, body width 2.6–2.9 in body depth. In SL: peduncle depth 10–11.5, HL 3.2–3.5, orbit diameter 7.3–7.5 (specimens 109–131 mm SL), interorbital width 10.4–11.9, predorsal length 2.5–2.6, pre-pelvic length 2.5–2.6, preanal length 2–2.1, and pectoral-fin length 2.9–3.2. Teeth in upper jaw strongly recurved, in 3 irregular close-set rows, in lower jaw minute, sharp, strongly recurved. GR 29–34. Scales mainly cycloid on nape and below dorsal fin; scales an equal combination of ctenoid and cycloid on chest; LL scales 52–59.

In life, usually brownish, can be reddish or silvery; dark bands along flanks formed by dark scale centres; dorsal fin with black oval apical spot, caudal fin can have broad dark distal band; anal fin can have diffuse dusky band along base, usually no black anal-fin margin, but black often prominent on first few rays (infrequently indistinct duskiness extends full-length); pectoral-fin base with or without dark crescent at base of rays and in axil. Iris brownish. When fresh and in preservative, body brownish or silvery, bands on flanks obscured. Attains at least 140 mm SL.

DISTRIBUTION Red Sea and Lessepsian migrant to Mediterranean Sea.

REMARKS The Red Sea population of the banded-flank species-complex; often misidentified as *P. vanicolensis* (not present in WIO). The synonymous *P. erythraea* types share the low 37–38 anal-fin soft rays and no or indistinct dark anal-fin margin (i.e., not *P. flavicycla*). DNA studies (Azzurro *et al.* 2015) show a single banded-flank lineage in the Red Sea, (i.e., only *P. rhomboidea*) and that it has invaded the Mediterranean. The mtDNA sequence is the same as other banded-flank species in the WIO and 1% away from the Indian banded species, true *Pempheris mangula*, i.e., the type population in Bay of Bengal (not WIO), not the “*P. mangula*” from widespread other locations used by Koeda *et al.* (2014) to tautologically synonymise the two species (see *P. mangula* remarks). If the WIO banded species are synonymised, *P. nesogallica* has priority, but this needs to be confirmed with DNA from the type population in Mauritius.

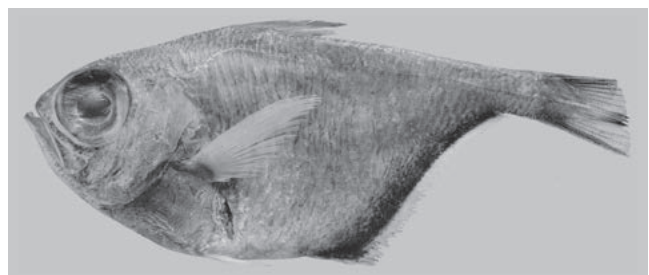
Pempheris rochai Randall & Victor 2015

Hamar sweeper

Pempheris rochai Randall & Victor 2015: 45, Fig. 31 (Ras Hamar, Oman).

Dorsal fin 6 spines, 10 rays; anal fin 3 spines, 39 rays; pectoral fins 17 or 18 rays. Body moderately deep and compressed, its depth 2.3 in SL, width 3.1 in depth. In SL: peduncle depth 10.6, HL 3.2, orbit diameter 6.8, predorsal length 2.7, pre-pelvic length 2.5, preanal length 1.7, and pectoral-fin length 3. Teeth in upper jaw conical, recurved, in single row, progressively smaller posteriorly, ending as small nodules; teeth in lower jaw minute, conical, in narrow band of 3–5 rows medially. GR 28. LL scales 59.

Preserved holotype pale brownish, dorsal fin with dark leading edge expanding at apex; caudal fin dark-edged; anal fin with broad black basal band; narrow dark crescent at pectoral-fin base.



Pempheris rochai, 12 cm SL, female holotype (Oman).

© HA Randall, Bishop Museum

DISTRIBUTION Known only from the holotype collected from Oman.

REMARKS A species without a clear distinction from other schwenkioid species and with identical mtDNA sequences to *P. connelli* from South Africa and *P. hollemani* from Madagascar. Likely a junior synonym of *P. connelli*.

Pempheris rubricauda Randall & Victor 2015

Redtail sweeper

PLATE 30

Pempheris rubricauda Randall & Victor 2015: 46, Fig. 32 (Nosy Vorona, Nosy Be, Madagascar).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–41 rays; pectoral fins 17 or (usually) 18 rays. Body depth 2.2–2.5 in SL, body width 2.8–2.9 in body depth. In SL: peduncle depth 10–11.1, HL 3.1–3.3, orbit diameter 7.6–8.2 (specimens 69–77 mm SL) (eyes relatively small), predorsal length 2.6–2.7, pre-pelvic length 2.4–2.5, preanal length 1.8–1.9, and pectoral-fin length 3.4–3.6. Teeth in upper jaw in 2 rows medially, then narrowing to single row; teeth in lower jaw minute, densely spaced, in band of 3 or 4 rows medially. GR 28 or 29. Type specimens missing most of outer layer of scales, but enough remain on holotype to determine cycloid scales on nape, in 1st row below dorsal fin, and on three-quarters of sides of chest, but ctenoid ventroanteriorly on chest; scales cycloid on sides of peduncle, but ctenoid dorsally and ventrally; LL scales 55–57.

In life, brownish to silvery, dorsal fin with dark leading edge and apical spot; caudal fin reddish with a dark margin; anal fin with a broad black basal band; pectoral fins reddish tinged, narrow dark crescent around base.

DISTRIBUTION Known from northwestern Madagascar.

REMARKS One of several recently described schwenkioid species. It has almost the same mtDNA sequence as the more northern *P. tominagai*, from which it differs only by a red tail and a higher range of LL scales: colour is highly variable in the group and additional sampling may merge the scale counts. In that case, it would likely be a junior synonym of *P. tominagai*.

Pempheris russellii Day 1888

Pakistan sweeper

PLATE 30

Pempheris russellii Day 1888: 788 (Karachi, Pakistan); Psomadakis *et al.* 2015.

Pempheris mangula (*non* Cuvier): Koeda *et al.* 2104: 309.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 39–42 rays; pectoral fins 17–19 (usually 18) rays. Body depth 2.1–2.2 in SL, body width 3.3–3.5 in body depth. In SL: HL 3.1–3.3, orbit diameter 7.6–8.2 (specimens 111–131 mm SL) (eyes relatively small), predorsal length 2.5–2.6, pre-pelvic length 2.55–2.6, preanal length 1.9–2, and pectoral-fin length 3.4–3.6. Teeth in upper jaw in 2 rows medially, narrowing to single row; teeth in lower jaw minute, densely spaced, in band of 3 or 4 rows medially. GR 30 or 31. Most specimens missing most of outer layer of scales, but enough remain on holotype to determine cycloid scales on nape, in 1st row below dorsal fin, and on three-quarters of sides of chest, with ctenoid scales ventroanteriorly on chest; scales cycloid on sides of peduncle, ctenoid dorsally and ventrally. LL scales 54–58.

In life, brownish to greyish with dark bands along flanks formed by dark scale centres; dorsal fin with black oval apical spot, caudal fin can have broad dark distal band; anal fin can have diffuse to dusky band along base, but with no dark margin; pectoral-fin base with dark crescent at base of rays and in axil. Iris brownish. When fresh and in preservative, body brownish or silvery, bands on flanks obscured. Attains at least 140 mm SL.

DISTRIBUTION WIO: Pakistan (Sindh coast) to Iran (Makran coast).

REMARKS The northern Arabian Sea coast (Iran and Pakistan) representative of the banded-flank species-complex, described in 1888. The local mtDNA sequence is the same as the widespread banded species-complex, i.e., *P. rhomboidea* (Red Sea) and several recently described species from Oman down the African coast. Underwater photos off Karachi show the typical bland appearance and there are no significant features separating *P. russellii*. If all WIO banded species represent one species, *P. nesogallica* from the Mascarenes has priority (although needs confirmation with a DNA sequence). The mtDNA lineage is about 1% divergent from the close relative, *P. mangula*, which ranges from India to Bali, Indonesia, and is distinguished by a reddish to dusky band along the anal-fin margin.

Pempheris sarayu Randall & Bineesh 2014

Kerala sweeper

PLATE 30

Pempheris sarayu Randall & Bineesh 2014: 33, Fig. 12 (Kovalam, Kerala, India); Randall & Victor 2015.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 39 rays; pectoral fins 18 or 19 rays. Head profile straight above eyes, convex on nape. Body depth 2.05 in SL. In SL: HL 3.3, orbit diameter 7.6, predorsal length 2.65, pre-pelvic length 2.55, preanal length 2,

and pectoral-fin length 3.65. Teeth anteriorly in upper jaw minute, conical, in 2 rows; teeth anteriorly in lower jaw smaller, nodular, in narrow band of 2–4 irregular rows. GR 31. Scales partly ctenoid posteriorly on nape, mainly ctenoid on peduncle, and ctenoid on chest; LL scales 55.

Fresh holotype coppery with dark bands along flanks formed by dark scale centres; dorsal fin with black apical spot, caudal fin with a dusky distal margin; anal fin unmarked; pectoral-fin base with dark crescent at base of rays. Iris brownish.

DISTRIBUTION Known only from Kovalam, India.

REMARKS Described from a single holotype from the Arabian Sea coast of southern India without DNA sequences. It is distinguished from other members of the banded-flank complex only by barely shorter pectoral fins and up to 19 pectoral-fin rays. It is likely a junior synonym of *P. nesogallica*.

Pempheris sergey Randall & Victor 2015

Jeddah sweeper

PLATE 30

Pempheris sergey Randall & Victor 2015: 47, Fig. 33 (Sharm Obhur, Saudi Arabia, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38–42 rays; pectoral fins 17 or 18 rays. Body depth 2.5–2.6 in SL, body width 2.7–2.8 in body depth. In SL: peduncle depth 11.1–11.6, HL 3.3–3.4, orbit diameter 7.4–7.7, predorsal length 2.7–2.8, pre-pelvic length 2.5–2.6, preanal length 1.7–1.8, and pectoral-fin length 3.1–3.4. Teeth in upper jaw conical, recurved, in double row, those of upper row more projecting, those of lower row more strongly recurved; teeth in lower jaw minute and slender, in band of 4 or 5 irregular close-set rows where broadest medially. GR 26 or 27. Scales cycloid on nape, below dorsal fin, on sides of peduncle, and as a few ventroanteriorly on chest; scales otherwise cycloid on sides of chest; LL scales 51–55.

Fresh specimens greenish yellow, with orangish tail and yellow iris; in preservative pale brown. Dorsal fin with dark leading edge and large oval apical spot; caudal fin with black margins, broadest posteriorly; anal fin with black band along base of fin; pectoral fin with dark crescent at base.

DISTRIBUTION Known only from the type collection in the Red Sea.

REMARKS One of several recently described schwenkioid species from the Red Sea, based on a single collection of greenish yellow specimens with the same mtDNA sequence as *P. tominagai* and no other distinction; it is very likely a junior synonym of *P. tominagai*.

Pempheris shimoni Randall & Victor 2015

Shimoni sweeper

Pempheris shimoni Randall & Victor 2015: 49, Fig. 34 (Shimoni, Kenya).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37–41 rays; pectoral fins 17–19 (usually 18) rays. Body depth 2.2 in SL, body width 3 in body depth. In SL: peduncle depth 9.9–10.3, HL ~3.3, eye diameter ~7.3, predorsal length ~2.5, preanal length ~1.9, and pectoral-fin length ~3.2. Lower jaw projecting when mouth fully closed, and with slight inward-projecting knob at tip. Upper jaw dentition typical of genus, with 2 irregular rows of sharply recurved teeth on each side of symphyseal gap, reduced to single row of gradually smaller teeth about half way back in jaw; teeth in lower jaw minute, seemingly only nodular (but microscopic inspection reveals them to be sharply pointed), progressively larger and more recurved inwardly, in close-set band of 4 or 5 irregular rows. Tongue deeply concave on each side, resulting in narrow, rectangular, anterior part, ending in rounded flexible flap. GR 28–31. Scales ctenoid on nape, below dorsal fin, and on ventroanterior two-thirds of chest; LL scales 53–58.

Preserved specimens uniformly orangish brown, fins slightly paler; reddish brown band across pectoral-fin bases (probably dark brown in life); dorsal fin with broad black tip; caudal fin without dark upper and lower edges [posterior margin damaged].



Pempheris shimoni, 13 cm SL, female holotype (Kenya).

© HA Randall, Bishop Museum

DISTRIBUTION WIO: Kenya (off Shimoni and Mombasa).

REMARKS A species described from a collection with only a single adult specimen, in poor condition and without mtDNA sequences. It has no distinctive characters and very likely represents a junior synonym of *P. nesogallica*.

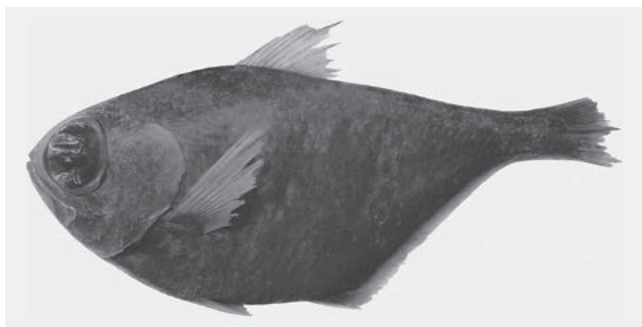
Pempheris shirleen Randall & Victor 2015

Hurghada sweeper

Pempheris shirleen Randall & Victor 2015: 50, Fig. 35 (Hurghada, Egypt, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37 or 38 rays; pectoral fins 17 or 18 rays. Body depth 2.3–2.4 in SL, body width 2.8–2.9 in body depth. In SL: peduncle depth 11.7–12.1, HL 3.2–3.25, orbit diameter 7.4–7.5 (specimens 103 and 105 mm SL), pectoral-fin length 3.4, predorsal length 2.7–2.8, pre-pelvic length 2.4–2.5, and preanal length 1.7–1.8. Teeth medially in upper jaw small, progressively more recurved inwardly, in 3 irregular rows; teeth in lower jaw smaller, more slender, in band of 3 or 4 close-set irregular rows where broadest. GR 27 or 28. Scales cycloid on nape, below dorsal fin, and on sides of peduncle; scales cycloid on sides of chest except for a few ctenoid scales ventroanteriorly; LL scales 50–54.

Preserved specimens dark purplish brown, scale edges slightly darker brown; anal-fin base with narrow dark brown band, and adjacent body darker than rest of body.



Pempheris shirleen, 11 cm SL, female holotype (Red Sea).
© HA Randall, Bishop Museum

DISTRIBUTION Known only from two type specimens collected from the Red Sea.

REMARKS One of several recently described schwenkioid species in the Red Sea, in this case from old specimens in poor condition without mtDNA sequences. It has no distinctive characters and is likely a junior synonym of *P. tominagai*.

Pempheris smithorum Randall & Victor 2015

Zanzibar sweeper

Pempheris smithorum Randall & Victor 2015: 51, Fig. 36 (Chumbe I., Zanzibar, Tanzania).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 40 or 41 rays; pectoral fins 17 or 18 rays [fins damaged in type specimens]. Lower jaw tip expanded to distinct knob, extending both anteriorly and posteriorly, and jaw strongly protruding when jaws fully closed. Body depth 2.3–2.4 in SL, body width 2.6–2.8 in body depth. In SL: peduncle depth ~10.2, HL ~3.4, orbit diameter ~7.2, predorsal length ~2.8, pre-pelvic length ~2.7, and preanal length ~1.9. Upper jaw appears to have 2 irregular rows of large recurved teeth on each side of symphyseal gap [many teeth missing], those in one row protruding forward, the others strongly recurved; lips with small, close-set, round papillae. GR 30 or 31. Scales ctenoid on nape, below dorsal fin, and on chest; scales cycloid on sides of peduncle; LL scales 56–59.

Preserved specimens uniformly dark brown, with large dark brown spot at pectoral-fin bases (probably black in life). Attains at least 130 mm SL.



Pempheris smithorum, 13 cm SL, male holotype (Tanzania).
© HA Randall, Bishop Museum

DISTRIBUTION WIO: Tanzania (Chumbe I. and Mafia Is.).

REMARKS A species described from two old specimens in poor condition without mtDNA sequences. It has no distinctive characters and is likely a junior synonym of *P. nesogallica*.

Pempheris tau Randall & Victor 2015

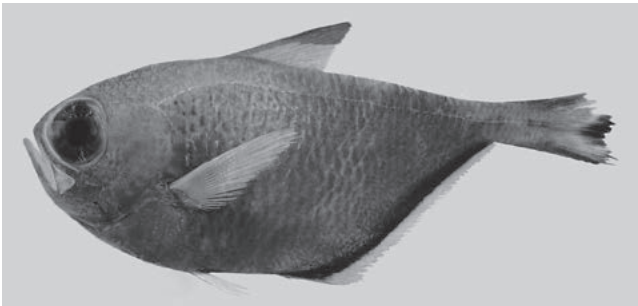
Tau sweeper

Pempheris tau Randall & Victor 2015: 52, Fig. 37 (Nuweiba, Egypt, Gulf of Aqaba, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 38 or 39 rays; pectoral fins 17 or 18 rays. Body depth 2.3–2.6 in SL, body width 2.5–2.7 in body depth. In SL: peduncle depth 11.8–11.9, HL 3.3–3.4, orbit diameter 7.9–8.7 (specimens 95–116.5 mm SL) (eyes very small), predorsal length ~2.7, pre-pelvic length ~2.5, preanal length ~1.9, and pectoral-fin length 3.1–3.3. Teeth in upper jaw conical and recurved, medially in 3 irregular rows, soon reduced to 2 rows, and finally

to single row of minute teeth near end of jaw; teeth in lower jaw similar but much smaller, more slender, in 3 or 4 irregular rows medially, then progressively fewer and smaller towards end of jaw. GR 30–33. Scales cycloid on nape, below dorsal fin, and on sides of peduncle; scales cycloid on sides of chest except for a few ctenoid scales ventroanteriorly; LL scales 50–55.

Preserved specimens brownish, dorsal fin with dark leading edge expanding at apex; caudal fin dark-edged, posterior margin with wide black band; anal fin with broad black basal band; narrow dark crescent at pectoral-fin base.



Pempheris tau, 10 cm SL, male holotype (Red Sea).
© HA Randall, Bishop Museum

DISTRIBUTION WIO: northern Red Sea (Sinai Peninsula).

REMARKS One of several recently described schwenkioid species in the Red Sea, in this case from two old specimens without mtDNA sequences. It has no distinctive characters and is likely a junior synonym of *P. tominagai*.

Pempheris ternay Randall & Victor 2015

Seychelles sweeper

PLATE 31

Pempheris ternay Randall & Victor 2015: 53, Fig. 38 (Cape Matoopa, Ternay Marine National Park, Mahé, Seychelles).

Pempheris tominagai (non Koeda, Yoshino, Imai & Tachihara 2014): Koeda *et al.* 2014 [in part].

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36 rays; pectoral fins 17 rays. Body depth 2.5 in SL, body width 2.9 in body depth; HL 3.3 in SL; orbit diameter 7.5 in SL (eyes relatively small and precisely circular). Teeth in upper jaw small, pointed and recurved, in 2 rows medially, those of upper row projecting forward, those of lower row curving downward, and progressively smaller and narrowing to single row about half way back in jaw; teeth in lower jaw minute, densely spaced, in band of 3 or 4 rows medially, progressively more retrorse inwardly. GR 28. [Specimen missing all outer-layer scales and nearly all of inner layer, except those of lateral line.] LL scales 51.

Fresh holotype brownish red with bright orange caudal fin; dorsal-fin with dark apical spot; caudal fin with broad black posterior margin; anal fin with black band along base of fin; pectoral fins reddish with dark crescent at base. Iris brownish.

DISTRIBUTION Known only from the holotype collected from the Seychelles.

REMARKS One of several recently described schwenkioid species without robust diagnostic characters. Its distinctive feature, the orange caudal fin, can occur in other species. It has almost the same mtDNA sequence as *P. tominagai* and is likely a junior synonym.

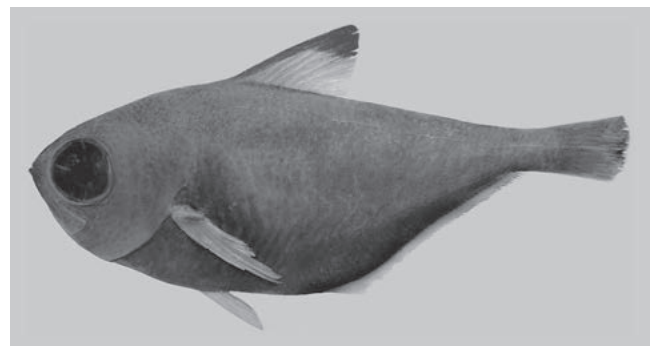
Pempheris tilman Randall & Victor 2015

Aqaba sweeper

Pempheris tilman Randall & Victor 2015: 54, Fig. 39 (off Aqaba, Jordan, Gulf of Aqaba, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–41 rays; pectoral fins 17 rays. Body depth 2.4–2.6 in SL, body width 2.5–2.7 in body depth. In SL: peduncle depth 10.7–11, HL 2.9–3.2, orbit diameter 7.6–7.9 (specimens 75–96.5 mm SL) (eyes relatively small), predorsal length 2.7–2.8, pre-pelvic length 2.7–2.8, and preanal length 1.8–1.9. Teeth conical and recurved, those at front of upper jaw in 2 irregular rows, reduced opposite nostrils to single irregular row of progressively smaller teeth; teeth in lower jaw minute, in 3 or 4 irregular rows medially, progressively fewer and smaller towards end of jaw. GR 29 or 30. Scales cycloid on nape, below dorsal fin, and on chest, except for a few ctenoid scales ventrally on chest near opercle; LL scales 49–52.

Preserved specimens brownish, dorsal fin with dark leading edge expanding at apex; caudal fin dark-edged, posterior margin with black band; anal fin with broad black basal band; narrow dark crescent at pectoral-fin base.



Pempheris tilman, 10 cm SL, male holotype (Red Sea).
© HA Randall, Bishop Museum

DISTRIBUTION Known only from two type specimens collected from northern Red Sea (Gulf of Aqaba).

REMARKS One of several recently described schwenkioid species in the Red Sea, in this case from two old specimens without mtDNA sequences. It has no distinctive characters and is likely a junior synonym of *P. tominagai*.

Pempheris tiran Randall & Victor 2015

Tiran sweeper

PLATE 31

Pempheris tiran Randall & Victor 2015: 55, Fig. 40 (Strait of Tiran, Saudi Arabia, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 42–44 rays; pectoral fins 17 or (usually) 18 rays. Body depth 2.4–2.5 in SL, body width ~2.7 in body depth. In SL: peduncle depth 10.7–11.8, HL 3.4–3.5, orbit diameter 7.8–8.3 (3 specimens: 121–125 mm SL), predorsal length 2.7–2.8, pre-pelvic length 2.7–2.8, preanal length 1.8–1.9, and pectoral-fin length 3.3–3.4. Teeth large for genus; teeth in medial third of upper jaw of male in 3 irregular rows, upper-row teeth conical and forward-projecting, those of inner rows strongly recurved and inwardly projecting, remaining teeth in jaw in 2 rows, progressively smaller, except for a few minute teeth in single row near end of jaw; teeth of female about half size of those of male, those of medial third of upper jaw in single irregular row, remaining teeth in 2 irregular rows, except for tiny teeth in single irregular row for last fourth of jaw; band of teeth in lower jaw of both sexes strongly outwardly curved medial to narrow symphysis, in 4 rows (progressively larger and more recurved inwardly in female; largest teeth of male in 2 outer rows, erect or slightly recurved), and outer medial teeth of lower jaw visible in both sexes when mouth fully closed; upper lip relatively smooth, with close-set low papillae; lower lip with smaller and more widely separated papillae; tongue with sides slightly incurved, tip rounded and flexible. GR 31 or 32. Scales cycloid on nape, below dorsal fin, and on sides of peduncle; LL scales 62–64.

The two preserved type specimens dark brown; dorsal fin with dusky leading edge and black apical spot, much wider than pupil diameter and not extending down to last several rays; caudal fin with broad dark posterior margin, thin dark upper and lower margins; anal fin with dark band along base and black band along margin of fin extending full-length; pectoral fin with large oval spot at base. Iris pale on inner portion.

DISTRIBUTION Known only from two type specimens from one location in the Red Sea.

REMARKS *Pempheris tiran* has identical mtDNA sequences and no significant differences in characters from *P. flavicycla*. It is certainly a junior synonym.

Pempheris tominagai Koeda, Yoshino & Tachihara 2014

African silver sweeper

PLATE 31

Pempheris vanicolensis (non Cuvier 1831) Randall 1995: 244,

Fig. 638 (Oman).

Pempheris tominagai Koeda, Yoshino & Tachihara in Koeda, Yoshino, Imai & Tachihara 2014: 317, Fig. 7 (Sharm el-Sheikh, Egypt, Red Sea); Randall *et al.* 2014; Azzurro *et al.* 2015.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–39 (Red Sea only) rays; pectoral fins 16–18 (usually 17) rays. In SL: body depth 2.3–2.5, HL 3.1–3.3, orbit diameter 6.8–7.3, and predorsal length 2.6–2.7. Teeth in upper jaw in 3 rows medially, all down-curved. GR 26–30. Scales cycloid on nape, in 1st row below dorsal fin, on sides of peduncle, and on sides of chest, except for 2 or 3 ctenoid scales anteroventrally on chest; LL scales 45–51 (Red Sea only).

Colour in life variable, from bronzy brownish (most underwater photographs) to silvery to greenish; upper body darkened; dorsal fin with dark leading edge often expanding to oval dark apical spot; caudal fin with dark upper and lower margins, with or without a wide dark posterior band; a prominent dark band along anal-fin base; pectoral fin reddish with thin dark crescent at base; iris yellow to brownish. Attains 101 mm SL.

DISTRIBUTION WIO: Red Sea, Oman and apparently widespread in NWIO.

REMARKS The first schwenkioid species described from the Red Sea, in 2014. Fish from the rest of the NWIO, i.e., Chagos Archipelago, Yemen (*P. xanthomma*), Seychelles (*P. ternay*) and northern Madagascar (*P. rubricauda*) share the mtDNA lineage. Farther east, from Maldives to India to Indonesia, it is replaced by the lineage of true *P. schwenkii*, 2.5% different. Only distantly related schwenkioid lineages occur in the SWIO (southern Madagascar, Mascarenes, and southern Africa). A number of recently described schwenkioid species from the Red Sea and NWIO are likely junior synonyms of *P. tominagai*. Koeda *et al.* (2014) include *P. connelli* and other unrelated species from southern Africa and Mauritius in their type series, thus the actual features of *P. tominagai* remain undocumented. They also presumed *P. schwenkii* is not in the Indian Ocean, but mtDNA indicates it occurs from Maldives eastward. If the two species eventually cannot be phenotypically distinguished, *P. schwenkii* would be the senior synonym.

Pempheris trinco Randall & Victor 2015

Sri Lanka sweeper

PLATE 31

Pempheris trinco Randall & Victor 2015: 57, Fig. 42 (Trincomalee, Sri Lanka).
Pempheris schwenkii (non Bleeker 1855): Randall & Bineesh 2014.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37–41 rays; pectoral fins 17 or (usually) 18 rays. Body depth 2.3–2.5 in SL, body width ~2.6 in body depth. In SL: HL 3.2–3.3, orbit diameter 7.1–7.8, predorsal length 2.6–2.7, and pectoral-fin length 3–3.4. Teeth in upper jaw in 2 rows medially, outer row slightly recurved, inner row larger and more strongly recurved, narrowing to single row posteriorly; teeth in lower jaw similar but smaller, in 3 irregular rows and more strongly recurved inward. GR 26–28. Scales cycloid on nape, in 1st row below dorsal fin, on sides of peduncle, and on sides of chest except for a few ctenoid scales ventroanteriorly; LL scales 49–58.

In life, body silvery, with scale centres silvery grey and scale edges broadly coppery; dark band across pectoral-fin bases; dorsal fin with dark apical spot; anal-fin base with relatively narrow dark band; caudal-fin margin broadly blackish.

DISTRIBUTION Indian Ocean: Sri Lanka.

REMARKS A poorly defined schwenkioid species native to Sri Lanka, without mtDNA sequences and with no distinctive characters. Likely a synonym of *P. schwenkii*, found to the west in Maldives and eastward to Indonesia.

Pempheris viridis Randall & Victor 2015

Arabian sweeper

PLATE 31

Pempheris viridis Randall & Victor 2015: 58, Fig. 43 (off Al Lith, Saudi Arabia, Red Sea).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 37 rays; pectoral fins 17 rays. Head profile nearly straight. Body depth 2.7 in SL, body width 2.7 in body depth. In SL: peduncle depth 11.3, HL 3.2, eye diameter 7.3, predorsal length 2.6, pre-pelvic length 2.5, preanal length 1.8, and pectoral-fin length 3.4. Teeth medially in upper jaw small, slender, conical and recurved, in 3 or 4 irregular rows, reduced laterally to 2 well-separated rows of larger, strongly recurved teeth; lower jaw with band of minute teeth at symphysis, gradually reduced posteriorly to single row. GR 25. Scales cycloid on nape, below dorsal fin, on sides of peduncle, and on most of sides of chest [specimen has 6 ctenoid scales in 2 rows on right side of chest, and 12 ctenoid scales in 4 rows on left side at angle of opercle]. LL scales 53; lateral line highly arched anteriorly, its vertical height above level of its origin equal to two-thirds orbit diameter.

In life, body bright metallic green, scale edges yellowish brown; relatively narrow dark band at anal-fin base; caudal fin

orange, with wide dark band at posterior margin, and narrower bands along upper and lower edges; iris yellow.

DISTRIBUTION Known only from the holotype collected from the Red Sea.

REMARKS One of several recently described schwenkioid species from the Red Sea, based on a single metallic green specimen with the same mtDNA sequence as *P. tominagai* and no other distinction; it is very likely a junior synonym of *P. tominagai*.

Pempheris wilsoni Randall & Victor 2015

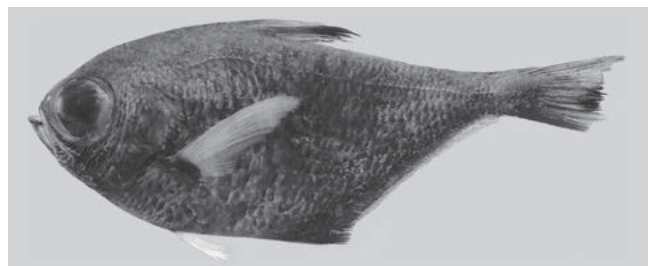
Fahal sweeper

PLATE 32

Pempheris wilsoni Randall & Victor 2015: 60, Figs. 45–48 (Fahal I., Oman, Gulf of Oman).

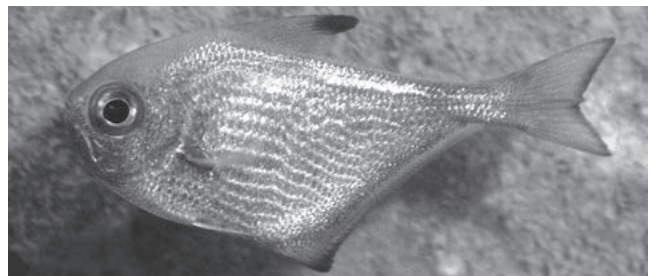
Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 45 rays; pectoral fins 17 rays. Body depth 2.4 in SL, body width 2.7 in body depth. In SL: peduncle depth 10.3, HL 3.5, orbit diameter 7.3, predorsal length 2.7, pre-pelvic length 2.7, preanal length 1.9, and pectoral-fin length 3.2. Dentition as described for *P. smithorum*, but teeth of lower jaw smaller; sides of tongue concave, tip rounded. GR 29. [Specimen missing most of outer layer of scales.] LL scales 59.

In life, coppery brown with dark bands along flanks made up of rows of darkened scale centres; dorsal fin with dark oval apical spot, caudal fin with thin dark posterior rim; anal fin with dark margin on first several rays only; pectoral fin with or without narrow dark crescent at base.



Pempheris wilsoni, 12 cm SL, male holotype (Oman).

© HA Randall, Bishop Museum



Pempheris wilsoni (Oman). © KDP Wilson

DISTRIBUTION Known only from the Gulf of Oman.

REMARKS The northern Oman population of the *P. nesogallica/rhomboides* complex; it shares mtDNA sequences with the other WIO species of that complex and has no distinctive features. Likely a junior synonym of *P. nesogallica*.

Pempheris xanthomma Randall & Victor 2015

Yemen sweeper

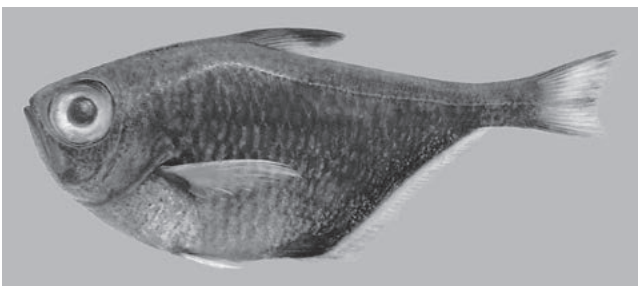
PLATE 32

Pempheris xanthomma Randall & Victor 2015: 62, Figs. 49–50
(Ras Majdah, Yemen, Gulf of Aden).

Pempheris tominagai (non Koeda, Yoshino, Imai & Tachihara 2014):
Randall *et al.* 2014.

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–41 rays; pectoral fins usually 17 (16–18) rays. Body depth 2.2–2.5 in SL, body width 2.5–3.5 in body depth. In SL: peduncle depth 9.7–11.2, HL 3.1–3.4, orbit diameter 7.5–7.8 (eyes relatively small), predorsal length 2.7–2.8, pre-pelvic length 2.5–2.6, preanal length 1.7–1.8, and pectoral-fin length 3.2–3.4. Dentition typical of most species of genus. GR 26–29. Scales cycloid on nape, below dorsal fin, on sides of peduncle, and on chest except for a few to up to one-fourth of the scales ctenoid ventroanteriorly; LL scales 49–57.

Preserved specimens brownish yellow; dorsal fin with dusky leading edge and oval dark apical spot; caudal fin with dark upper and lower margins, dusky on posterior margin; anal-fin base with wide dark band; pectoral fin with narrow dark crescent at base; iris yellow.



Pempheris xanthomma, 9 cm SL, female holotype (Gulf of Aden).
© HA Randall, Bishop Museum

DISTRIBUTION Known only from type series collected from the Gulf of Aden.

REMARKS A schwenkioid species based on a single collection from Yemen, sharing a mtDNA lineage with *P. tominagai* and with no distinctive characters. It is very likely a junior synonym of *P. tominagai*.

Pempheris zajonzi Randall & Victor 2015

Socotra sweeper

PLATE 32

Pempheris zajonzi Randall & Victor 2015: 64, Fig. 51 (off Ras Qatanin, Socotra I., Yemen).

Dorsal fin 6 spines, 9 rays; anal fin 3 spines, 36–38 rays; pectoral fins 17 rays. Head profile from above eyes to dorsal-fin origin nearly straight; lower jaw not protruding when mouth firmly shut. Body depth ~2.4 in SL, body width ~2.7 in body depth. In SL: HL ~3.2, orbit diameter ~8 (eyes relatively small), predorsal length ~2.6, pre-pelvic length ~2.5, preanal length ~1.8, and pectoral-fin length ~3.3. Teeth at front of upper jaw in 3 irregular rows, well-developed, recurved for two-thirds length of tooth-bearing part of jaw, upper teeth more protruding, and lower teeth strongly recurved; teeth at front of lower jaw minute, in 3 or 4 irregular close-set rows, progressively more recurved and larger inwardly. GR 28–30. Scales cycloid on nape, below dorsal fin, on sides of peduncle, and on chest except about one-fourth of scales ctenoid ventroanteriorly; LL scales 49–54.

Preserved specimens uniformly brown; pectoral-fin bases only slightly darker than adjacent body; leading edge of dorsal fin black, slightly expanding distally; anal fin with broad black band; caudal fin yellow, with narrowly black upper and lower edges, and broadly black posterior margin; iris dark bluish grey. Attains at least 90 mm SL.

DISTRIBUTION Known from a single collection at Socotra.

REMARKS A poorly defined schwenkioid species from Socotra, without mtDNA sequences and with no distinctive characters. Its relatively narrow body indicates it is likely a junior synonym of *P. tominagai* (the alternative species *P. conelli/rochai* has a wider body).

FAMILY TOXOTIDAE

Archerfishes

Gerald R Allen

Body moderately compressed, ovate or rhomboidal, covered with relatively large ctenoid scales, extending onto head and median fins; cheek and opercle scaly. Dorsal fin single, with 4–6 stout spines, 15–18 rays; anal fin 3 stout spines, 15–18 rays; caudal fin generally truncate. Eyes large, set near dorsal profile and above rear portion of mouth. Mouth moderately large, protrusile, with lower jaw protruding; villiform teeth on jaws, vomer and palatines; roof of mouth with deep longitudinal groove that forms a tube when the tongue is pressed against it. Gill rakers 2–8 on lower limb of 1st arch. Lateral line continuous, from upper edge of gill cover to caudal-fin base.

These fishes exhibit one of nature's most remarkable feeding adaptations. When suitable prey is sighted, usually small insects and spiders, the fish rises to the surface and squirts a jet of water by forcefully compressing the gill cover. The water is propelled through the tubular structure formed when the tongue is pressed tightly against the groove on the roof of mouth, knocking the prey into the water from overhanging vegetation. The aim is uncannily accurate over a distance of at least 2 m. Small-sized, of little commercial importance except in small-scale subsistence fisheries, and young fish sometimes sold in the aquarium trade. Occur mainly in the Indo-Malay and Australian regions, primarily in brackish and freshwater habitats. One genus, *Toxotes* Cuvier 1816, with 7 species, 2 in WIO.

KEY TO SPECIES

- | | |
|----|---|
| 1a | Dorsal fin 4 spines; upper sides of body with 4 or 5 black bars <i>T. jaculatrix</i> |
| 1b | Dorsal fin 5 or 6 spines; upper sides of body with 6 or 7 alternating large and small black spots <i>T. chatareus</i> |

Toxotes chatareus (Hamilton 1822)

Sevenspot archerfish

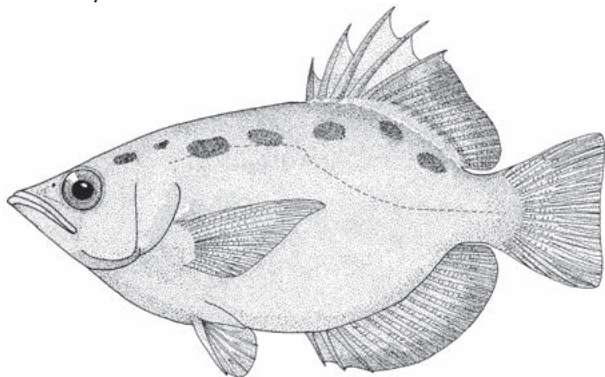
PLATE 32

Coius chatareus Hamilton 1822: 101, 370, Pl. 14 (Ganges River estuaries, India).

Toxotes chatareus: Allen 1978*; Pethiyagoda 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 5 or 6 spines, 12 or 13 rays; anal fin 3 spines, 15–17 rays; pectoral fins 11–14 rays. Body depth 1.9–2.4 in SL; HL 2.3–3.2 in SL; penultimate spine of dorsal fin usually longest, 1.3–2.3 in HL. GR 5–7. LL scales 29–37.

Body silvery white overall, slightly dusky greyish dorsally; 6 or 7 irregular blackish blotches or short bars on upper sides; fins generally whitish, but frequently dusky brown on soft-rayed portions of dorsal and anal fins. Attains 40 cm SL (commonly 25 cm TL).



Toxotes chatareus, 16 cm SL. © Food and Agriculture Organization of the United Nations, Original Scientific Illustrations Archive; reproduced with permission

DISTRIBUTION Indo-Pacific: India, Sri Lanka, Bangladesh, Thailand, Vietnam, Indonesia, New Guinea and northern Australia.

REMARKS Inhabits freshwater streams and mangrove estuaries, to ~4 m deep.

Toxotes jaculatrix (Pallas 1767)

Banded archerfish

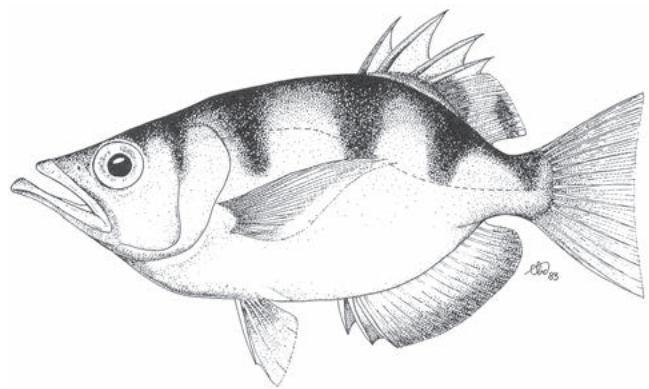
PLATE 32

Sciaena jaculatrix Pallas 1767: 186, Pl. 8, Fig. 6 (Jakarta, Java, Indonesia [Raffles Marina at Tuas, Singapore]).

Toxotes jaculator: Allen 1978*; Talwar & Jhingran 1991.

Dorsal fin 4 spines, 11–13 rays; anal fin 3 spines, 15–17 rays; pectoral fins 12 or 13 rays. Body depth 2.1–2.4 in SL; HL 2.3–2.7 in SL; 3rd spine of dorsal fin longest, 1.7–1.9 in HL. GR 5–7. LL scales 26–30.

Body silvery white overall, dusky greyish dorsally; 5 prominent black bars along upper sides, 4th bar may continue onto dorsal fin; anal-fin margin blackish, fins otherwise pale yellowish or whitish. Attains 30 cm TL.



Toxotes jaculatrix, 15 cm SL. © Food and Agriculture Organization of the United Nations, Original Scientific Illustrations Archive; reproduced with permission

DISTRIBUTION Indo-Pacific: India, Andaman Is., Bangladesh, Myanmar, Thailand, Cambodia, Malaysia, Singapore, Indonesia, Philippines, Ryukyu Is., Palau, New Guinea, Solomon Is., northern Australia and Vanuatu.

REMARKS Found mainly in brackish habitats, especially mangrove estuaries, to ~4 m deep, but also seen at the reef-mangrove interface.

FAMILY POMACENTRIDAE

Damselfishes

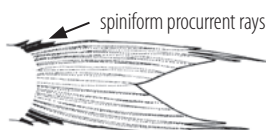
Gerald R Allen

Body compressed, ovoid to almost orbicular, covered with ctenoid scales usually extending onto fins. Single dorsal fin with 8–17 spines (maximum 14 spines in WIO species), spinous portion longer than soft-rayed portion; anal fin with 2 spines, 1st spine much shorter than 2nd; caudal fin forked to emarginate. Lateral line interrupted: anterior section of tubular scales more or less parallel with dorsal profile of body and usually ending below soft-rayed dorsal fin, and rear section consisting of several pits or obscure pores along peduncle. Snout short and blunt; 1 nostril (rarely 2) on each side. Mouth small, slightly protractile; teeth conical or compressed, uniserial, or in 2 or more rows with outer series somewhat enlarged; no teeth on palate. Lower pharyngeal bones fused as triangular unit. Gill opening unrestricted; gill arches 3½, pseudobranch present.

Small fishes of commercial importance only to the aquarium fish trade. Planktivores, herbivores or omnivores; solitary or in large groups, and many species are territorial. Lay demersal eggs guarded mainly by the male. Occur in all tropical to warm-temperate seas where they are one of the most abundant families on coral and rocky reefs in terms of number of individuals and species. Twenty-nine genera and 423 species; 16 genera and 112 species in WIO. Two recent additions, *Chromis torquata* (Allen 2018) and *Pomacentrus vatosoa* (Frable & Tea 2019) are illustrated (Plates 41, 42 and 53), but not included in the following keys and text.

KEY TO GENERA

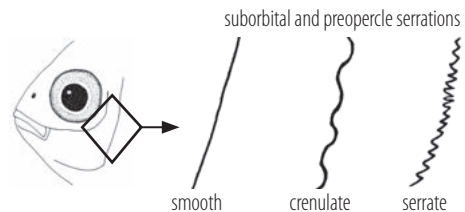
- 1a LSS >50; all bones of opercular series (gill cover) with strongly serrate rear margin *Amphiprion*
 1b LSS <50; some opercular bones with smooth rear margin 2
- 2a LSS 40–50 from rear edge of gill opening to caudal-fin base; most opercular bones with at least slightly serrate margin *Teixeirichthys*
 2b LSS <40; only preopercle with serrate margin or all opercular bones with relatively smooth margin 3
- 3a Upper and lower edges of caudal-fin base usually with 2 or 3 projecting (easily detectable with dissecting needle) spiniform, procurent rays; teeth usually conical, in ≥2 rows (single row of flattened teeth in *Chromis dasygenys*) 4



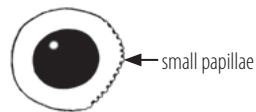
Continued ...

KEY TO GENERA

- 3b Upper and lower edges of caudal-fin base usually without projecting spiniform, procurent rays; teeth conical, in 1 or 2 rows 5
- 4a Margins of suborbital series and preopercle finely serrate; body orbiculate, depth 1.4–1.7 in SL *Dascyllus*
 4b Suborbitals smooth or covered with scales, and preopercle margin usually smooth or only weakly crenulate; body more elongate, depth 1.8–2.3 in SL *Chromis*



- 5a Small, slender papillae on rear edge of orbits; body very slender, depth 2.8–3.1 in SL *Lepidozygus*



- 5b No papillae on edge of orbits; body depth variable but usually <2.8 in SL for most species 6

- 6a Upper half of peduncle blackish, with mark tapering posteriorly along upper margin of caudal fin, and narrower but similar marking along lower caudal-fin margin; body slender, depth 2.5–2.7 in SL *Pomachromis*
 6b No dark markings on peduncle and caudal fin as described above; body depth variable, 1.5–3 in SL 7

- 7a Tips of median fins filamentous; caudal fin lunate or strongly emarginate *Neopomacentrus*
 7b Tips of median fins not filamentous; caudal fin emarginate ... 8

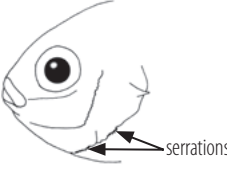
- 8a Preopercle margin smooth 9
 8b Preopercle margin serrate 13

- 9a Scale rows 3–3½ from base of 6th dorsal-fin spine to lateral line *Abudefduf*
 9b Scale rows 1½–2½ from base of 6th dorsal-fin spine to lateral line 10

- 10a Body orbiculate, depth 1.6–1.7 in SL; longest dorsal-fin spine subequal to distance from snout tip to upper end of preopercle *Amblyglyphidodon*
 10b Body more slender, depth usually >1.7 in SL; longest dorsal-fin spine slightly less than distance from snout tip to upper end of preopercle 11

Continued ...

KEY TO GENERA

- 11a Teeth in single row on jaws; dorsal fin 12 spines (except 13 spines in *Plectroglyphidodon randalli*) *Plectroglyphidodon*
- 11b Teeth in 2 rows on jaws; dorsal fin 13 spines 12
- 12a Body depth usually <2 in SL; suborbital bones scaly
..... *Neoglyphidodon*
- 12b Body depth usually >2 in SL; suborbital bones naked
..... *Chrysiptera*
- 13a Preopercle margin weakly serrate; body silvery white, with wide black bar through eyes and pair of black saddle-like markings on upper sides *Amblypomacentrus*
- 13b Preopercle margin strongly serrate; colour not as above 14
- 14a Margins of subopercle and interopercle serrate; lower edge of suborbitals hidden by scales; GR 26–30 *Pristotis*
- 
- 14b Margins of subopercle and interopercle smooth; lower edge of suborbitals exposed; GR 15–31 15
- 15a Teeth in 2 rows on jaws; notch usually present between lachrymal and suborbital series *Pomacentrus*
- 15b Teeth in single row on jaws; no notch between lachrymal and suborbital series *Stegastes*

GENUS *Abudefduf* Fabricius 1775

Margins of suborbitals and preopercle smooth; teeth uniserial, those at front of jaws usually with notched or flattened tips; dorsal fin 13 (rarely 12) spines, 11–16 rays; body relatively deep, body depth of adults 1.5–2 in SL; most species with dark vertical crossbars on sides. Atlantic and Indo-Pacific; 21 species, 9 in WIO.

KEY TO SPECIES

- 1a Peduncle with large, oval, black spot on sides; no dark markings on body *A. sparoides*
- 1b No oval black spot on sides of peduncle; body usually with dark vertical bars 2

Continued...

KEY TO SPECIES

- 2a Peduncle with small black spot on dorsal surface; dorsal fin usually 15 or 16 (rarely 14) rays *A. sordidus*
- 2b No black spot on dorsal surface of peduncle; dorsal fin usually 12–14 rays (last ray may be branched near base) 3
- 3a Caudal-fin lobes each with prominent longitudinal dark band near outer margin 4
- 3b No dark longitudinal bands on caudal-fin lobes 5
- 4a Body with 3 broad dark bars, and 4th dark bar at caudal-fin base joining dark band along upper and lower margins of caudal fin *A. natalensis*
- 4b Body with 4 dark bars, and 5th bar at caudal-fin base joining dark submarginal band of upper lobe *A. sexfasciatus*
- 5a Body brown, with 0–5 narrow pale bars on sides, and caudal fin usually yellow or dusky yellow *A. notatus*
- 5b Body generally pale, with 5 or 6 dark bars on sides 6
- 6a Body with 5 more-or-less distinct dark bars, 1st from nape across opercle to pectoral-fin bases *A. vaigiensis*
- 6b Body with 6, sometimes faint, dark bars 7
- 7a Juveniles with 6 black bars, ventral part of 2nd and 4th bars converging towards 3rd bar, and caudal fin yellowish; adults bluish green, covered with small blue spots [Mascarenes]
..... *A. margariteus*
- 7b Colours not as above 8
- 8a Body whitish, with 6 dusky bars wider than pale interspaces, anterior 3 bars often blackish dorsally, 1st bar from dorsal-fin origin to pectoral-fin base *A. septemfasciatus*
- 8b Head and body greenish grey, with 6 distinct black bars narrower than pale interspaces, 1st bar from dorsal-fin origin to behind pectoral-fin base *A. bengalensis*

Abudefduf bengalensis (Bloch 1787)

Bengal sergeant

PLATES 33 & 34

Chaetodon bengalensis Bloch 1787: 110, Pl. 213, Fig. 2 (Bay of Bengal, India).

Abudefduf bengalensis: Allen 1991*; Eichler & Lieske 1994*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 13–15 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 16–20 rays. Body depth 1.6–2 in SL; nape steep and slightly convex; adults with middle dorsal- and anal-fin rays elongated, giving fins a pointed profile and reaching well past caudal-fin base; caudal-fin lobes rounded. GR 21–26. LL scales 19–23.

Body whitish to pale greenish grey, with 6 black bars (1st from nape to gill opening); fins pale greyish to black, except juveniles with translucent caudal fin; small black spot at base of uppermost pectoral-fin rays. Attains 17 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Pakistan to India; elsewhere to east coast of India, Thailand, Vietnam, Indonesia, Philippines, China, Japan and northern Australia.

REMARKS Adults solitary, territorial. Common on near-shore reefs and in lagoons, in 1–6 m.

Abudefduf margariteus (Cuvier 1830)

Pearly sergeant

PLATES 33 & 34

Glyphisodon margariteus Cuvier in Cuv. & Val. 1830: 470 (Mauritius, Mascarenes).

Abudefduf margariteus: Allen 1991*; Eichler & Lieske 1994*; Heemstra *et al.* 2004.

Dorsal fin 13 spines, 13 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18–21 rays. Body depth 1.8–2 in SL. GR 28–31. LL scales 21–23.

Body pale greenish white, with 6 dark vertical bars from pectoral-fin base to middle of peduncle; bars nearly black in juveniles, often faint in adults, which also have scattered small blue spots on head and body; scales below lateral line each with small blue spot forming horizontal rows; fins bluish grey to translucent, except caudal fin of juveniles often pale yellow. Attains 25 cm TL.



Abudefduf margariteus, 11 cm SL (Mauritius). © JE Randall, Bishop Museum

DISTRIBUTION WIO: Mauritius and Réunion.

REMARKS Common in small groups in surge areas of coral reefs, in 2–8 m.

Abudefduf natalensis Hensley & Randall 1983

Natal sergeant

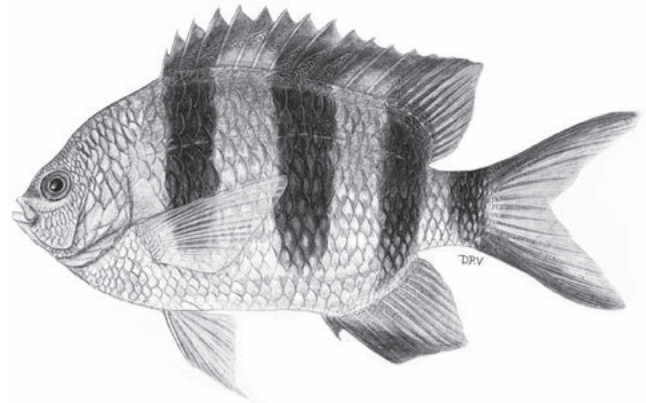
PLATE 34

Abudefduf natalensis Hensley & Randall 1983: 2, Figs. 1–3 (reef off Sodwana Bay, South Africa); SSF No. 219.1*; Allen 1991*; Heemstra & Heemstra 2004.

Abudefduf sexfasciatus (*non* Lacepède 1801): SFSA No. 762 [in part]; Smith 1960 [in part].

Dorsal fin 12 or 13 spines, 12 or 13 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 18–20 rays. Body depth 1.7–2 in SL. GR 22–26. LL scales 20–22.

Body whitish, with 4 blackish vertical bars from pectoral-fin bases to caudal fin, the last bar merging with dark dorsal and ventral caudal-fin margins; fins otherwise pale grey to translucent. Attains 17 cm TL.



Abudefduf natalensis, 12 cm TL, paratype (South Africa). Source: SSF

DISTRIBUTION WIO: endemic to South Africa (Kosi Bay to Transkei region).

REMARKS Common on rocky or coral reefs, in 1–25 m.

Abudefduf notatus (Day 1870)

Yellow-tail sergeant

PLATE 34

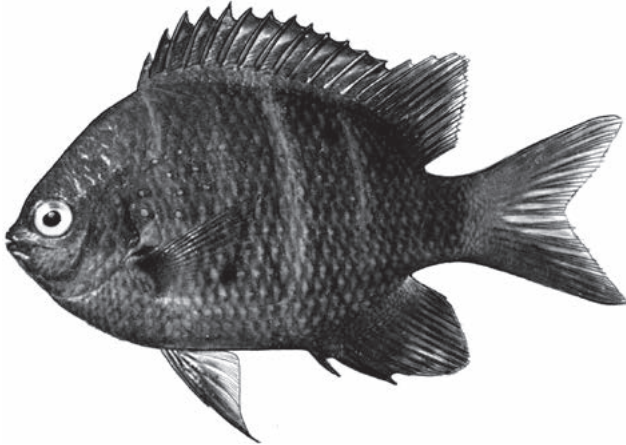
Glyphidodon notatus Day 1870: 521 (Andaman Is.).

Abudefduf notatus: Smith 1960*; SSF No. 219.2*; Allen 1991*; Randall & Anderson 1993*; Eichler & Lieske 1994*; Randall 1995*; Kuitert 1998*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 12–14 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18–20 rays. Body depth 1.7–2 in SL. GR 26–31. LL scales 20–22.

Body grey or dark brown, with blue spots on scales; 5 narrow whitish bars from pectoral-fin bases to peduncle, first

2 bars may be faint or absent; blackish 'ear' spot at origin of LL scales, and opercle margin narrowly black; small black spot at upper end of pectoral-fin bases; caudal fin usually yellow, anal fin and pelvic fins often yellow, other fins usually pale greyish to translucent. Attains 17 cm TL.



Abudedefduf notatus, 16 cm TL (Seychelles). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Oman, Kenya to South Africa (Transkei region; juveniles to Algoa Bay), Aldabra, Seychelles and Maldives; elsewhere to Andaman Is., Christmas I., Thailand, Indonesia, Philippines, southern Japan and New Guinea.

REMARKS Often occurs in aggregations on rocky inshore reefs exposed to wave action, in 1–12 m.

Abudedefduf septemfasciatus (Cuvier 1830)

Barred sergeant

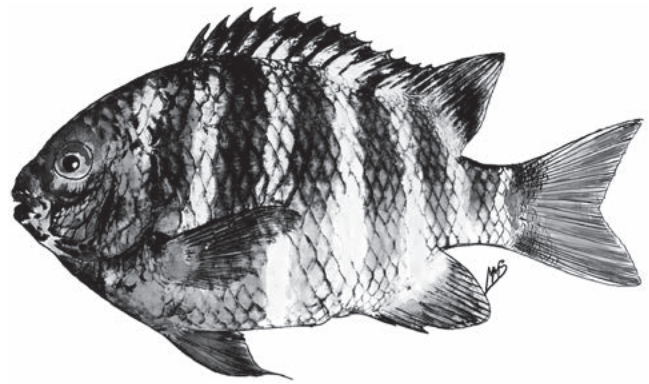
PLATE 34

Glyphisodon septemfasciatus Cuvier in Cuv. & Val. 1830: 463 (Mauritius, Mascarenes).

Abudedefduf septemfasciatus: SFSA No. 762*; Smith 1960*; SSF No. 219.3*; Winterbottom *et al.* 1989; Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*; Winterbottom & Anderson 1997; Kuitert 1998*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Dorsal fin 13 spines, 12–14 rays; anal fin 2 spines, 11–13 rays; pectoral fins 17–19 rays. Body depth 1.7–1.9 in SL. GR 20–26. LL scales 20–22.

Body usually whitish, with 6 dusky grey vertical bars from rear of head to caudal-fin base; small black spot at upper end of pectoral-fin bases; fins pale greyish to translucent. Attains 23 cm TL.



Abudedefduf septemfasciatus, 16 cm TL (N Mozambique).

Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa (Eastern Cape), Madagascar, Aldabra, Mascarenes, Chagos and Maldives; elsewhere to Japan, Australia, Tuamotu Is. and Line Is.

REMARKS Common on reefs in areas of mild to moderate surge, generally to ~3 m deep.

Abudedefduf sexfasciatus (Lacepède 1801)

Scissortail sergeant

PLATE 34

Labrus sexfasciatus Lacepède 1801: 430, 477, Pl. 19, Fig. 2 [Indian Ocean].

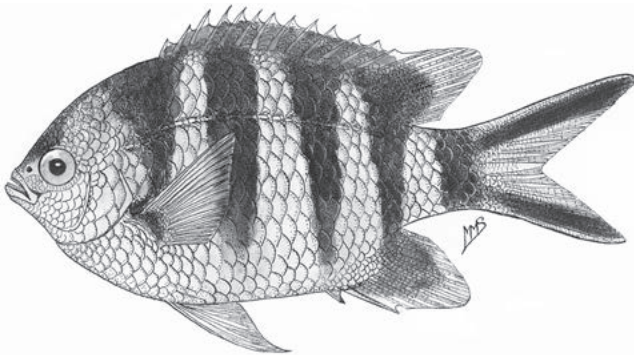
Glyphisodon coelestinus Cuvier (ex Solander) in Cuv. & Val. 1830: 464 (Malabar coast, India).

Abudedefduf sexfasciatus: SFSA No. 762 [in part]; Smith 1960* [in part]; SSF No. 219.4*; Allen 1991*; Eichler & Lieske 1994*; Randall 1995*; Winterbottom & Anderson 1997; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Abudedefduf coelestinus: Winterbottom *et al.* 1989.

Dorsal fin 13 spines, 11–14 rays; anal fin 2 spines, 11–13 rays; pectoral fins 17–20 rays. Body depth 1.8–2 in SL. GR 23–30. LL scales 18–22.

Body blue-green dorsally, whitish ventrally; 4 blackish vertical bars from head to peduncle, and short 5th bar at caudal-fin base joins black band of upper lobe; each caudal-fin lobe with submarginal black band, other fins whitish to translucent. Attains 17 cm TL.



Abudefduf sexfasciatus, 15 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea, Oman to Mozambique (Pinda), Madagascar, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to southern Japan, Marshall Is., Australia and Rapa Iti.

REMARKS A shoaling species, common on coral reefs in 1–15 m; apparently replaced in South African waters by the closely allied *A. natalensis*.

Abudefduf sordidus (Forsskål 1775)

Blackspot sergeant

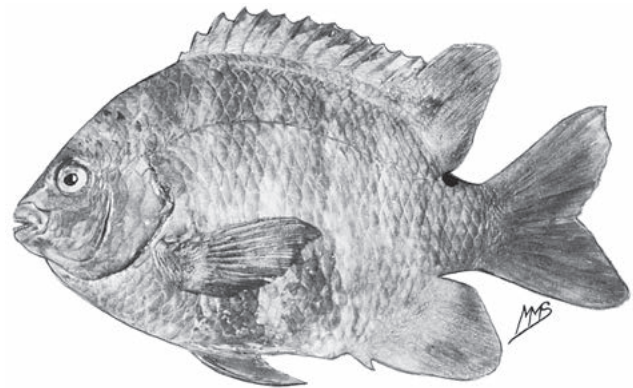
PLATE 33

Chaetodon sordidus Forsskål in Niebuhr 1775: 62, xiii (Jeddah, Saudi Arabia, Red Sea).

Abudefduf sordidus: Smith 1960*; SFSA No. 760*; SSF No. 219.5*; Winterbottom *et al.* 1989; Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*; Randall 1995*; Winterbottom & Anderson 1997; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

Dorsal fin 13 spines, 14–16 rays; anal fin 2 spines, 13–15 rays; pectoral fins 18–20 rays. Body depth 1.5–1.8 in SL. GR 20–28. LL scales 21–23.

Body with 6 dark grey bars and narrower pale interspaces; intense black spot on upper surface of peduncle; small black spot at upper end of pectoral-fin bases; fins pale greyish to translucent. Juveniles with black blotch at front of dorsal fin connecting with 2 black bars on body; dark bars on body and black spot on peduncle may be faint or absent. Attains 23 cm TL.



Abudefduf sordidus, 23 cm TL (Seychelles). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Oman to South Africa (Transkei region; juveniles to Kenton-on-Sea), Madagascar, Seychelles, Mascarenes, Chagos and Maldives; elsewhere to southern Japan, Australia, Pitcairn Is. and Hawaii.

REMARKS Common on exposed rocky shores and nearshore reefs in areas of moderate surge, generally to ~5 m deep; juveniles common in tidepools. Feeds primarily on algae, also crustaceans.

Abudefduf sparoides (Quoy & Gaimard 1825)

False-eye sergeant

PLATE 33

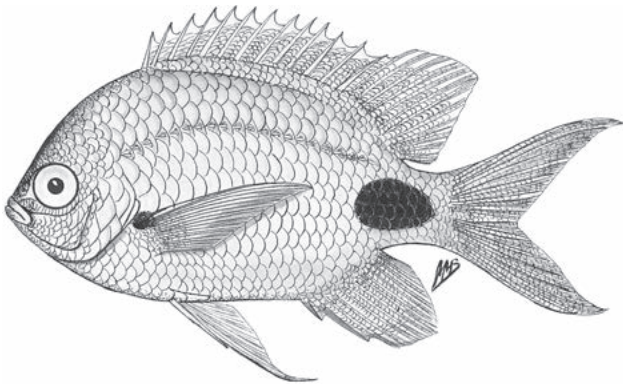
Glyphisodon sparoides Quoy & Gaimard 1825: 394 (Mauritius, Mascarenes).

Pomacentrus zanzibarensis Von Bonde 1934: 452, Pl. 23, Fig. 5 (north of Zanzibar, Tanzania).

Abudefduf sparoides: Smith 1960*; SFSA No. 765*; SSF No. 219.6*; Allen 1991*; Eichler & Lieske 1994*; Heemstra *et al.* 2004.

Dorsal fin 13 spines, 12–14 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 18–20 rays. Body depth 1.7–1.8 in SL; caudal fin deeply forked, lobes pointed. GR 24–28. LL scales 20–22.

Body uniformly pale greenish blue, but with large, oval, black blotch below rear end of lateral line and centred over most of peduncle; small black spot at upper end of pectoral-fin bases; fins pale greenish to translucent. Attains 16 cm TL.



Abudedefduf sparoides, 12 cm TL (Aldabra). Source: Smith & Smith 1963

DISTRIBUTION WIO: Kenya to South Africa (Transkei region, Eastern Cape), Madagascar, Aldabra and Mascarenes.

REMARKS Prefers inshore rocky and coral reefs, in 1–6 m; usually seen in small groups feeding on plankton.

Abudedefduf vaigiensis (Quoy & Gaimard 1825)

Indo-Pacific sergeant

PLATE 33

Glyphisodon vaigiensis Quoy & Gaimard 1825: 391 (New Guinea).

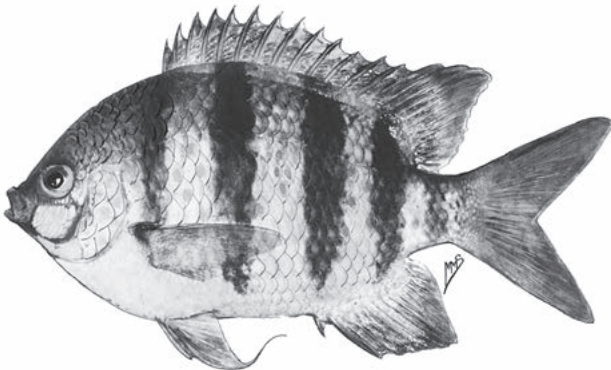
Abudedefduf quinquilineatus Von Bonde 1934: 452, Pl. 23, Fig. 6 (Zanzibar, Tanzania).

Abudedefduf saxatilis (non Linnaeus 1758): Smith 1960*; SFSa No. 761*.

Abudedefduf vaigiensis: SSF No. 219.7*; Winterbottom *et al.* 1989; Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*; Randall 1995*; Winterbottom & Anderson 1997; Debelius 1998*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004*.

Dorsal fin 13 spines, 12–14 rays; anal fin 2 spines, 11–13 rays; pectoral fins 16–20 rays. Body depth 1.5–1.8 in SL. GR 23–33. LL scales 19–23.

Body usually whitish (with yellow tinge dorsally), with 5 vertical blackish bars from pectoral-fin base to peduncle; fins whitish to translucent. Attains 20 cm TL.



Abudedefduf vaigiensis, 20 cm TL (S Mozambique). Source: SFSa

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Oman to South Africa (Transkei region, juveniles to Knysna), Tanzania (Zanzibar), Bassas da India (Mozambique Channel), Madagascar, Comoros, Seychelles, Réunion, Mauritius, Chagos and Maldives; elsewhere to Indonesia, southern Japan, New Guinea, Australia, northern New Zealand (vagrant), Tuamotu Is. and Marquesas Is.; introduced in Hawaii.

REMARKS Shoaling, commonly on coral or rocky reefs, in 1–12 m. Feeds on zooplankton, algae and small benthic invertebrates.

GENUS *Amblyglyphidodon* Bleeker 1877

Body orbicular, depth 1.5–1.8 in SL; margins of suborbital and preopercle smooth; suborbitals usually scaly (except in *A. aureus*); teeth uniserial or weakly biserial (inner row poorly developed if present); dorsal fin with 13 or 14 elongate spines, longest subequal to distance between snout tip and upper edge of preopercle. Indo-Pacific; 11 species, 2 in WIO.

KEY TO SPECIES

- 1a Teeth biserial at front of jaws; pectoral fins usually 15 (rarely 16) rays; rear half of body yellow in life; preopercle margin not blackish [Red Sea and Gulf of Aden] *A. flavilatus*
- 1b Teeth uniserial at front of jaws; pectoral fins usually 17 or 18 rays; rear part of body not yellow; preopercle margin blackish [Red Sea and WIO] *A. indicus*

Amblyglyphidodon flavilatus Allen & Randall 1981

Yellowflank damsel

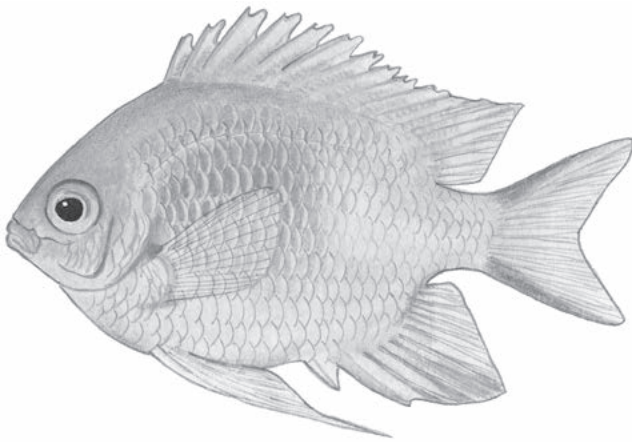
PLATE 36

Amblyglyphidodon flavilatus Allen & Randall 1981: 14, Figs. 4–5

(Taba, Egypt, Gulf of Aqaba, Red Sea); Allen 1991*; Eichler & Lieske 1994*; Debelius 1998*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 11–13 rays; anal fin 2 spines, 11–13 rays; pectoral fins 15 (rarely 16) rays. Teeth biserial at front of jaws. Body depth 1.6–1.7 in SL. GR 26–29. LL scales 15–17.

Head and front of body pale greyish green, grading to whitish ventrally and yellowish posteriorly; scales on head and rear of body each with large white spot; fins greenish to translucent or white, middle of anal fin sometimes with darkish area distally. Attains 10 cm TL.



Amblyglyphidodon flavilatus, ~8 cm SL, adult (Red Sea).

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba) and Gulf of Aden.

REMARKS Usually seen on coral reefs, in 8–20 m.

Amblyglyphidodon indicus Allen & Randall 2002

Maldives damsel

PLATES 35 & 36

Abudefduf leucogaster (non Bleeker 1847): Smith 1960*.

Amblyglyphidodon leucogaster (non Bleeker 1847): Allen & Randall 1980*;
Allen 1991* [in part]; Kuitert 1998*.

Amblyglyphidodon sp.: Winterbottom *et al.* 1989.

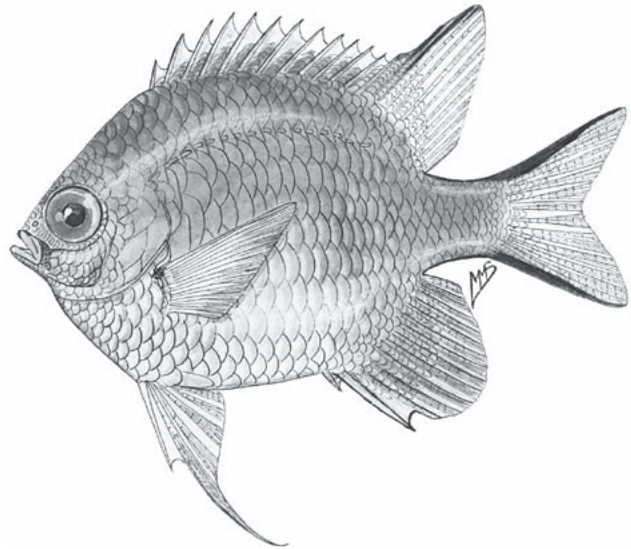
Amblyglyphidodon indicus Allen & Randall 2002: 140, Figs. 1–3
(Villinglii I., north of Malé Atoll, Maldives).

Dorsal fin 13 spines, 11–13 (usually 12) rays; anal fin 2 spines, 13 or 14 (usually 13) rays; pectoral fins 17 or 18 rays. Teeth uniserial at front of jaws. Body depth 1.5–1.7 in SL. GR 25–28. LL scales 15–18 (usually 16 or 17).

Head and body pale greenish grey with silvery sheen, shading to white ventrally; scale margins only slightly dusky; fish from Maldives with broad dusky streak on most body scales; preopercle margin narrowly blackish, opercle margin dusky brownish; fins greyish green to white or translucent; dorsal surface of peduncle and upper and lower margins of caudal fin narrowly black. Attains ~12 cm TL.

DISTRIBUTION Tropical waters of Indian Ocean. WIO: Red Sea to Mozambique (Pinda), Madagascar, Comoros, Seychelles, Chagos, Maldives and Sri Lanka; elsewhere to Andaman Sea and Indonesia (northwestern tip of Sumatra).

REMARKS Commonly associated with nearshore and outer reefs, in 2–45 m.



Amblyglyphidodon indicus, 10 cm TL (N Mozambique). Source: Smith 1960

GENUS *Amblypomacentrus* Bleeker 1877

Body relatively slender, depth 2.1–2.3 in SL; margins of suborbitals and preopercle weakly serrate; no notch between lachrymal and suborbital series; teeth uniserial; dorsal fin 13 spines. Indo-Pacific; 2 (questionably 3) species, 1 in WIO.

Amblypomacentrus breviceps

(Schlegel & Müller 1840)

Black-banded damsel

PLATE 36

Glyphisodon breviceps Schlegel & Müller 1840: 23 (Sumatra, Indonesia).

Amblypomacentrus breviceps: Allen 1991*; Kuitert 1998.

Dorsal fin 13 spines, 10–12 rays; anal fin 2 spines, 11–13 rays; pectoral fins 16 or 17 rays. Body depth 2.1–2.3 in SL. GR 20–23. LL scales 16 or 17.

Body generally white to silvery white, with pair of black bars (in juveniles) or saddles (in adults) on sides at level of pectoral fins and beneath anterior dorsal-fin rays; fins whitish to translucent in adults; pelvic fins, anal fin and caudal fin yellow in juveniles. Attains 7 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives; elsewhere, Indonesia, Philippines, Australia and Solomon Is.

REMARKS Commonly found in small groups on sandy or silty bottom in lagoons or sheltered bays, and around outcrops of sponge or rock, in 2–35 m. The status of the Indian Ocean population requires further investigation.

GENUS **Amphiprion** Bloch & Schneider 1801

Margins of opercle, subopercle and interopercle with strong serrations; lachrymal and suborbitals each with ≥ 1 serrations; dorsal fin 8–11 spines; scales small, LSS ~47–66. Colourful reef fishes that live commensally with anemones. Indo-Pacific; 29 species, 11 in WIO.

KEY TO SPECIES

- 1a Head and body uniformly pale orange-brown; dorsal midline with white streak from snout to peduncle *A. akallopisos*
- 1b Head and body with 1–3 pale transverse vertical bars 2

- 2a Head and body orange or yellowish orange, with 1 pale transverse bar on head only *A. nigripes*
- 2b Head and body with 2 or 3 transverse pale bars 3

- 3a Caudal fin pale (yellow to white in life) 4
- 3b Caudal fin dark 10

- 4a Predorsal scales extending past mid-interorbital area; white vertical bar on rear of head and another from middle of dorsal fin to anus; pelvic fins dusky *A. chagosensis*
- 4b Predorsal scales not extending past mid-interorbital area; colour not as above 5

- 5a Adults mostly blackish brown, with 2 transverse pale bars (juveniles orange, with 2 black-edged white bars); front and lower part of head orange; usually abrupt pale–dark boundary (convex anteriorly) or white bar on peduncle; caudal fin white or yellow; dorsal fin usually 10 spines *A. darkii*
- 5b Body usually without abrupt pale–dark boundary at peduncle; dorsal fin usually 10 or 11 spines 6

- 6a White bar at midbody extending onto margin of soft-rayed dorsal fin; dorsal fin usually 11 spines *A. sebae*
- 6b White bar at midbody not extending onto dorsal-fin margin (at least in adults); dorsal fin 10 or 11 spines 7

- 7a White bar at midbody >9 scales wide; dorsal fin usually 11 spines; caudal fin forked *A. latifasciatus*
- 7b Pale bar at midbody <9 scales wide; dorsal fin 9–11 (usually 10) spines 8

- 8a Caudal fin lunate, with elongate upper and lower rays; white bars on head and body narrow, bar at midbody 1½–4 scales wide (may be absent in large adults) *A. omanensis*
- 8b Caudal fin truncate to slightly emarginate; pale bars on head and body generally wider, especially across nape 9

Continued ...

KEY TO SPECIES

- 9a Pectoral fins usually 20 rays; body mostly black, with 2 pale vertical bars, and fins and belly yellow or orange; peduncle to caudal fin pale in juveniles, subadults, and frequently adults *A. allardi*
- 9b Pectoral fins usually 19 rays; body yellow-orange (tan to dark brown in preservative), with 2 pale vertical bars; pale saddle on peduncle in some juveniles only *A. bicinctus*

- 10a Caudal-fin rays pale brownish grey and membranes very dark; dorsal fin 11 spines *A. fuscocaudatus*
- 10b Caudal fin uniformly dark, except for narrow white margin; dorsal fin 10 (rarely 11) spines *A. chrysogaster*

Amphiprion akallopisos Bleeker 1853

Nosestripe anemonefish

PLATES 35 & 36

Amphiprion akallopisos Bleeker 1853: 281 (Priaman, Sumatra, Indonesia); Allen 1972*, 1991*; SSF No. 219.8*; Fautin & Allen 1992*; Eichler & Lieske 1994*; Heemstra & Heemstra 2004*.

Phalerebus akallopisos: SFSA No. 745a; Smith 1961.

Dorsal fin 8 or 9 spines, 17–20 rays; anal fin 2 spines, 12–14 rays; pectoral fins 16–18 rays. Body depth 2.1–2.5 in SL. GR 17–20. LL scales 34–45.

Body uniformly orange to yellowish or pinkish brown (no vertical white bars on head or body), and dorsal midline with white stripe from snout to peduncle; fins whitish or translucent to pale orange or pinkish. Attains 11 cm TL.



Amphiprion akallopisos, 7 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Somalia to South Africa (Aliwal Shoal), Madagascar, Comoros and Seychelles; elsewhere to Andaman Sea, Indonesia and Java Sea (northern Bali).

REMARKS Associates with *Heteractis magnifica* and *Stichodactyla mertensii* anemones, in 3–25 m.

Amphiprion allardi Klausewitz 1970

Allard's anemonefish

PLATES 35 & 36

Amphiprion allardi Klausewitz 1970: 182, Figs. 1–6 (Mombasa, Kenya);Allen 1972*, 1991*; SSF No. 219.9*; Fautin & Allen 1992*; Eichler & Lieske 1994*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.*Amphiprion ephippium* (non Bloch 1790): Smith 1960* [in part].*Amphiprion polymnus* (non Linnaeus 1758): SFSA No. 747.*Amphiprion bicinctus* (non Rüppell 1830): SFSA No. 784*.

Dorsal fin 10 or 11 spines, 15–17 rays; anal fin 2 spines, 13–15 rays; pectoral fins 19–21 rays. Body depth 1.8–2 in SL. GR 19–22. LL scales 35–41.

Body and rear of head dark brown to black, with 2 white or bluish white transverse bars, bar on head widest at nape; dorsal surface of peduncle and caudal fin whitish, other fins orange. Juveniles with black blotch covering most of caudal fin, and small white spot on upper surface of peduncle. Attains 14 cm TL.

*Amphiprion allardi*, 11 cm SL (S Mozambique). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Kenya to South Africa (KwaZulu-Natal), Comoros, Bassas da India (Mozambique Channel), Madagascar, Mauritius and Rodrigues.

REMARKS Associates with *Entacmaea quadricolor*, *Heteractis aurora* and *Stichodactyla mertensii* anemones, in 1–30 m.

Amphiprion bicinctus Rüppell 1830

Two-band anemonefish

PLATES 35 & 36

Amphiprion bicinctus Rüppell 1830: 139, Pl. 35, Fig. 1 (El Tur, Sinai coast,

Egypt, Gulf of Suez, or Massawa, Eritrea, Red Sea); Smith 1960*;

Allen 1972*, 1991*; Allen & Randall 1980*; Fautin & Allen 1992*;

Eichler & Lieske 1994*; Winterbottom & Anderson 1997*; Debelius 1998*; Manilo & Bogorodsky 2003.

Amphiprion sp. 1: Winterbottom *et al.* 1989.

Dorsal fin 9–11 spines, 15–17 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 17–21 rays. Body depth 1.8–1.9 in SL. GR 18–20. LL scales 37–40.

Head and body bright orange to dark brown, with 2 white or bluish white bars; fins orange or yellow. Attains 14 cm TL.

*Amphiprion bicinctus*, lectotype (Red Sea).

DISTRIBUTION WIO: Gulf of Suez, Red Sea, Gulf of Aden, Seychelles and Chagos.

REMARKS Associates with *Entacmaea quadricolor*, *Heteractis aurora*, *H. crista*, *H. magnifica* and *Stichodactyla gigantea* anemones, in 1–30 m.

Amphiprion chagosensis Allen 1972

Chagos anemonefish

PLATES 35 & 37

Amphiprion chagosensis Allen 1972: 161, Figs. 81–82 (Diego Garcia Atoll,Chagos); Winterbottom *et al.* 1989; Allen 1991*; Allen & Fautin 1992*.

Dorsal fin 9–11 spines, 15–17 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18–20 rays. Body depth 1.8–1.9 in SL. GR 17–20. LL scales 36–43.

Head and body pale orange to dark orange-brown, with 2 white bars; pectoral fins yellowish; pelvic fins dusky orange; dorsal and anal fins yellowish in young, brownish in adults; caudal fin yellow or whitish. Attains 10 cm TL.

DISTRIBUTION WIO: Red Sea and Chagos.

REMARKS Associates with *Heteractis magnifica* anemones, in 5–30 m.

Amphiprion chrysogaster Cuvier 1830

Mauritian anemonefish

PLATES 35 & 37

Amphiprion chrysogaster Cuvier in Cuv. & Val. 1830: 400 (Réunion, Mascarenes); Allen 1972*, 1991*; Fautin & Allen 1992*; Eichler & Lieske 1994*; Astakhov 1996; Heemstra *et al.* 2004.

Amphiprion fusciventer Bennett 1832: 165 (Mauritius, Mascarenes).

Amphiprion mauritiensis Schultz 1953: 196, Pl. 9, Fig. 1 (Mauritius, Mascarenes).

Dorsal fin 10 spines, 16 or 17 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 20 or 21 rays. Body depth 1.9–2.1 in SL. GR 18–20. LL scales 35–42.

Head and body mostly dark brown to black, with 3 white to bluish white bars, last bar encircling peduncle; lower part of head (also snout in juveniles), chest, and pectoral and pelvic fins bright yellow; dorsal fin dark brown to black, white distal margin of soft-rayed part connected to white bar at midbody; anal fin brownish to yellow; caudal fin dark brown to blackish with narrow white margin. Attains 14 cm TL.



Amphiprion chrysogaster, 8 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Madagascar and Mascarenes.

REMARKS Associates with *Heteractis aurora*, *H. magnifica*, *Macrodactyla doreensis*, *Stichodactyla haddoni* and *S. mertensii* anemones, in 2–40 m.

Amphiprion clarkii (Bennett 1830)

Variable anemonefish

PLATES 35 & 37

Anthias clarkii Bennett 1830: no page number, Pl. 29 (southern coast of Sri Lanka).

Amphiprion clarkii: Allen 1972*, 1991*; Fautin & Allen 1992*; Eichler & Lieske 1994*; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Dorsal fin 10 or 11 spines, 14–17 rays; anal fin 2 spines, 12–15 rays; pectoral fins 18–21 rays. Body depth 1.7–2 in SL. GR 18–20. LL scales 34–45.

Body ground colour extremely variable, ranging from entirely orange to entirely black or brown, or a combination of brown or black over most of body, with orange on breast and front of head, and 2 wide white bars across body; rear half of peduncle abruptly white; dorsal and anal fins usually dark brown to black, sometimes orange; pelvic fins black, brown or yellow; pectoral fins translucent yellowish; caudal fin yellow, or white with lobes yellow distally. Attains 14 cm TL.



Amphiprion clarkii, 5 cm SL (Taiwan). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Oman, Persian/Arabian Gulf, Pakistan, India, Maldives and Sri Lanka; elsewhere to Philippines, Indonesia, Brunei, Taiwan, Japan, Micronesia, Australia, Society Is. and Tuamotu Is.

REMARKS Associates with *Cryptodendrum adhaesivum*, *Entacmaea quadricolor*, *Heteractis aurora*, *H. crispa*, *H. magnifica*, *Stichodactyla gigantea*, *S. haddoni* and *S. mertensii* anemones, in 1–55 m.

Amphiprion fuscocaudatus Allen 1972

Seychelles anemonefish

PLATES 35 & 37

Amphiprion ephippium (*non* Bloch 1790): Smith 1960* [in part].

Amphiprion fuscocaudatus Allen 1972: 134, Figs. 64–65 (Beacon I., Seychelles); Allen 1991*; Fautin & Allen 1992*; Eichler & Lieske 1994*.

Dorsal fin 11 spines, 15 or 16 rays; anal fin 2 spines, 14 rays; pectoral fins 20 rays. Body depth ~1.9 in SL. GR 19–21. LL scales 40.

Head and body mostly dark brown to greyish, with 3 white bars, last at caudal-fin base; snout, breast and belly bright yellow-orange; dorsal fin dark brown to black; anal, pelvic and

pectoral fins yellow; caudal fin membranes dusky brown to blackish. Attains 14 cm TL.

DISTRIBUTION WIO: Aldabra and other islands of the Seychelles.

REMARKS Associates with *Stichodactyla mertensii* and probably other host anemones, in 5–50 m.

Amphiprion latifasciatus Allen 1972

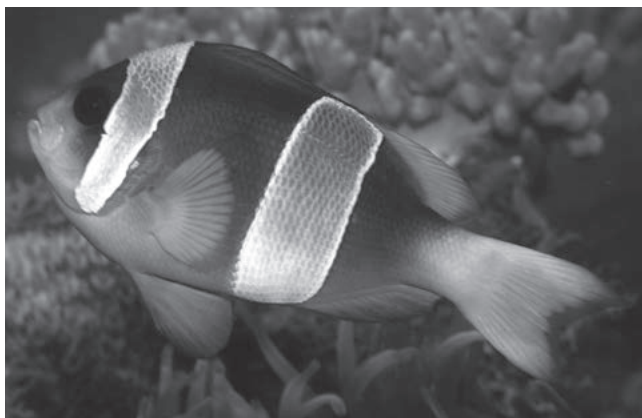
Madagascar anemonefish

PLATE 37

Amphiprion latifasciatus Allen 1972: 138, Figs. 66–67 (Nosy Be, Madagascar); Allen 1991*; Fautin & Allen 1992 [in part].

Dorsal fin 10 or 11 spines, 15 or 16 rays; anal fin 2 spines, 12–14 rays; pectoral fins 20 or 21 rays. Body depth 1.7–1.9 in SL; caudal fin slightly forked. GR 18–20. LL scales 33–39.

Head and body dark brown grading to orange on lower head, breast and peduncle, with pair of white to greyish transverse bars; dorsal, anal and pelvic fins orange-brown with broad white margin on rear dorsal fin; pectoral fins mainly orange; caudal fin orange with white outer lobes. Attains 13 cm TL.



Amphiprion latifasciatus, adult (Madagascar). © GR Allen

DISTRIBUTION WIO: Madagascar only; previous reports from Comoros based on *A. allardi*.

REMARKS Associates with *Heteractis crispa* and probably other host anemones, in 5–30 m.

Amphiprion nigripes Regan 1908

Maldives anemonefish

PLATE 35

Amphiprion nigripes Regan 1908: 230, Pl. 24, Fig. 2 (Maldives); Allen 1972*, 1991*; Fautin & Allen 1992*; Randall & Anderson 1993; Eichler & Lieske 1994*.

Dorsal fin 10 or 11 spines, 17 or 18 rays; anal fin 2 spines, 13–15 rays; pectoral fins 18 or 19 rays. Body depth 2–2.2 in SL. GR 17–20. LL scales 33–45.

Head and body pale rusty orange, except ventral part of body dusky brown to blackish; narrow bluish white bar on head; pelvic fins and anal fin black, other fins pale orange to yellowish. Attains 11 cm TL.

DISTRIBUTION WIO: Maldives and Sri Lanka.

REMARKS Associates with *Heteractis magnifica* anemones, in 2–15 m.

Amphiprion omanensis Allen & Mee 1991

Oman anemonefish

PLATES 35 & 38

Amphiprion omanensis Allen & Mee in Allen 1991: 47, 220, Fig. (Ras Kanasa, Oman); Fautin & Allen 1992*; Randall 1995*; Debelius 1998*; Manilo & Bogorodsky 2003.

Dorsal fin 10 spines, 16 or 17 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 19 or 20 rays. Body depth 1.9–2.1 in SL; caudal fin deeply forked in adults. GR 16–19. LL scales 36–42.

Head and body brown, except tan on snout and peduncle, with 2 narrow bluish white bars; dorsal fin and caudal fin pale brown to whitish; pelvic fins and anal fin dark brown or blackish, anal fin with narrow white margin; pectoral fins yellowish brown. Juveniles with white body bar joining white margin of soft-rayed dorsal fin; black spot on caudal fin below white dorsal-fin margin; anal fin brownish yellow with white margin. Attains 16 cm TL.

DISTRIBUTION WIO: Arabian Sea (Oman and Yemen).

REMARKS Associates with *Entacmaea quadricolor* and *Stichodactyla mertensii* anemones, in 2–15 m.

Amphiprion sebae Bleeker 1853

Yellowtail anemonefish

PLATES 35 & 38

Amphiprion sebae Bleeker 1853: 478 (Jakarta, Java, Indonesia); Allen 1972*, 1991*; Fautin & Allen 1992*; Randall & Anderson 1993; Randall 1995*; Debelius 1998*; Manilo & Bogorodsky 2003.

Dorsal fin 10 or 11 spines, 14–17 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18 or 19 rays. Body depth 2–2.2 in SL. GR 18 or 19. LL scales 36–43.

Body ground colour variable, entirely dark brown to blackish, or dark over most of body and yellow on snout, breast, belly and peduncle; 2 broad white transverse bars, bar

at midbody extending onto margin of soft-rayed dorsal fin; dorsal fin mainly blackish or dark brown; pelvic fins and anal fin yellow or dark brown/black; pectoral fins usually yellowish, sometimes black; caudal fin yellow, central portion sometimes black. Attains 14 cm TL.

DISTRIBUTION Indian Ocean. WIO: Gulf of Aden, Oman, Maldives, India and Sri Lanka, elsewhere to Andaman Is. and Indonesia (Java and Sumatra).

REMARKS Associates with *Stichodactyla haddoni* anemones, in 2–25 m.

GENUS *Chromis* Cuvier 1814

Caudal-fin base with 2 or 3 procurrent spines on upper and lower edges; dorsal fin 12–14 spines; jaws with outer row of enlarged conical teeth, and irregular band of small villiform teeth behind; preopercle margin usually smooth (rarely with minute serrations); edge of suborbitals exposed or hidden by scales; scales relatively large, LSS <30. Atlantic and Indo-Pacific; ~100 species, 28 in WIO.

KEY TO SPECIES

1a	Dorsal fin 12 spines	2
1b	Dorsal fin 13 or 14 (rarely 12) spines	16
2a	Body dark brown to blackish and the rear part of body and/or caudal fin abruptly pale	3
2b	Colour not as above	7
3a	Line of demarcation between dark and pale areas of body near anal-fin origin	4
3b	Line of demarcation between dark and pale areas of body at or slightly anterior to peduncle	5
4a	Demarcation of dark brown (anteriorly) from white (posteriorly) convex but not sharply defined dorsally and ventrally; pectoral fins usually 17 rays; LL scales usually 17 [Indian Ocean]	<i>C. fieldi</i>
4b	Demarcation of dark brown (anteriorly) from white (posteriorly) nearly straight and sharply defined dorsally and ventrally; pectoral fins usually 16 rays; LL scales usually 15 [Red Sea]	<i>C. dimidiata</i>

Continued ...

KEY TO SPECIES

5a	Pectoral-fin bases pale (yellow in life); belly, pelvic fins and anal fin pale grey to white	<i>C. flavipectoralis</i>
5b	Pectoral-fin bases covered by black spot; belly and anal fin dark blue or grey	6
6a	Body medium grey overall including median fins and pelvic fins, but peduncle white; 2 elongated rays at tip of each caudal-fin lobe [Maldives and eastern Indian Ocean to western-central Pacific]	<i>C. delta</i>
6b	Body dark blue or grey (sometimes nearly blackish) overall, and white at caudal-fin base; pelvic fins and caudal fin both mostly white, or pelvic fins yellowish; black bar at peduncle joining black margins of soft-rayed dorsal fin and anal fin	<i>C. leucura</i>
7a	Body pale greenish grey overall; tips of interspinous dorsal-fin membranes and soft-rayed dorsal-fin margin narrowly black; tips of anal fin and caudal-fin lobes also black, and some fish with black margin along upper and lower edges of caudal fin; pupil-sized black bar through eyes; scales on front of body and top of head with 1–3 small auxiliary scales at base	<i>C. lepidolepis</i>
7b	Colour not as above; bases of body scales without auxiliary scales	8
8a	Body slender, depth 2.4–2.6 in SL; body brownish grey dorsally, with blue spots forming lines on each scale row below lateral line; anal fin blue-black; caudal fin yellow	<i>C. nigrura</i>
8b	Body more ovate, depth 1.7–2.2 in SL; colour not as above ...	9
9a	Caudal fin with dark streak on upper and lower lobes	10
9b	No dark streak on caudal-fin lobes	11
10a	Caudal fin emarginate, caudal concavity (difference between longest and shortest rays) 4.7–6.2 in HL; body brown, darker dorsally, with noticeably paler scale centres; fins brown to translucent, except upper and lower margins of caudal fin blackish; pectoral-fin axils orange-yellow	<i>C. flavaxilla</i>
10b	Caudal fin deeply forked, caudal concavity 2.6–3.4 in HL; head and body mostly silvery greenish blue, yellow dorsally; pectoral-fin bases silvery	<i>C. ternatensis</i>
11a	Body reddish brown; black spot covering pectoral-fin bases ...	<i>C. agilis</i>
11b	Black spot on pectoral-fin base limited to axil or spot absent, or small spot at base of uppermost fin rays	12

Continued ...

KEY TO SPECIES

- 12a Body and fins dark grey-brown; bases of last dorsal- and anal-fin rays each with diffuse white spot 15
- 12b Body and fins pale green or blue to pale brown; no white spot posteriorly at bases of dorsal and anal fins 13
- 13a Head and body mostly yellowish or pale brown; dorsal fin 11 or 12 rays; peduncle depth subequal to its length; snout shorter than eye diameter; 2 elongate, free rays at tip of each caudal-fin lobe *C. xutha*
- 13b Head and body bluish green (some fish yellowish dorsally), with large bluish green spot on each scale; dorsal fin 9 or 10 rays; peduncle depth distinctly less than its length; snout length equal to or longer than eye diameter; caudal-fin lobes elongate in adults, but no free rays at lobe tips 14
- 14a Pectoral-fin axils black; head and body bluish green or yellowish, with 1 or more bluish green spots on each scale; pectoral fins 18–20 rays *C. atripectoralis*
- 14b Pectoral-fin axils pale, but often with small faint dark spot at upper end of fin bases; nest-guarding males yellowish, with spinous dorsal fin blackish and soft-rayed dorsal and anal fins yellow; pectoral fins 17 or 18 rays *C. viridis*
- 15a Body with blue spot on each scale, and bluish white blotch at base of middle caudal-fin rays; body depth 2.1–2.2 in SL *C. trialpha*
- 15b No blue spot on scales, and no pale spot at base of middle caudal-fin rays; body depth 1.8–1.9 in SL *C. elerae*
- 16a Dorsal fin 13 spines 17
- 16b Dorsal fin 14 spines 25
- 17a Body depth usually 1.6–2 in SL 18
- 17b Body depth usually 2.1–2.3 in SL 22
- 18a Body generally brown, and peduncle and caudal fin pale; body depth usually 1.6–1.8 in SL; dorsal fin usually 14 or 15 rays; LL scales usually 18 or 19 [Mascarenes] *C. chrysur*
- 18b Colour not as above; body depth usually 1.7–2.2 in SL; dorsal fin usually 11 or 12 (rarely 13) rays; LL scales 15–20 19
- 19a All median fins pale 20
- 19b Some median fins dark (brown or black in life), and pelvic fins white 21
- 20a Pectoral fins 18 or 19 rays; body yellow overall in life ... *C. xouthos*
- 20b Pectoral fins 15–17 rays; body greenish overall in life *C. cinerascens*
- 21a Proximal halves of soft-rayed dorsal and anal fins dark brown, distal halves white; spinous dorsal fin reddish orange distally; caudal fin white or yellow; no dark bar on preopercle edge *C. pembae*
- 21b Anal fin mostly blackish, rear margin white; spinous dorsal fin blackish distally; upper and lower edge of caudal fin dark brown; narrow dusky brown bar on preopercle edge *C. nigroanal*
- 22a Dark band at rear edge of preopercle and another at upper edge of opercle (in fish from Mauritius, dark band extends onto body and pectoral-fin bases) 23
- 22b No dark band on preopercle edge or upper edge of opercle 24
- 23a Black spot covering entire pectoral-fin base; tips of caudal-fin lobes not intensely black *C. opercularis*
- 23b Dusky spot confined to base of upper pectoral-fin rays; tips of caudal-fin lobes intensely black *C. weberi*
- 24a Body yellowish, and scales below lateral line each with large blue spot; teeth on jaws uniserial, and flattened or notched; dorsal and anal fins each with 12 or 13 rays; LL scales 19 or 20; GR 26–28 *C. dasygenys*
- 24b Body yellowish brown, with faint bluish grey stripes following scale rows below lateral line; teeth on jaws biserial, conical; dorsal and anal fins each with 10 or 11 rays; LL scales 15–18; GR 29–35 *C. xanthopterygia*
- 25a Peduncle same colour as adjacent body, without dark bar *C. durvillei*
- 25b Peduncle with contrasting dark bar 26
- 26a Dorsal fin 11 or 12 rays; GR 23–25; distal half of anal fin black *C. woodsi*
- 26b Dorsal fin 13 or 14 rays; GR 26–32; no black on anal fin 27
- 27a Eye diameter 10.4–12.3% SL; maxilla ending below front of eye *C. pelloura*
- 27b Eye diameter 12.2–15.1% SL; maxilla ending well before eye *C. axillaris*

Chromis agilis Smith 1960

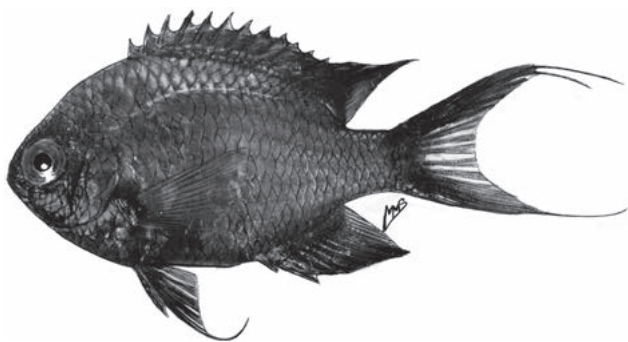
Reef chromis

PLATES 38, 39 & 42

Chromis agilis Smith 1960: 324, Pls. 26a, 32j (Astove I., Seychelles);
SSF No. 219.10*; Allen 1991 [in part]; Eichler & Lieske 1994*;
Allen & Erdmann 2020*.

Dorsal fin 12 spines, 12–14 rays; anal fin 2 spines, 12–14 rays;
pectoral fins 17 or 18 rays. Body depth 1.7–1.9 in SL.
GR 27–30. LL scales 15–17.

Body mostly brown, bluish on breast and lower part of
head; scale margins dark and longitudinal rows of small blue
spots (one per scale) on body, most distinct on lower half; fins
brown to translucent; prominent black spot covering pectoral-
fin bases. Attains 8.5 cm TL.



Chromis agilis, 7 cm TL, holotype (Seychelles). Source: Smith 1960

DISTRIBUTION Indian Ocean. WIO: Kenya to Mozambique
(Bazaruto), Madagascar, Comoros, Seychelles, Chagos and
Maldives.

REMARKS Inhabits coral and rocky reefs, in 12–48 m.

Chromis atripectoralis Welander & Schultz 1951

Black-axil chromis

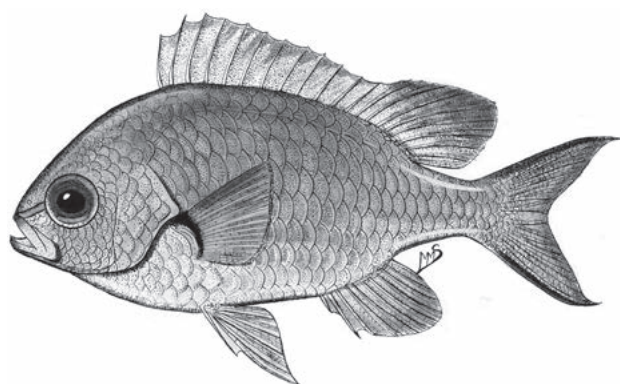
PLATES 38 & 39

Chromis atripectoralis Welander & Schultz 1951: 107, Fig. 1 (Bikini Atoll,
Marshall Is.); Winterbottom *et al.* 1989; Allen 1991*; Randall &
Anderson 1993*; Winterbottom & Anderson 1997; Kuitert 1998;
Heemstra *et al.* 2004.

Chromis viridis (*non* Cuvier 1830): Eichler & Lieske 1994* [middle figure];
King 1996*; Debelius 1998*.

Dorsal fin 12 spines, 9 or 10 rays; anal fin 2 spines, 9 or 10 rays;
pectoral fins 18–20 rays. Body depth 2–2.1 in SL. GR 28–33.
LL scales 15 or 16.

Head, body and fins pale blue to pale green (depending on
viewing angle); prominent black spot covering pectoral-fin
axils. Attains 9 cm TL.



Chromis atripectoralis, 5 cm TL (S Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Mozambique,
South Africa, Madagascar, Seychelles, Mascarenes, Chagos and
Maldives; elsewhere to Thailand, southern Japan, Marshall Is.,
Australia, Solomon Is., Marquesas Is. and Pitcairn Is.

REMARKS Occurs in aggregations, over branching corals in
lagoons and on offshore reefs, in 2–29 m.

Chromis axillaris (Bennett 1831)

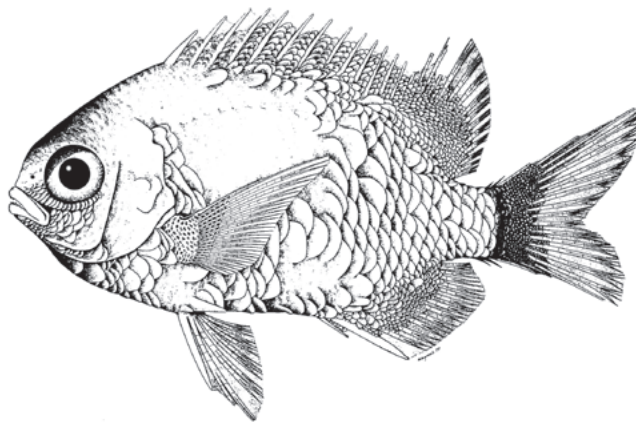
Grey chromis

PLATE 39

Heliases axillaris Bennett 1831: 128 (Mauritius, Mascarenes).
Chromis axillaris: Smith 1960; SSF No. 219.11*; Allen 1991*; Manilo &
Bogorodsky 2003.

Dorsal fin 14 spines, 13 or 14 rays; anal fin 2 spines, 12 or
13 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2 in SL.
GR 26–30. LL scales 15–17.

Head, body and fins pale grey, brown or whitish, with black
bar at caudal-fin base; pectoral-fin axils blackish. Attains
10 cm TL.



Chromis axillaris, 9 cm SL (Somalia).
Source: Bruner & Arnam 1979 (by ZT Jastrzebski)

DISTRIBUTION Indian Ocean. WIO: Somalia to Mozambique (Beira), Walters Shoals and Mauritius; elsewhere, New Caledonia.

REMARKS Poorly known; inhabits deeper reefs and offshore trawling grounds, in 30–80 m.

Chromis chrysurus (Bliss 1883)

Stout-body chromis PLATES 38 & 39

Heliastes chrysurus Bliss 1883: 56 (Mauritius, Mascarenes).
Chromis chrysurus: Smith 1960; Allen 1991*; Eichler & Lieske 1994*;
Heemstra *et al.* 2004.

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18 or 19 rays. Body depth 1.6–1.8 in SL. GR 29–33. LL scales 17–19.

Body golden brown, scales with broad dusky grey margins, and peduncle white; head grey with pale bluish streak below eyes; fins mostly brownish, caudal fin and rear portions of dorsal and anal fins white. Attains 14 cm TL.

DISTRIBUTION Indo-Pacific, with three apparently isolated populations: South Africa, Réunion and Mauritius in SWIO; Taiwan to southern Japan in western Pacific; and Coral Sea, eastern Australia, New Caledonia, Vanuatu and Fiji in southwestern Pacific.

REMARKS Found on rocky or coral reefs, in 6–30 m.

Chromis cinerascens (Cuvier 1830)

Green chromis PLATES 38 & 39

Heliastes cinerascens Cuvier in Cuv. & Val. 1830: 495 (Java, Indonesia).
Chromis cinerascens: Allen 1991*; Eichler & Lieske 1994*.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 15–17 rays. Body depth 1.9–2.2 in SL. GR 26–30. LL scales 16 or 17.

Head and body dark olive-green, and sides with faint dusky stripes following scale rows; fins greenish to translucent. Attains 13 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Sri Lanka; elsewhere to Andaman Sea, northwestern Australia, Indonesia, Malaysia, Brunei, Hong Kong and Philippines.

REMARKS Commonly found on silty inshore reefs, in 3–15 m.

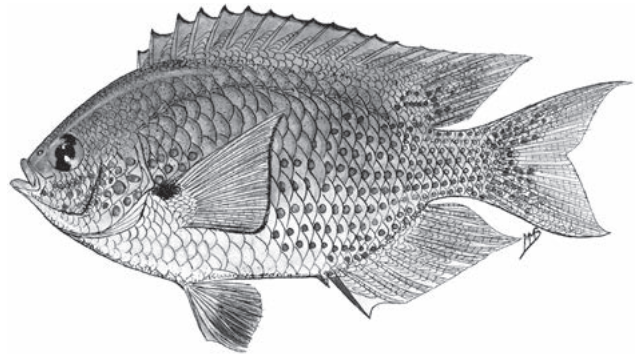
Chromis dasygenys (Fowler 1935)

Blue-spotted chromis PLATES 39 & 40

Abudefduf dasygenys Fowler 1935: 400, Fig. 34 (Durban, KwaZulu-Natal, South Africa); Smith 1960*; SFSa No. 768*.
Pomacentrus sindensis (*non* Day 1873): Regan 1916; SFSa No. 755*.
Chromis dasygenys: SSF No. 219.13*; Allen 1991*; King 1996*; Heemstra & Heemstra 2004*.

Dorsal fin 13 spines, 12 or 13 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 18 or 19 rays. Body depth 2.1–2.3 in SL; middle dorsal- and anal-fin rays elongated in adults. GR 26–28. LL scales 19 or 20.

Head and body generally pale greyish green, except lime or olive green on upper half of head and adjacent anterodorsal part of body; each scale on lower half and rear part of body with small blue spot; lips pale yellowish. Attains 14 cm TL.



Chromis dasygenys, 12 cm TL (S Mozambique). Source: SSF

DISTRIBUTION WIO: Somalia to South Africa (Transkei region; juveniles to Tsitsikamma).

REMARKS Found on rocky or coral reefs and algal beds, in 2–40 m.

Chromis delta Randall 1988

Deep-reef chromis PLATES 39 & 40

Chromis delta Randall 1988: 78, Fig. 3 (reef at Guadalcanal, Solomon Is.); Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*;
Kuitert 1998*.

Dorsal fin 12 spines, 12–14 rays; anal fin 2 spines, 12–14 rays; pectoral fins 15–17 rays. Body depth 1.8–2.1 in SL. GR 24–28. LL scales 12–14.

Head and body dark grey, with abruptly white peduncle and caudal fin; other fins grey to translucent; black spot covering pectoral-fin bases. Attains 6.5 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives; elsewhere to Andaman Is., Cocos (Keeling) Is., Christmas I., Indonesia, Philippines, Taiwan, Palau, Great Barrier Reef, New Guinea, Solomon Is. and Fiji.

REMARKS Inhabits steep outer-reef slopes, in 10–80 m.

Chromis dimidiata (Klunzinger 1871)

Two-tone chromis

PLATE 40

Heliastes dimidiatus Klunzinger 1871: 529 (Al-Qusayr, Egypt, Red Sea).

Chromis dimidiatus: Allen & Randall 1980*; Debelius 1998*.

Chromis dimidiata: SSF No. 219.14*; Manilo & Bogorodsky 2003;

Heemstra & Heemstra 2004* [in part].

Dorsal fin 12 spines, 11–13 (usually 12) rays; anal fin 2 spines, 11–14 (usually 12 or 13) rays; pectoral fins 16 or 17 (rarely 17) rays. Body depth 2–2.3 in SL. GR 26–30. LL scales 14–16 (rarely 14).

Head and anterior two-thirds of body dark brown, abruptly white posteriorly; fins same colour as adjacent parts of body; black spot at pectoral-fin bases. Attains 7 cm TL.



Chromis dimidiata (Red Sea). © SV Bogorodsky

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Common nearshore and on seaward reef slopes, in 2–36 m. Records elsewhere in WIO are now described as *C. fieldi*.

Chromis durvillei Quéro, Spitz & Vayne 2010

Durville's chromis

PLATE 40

Chromis durvillei Quéro, Spitz & Vayne 2010: 322, Figs. 1–3 (Réunion, Mascarenes).

Dorsal fin 14 spines, 14 rays; anal fin 2 spines, 12 rays; pectoral fins 19 rays. Body depth 1.6–1.9 in SL. GR 23. LL scales 17.

Head, body and median fins generally yellowish brown, darker on head and dorsally. Attains at least 10 cm TL.

DISTRIBUTION Known only from 10 specimens found floating on the surface following a volcanic eruption in April 2007 at Réunion.

REMARKS Probably a deep-dwelling species from ~100 m.

Chromis elerae Fowler & Bean 1928

Twin-spot chromis

PLATES 39 & 40

Chromis elerae Fowler & Bean 1928: 52, Pl. 4 (Ragay Gulf, Philippines);

Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*;

Kuiter 1998*.

Dorsal fin 12 spines, 11 or 12 rays; anal fin 2 spines, 10 or 11 rays; pectoral fins 17 or 18 rays. Body depth 1.8–1.9 in SL. GR 26–31. LL scales 15–17.

Head and body greyish brown, with 2 white spots, one each at base of last dorsal- and anal-fin rays; fins brownish grey to translucent. Attains 6.5 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives; elsewhere to Cocos (Keeling) Is., Indonesia, Philippines, Taiwan, Micronesia, Australia and Fiji.

REMARKS Found in caves, on ledges, and in thickets of black coral, usually on steep outer-reef slopes, in 12–70 m.

Chromis fieldi Randall & DiBattista 2013

Chocolate-dip chromis

PLATE 40

Chromis fieldi Randall & DiBattista 2013: 5, Figs. 4–9 (off Medine, Mauritius, Mascarenes).

Chromis dimidiata (non Klunzinger 1871): Smith 1960*; SFSA No. 746a*;

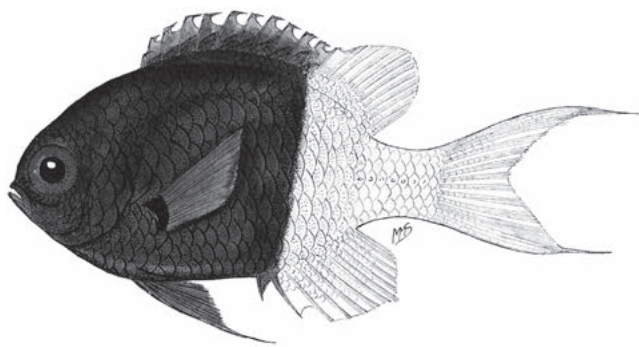
SSF No. 219.14* [in part]; Winterbottom *et al.* 1989; Allen 1991*;

Randall & Anderson 1993; Eichler & Lieske 1994* [in part]; Randall

1995*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004* [in part].

Dorsal fin 12 spines, 12 or 13 rays; anal fin 2 spines, 12–14 (usually 13) rays; pectoral fins 16 or 17 (rarely 16) rays. Body depth 2.2–2.4 in SL. GR 26–30. LL scales 16 or 17 (rarely 16).

Head and anterior of body dark brown, abruptly white posteriorly; fins same colour as adjacent parts of body; black spot at pectoral-fin bases. Attains 7 cm TL.



Chromis fieldi, 7 cm TL (S Mozambique). Source: SSF

DISTRIBUTION Indian Ocean. WIO: Oman to South Africa (KwaZulu-Natal), Madagascar, Bassas da India, Comoros, Aldabra, Seychelles, Réunion, Mauritius, Chagos, Maldives and Sri Lanka; elsewhere to Andaman Sea, Christmas I. and Indonesia (Java).

REMARKS Common, near shore and on seaward reef slopes, in 1–40 m. Previously confused with *C. dimidiata*, a Red Sea endemic.

Chromis flavaxilla Randall 1994

Yellow-axil chromis

PLATES 39 & 40

Chromis ternatensis (non Bleeker 1856): Allen & Randall 1980*.

Chromis flavaxilla Randall 1994: 40, Figs. 1–3 (Dahlak Archipelago, Red Sea); Randall 1995*; Debelius 1998*; Field & Field 1998*; Manilo & Bogorodsky 2003.

Dorsal fin 12 spines, 10–12 rays, interspinous membrane not incised; anal fin 2 spines, 11 rays; pectoral fins 17–19 rays. Body depth 1.9–2 in SL. GR 20–24. LL scales 15–17.

Head and body olive-brown, scale edges darker on upper half of body; fins brown to translucent; upper and lower margins of caudal fin broadly blackish, with thin blue line along distalmost margin, and also along leading edges of dorsal, anal and pelvic fins; pectoral-fin axils orange-yellow. Attains at least 7 cm TL.

DISTRIBUTION WIO: northern Red Sea (Gulf of Aqaba) to Persian/Arabian Gulf.

REMARKS Common, often forming large aggregations over beds of *Acropora* corals, in 3–20 m.

Chromis flavipectoralis Randall 1988

Malay chromis

PLATES 39 & 41

Chromis flavipectoralis Randall 1988: 52, Figs. 3–4 (Seribu Is., Indonesia, Java Sea); Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*; Kuitert 1998*.

Dorsal fin 12 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 16 rays. Body depth 1.8–1.9 in SL. GR 24–26. LL scales 11–14.

Body and most of head golden brown or greyish brown, and peduncle abruptly white; dorsal fin brown, with rear margin and other fins white to translucent; large yellow blotch covering pectoral-fin bases. Attains 8 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives; elsewhere, Andaman Sea and Indonesia (Java Sea).

REMARKS Inhabits coral areas near shore and on seaward reef slopes, in 2–16 m.

Chromis lepidolepis Bleeker 1876

Scaly chromis

PLATE 39

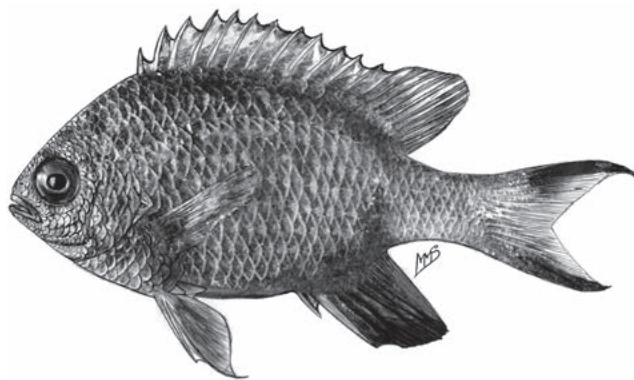
Chromis lepidolepis Bleeker 1876: 389 (western Timor, Indonesia); SSF No. 219.15*; Winterbottom *et al.* 1989; Allen 1991*;

Winterbottom & Anderson 1997; Kuitert 1998*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Lepidochromis brunneus Smith 1960: 328, Pl. 32b (Pinda, Mozambique).

Dorsal fin 12 spines, 11–13 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 17–19 rays. Body depth 1.9–2.2 in SL; caudal fin moderately forked. Jaws with broad band of small conical teeth. GR 27–30. Scales on head and front part of body with 1–3 small auxiliary scales at base; LL scales 15–18.

Body uniformly pale greenish grey or greyish brown; tips of interspinous dorsal fin membranes and soft-rayed margin blackish; tips of anal fin and caudal-fin lobes black. Attains 8 cm TL.



Chromis lepidolepis, 8 cm TL, holotype of *Lepidochromis brunneus* (N Mozambique). Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Aliwal Shoal), Comoros, Aldabra, Assumption I., Seychelles, Mauritius, Chagos, Maldives and Sri Lanka; elsewhere to Indonesia, southern Japan, Marshall Is., Australia and Line Is.

REMARKS Common near shore and on seaward reef slopes, in 2–43 m.

Chromis leucura Gilbert 1905

White-tailed chromis

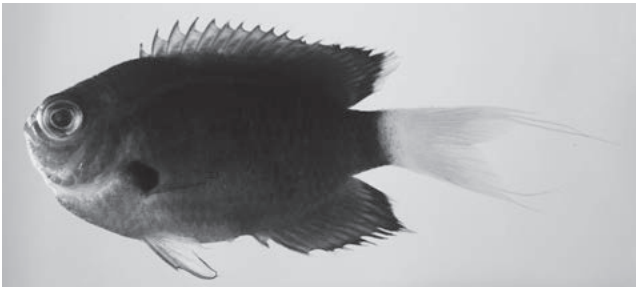
PLATES 39 & 41

Chromis leucurus Gilbert 1905: 620, Pl. 77, Fig. 2 (Auau Channel, between Maui I. and Lanai I., Hawaii).

Chromis leucura: Allen 1991*; Heemstra *et al.* 2004.

Dorsal fin 12 spines, 14 rays; anal fin 2 spines, 13–15 rays; pectoral fins 16 or 17 rays. Body depth 1.8–2 in SL. GR 24–27. LL scales 13–15.

Head, body, and dorsal and anal fins dark blue-grey; rear margin of dorsal and anal fins black, joining black bar across peduncle; pelvic fins yellow; pectoral fins translucent, with black spot covering base; caudal fin white to translucent. Attains 7 cm TL.



Chromis leucura, 4 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-central Pacific (scattered). WIO: South Africa (Leadsman Shoal, Sodwana Bay), Madagascar, Réunion and Mauritius; elsewhere, Indonesia (Sumatra), Ryukyu Is., Marquesas Is. and Hawaii.

REMARKS Usually found in deeper water, among boulders and scattered corals, at 16–119 m.

Chromis nigroanalis Randall 1988

Kenyan chromis

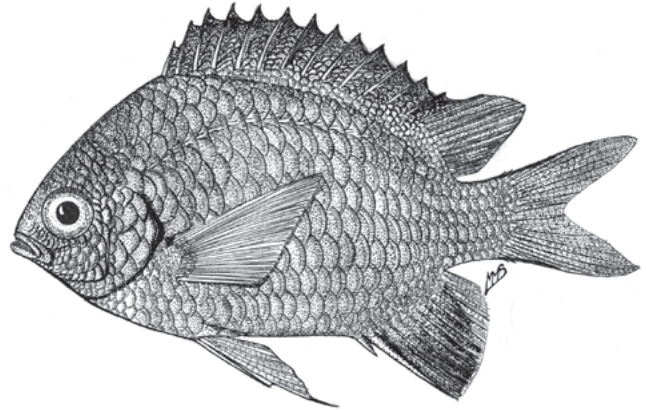
PLATES 41 & 42

Chromis nigroanalis Randall 1988: 49, Figs. 1–2 (cave south of Malindi, Kenya); Allen 1991*; Randall & Anderson 1993; Kuitert 1998*.

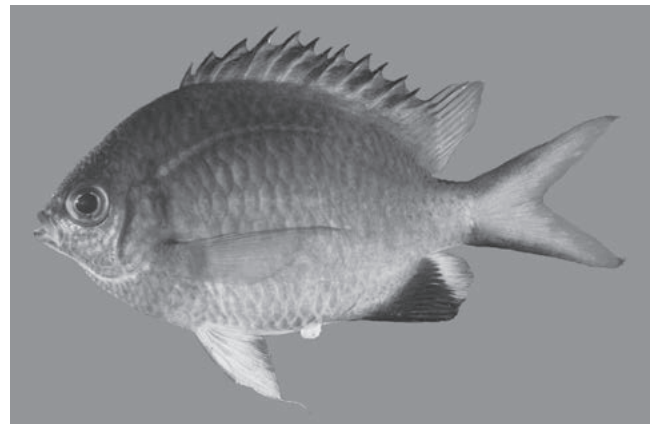
Chromis analis (*non* Cuvier 1830): Smith 1960*.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 17 or 18 rays. Body depth 1.7–1.8 in SL. GR 23–25. LL scales 15 or 16 rays.

Head, body, and dorsal fin bluish grey; dorsal-fin margin and most of anal fin blackish; anal fin tan to translucent; pelvic and pectoral fins white to translucent. Attains 12 cm TL.



Chromis nigroanalis, 10 cm TL (N Mozambique). Source: Smith 1960



Chromis nigroanalis, 8 cm SL (Comoros). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Kenya, Mozambique, Madagascar, Maldives and Comoros; elsewhere, Java Sea.

REMARKS Found on outer-reef slopes, in 20–40 m.

Chromis nigrura Smith 1960

Blacktail chromis

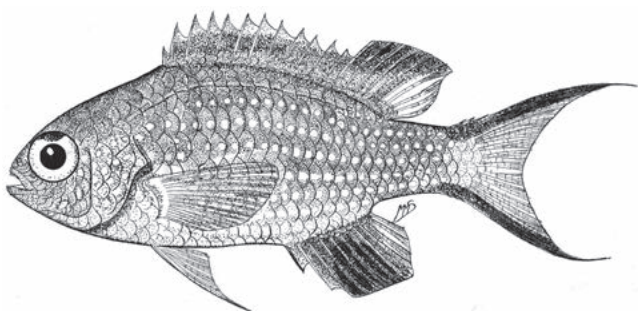
PLATE 42

Chromis nigrurus Smith 1960: 325, Pl. 29, Fig. I (Inhaca I., Mozambique).

Chromis nigrura: SSF No. 219.16*; Winterbottom *et al.* 1989; Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*; King 1996*; Winterbottom & Anderson 1997; Kuitert 1998*; Heemstra *et al.* 2004.

Dorsal fin 12 spines, 10 or 11 rays; anal fin 2 spines, 11 rays; pectoral fins 17 rays. Body depth 2.4–2.6 in SL. GR 26 or 27. LL scales 15 or 16.

Head and body mainly grey, midlateral parts yellowish; blue spot on each scale forming horizontal blue stripes on body; dorsal fin grey to translucent; caudal fin yellowish, upper and lower margins black in adults; soft-rayed dorsal and anal fins bluish grey, with dark blue blotch anteriorly; pelvic fins pale grey to translucent; pectoral fins translucent yellowish. Attains 5.5 cm TL.



Chromis nigrura, 5 cm TL (S Mozambique). Source: SSF

DISTRIBUTION Indian Ocean. WIO: Kenya to South Africa (Transkei region), Bassas da India, Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Cocos (Keeling) Is., Christmas Is. and Indonesia.

REMARKS Usually occurs in aggregations feeding on plankton above coral heads on outer-reef slopes, in 1–30 m.

Chromis opercularis (Günther 1867)

Doublebar chromis

PLATES 41 & 42

Heliastes opercularis Günther in Playfair & Günther 1867: 84, Pl. 11, Fig. 2 (Zanzibar, Tanzania).

Chromis opercularis: Smith 1960*; SSF No. 219.17*; Allen 1991*; Randall & Anderson 1993*; Eichler & Lieske 1994*; Winterbottom & Anderson 1997; Kuitert 1998*; Heemstra & Heemstra 2004.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 10–12 rays; pectoral fins 18 or 19 rays. Body depth 2.1–2.3 in SL; caudal-fin lobes of juveniles elongate, more than twice HL, lobes of adults subequal to HL. GR 26–29. LL scales 17 or 18.

Head and body silvery charcoal-grey or brownish, scale margins darker; narrow black band along edge of preopercle (sometimes absent) and broad blackish bar on edge of opercle,

usually joining black blotch covering pectoral-fin base; fins generally dark grey, except pelvic fins whitish with black spot at base. Juveniles (~4 cm TL) with upper surface of peduncle and upper and lower caudal-fin margins yellow, and front half of anal fin black. Attains 16 cm TL.



Chromis opercularis, 15 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Throughout insular and continental areas of WIO: Kenya (Shimoni) to South Africa (Aliwal Shoal), Zanzibar (Tanzania) and to Maldives; not known from Red Sea or coast of Oman; elsewhere to Andaman Sea, Cocos (Keeling) Is., Christmas Is. and Indonesia (Sumatra, Java and Bali).

REMARKS Inhabits outer-reef slopes, in 5–40 m.

Chromis pelloura Randall & Allen 1982

Duskytail chromis

PLATES 39 & 41

Chromis axillaris (*non* Bennett 1831): Allen & Randall 1980*.

Chromis pelloura Randall & Allen 1982: 16, Figs. 1–3 (Eilat, Israel, Gulf of Aqaba, Red Sea).

Dorsal fin 14 spines, 13 or 14 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2 in SL. GR 28–32. LL scales 15–17.

Head and body pale bluish green, with black blotch covering caudal-fin base; silvery band from tip of snout across suborbitals; fins bluish green to translucent; black spot on pectoral-fin axils. Attains 13 cm TL.

DISTRIBUTION WIO: northern Red Sea (Gulf of Aqaba).

REMARKS Found in large aggregations on steep outer-reef slopes, in 30–175 m.

Chromis pembae Smith 1960

Pemba chromis

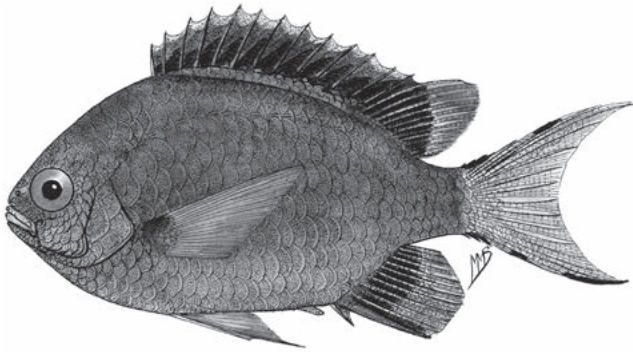
PLATES 41 & 42

Chromis pembae Smith 1960: 323, Pl. 31e (Pemba I., Tanzania); Allen & Randall 1980*; Winterbottom *et al.* 1989; Allen 1991*; Randall 1995*; Debelius 1998*; Manilo & Bogorodsky 2003.

Chromis analis (*non* Cuvier 1830): Randall & Van Egmond 1994*.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 17–19 rays. Body depth 1.8–2 in SL. GR 27–31. LL scales 15 or 16.

Head and body usually dark brown (sometimes yellowish); silvery area below and in front of eyes; tips of spinous dorsal-fin membranes reddish, gold or yellow; dorsal and anal fins brown to translucent, basal parts usually dark brown or black; pelvic fins and caudal fin white or pale yellow. Attains 14 cm TL.



Chromis pembae, 13 cm TL, type (Tanzania). Source: Smith 1960

DISTRIBUTION WIO: Red Sea, Oman to South Africa (KwaZulu-Natal), Seychelles and Chagos.

REMARKS Occurs in loose aggregations feeding on plankton over outer-reef slopes, in 15–50 m.

Chromis ternatensis (Bleeker 1856)

Ternate chromis

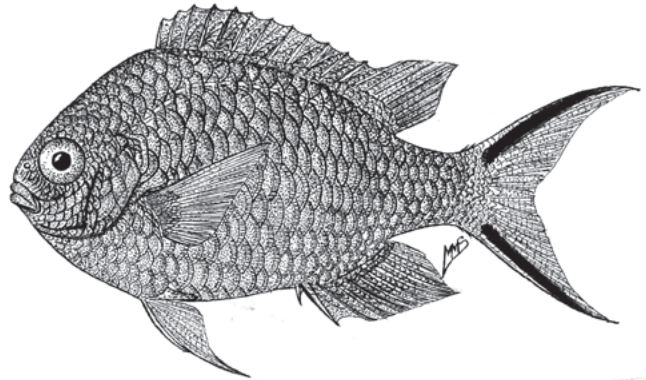
PLATE 42

Heliases ternatensis Bleeker 1856: 377 (Ternate, Moluccas, Indonesia).
Chromis ternatensis: Smith 1960*; SSF No. 219.18*; Winterbottom *et al.* 1989; Allen 1991*; Randall & Anderson 1993; Eichler & Lieske 1994*; King 1996*; Kuiter 1998*; Manilo & Bogorodsky 2003.

Dorsal fin 12 or 13 spines, 10–12 rays; anal fin 2 spines, 10–12 rays; pectoral fins 16–18 rays. Body depth 1.8–1.9 in SL. GR 27–30. LL scales 14–17.

Adults brown (sometimes yellow), darker (or yellowish) dorsally, with noticeably paler scale centres, especially on

upper half of body; fins brown or greenish blue to translucent; upper and lower caudal-fin margins dark brown to blackish. Juveniles pale greenish blue, yellow on head and dorsally. Attains 10.5 cm TL.



Chromis ternatensis, 9 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to Indonesia, Japan, Marshall Is., Australia, New Caledonia, Gilbert Is. and Fiji.

REMARKS Common, often forming large aggregations over beds of *Acropora* corals, in 2–36 m. Resembles *C. flavaxilla*, but lacks orange-yellow pectoral-fin axils.

Chromis trialpha Allen & Randall 1981

Trispot chromis

PLATES 41 & 42

Chromis trialpha Allen & Randall 1981: 33, Figs. 18–19 (Ras Muhammad, Sinai Peninsula, Egypt, Red Sea); Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 12 spines, 10 or 11 rays; anal fin 2 spines, 10 or 11 rays; pectoral fins 15 or 16 rays. Body depth 2.1–2.2 in SL. GR 28–33. LL scales 15 or 16.

Head and body brown, each scale with blue spot; 3 white spots, one each at base of last dorsal- and anal-fin rays, and at middle of caudal-fin base; fins brown to translucent, upper and lower caudal-fin margins and anterior parts of soft-rayed dorsal and anal fins broadly black. Attains 6 cm TL.

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Occurs in caves, on ledges, and in thickets of black coral, usually on steep outer-reef slopes in 20–50 m, but also observed at 3–6 m.

Chromis viridis (Cuvier 1830)

Blue-green chromis

PLATES 42 & 43

Pomacentrus viridis Cuvier (ex Ehrenberg) in Cuv. & Val. 1830: 420
(Massawa, Eritrea, Red Sea; Guam, Mariana Is.).

Chromis caeruleus: Smith 1960*; Allen & Randall 1980*; SSF No. 219.12*
[as *caerulea*]; Manilo & Bogorodsky 2003.

Chromis viridis: Winterbottom *et al.* 1989; Allen 1991*; Kuitert 1998*;
Heemstra *et al.* 2004.

Dorsal fin 12 spines, 9 or 10 rays; anal fin 2 spines, 10 or 11 rays; pectoral fins 17 or 18 rays. Body depth 2–2.1 in SL. GR 28–33. LL scales 15 or 16.

Body pale blue to pale green depending on viewing angle; small black spot at base of uppermost pectoral-fin rays; fins similar to body colour. Males golden yellow when nesting. Attains 8 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Red Sea to Mozambique (Inhaca I.), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to southern Japan, Mariana Is., Great Barrier Reef, New Caledonia, Fiji and Tuamotu Is.

REMARKS Occurs in aggregations, in lagoons, on reef flats and offshore reefs, at 1–15 m; closely associated with branching corals, especially *Acropora*.

Chromis weberi Fowler & Bean 1928

Weber's chromis

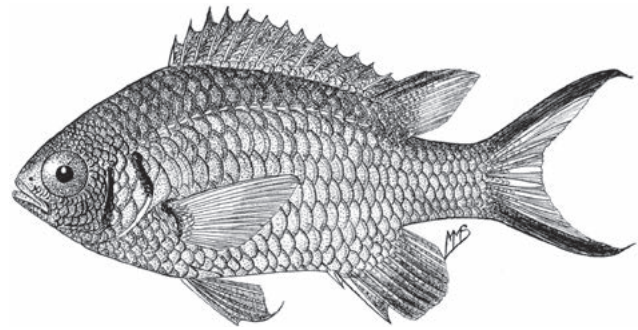
PLATE 43

Chromis weberi Fowler & Bean 1928: 41, Pl. 1 (Jakarta, Java, Indonesia); Allen & Randall 1980*; SSF No. 219.19*; Winterbottom *et al.* 1989; Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004*.

Chromis simulans Smith 1960: 326, Fig. 4 (Mozambique); Winterbottom *et al.* 1989.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 18–20 rays. Body depth 2.1–2.3 in SL. GR 27–32. LL scales 17–19.

Body pale grey-brown, most body scales with dark brown margin; dark brown or black bar on rear edge of preopercle, and another from upper edge of opercle to pectoral-fin base; fins similar to adjacent body colour to translucent, except pelvic fins whitish; upper and lower caudal-fin margins dusky brown and lobe tips blackish. Attains 13.5 cm TL.



Chromis weberi, 11 cm TL, holotype of *C. simulans* (Mozambique).

Source: Smith 1960

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Oman to South Africa (Aliwal Shoal), Madagascar, Seychelles, Réunion, Chagos, Maldives, India and Sri Lanka; elsewhere to Myanmar, Indonesia, Philippines, southern Japan, Line Is. and Pitcairn Is.

REMARKS Found above coral and rocky reefs, usually in schools, at 3–25 m.

Chromis woodsi Bruner & Arnam 1979

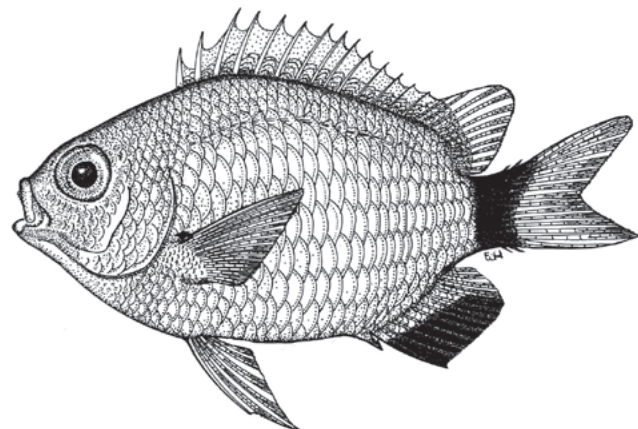
Woods' chromis

PLATE 43

Chromis woodsi Bruner & Arnam 1979: 50, Figs. 1–2 (Somalia); SSF No. 219.20*; Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 14 spines, 11 or 12 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 17 or 18 rays. Body depth 1.8–2 in SL. GR 23–25. LL scales 17 or 18.

Body entirely white, with black bar on peduncle, and anal fin with broad black margin; small black spot on pectoral-fin axil; fins otherwise whitish to translucent. Attains 10 cm TL.



Chromis woodsi, 8 cm SL (South Africa). Source: SSF 1995

DISTRIBUTION WIO: Somalia to South Africa (Park Rynie) and Mauritius.

REMARKS Poorly known, deepwater species, in 30–175 m.

Chromis xanthopterygia Randall & McCarthy 1988

Arabian chromis PLATES 42 & 43

Chromis xanthopterygia Randall & McCarthy 1988: 134, Figs. 1–3 (coral reef at Jana I., Persian/Arabian Gulf); Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 10 or 11 rays; anal fin 2 spines, 11 rays; pectoral fins 18 or 19 rays. Body depth 2.2–2.3 in SL. GR 29–35. LL scales 15–18.

Head and body brown to yellow-brown, and scale centres pale, forming pale horizontal stripes; dorsal and anal fins brown to translucent; pelvic and pectoral fins whitish to translucent; caudal fin tan to translucent, with broad brownish upper and lower margins ending in yellowish tips. Attains 10 cm TL.

DISTRIBUTION WIO: endemic to Persian/Arabian Gulf and Gulf of Oman where it is the most common species of *Chromis*.

REMARKS Found on coral and rocky reefs, in 5–20 m.

Chromis xouthos Allen & Erdmann 2005

Yellow-brown chromis PLATE 43

Chromis xouthos Allen & Erdmann 2005: 90, Figs. 1–2 (Pulau Weh, Sumatra, Indonesia).
Chromis pembae (non Smith 1960): Kuitert 1998*.

Dorsal fin 13 spines, 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2 in SL. GR 26–28. LL scales 16 or 17.

Head and body dusky yellowish; caudal fin yellow to white. Attains 13.5 cm TL.

DISTRIBUTION Indian Ocean. WIO: Maldives; elsewhere, Indonesia (northwestern Sumatra).

REMARKS Known from coastal reefs and outer slopes, in 12–50 m.

Chromis xutha Randall 1988

Buff chromis PLATE 43

Chromis xutha Randall 1988: 54, Figs. 5–6 (reef front, Villingili I., North Malé Atoll, Maldives); Allen 1991*.

Chromis atripes (non Fowler & Bean 1928): Winterbottom *et al.* 1989.

Dorsal fin 12 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 15 or 16 rays. Body depth 1.9–2 in SL; snout shorter than eye diameter; peduncle depth subequal to its length; 2 elongate, free rays at tip of each caudal-fin lobe. GR 27–30. LL scales 14 or 15.

Body pale yellowish brown; bluish below eyes and on snout, also faint blue stripes evident on lower sides; fins pale brown to translucent, but anal fin and pelvic fins suffused with bluish; pectoral-fin axils black. Attains 7 cm TL.

DISTRIBUTION WIO: Kenya, Seychelles, Chagos and Maldives; elsewhere, Indonesia.

REMARKS Known from offshore coral reefs, in 2–48 m.

GENUS *Chrysiptera* Swainson 1839

Margins of suborbital and preopercle smooth; no notch between lachrymal and suborbital series; suborbital scaly or naked; teeth usually biserial, occasionally uniserial; body depth usually 2–2.7 in SL; dorsal fin usually 13 spines (a few species with 12 or 14 spines). Indo-Pacific; ~40 species, 7 in WIO.

KEY TO SPECIES

1a	Head and body white with black bars	2
1a	Colour not as above	3
2a	Head and body with 3 dark bars	<i>C. kuiteri</i>
2b	Body with 5 dark bars (first through eye and last at caudal-fin base)	<i>C. annulata</i>
3a	Anus black; body generally pale grey or blue	<i>C. glauca</i>
3b	Anus not black; body yellow to brown	4
4a	Body pale yellow, with blue band dorsally, from snout to beneath length of dorsal-fin base, and frequently interrupted by 1 or 2 black spots beneath soft-rayed dorsal fin; another colour phase consisting of brown ground colour and 3 or 4 broad yellowish crossbars, and elongate black spot at rear of soft-rayed dorsal-fin base	<i>C. brownriggii</i>
4b	Colour not as above	5

Continued ...

KEY TO SPECIES

- 5a Body dark grey-brown, frequently with wide pale bar on body below middle of spinous dorsal fin; pale-rimmed large black spot (except in large adults) at base of posterior dorsal-fin spines, and small black spot at rear of soft-rayed dorsal-fin base *C. biocellata*
- 5b Colour not as above 6
- 6a GR usually 22–25; adults mainly brown, with soft-rayed dorsal-fin base blackish posteriorly; juveniles yellowish, with 2 blue-rimmed black spots at base of soft-rayed dorsal fin (no blue band) *C. unimaculata*
- 6b GR usually 18–21; adults mainly brown, with pale scale centres; juveniles yellow, with blue band along dorsal-fin base and pair of blue-rimmed black spots at base of rear half of dorsal fin *C. sheila*

Chrysiptera annulata (Peters 1855)

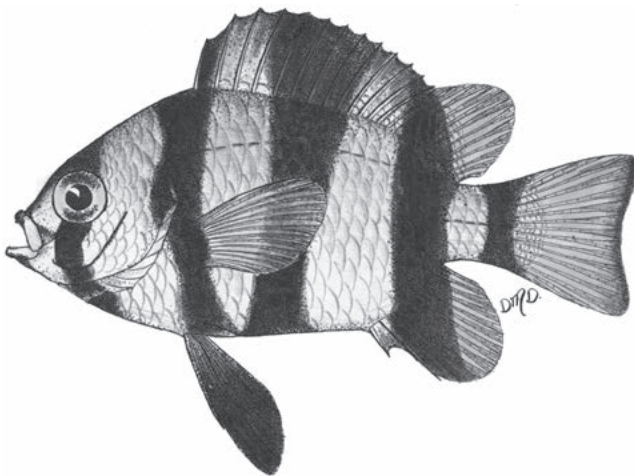
Footballer damsel

PLATES 43 & 44

Pomacentrus annulatus Peters 1855: 455 (Mozambique); SFSA No. 754*.*Abudefduf annulatus*: Smith 1960*.*Chrysiptera annulata*: Allen & Randall 1980*; SSF No. 219.21*; Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003; Fricke *et al.* 2009.

Dorsal fin 13 spines, 12 or 13 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 17 or 18 rays. Body depth 2–2.1 in SL. GR 15 or 16. LL scales 17 or 18.

Body white with 5 black transverse bars (on head, body and adjacent fins); pelvic fins black; other fins white or yellow to translucent (except for continuation of dark body bars). Attains 7 cm TL.

*Chrysiptera annulata*, 7 cm TL (WIO). Source: SFSA

DISTRIBUTION WIO: Red Sea to South Africa (KwaZulu-Natal), Madagascar, Aldabra, Seychelles, Réunion and Mauritius.

REMARKS Inhabits algae and seagrass areas on sand bottom, to ~2 m deep.

Chrysiptera biocellata (Quoy & Gaimard 1825)

Twin-spot damsel

PLATES 44 & 45

Glyphisodon biocellatus Quoy & Gaimard 1825: 389 (Guam, Mariana Is.).*Abudefduf zonatus*: Smith 1960*.*Chrysiptera biocellata*: Winterbottom *et al.* 1989; Allen 1991*; Randall & Anderson 1993.

Dorsal fin 13 spines, 12–14 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 17–19 rays. Body depth 2.2–2.5 in SL. GR 23–25. LL scales 16–18.

Adults dark greyish brown, with wide pale bar on body below middle of spinous dorsal fin; large pale-rimmed black spot (except in large adults) at base of posterior dorsal-fin spines, and small black spot at rear of soft-rayed dorsal fin; lower margin of opercle yellowish; snout and lips bluish, and scattered blue spots on head; fins grey brown to translucent. Juveniles with extensive yellow areas ventrally; several blue lines on forehead and upper sides; caudal fin and paired fins yellow; twin black spots present on dorsal fin as in adults. Attains 10 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa, Seychelles, Chagos, Maldives, India and Sri Lanka; elsewhere to Japan, Mariana Is., Australia and Samoa.

REMARKS Found on rubble and rock outcrops of lagoons and inshore reefs, to ~5 m deep.

Chrysiptera brownriggii (Bennett 1828)

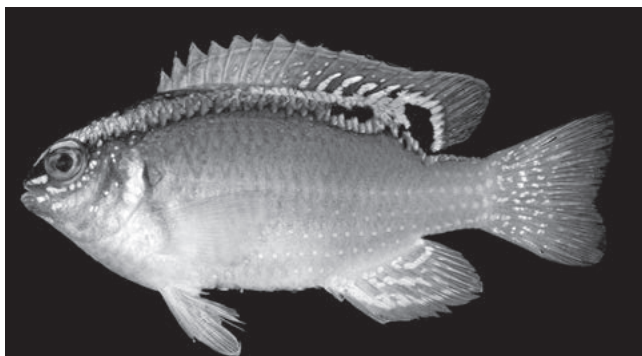
Surge damsel

PLATES 44 & 45

Chaetodon brownriggii Bennett 1828: no page number, Pl. 8 (south coast of Sri Lanka).*Abudefduf biocellatus* (non Quoy & Gaimard 1825): Smith 1960*; SFSA No. 769*.*Abudefduf xanthozonus*: Smith 1960*.*Chrysiptera leucopoma* (non Cuvier 1830): SSF No. 219.23*; Winterbottom *et al.* 1989; Allen 1991*.*Chrysiptera xanthozona*: Winterbottom *et al.* 1989.*Chrysiptera brownriggii*: Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 12 or 13 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 18 or 19 rays. Body depth 2.3–2.5 in SL. GR 19–21. LL scales 18 or 19.

Two distinct colour forms: pale form mainly pale yellow body, including fins, and with prominent bright blue stripe dorsally, from snout and over eyes and beneath dorsal-fin base to peduncle; blue-edged black ocellus on rear part of dorsal fin. Dark form dark brown overall, with broad white bar at midbody and another on peduncle; rear margin of opercle white or yellowish; fins brown to translucent except middle portion of caudal fin whitish or pale yellow. Attains 8 cm TL.



Chrysiptera brownriggii, 5 cm SL (Seychelles). © JE Randall, Bishop Museum

DISTRIBUTION Indian Ocean (widespread). WIO: Kenya to South Africa, Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to Andaman Sea and Indonesia.

REMARKS Occurs on shallow reefs exposed to wave action, to ~2 m deep. Pale form often found on either side of outer-reef crests where wave action is less severe, whereas dark fish mainly inhabit wave-swept algal ridges (however, the two colour forms are sometimes seen together). Small juveniles usually exhibit the pale colouration, but adults show both variations, which do not appear to be related to sex.

Chrysiptera glauca (Cuvier 1830)

Grey damsel

PLATES 42 & 45

Glyphisodon glaucus Cuvier in Cuv. & Val. 1830: 475 (Guam, Mariana Is.).

Abudefduf glaucus: Smith 1960*.

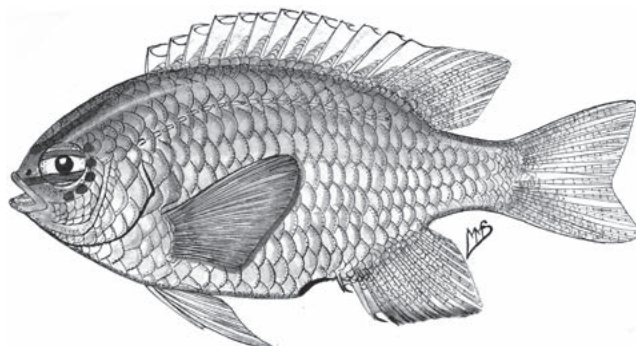
Chrysiptera glauca: Winterbottom *et al.* 1989; SSF No. 219.22*;

Heemstra *et al.* 2004.

Dorsal fin 13 spines, 12 or 13 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 17 or 18 rays. Body depth 2.2–2.3 in SL. GR 21–24. LL scales 17–19.

Body pale blue-grey, sometimes with yellowish hue on upper half of head and body; fins grey to whitish or translucent.

Juveniles entirely pale blue, with pair of darker blue stripes from snout tip to dorsal-fin origin. Attains 10 cm TL.



Chrysiptera glauca, 8 cm TL (Seychelles). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: East Africa to South Africa (Sodwana Bay), Madagascar, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to southern Japan, Mariana Is., Caroline Is., Australia, Pitcairn Is. and Line Is.

REMARKS Known from shallow reefs exposed to wave action, to ~2 m deep.

Chrysiptera kuiteri Allen & Rajasuriya 1995

Kuiter's demoiselle

PLATE 44

Chrysiptera kuiteri Allen & Rajasuriya 1995: 283, Fig. 1 (Tulamben, Bali, Indonesia).

Dorsal fin 13 spines, 11 rays; anal fin 2 spines, 12 rays; pectoral fins 17 or 18 rays. Body depth 2.2–2.5 in SL. GR 20–22. LL scales 16–18.

Body white, with 2 black bars (below anterior half of spinous dorsal fin and below last dorsal-fin spines); fins whitish to translucent except where interrupted by black bars, also blackish margin on middle of dorsal fin that connects the transverse bars; broad black bar through eyes. Attains 7.5 cm TL.



Chrysiptera kuiteri (Brunei). © GR Allen

DISTRIBUTION Indian Ocean. WIO: Sri Lanka; elsewhere, Indonesia (Bali) and Brunei.

REMARKS Solitary or in pairs; found over flat or sloping sand bottom with scattered coral outcrops, in areas with periodic strong currents, in 15–30 m.

Chrysiptera sheila Randall 1994

Sheila's demoiselle

PLATE 44

Chrysiptera sheila Randall 1994: 43, Figs. 5–8 (Rahah Bay, southern Oman); Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 12–14 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 18 or 19 rays. Body depth 2–2.3 in SL. GR 18–22. LL scales 17–19.

Adults uniformly brown, including fins. Small juveniles entirely yellow, with black spot on rear half of dorsal fin and smaller black spot at base of last dorsal-fin rays. Subadults yellow-brown on head and back, brown below, and pair of black spots on posterior part of dorsal fin as in juveniles. Attains 10 cm TL.

DISTRIBUTION WIO: Oman.

REMARKS Type specimens collected from exposed rocky shore, in <3 m.

Chrysiptera unimaculata (Cuvier 1830)

Onespot demoiselle

PLATES 44 & 45

Glyphisodon unimaculatus Cuvier in Cuv. & Val. 1830: 478 (Timor, Timor Sea).

Abudefduf biocellatus (non Quoy & Gaimard 1825): Smith 1960* [in part], 1961; SFSA No. 769a.

Abudefduf zonatus (non Cuvier 1830): Smith 1960*.

Chrysiptera unimaculata: Allen & Randall 1980*; SSF No. 219.24*; Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 13 or 14 rays; anal fin 2 spines, 12–14 rays; pectoral fins 18 or 19 rays. Body depth 2.1–2.4 in SL. GR 22–26. LL scales 16–18.

Adults brown to pale bluish grey, often with pale streak at centre of each scale; black blotch or blue-edged black spot on rear of dorsal fin; head and anterior part of body sometimes much paler than rest of body; fins brown or grey to translucent, except pectoral fins translucent yellow. Juveniles mainly yellow, with prominent blue stripe on sides from snout to below rear half of dorsal fin; large blue-edged black spot at

base of last dorsal-fin spines, and similar smaller spot at base of last dorsal-fin rays. Attains 8 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: Oman, East Africa to South Africa (Transkei region), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to Ryukyu Is., Timor Sea, Australia and Fiji.

REMARKS Found on shallow reefs usually exposed to mild wave action, to ~2 m deep.

GENUS *Dascyllus* Cuvier 1829

Body orbiculate, depth usually 1.5–1.7 in SL; pair of procurvent spines on upper and lower edges of caudal-fin base; lachrymal and suborbitals scaly, their lower edges finely serrate; margins of opercular series smooth to weakly serrate; teeth on jaws biserial, with outer row of larger conical teeth, and patch of small villiform teeth behind outer row of teeth at front of jaws; scales relatively large, LSS <30. Indo-Pacific; 10 species, 4 in WIO.

KEY TO SPECIES

- | | | |
|----|---|------------------------|
| 1a | Dorsal fin usually 12 (rarely 11 or 13) rays; head and body white with 3 transverse black bands | <i>D. aruanus</i> |
| 1b | Dorsal fin usually 14–16 rays; colour not as above | 2 |
| 2a | Ground colour dark; juveniles blackish with white spot on forehead and another on upper side (may persist in adults) | <i>D. trimaculatus</i> |
| 2b | Ground colour of adults and juveniles whitish | 3 |
| 3a | Diffuse black bar behind head extending from dorsal-fin origin to pelvic-fin bases; pectoral fins usually 20 or 21 (rarely 19) rays | <i>D. carneus</i> |
| 3b | No black bar behind head; pectoral fins usually 18 or 19 rays | <i>D. marginatus</i> |

Dascyllus aruanus (Linnaeus 1758)

Zebra humbug

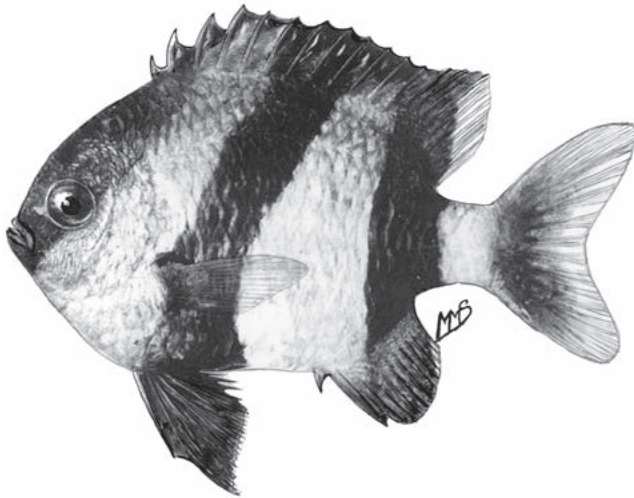
PLATE 34

Chaetodon aruanus Linnaeus 1758: 275 [Aru Is., Moluccas, Indonesia].

Dascyllus aruanus: Smith 1960*; SFSA No. 749*; Randall & Allen 1977*; Allen & Randall 1980*; SSF No. 219.25*; Allen 1991*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Dorsal fin 13 spines, 11–13 rays; anal fin 2 spines, 11–13 rays; pectoral fins 17–19 rays. Body depth 1.5–1.7 in SL. GR 21–26. LL scales 15–19.

Body white, with wide black band from forehead to chin, and 2 similar transverse black bands on body (one from middle of dorsal fin through pectoral fins and to pelvic fins; one at rear of body from rear of dorsal fin through most of anal fin); lips white or pale greyish, and white patch often present on snout–interorbital region; pelvic fins black; other fins white to translucent where not interrupted by black bands. Attains 9 cm TL.



Dascyllus aruanus, 9 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Kenya to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Mascarenes, Maldives and India; elsewhere to Philippines, Indonesia, southern Japan, Australia, Tuamotu Is. and Marquesas Is.

REMARKS Associated with branching corals on inshore and lagoon reefs, in 1–12 m.

Dascyllus carneus Fischer 1885

Indian humbug

PLATES 34 & 45

Dascyllus carneus Fischer 1885: 71, Pl. 2, Fig. 5 (Mozambique);

SFSA No. 750*; Randall & Allen 1977*; SSF No. 219.26;

Winterbottom *et al.* 1989; Allen 1991*; Manilo & Bogorodsky 2003.

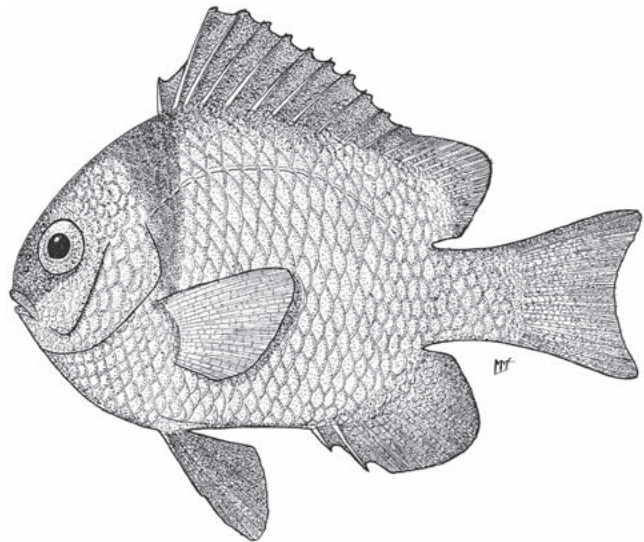
Dascyllus reticulatus (non Richardson 1846): Smith 1960*.

Dascyllus marginatus (non Rüppell 1829): SFSA No. 753*.

Dorsal fin 12 spines, 14–16 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 17–19 rays. Body depth 1.5–1.6 in SL. GR 23–27. LL scales 17–19.

Body white, with diffuse black bar behind head (from dorsal-fin origin to pelvic-fin bases); scales of forehead,

dorsum, and ventral part of sides with bluish spot or streak; dorsal fin with broad black margin; anal fin and pelvic fins mainly blackish; caudal fin and pectoral fins translucent to pale bluish white. Attains 7 cm TL.



Dascyllus carneus, 7 cm TL (WIO). Source: SFSA

DISTRIBUTION Indian Ocean. WIO: Kenya to South Africa (KwaZulu-Natal), Madagascar, Comoros, Aldabra, Assumption I., Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to Andaman Sea and Java Sea.

REMARKS Associated with branching corals on inshore and offshore reefs, in 5–35 m.

Dascyllus marginatus (Rüppell 1829)

Arabian humbug

PLATES 34 & 45

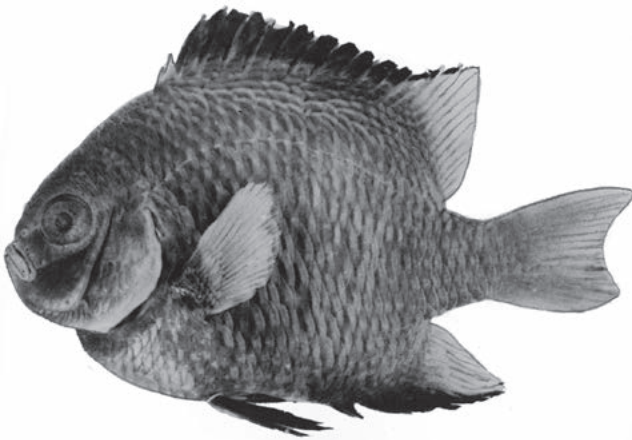
Pomacentrus marginatus Rüppell 1829: 38, Pl. 8, Fig. 2 (Massawa, Eritrea, Red Sea).

Dascyllus marginatus: Smith 1960*; Randall & Allen 1977*; Allen 1991*;

Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 12 spines, 14 or 15 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18–20 rays. Body depth 1.4–1.6 in SL. GR 26–30. LL scales 15–19.

Body entirely white, sometimes also with pale blue scale margins, or sometimes greyish on head (below level of eyes) and over much of lower sides; fins mostly white to bluish, except pelvic fins black, and dorsal and anal fins with prominent black margins; black or blackish spot covering pectoral-fin bases. Attains 6 cm TL.



Dascyllus marginatus, 6 cm TL (Red Sea).

DISTRIBUTION WIO: Red Sea and Gulf of Oman.

REMARKS Associated with branching corals, in 1–15 m.

Dascyllus trimaculatus (Rüppell 1829)

Domino humbug

PLATES 34 & 46

Pomacentrus trimaculatus Rüppell 1829: 39, Pl. 8, Fig. 3 (Massawa, Eritrea, Red Sea).

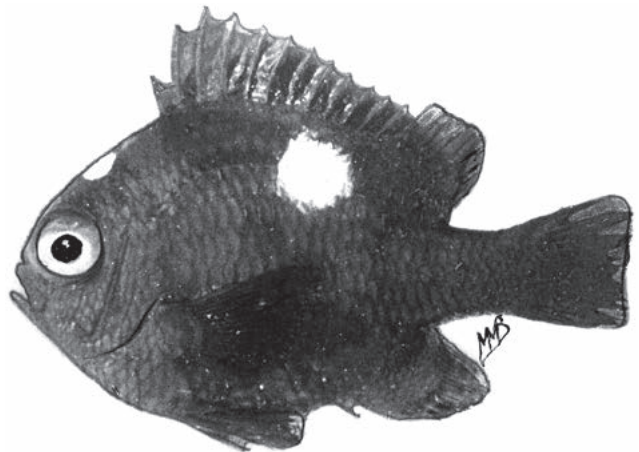
Dascyllus axillaris Smith 1935: 205, Pl. 22d (Great Fish Point, Eastern Cape, South Africa).

Dascyllus trimaculatus: Smith 1960*; SFSA No. 751*; Randall & Allen 1977*; SSF No. 219.27*; Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

Dorsal fin 12 spines, 14–16 rays; anal fin 2 spines, 14–16 rays; pectoral fins 19–21 rays. Body depth 1.4–1.6 in SL. GR 22–26. LL scales 17–19.

Adults dark grey, with black scale edges, and small white spot on body just beneath middle of dorsal fin; sometimes with suffusion of yellow on lower half of head and breast; pelvic fins black; median blackish distally. Juveniles entirely black, with white to pale blue spot on upper back and another in middle of forehead. Attains 14 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Gulf of Aden, Oman to South Africa (Eastern Cape), Madagascar, Comoros, Seychelles, Mascarenes, Maldives, India and Sri Lanka; elsewhere to southern Japan, Marshall Is., Australia, Solomon Is. and islands of Polynesia, except Hawaii and Marquesas Is.



Dascyllus trimaculatus, 3 cm TL, juvenile (N Mozambique). Source: SSF

REMARKS Adults generally solitary, juveniles in small groups. Associated with branching corals, in 1–15 m; juveniles commensal with large sea anemones.

GENUS *Lepidozygus* Günther 1862

Row of papilla-like structures on rear edge of eye socket (posterior circumorbital bones); body extremely elongate, depth ~2.8–3.1 in SL; teeth on jaws uniserial; preopercle margin finely serrate; edge of suborbital hidden by scales; LSS 33–36; dorsal fin 12 spines. One species.

Lepidozygus tapeinosoma (Bleeker 1856)

Fusilier damsel

PLATE 34

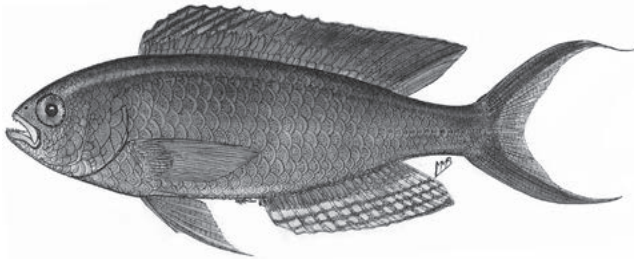
Pomacentrus tapeinosoma Bleeker 1856: 376 (Ternate, Moluccas, Indonesia).

Lepidozygus anthioides Smith 1956: 888, Pl. 20c (Astove I., Seychelles); Smith 1960*.

Lepidozygus tapeinosoma: SSF No. 219.28*; Allen 1991*; Manilo & Bogorodsky 2003.

Diagnosis as for genus. Dorsal fin 12 spines, 14 or 15 rays; anal fin 2 spines, 15 or 16 rays; pectoral fins 21 or 22 rays. Body depth 2.8–3.1 in SL. GR 25–29. LL scales 19 or 20.

Body greenish brown dorsally, bluish to pink ventrally; usually yellow spot at base of last dorsal-fin ray; dorsal fin greenish brown to translucent, other fins whitish to translucent. Attains 10 cm TL.



Lepidozygus tapeinosoma, 10 cm TL, holotype of *L. anthioides* (Seychelles). Source: Smith 1956

DISTRIBUTION Indo-Pacific (widespread). WIO: Kenya to South Africa (KwaZulu-Natal), Madagascar, Comoros, Aldabra, Assumption I., Seychelles, Chagos, Maldives and Sri Lanka; elsewhere to Indonesia, Ryukyu Is., Australia, New Caledonia, Tuamotu Is., Marquesas Is. and Line Is.

REMARKS Found in lagoons and on outer-reef slopes, usually in aggregations, in 5–25 m.

GENUS *Neoglyphidodon* Allen 1991

Margins of suborbitals and preopercle smooth; suborbitals scaly (at least in WIO species); teeth biserial at least at front of jaws; predorsal scales extend to level of nostrils or further forward; body depth 1.6–2.1 in SL; dorsal fin 13 or 14 spines; colour pattern of juveniles very different to that of adults. Indo-Pacific; 8 species, 2 in WIO.

KEY TO SPECIES

- 1a Adults entirely blackish, including pectoral fins; juveniles pale grey-blue with yellow swathe dorsally (from head to spinous dorsal fin), leading edges of caudal fin also sometimes yellow, and leading edges of pelvic fins and anal fin broadly blackish; LL scales 16 or 17 *N. melas*
- 1b Adults brown (paler anteriorly), with translucent pectoral fins; juveniles brown, with blue-edged black spot at middle of dorsal-fin base; LL scales 17–20 [Sri Lanka only in WIO] *N. bonang*

Neoglyphidodon bonang (Bleeker 1852)

Ocellated damsel

PLATE 46

Glyphisodon bonang Bleeker 1852: 582 (Padang, Sumatra, Indonesia).
Neoglyphidodon bonang: Allen 1991.

Dorsal fin 13 spines, 15 or 16 rays; anal fin 2 spines, 13–15 rays; pectoral fins 18–20 rays. Body depth 1.6–1.8 in SL. GR 17–20. LL scales 16 or 17.

Body and fins brown or orangish brown, darker posteriorly; large blue-edged black spot (often absent in large adults) at base of middle of dorsal fin, and tiny blue spot at base of last dorsal-fin rays. Attains 13.5 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Sri Lanka; elsewhere to Indonesia (Sumatra, Java, Bali and Komodo I.).

REMARKS Found on shallow rocky areas next to shore and exposed to surge, in 2–15 m.

Neoglyphidodon melas (Valenciennes 1830)

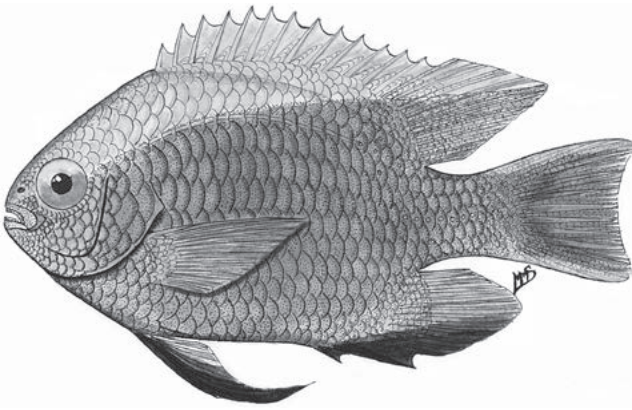
Black damsel

PLATE 44

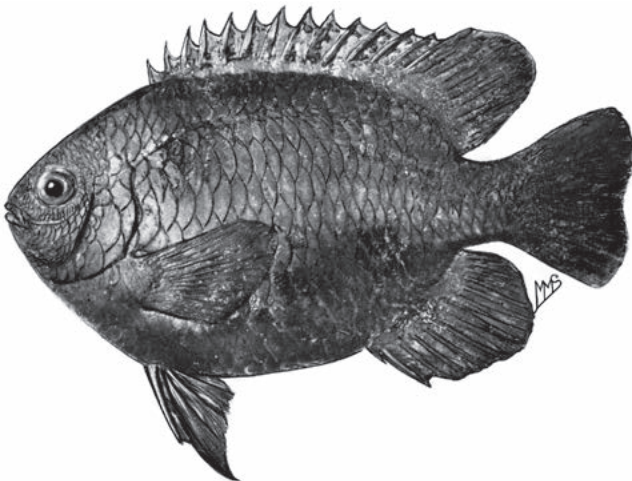
Glyphisodon melas Valenciennes (ex Kuhl & Van Hasselt) in Cuv. & Val. 1830: 472 (Java, Indonesia).
Abudefduf melas: Smith 1960*.
Abudefduf xanthonotus: Smith 1961*.
Paraglyphidodon melas: Allen & Randall 1980*; SSF No. 219.32*.
Neoglyphidodon melas: Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 13–15 rays; pectoral fins 18 or 19 rays. Body depth 1.7–2 in SL. GR 19–22. LL scales 16 or 17.

Adults uniformly black, including all fins. Juveniles pale grey-blue with yellow swathe dorsally (from snout to anterior dorsal-fin rays); dorsal fin mostly yellow, except posteriormost portion blue to transparent; leading edges of anal fin and pelvic fins broadly black; caudal fin translucent, often with bluish suffusion, and upper and lower edges often narrowly yellow. Attains 15 cm TL.



Neoglyphidodon melas, 6 cm TL, juvenile (Kenya). Source: Smith & Smith 1963



Neoglyphidodon melas, 13 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Kenya to Mozambique (Tekomaji I.), Madagascar, Seychelles and Sri Lanka; elsewhere to Indonesia, Ryukyu Is., Palau, New Guinea, Solomon Is., northern Australia and Vanuatu.

REMARKS Found in lagoons and on outer-reef slopes, often in areas rich with soft corals, from 1–12 m.

GENUS *Neopomacentrus* Allen 1975

Body elongate, depth usually 2.2–2.8 in SL; middle dorsal- and anal-fin rays and outer caudal-fin rays frequently elongated into long filaments; lower edge of suborbitals usually smooth or hidden by scales; teeth biserial at least at front of jaws; scales relatively large, LSS <30; dorsal fin 13 spines. Indo-Pacific; 16 species, 7 in WIO.

KEY TO SPECIES

- | | | |
|----|--|-----------------------|
| 1a | Lower edge of suborbital series hidden by scales | 2 |
| 1b | Lower edge of suborbital series exposed | 5 |
| 2a | GR 25–30 | 3 |
| 2b | GR 19–23 | 4 |
| 3a | Small white saddle on peduncle; no black on pelvic fins | <i>N. miryae</i> |
| 3b | No white saddle on peduncle; pelvic fins partly black | <i>N. sindensis</i> |
| 4a | Caudal-fin upper and lower edges dark (at least on basal half of fin); ground colour dark brown; pale spot usually present at base of last dorsal-fin rays | <i>N. cyanomos</i> |
| 4b | Caudal fin entirely pale (yellow in life); ground colour bluish grey in life; no pale spot at base of last dorsal-fin rays | <i>N. sororius</i> |
| 5a | Caudal fin mostly pale (yellow in life) with dark upper and lower edges; brackish and freshwater habitats | <i>N. taeniurus</i> |
| 5b | Caudal fin entirely pale (yellow in life); reef habitats | 6 |
| 6a | Body depth 2.2–2.3 in SL; tips of caudal-fin lobes and longest rays of dorsal and anal fins not forming pronounced filaments in adults | <i>N. fuliginosus</i> |
| 6a | Body depth 2.4–2.6 in SL; tips of caudal-fin lobes and longest rays of dorsal and anal fins forming pronounced filaments in adults | <i>N. xanthurus</i> |

Neopomacentrus cyanomos (Bleeker 1856)

Regal demoiselle

PLATES 44 & 46

Pomacentrus cyanomos Bleeker 1856: 89 (Jakarta, Java, Indonesia).

Pomacentrus prateri Fowler 1928: 117, Pl. 2 (Back Bay, Mumbai, India).

Pomacentrus opercularis (non Günther 1867): SFSA No. 758*.

Pomacentrus inhacae Smith 1955: 894 (Inhaca I., Mozambique).

Pomacentrus taeniurus (non Bleeker 1856): Smith 1960*.

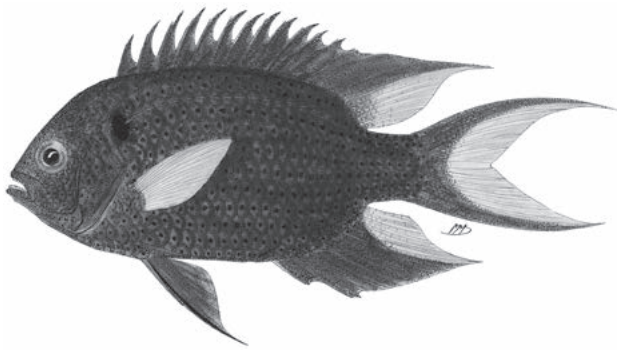
Neopomacentrus cyanomos: Allen & Randall 1980*; SSF No. 219.29*;

Allen 1991; Goren & Dor 1994; Randall 1995*;

Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 17 or 18 rays. Body depth 2.2–2.6 in SL. GR 22–24. LL scales 17 or 18.

Body dark brown, with white or yellow spot at base of last dorsal-fin rays; small black 'ear' spot; dorsal fin dark brown except last rays abruptly yellow; anal fin dark brown to bluish, with yellow rear edge; pelvic fins brownish, with blue leading edge; pectoral fins translucent yellow; caudal fin with dusky brown upper and lower margins, central portion often yellowish. Attains 12 cm TL.



Neopomacentrus cyanomos, 10 cm TL (N Mozambique). Source: SFSA

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Yemen, East Africa to South Africa (Kosi Bay), throughout islands of WIO, and India; elsewhere to Indonesia, Philippines, southern Japan, Melanesia and Australia.

REMARKS Usually found in groups; most common in sheltered conditions but also occurs on outer reefs, in ~5–18 m.

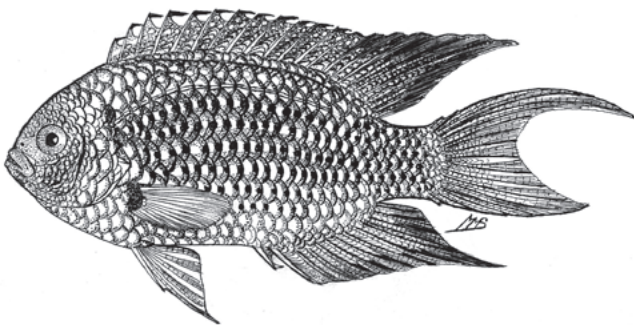
Neopomacentrus fuliginosus (Smith 1960)

African demoiselle PLATE 44

Abudefduf fuliginosus Smith 1960: 339, Fig. 6 (Mozambique).
Neopomacentrus fuliginosus: SSF No. 219.31*; Allen 1991*.

Dorsal fin 13 spines, 11 rays; anal fin 2 spines, 12 rays; pectoral fins 16 or 17 rays. Body depth 2.2–2.3 in SL. GR 20–23. LL scales 16 or 17.

Body greyish brown, with darker scale margins; faint dark ‘ear’ spot; median fins mainly greyish brown, except caudal fin yellow, and rear edge of dorsal and anal fins with yellow suffusion; pelvic fins greyish, with narrow blue leading edge; dark bar across pectoral-fin bases. Attains 11 cm TL.



Neopomacentrus fuliginosus, 11 cm TL, holotype (N Mozambique). Source: Smith 1960

DISTRIBUTION WIO: Kenya to Mozambique, Madagascar and Mauritius.

REMARKS Found in inshore areas, on soft bottom around rock outcrops, around wharf pilings and wreckage, etc., in 1–10 m.

Neopomacentrus miryae Dor & Allen 1977

Miry’s demoiselle PLATES 44 & 46

Neopomacentrus miryae Dor & Allen 1977: 183, Fig. 1 (Dahab, Sinai Peninsula, Egypt, Gulf of Aqaba, Red Sea); Allen & Randall 1980*; Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 11–13 rays; anal fin 2 spines, 11 rays; pectoral fins 18 or 19 rays. Body depth 2.2–2.6 in SL. GR 26–30. LL scales 17 or 18.

Body mostly olive-green, with grey to blue patch on each scale; snout suffused with yellow; upper half of peduncle and outer margins of caudal-fin lobes yellow-orange; dorsal fin greyish green, with narrow black margin, and prominent white spot (smaller than pupil) behind last dorsal-fin ray; anal fin and pelvic fins whitish; pectoral fins translucent, with small black spot on upper part of base. Attains 11 cm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) to Gulf of Oman.

REMARKS Known from inshore coral reefs, in 2–25 m.

Neopomacentrus sindensis (Day 1873)

Arabian demoiselle PLATES 44 & 46

Glyphidodon sindensis Day 1873: cclxiii (Karachi, Pakistan).
Neopomacentrus sindensis: Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003; Psomadakis *et al.* 2015.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 18 or 19 rays. Body depth 2.3–2.6 in SL. GR 25–27. LL scales 18 or 19.

Body brownish to bluish grey, with darker scale edges; rear part of dorsal fin, peduncle and caudal fin yellow; margins of dorsal and anal fins bright blue, except posteriorly; small black spot at upper part of pectoral-fin bases; pelvic fins mostly black. Attains 10 cm TL.

DISTRIBUTION WIO: Persian/Arabian Gulf, Oman, Pakistan to southwestern India.

REMARKS Common on protected inshore reefs where the bottom is silty sand or mud, in 1–10 m.

Neopomacentrus sororius Randall & Allen 2005

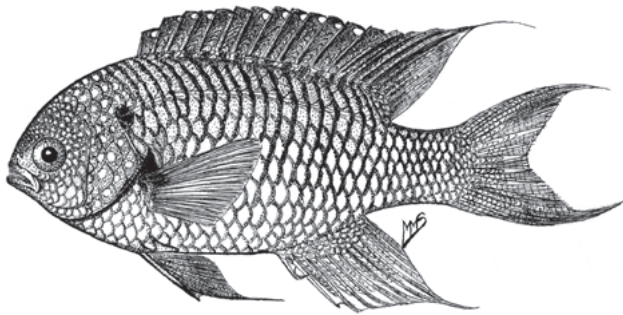
Sister demoiselle

PLATES 44 & 46

Neopomacentrus azysron (non Bleeker 1877): Allen 1991* [in part].*Neopomacentrus sororius* Randall & Allen 2005: 77, Figs. 5–7 (Trincomalee, Sri Lanka).

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 16–18 (usually 17, rarely 16) rays. Body depth 2.4–2.9 in SL. GR 20–23 (usually 22). LL scales 16–18 (usually 17).

Body mostly bluish grey; rear part of dorsal fin, distal part of anal fin, and caudal fin yellow; pelvic fins greyish; most fins with thin blue margins, except pectoral fins entirely translucent, black spot on upper part of bases, and diffuse black wedge-shaped mark on body just above bases; dark grey to blackish 'ear' spot. Attains 8.5 cm TL.

*Neopomacentrus sororius*, 7 cm TL (Kenya). Source: Smith 1960

DISTRIBUTION Indian Ocean (widespread). WIO: Kenya to Mozambique, Madagascar, Maldives, southwestern India and Sri Lanka; elsewhere to Andaman Sea and Indonesia (western Sumatra).

REMARKS Found on coral reefs, frequently in deeper surge channels or near ledges, in 1–12 m.

Neopomacentrus taeniurus (Bleeker 1856)

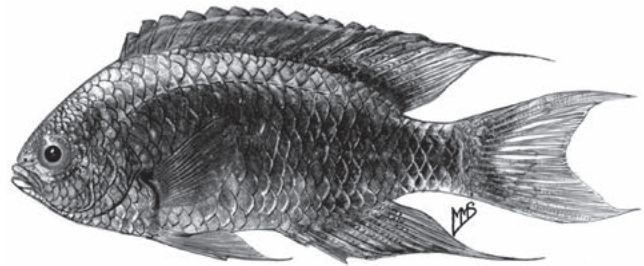
Freshwater demoiselle

PLATE 44

Glyphidodon fallax Peters 1855: 456 (Mozambique).*Pomacentrus taeniurus* Bleeker 1856: 51 (Ambon I., Moluccas, Indonesia).*Abudefduf fallax*: Smith 1960*; SPSA No. 767.*Neopomacentrus taeniurus*: Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 16–18 rays. Body depth 2.3–2.5 in SL. GR 19–23. LL scales 15–17.

Body greyish brown, with darker scale margins; dorsal and anal fins suffused with bright blue, except rear edges broadly yellow; caudal fin mostly yellow, with broad dark upper and lower margins; small black spot at upper part of pectoral-fin bases. Attains 10 cm TL.

*Neopomacentrus taeniurus*, 7 cm TL (Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to Mozambique, India and Sri Lanka; elsewhere to Andaman Sea, Indonesia, Philippines, Ryukyu Is., northern Australia, Solomon Is. and Vanuatu.

REMARKS Found in mangrove estuaries, lowermost reaches of freshwater streams, and harbours with freshwater discharge, to ~3 m deep.

Neopomacentrus xanthurus Allen & Randall 1980

Red Sea demoiselle

PLATES 44 & 47

Neopomacentrus xanthurus Allen & Randall 1980: [6] 54, Figs. 36–37

(Suakin harbour, Sudan, Red Sea); Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 10–12 rays; anal fin 2 spines, 10 or 11 rays; pectoral fins 16 or 17 rays. Body depth 2.4–2.6 in SL. Longest rays of dorsal and anal fins forming pronounced filaments in adults. GR 19–22. LL scales 15–17.

Body blue-grey to bluish, with darker scale margins, grading to yellow on peduncle; fins grey, except caudal fin and rear half of soft-rayed dorsal fin yellow; all fins except pectoral fins with narrow bright blue margins; small black spot at upper part of pectoral-fin bases. Attains 7 cm TL.

DISTRIBUTION WIO: Red Sea (Jeddah, Saudi Arabia) to Gulf of Aden.

REMARKS Found on coral reefs, at 1–15 m.

GENUS *Plectroglyphidodon*

Fowler & Ball 1924

Edge of suborbitals and preopercle margin smooth; gill-raker count usually low (GR 10–17, except GR 21–23 in *P. lacrymatus*); teeth uniserial, relatively elongate; suborbitals scaly; body depth usually 1.7–2 in SL (2.1–2.4 in SL for *P. imparipennis*); dorsal fin usually 12 spines (13 spines in *P. randalli*). Indo-Pacific; 10 species, 7 in WIO.

KEY TO SPECIES

- | | | |
|----|---|-------------------------|
| 1a | Dorsal fin 13 spines | <i>P. randalli</i> |
| 1b | Dorsal fin 12 spines | 2 |
| 2a | Body depth 2.1–2.4 in SL; dorsal fin 14 or 15 rays; anal fin 11 or 12 rays; GR 10–12; body pale (blue-grey to yellowish white in life); peduncle and caudal fin yellow; black vertical bar through iris | <i>P. imparipennis</i> |
| 2b | Body depth 1.7–2 in SL; dorsal fin 15–19 rays; anal fin usually 12–18 rays; GR 12–25; colour not as above | 3 |
| 3a | LL scales 17 or 18; anal fin 13 or 14 rays; dorsal fin 15–18 rays; body dark brown, with small blue spots (often obscure in preservative) scattered on head and back | <i>P. lacrymatus</i> |
| 3b | LL scales 19–22; anal fin 12–18 rays; colour variable but not as above | 4 |
| 4a | Body entirely brown with 1–4 pale bars on sides; pectoral fins 19–21 rays | 5 |
| 4b | Body mostly pale tan to brown, without pale bars (may have dark bar posteriorly); pectoral fins 18 or 19 rays | 6 |
| 5a | Peduncle with broad black bar bordered anteriorly with narrow white bar; remainder of body dark brown with 3 narrow pale bars; dorsal fin 16 or 17 rays; anal fin 13 or 14 rays | <i>P. phoenixensis</i> |
| 5b | Peduncle without black bar; body entirely dark brown or with single pale bar below base of 4th–6th dorsal-fin spines; dorsal fin usually 15 (rarely 16) rays; anal fin usually 12 (rarely 13) rays | <i>P. leucozonus</i> |
| 6a | Anal fin 14–16 (rarely 16) rays; GR 16 or 17; lips not swollen; colour mostly tan to brown with single black bar (4–5 scales wide) across rear of body | <i>P. dickii</i> |
| 6b | Anal fin 16–18 rays; GR 12–14; lips noticeably swollen; colour either uniformly tan or with diffuse dark bar across rear of body | <i>P. johnstonianus</i> |

Plectroglyphidodon dickii (Liénard 1839)

Narrowbar damsel

PLATE 47

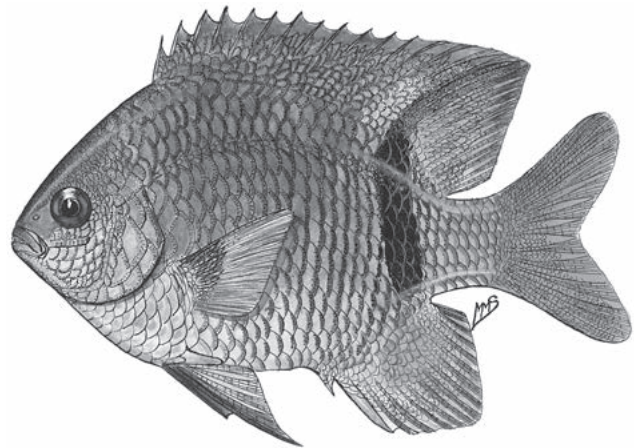
Glyphisodon dickii Liénard 1839: 35 (Mauritius, Mascarenes).

Abudefduf dickii: Smith 1960*.

Plectroglyphidodon dickii: SSF No. 219.33*; Allen 1991*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Dorsal fin 12 spines, 17 or 18 rays; anal fin 2 spines, 14–16 rays; pectoral fins 18 or 19 rays. Body depth 1.8–1.9 in SL. GR 16 or 17. LL scales 21 or 22.

Body tan, with dark scale margins; diffuse black bar across body below dorsal-fin rays, and area behind black bar (peduncle and caudal fin) abruptly yellow or white; other fins tan to pale bluish or translucent, except pectoral fins sometimes with yellow suffusion. Attains 11.5 cm TL.



Plectroglyphidodon dickii, 9 cm TL (N Mozambique). Source: Smith 1960

DISTRIBUTION Indo-Pacific (widespread). WIO: Kenya to South Africa (Sodwana Bay), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to southern Japan, Australia, Tuamotu Is. and Line Is.

REMARKS Found in lagoons and on outer-reef slopes, in 1–12 m.

Plectroglyphidodon imparipennis

(Vaillant & Sauvage 1875)

Brighteye damsel

PLATE 47

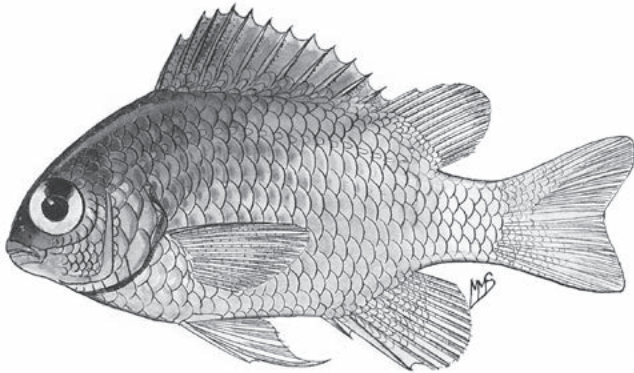
Glyphisodon imparipennis Vaillant & Sauvage 1875: 279 (Honolulu, Oahu I., Hawaii).

Abudefduf imparipennis: Smith 1960*.

Plectroglyphidodon imparipennis: SSF No. 219.34*; Allen 1991*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Dorsal fin 12 spines, 14 or 15 rays; anal fin 2 spines, 11 or 12 rays; pectoral fins 18 or 19 rays. Body depth 2.1–2.4 in SL. GR 10–12. LL scales 21.

Body pale blue-grey; fins pale blue-grey to translucent, except caudal fin pale yellow; WIO fish with yellow peduncle; iris noticeably silvery with prominent black vertical bar through centre. Attains 6 cm TL.



Plectroglyphidodon imparipennis, 6 cm TL (N Mozambique).
Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific (widespread). WIO: Kenya to South Africa (Sodwana Bay), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Indonesia, southern Japan, Australia, Pitcairn Is. and Hawaii.

REMARKS Found on rocky shores and reef flats exposed to wave action, to ~3 m deep.

Plectroglyphidodon johnstonianus

Fowler & Ball 1924

Johnston damsel

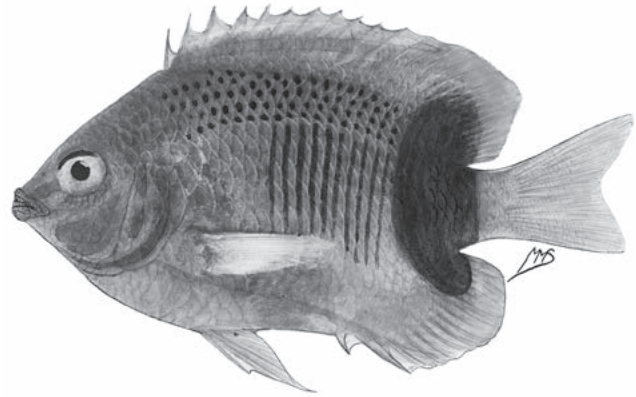
PLATE 48

Plectroglyphidodon johnstonianus Fowler & Ball 1924: 271 (Johnston Atoll, Pacific Ocean); SSF No. 219.35*; Allen 1991*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Plectroglyphidodon nitidus Smith 1956: 892, Pl. 21b (Aldabra); Smith 1960*; Randall 1995*.

Dorsal fin 12 spines, 18 or 19 rays; anal fin 2 spines, 16–18 rays; pectoral fins 19 rays. Body depth 1.7–1.9 in SL. GR 12–14. LL scales 21 or 22.

Body yellowish tan, with blue streak on each scale; broad black blotch or bar across rear of body, linking soft-rayed dorsal and anal fins; fins yellowish, tan or translucent. Attains 9 cm TL.



Plectroglyphidodon johnstonianus, 6 cm TL, holotype of *P. nitidus* (Aldabra).
Source: Smith 1956

DISTRIBUTION Indo-Pacific (widespread). WIO: Oman to South Africa (Sodwana Bay), Comoros, Aldabra, Seychelles, Mascarenes, Chagos, Maldives, Sri Lanka and India; elsewhere to southern Japan, Australia, Pitcairn Is., Johnston Atoll and Hawaii.

REMARKS Feeds on live corals and is closely associated with *Acropora* and *Pocillopora* corals, in 2–12 m.

Plectroglyphidodon lacrymatus

(Quoy & Gaimard 1825)

Jewel damsel

PLATE 47

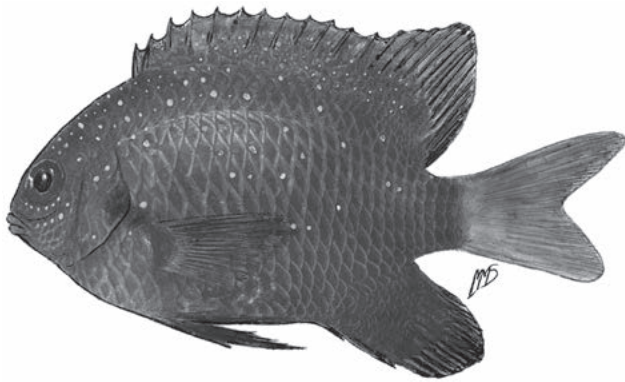
Glyphisodon lacrymatus Quoy & Gaimard 1825: 388, Pl. 62, Fig. 7 (Guam, Mariana Is.).

Abudefduf lacrymatus: Smith 1960*; SFSA No. 764*.

Plectroglyphidodon lacrymatus: Allen & Randall 1980*; SSF No. 219.36*; Allen 1991*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004.

Dorsal fin 12 spines, 15–18 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18–20 rays. Body depth 1.8–1.9 in SL. GR 21–25. LL scales 17 or 18.

Body brown, with blackish scale margins, grading to whitish on peduncle; regularly spaced tiny blue spots on head and body; fins brown or pale brown, except pectoral fins translucent and caudal fin whitish. Attains 10 cm TL.



Plectroglyphidodon lacrymatus, 9 cm TL (S Mozambique). Source: SFSA

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, East Africa to South Africa (Sodwana Bay), Madagascar, Comoros, Seychelles, Chagos, Mascarenes, Maldives, India and Sri Lanka; elsewhere to Thailand, Ryukyu Is., Mariana Is., Marshall Is., Australia, Society Is. and Marquesas Is.

REMARKS Found in lagoons and on outer reefs, in 2–12 m.

Plectroglyphidodon leucozonus (Bleeker 1859)

Whiteband damsel PLATES 47, 48 & 49

Glyphisodon leucozona Bleeker 1859: 338 (Karang-Bollong Bay, Java, Indonesia).

Glyphidodon cingulum Klunzinger 1871: 526 (Al-Qusayr, Egypt, Red Sea).

Abudefduf cingulum: Smith 1960*.

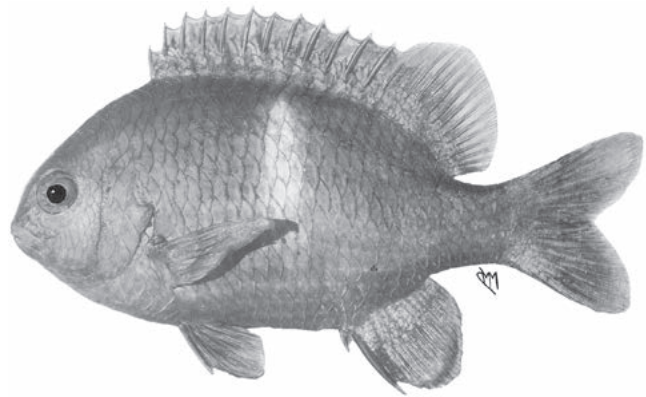
Abudefduf leucozona: SFSA No. 759*.

Plectroglyphidodon leucozonus: SSF No. 219.37*; Winterbottom *et al.* 1989; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004*.

Plectroglyphidodon leucozonus cingulum: Allen 1991*.

Dorsal fin 12 spines, 15 or 16 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 19 or 20 rays. Body depth 1.8–1.9 in SL. GR 15–24; Red Sea subspecies *P. leucozonus cingulum* with more gill rakers on upper limb of 1st arch as compared with nominal subspecies (6–10 versus 3 or 4). LL scales 19 or 20.

Body dark brown, generally paler on head and breast, with white bar across middle of body; head sometimes with tiny bluish spots or bluish suffusion on chin and suborbital region; fins brown, except pectoral fins translucent with brown rays; small blackish spot at upper part of pectoral-fin bases. Red Sea subspecies *P. leucozonus cingulum* generally paler overall, with dorsal, anal and caudal fins yellow posteriorly. Attains 12 cm TL.



Plectroglyphidodon leucozonus, 10 cm TL. Source: SFSA

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Oman, Kenya to South Africa (Transkei region), Madagascar, Comoros, Seychelles, Mauritius, Chagos, Maldives, India and Sri Lanka; elsewhere to Indonesia, Japan, Marshall Is., Australia and Pitcairn Is.

REMARKS Inhabits rocky shores and reef flats exposed to wave action, to ~4 m deep; juveniles common in tidepools. Solitary and territorial.

Plectroglyphidodon phoenixensis (Schultz 1943)

Phoenix damsel PLATE 48

Abudefduf phoenixensis Schultz 1943: 190, Fig. 15 (reef at Enderbury I., Phoenix Is.).

Abudefduf manikfani Jones & Kumaran 1970: 324, Fig. 5 (Minicoy I., India).

Plectroglyphidodon phoenixensis: SSF No. 219.38*; Allen 1991*.

Dorsal fin 12 spines, 16 or 17 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 20 or 21 rays. Body depth 1.9–2.1 in SL. GR 14–16. LL scales 21 or 22.

Body brown with darker scale margins, but bluish to violet spot often present on centre of scales of breast, belly and lower part of head, and with 4 relatively narrow white to pale yellow bars (1st from dorsal-fin origin to lower edge of opercle, 2nd from edge of middle of spinous dorsal fin to belly, 3rd from anterior dorsal-fin rays to above anal fin, and 4th across anterior of peduncle); fins brown, except caudal fin abruptly white at base and translucent distally; pale-rimmed eye-sized black spot often covering anterior dorsal-fin rays. Attains 9 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: Kenya to South Africa (Grosvenor Point, Eastern Cape), Madagascar, Seychelles, Mauritius, Chagos and Maldives; elsewhere to Christmas I., Indonesia, southern Japan, Marquesas Is., Tuamotu Is., Johnston Atoll and Hawaii.

REMARKS Known from rocky shores and reef flats exposed to wave action, to ~8 m.

Plectroglyphidodon randalli Allen 1991

Mauritian damselfish PLATES 48 & 49

Plectroglyphidodon randalli Allen 1991: 135, 221, Fig. (north of Flic-en-Flac, Mauritius).

Dorsal fin 13 (rarely 14) spines, 15 or 16 rays; anal fin 2 spines, 12 rays; pectoral fins 19 or 20 rays. Body depth 1.9–2.1 in SL. GR 17–20. LL scales 20–22.

Body golden brown anteriorly, with dusky scale margins, grading to greyish brown posteriorly; upper surface of peduncle dark brown; bluish stripe from upper lip to eyes, suborbital region blue, and tiny scattered blue spots on head and belly; fins brown or grey-brown to yellowish, middle of spinous dorsal fin dark brown; black spot at upper part of pectoral-fin bases. Attains 9 cm TL.

DISTRIBUTION WIO: Réunion and Mauritius.

REMARKS Known from rocky inshore reefs exposed to wave action, in <4 m.

GENUS *Pomacentrus* Lacepède 1802

Edge of suborbitals usually serrate, rarely smooth; preopercle margin usually with distinct serrations (weakly serrate in a few species); notch usually present between lachrymal and suborbital series; lachrymal naked in WIO species; suborbitals naked, except in *P. philippinus*; teeth biserial at least at front of jaws; dorsal fin 13 or 14 spines. Indo-Pacific; ~80 species, 22 in WIO.

KEY TO SPECIES

- | | | |
|----|------------------------------|----|
| 1a | Dorsal fin usually 13 spines | 2 |
| 1b | Dorsal fin usually 14 spines | 13 |

Continued ...

KEY TO SPECIES

- | | | |
|-----|---|-----------------------------|
| 2a | Body mainly blue in life (except <i>P. leptus</i> mostly brown); body relatively slender, depth 2–2.8 in SL (usually >2.2) | 3 |
| 2b | Body mainly brown to greyish in life; body more ovate, depth 1.6–2.2 in SL | 7 |
| 3a | Body brown or blue in life with abruptly white caudal fin; LL scales 14–16 [northwestern Indian Ocean and southern Red Sea] | <i>P. leptus</i> |
| 3b | Body blue in life without abruptly white caudal fin; LL scales 16–19 | 4 |
| 4a | Opercle with dark spot (pupil-sized or larger) at upper edge; tips of caudal-fin lobes filamentous in large adults; GR 23 or 24 | <i>P. pavo</i> |
| 4b | Opercle with or without dark spot at upper edge, spot smaller than pupil if present; tips of caudal-fin lobes never filamentous; GR 18–23 | 5 |
| 5a | Anal fin yellowish (tan in preservative); body uniformly blue without dark spots on scales, or if spots present usually single small spot per scale or restricted to rear or ventral part of body | <i>P. caeruleus</i> |
| 5b | Anal fin dark blue (dusky brown to blackish in preservative); body more or less uniformly blue or with 2 or 3 horizontally elongate dark spots on each scale | 6 |
| 6a | Caudal fin mainly blue in life; body with 2 or 3 horizontally elongate dark spots on each scale | <i>P. caeruleopunctatus</i> |
| 6b | Caudal fin yellow in life; no dark spots on scales, but scales may have narrow dark margin [Sri Lanka only in WIO] | <i>P. similis</i> |
| 7a | Rear part of suborbital region scaly; body generally blackish with pale caudal fin (yellow in life) | <i>P. philippinus</i> |
| 7b | Rear part of suborbital region naked; colour variable | 8 |
| 8a | GR 25–31; caudal fin either dark or pale | 9 |
| 8b | GR 18–22; caudal fin pale and contrasting with darker body colour | 10 |
| 9a | Body generally black, including fins; no black spot on upper surface of peduncle [Madagascar, Réunion and Mauritius] | <i>P. agassizii</i> |
| 9b | Body yellowish to dark brown; caudal fin pale; small black spot on upper surface of peduncle [Red Sea and western coasts of WIO, including Madagascar] | <i>P. trilineatus</i> |
| 10a | Peduncle with black saddle | <i>P. tripunctatus</i> |
| 10b | Peduncle without black saddle | 11 |
| 11a | Pectoral fins 15 or 16 rays; LL scales 15 or 16 [Red Sea] | <i>P. albicaudatus</i> |
| 11b | Pectoral fins 17 or 18 rays; LL scales 17–19 | 12 |

Continued ...

KEY TO SPECIES

- | | | | |
|-----|---|--------------------------|----|
| 12a | Black spot covering pectoral-fin bases; faint wavy lines usually evident on median fins | <i>P. nagasakiensis</i> | |
| 12b | No black spot on pectoral-fin bases; no faint wavy lines on median fins | <i>P. chrysurus</i> | |
| 13a | Body ground colour pale | | 14 |
| 13b | Body ground colour dark | | 17 |
| 14a | Pectoral-fin bases (outer surface) covered by large black spot | <i>P. sulfureus</i> | |
| 14b | Upper part of pectoral-fin bases (outer surface) with small dark spot (pupil-sized or smaller) | | 15 |
| 15a | Pectoral-fin axils entirely black [northern Madagascar] | <i>P. atriaxillaris</i> | |
| 15b | Pectoral-fin axils not entirely black | | 16 |
| 16a | Body ground colour yellow; faint, poorly contrasted blue spots and streaks on scales | <i>P. pikei</i> | |
| 16b | Body ground colour pale grey; well-contrasted blue spots and streaks on scales | <i>P. baenschi</i> | |
| 17a | Entire pectoral-fin base covered by black spot | | 18 |
| 17b | Pectoral-fin bases without black spot or spot at base of uppermost rays only | | 19 |
| 18a | Caudal fin abruptly pale (yellow to white in life) ... | <i>P. trichourus</i> | |
| 18b | Caudal fin not abruptly pale | <i>P. indicus</i> | |
| 19a | Peduncle with black spot or saddle; body depth 1.9–2 in SL [Red Sea to Persian/Arabian Gulf] | <i>P. aquilus</i> | |
| 19b | Peduncle without black spot or saddle | | 20 |
| 20a | Body relatively deep, depth 1.6–1.8 in SL, and uniformly dark brown [Arabian Sea] | <i>P. arabicus</i> | |
| 20b | Body more slender, depth 1.8–2 in SL; breast and belly generally paler than rest of body | | 21 |
| 21a | Spinous dorsal-fin margin broadly pale (yellowish in life); dark spot on upper part of pectoral-fin bases; usually no ocellus on dorsal fin of adults (>5.5 cm SL) [Rodrigues I.] ... | <i>P. rodriguesensis</i> | |
| 21b | Spinous dorsal-fin margin not broadly pale; no dark spot at upper part of pectoral-fin bases; dorsal fin of adults usually with ocellus [Sri Lanka and Andaman Sea] | <i>P. proteus</i> | |

Pomacentrus agassizii Bliss 1883

Creole damsel

PLATES 48 & 49

Pomacentrus agassizii Bliss 1883: 53 (Mauritius, Mascarenes); Allen 1991*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 13 spines, 15 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 18 rays. Body depth 2–2.1 in SL. GR 28–30. LL scales 18 or 19.

Body bluish black, with 2 or 3 small blue dots on most body scales, and blue spots and streaks scattered on head; black ‘ear’ spot; fins blackish, except pectoral fins translucent with black rays and dark spot covering most of fin base; dorsal and anal fins with narrow bright blue margin. Attains 11 cm TL.

DISTRIBUTION WIO: Mozambique Channel, Madagascar, Seychelles and Mascarenes.

REMARKS Found on lagoonal and inshore coral reefs, usually close to *Acropora* staghorn corals, in 1–4 m.

Pomacentrus albicaudatus Baschieri-Salvadori 1955

Whitefin damsel

PLATES 48 & 49

Pomacentrus albicaudatus Baschieri-Salvadori 1955: 64, Pl. 4, Fig. 4 (Red Sea); Allen & Randall 1980*; Allen 1991*.

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 15 rays; pectoral fins 15 or 16 rays. Body depth 1.9–2.1 in SL. GR 19–22. LL scales 15 or 16.

Body brown, with slight purple suffusion dorsoposteriorly, and head and breast paler brown and suffused with yellow; most body scales with 1–3 small blue dots; dark brown ‘ear’ spot; dorsal, anal and pelvic fins brown; pectoral fins translucent, with small black spot at base of uppermost rays; caudal fin abruptly white, translucent towards margin. Attains 7 cm TL.

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Found on inshore and outer reefs, in 5–25 m.

Pomacentrus aquilus Allen & Randall 1981

Dark damself

PLATES 48 & 49

Pomacentrus aquilus Allen & Randall 1981: 68, Figs. 45–47 (outer-reef flat at Marsa el Muqabila, Gulf of Aqaba, Red Sea); Allen 1991* [figs. of *P. aquilus* and *P. arabicus* incorrectly reversed]; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003.

Dorsal fin 14 spines, 13–15 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 17–19 rays. Body depth 1.9–2 in SL. GR 19–22. LL scales 16–18.

Body dark greenish brown, with relatively broad dark scale margins, and small blue spot near centre of scales on body (except not anterodorsally) and on basal sheaths of dorsal, anal and caudal fins; narrow blue lines on snout and below eyes, also scattered blue spots and streaks on cheek and opercle; black spot dorsally on peduncle (difficult to see on dark individuals); median fins and pelvic fins with narrow blue margins; pectoral fins translucent with brown rays, and black spot at base of uppermost rays. Juveniles mainly yellow, with pair of blue bands from snout and upper part of head to dorsal-fin base, and prominent blue-edged black spot between dorsal-fin spines and rays; black spot dorsally on peduncle. Attains 12 cm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) and Persian/Arabian Gulf.

REMARKS Common on coral reefs and rocky bottoms, in 1–15 m.

Pomacentrus arabicus Allen 1991

Arabian damself

PLATES 48 & 49

Pomacentrus arabicus Allen 1991: 139, 223, Fig. (Muscat, Oman, Gulf of Oman); Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 14 spines, 14 or 15 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 17 or 18 rays. Body depth 1.6–1.8 in SL. GR 19–22. LL scales 16–18.

Body dark brown, with black scale margins; juveniles may resemble *P. aquilus*. Attains 14.5 cm TL.

DISTRIBUTION WIO: Persian/Arabian Gulf and Gulf of Oman.

REMARKS Collected from rocky inshore reef, in 2–6 m.

Pomacentrus atriaxillaris Allen 2002

Blackaxil damself

PLATES 49 & 52

Pomacentrus atriaxillaris Allen 2002: 46, Figs. 1–2 (Marie Bank, Mitsio I., Madagascar).

Dorsal fin 14 spines, 14 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2.1 in SL. GR 21–24. LL scales 18–20.

Body pale grey, slightly darker on upper part of head and dorsum, with dark grey scale outlines; dorsal, anal and caudal fins dark grey, with pale grey submarginal stripe on dorsal fin; pectoral fins translucent, with blackish spot at upper part of base and covering most of axil; pelvic fins white. Attains 9 cm TL.

DISTRIBUTION WIO: northwestern Madagascar.

REMARKS Known from near shore and outer coral reefs, on mixed coral and rubble bottom, in ~10–30 m.

Pomacentrus baenschii Allen 1991

Multispotted damself

PLATES 48, 49 & 50

Pomacentrus baenschii Allen 1991: 141, 226, Fig. (Kisiti Reef off Shimoni, Kenya).

Dorsal fin 14 spines, 14 or 15 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2 in SL. GR 19–21. LL scales 18 or 19.

Body pale grey with yellow suffusion on head, anterodorsal portion of body, and peduncle; 1–3 blue spots or an elongate blue streak on each scale of head, body, and basal sheaths of median fins; fins mostly pale yellow; median fins and pelvic fins with narrow blue margins. Juveniles with blue-edged black spot between dorsal-fin spines and rays (sometimes persisting as faint remnant in adults). Attains 11 cm TL.

DISTRIBUTION WIO: Kenya to Mozambique, Comoros, Madagascar and reefs in Mozambique Channel.

REMARKS Found near shore and on outer coral reefs, in 1–10 m.

Pomacentrus caeruleopunctatus Allen 2002

Bluespot damsel

PLATES 50 & 52

Pomacentrus caeruleopunctatus Allen 2002: 49, Figs. 4–6 (Marie Bank, Mitsio I., northwestern Madagascar).

Dorsal fin 13 spines, 13 rays; anal fin 2 spines, 15 rays; pectoral fins 18 rays. Body depth 2–2.3 in SL. GR 20–22. LL scales 17–19.

Body mainly blue, with dark grey scale margins, and most of body scales with 2 or 3 intensely blue, horizontally elongate spots; narrow blackish bar on preopercle margin and slightly wider blackish bar on upper margin of opercle; dorsal, anal and caudal fins grey to blackish, with fine blue margins, and pair of submarginal blue stripes; sheath scales at bases of dorsal and anal fins, and interradiation scales of dorsal, anal and caudal fins bright blue; blue streaks on rear edge of dorsal and anal fins; pectoral fins pale yellow, with blackish bar across bases; pelvic fins pale yellow, with blue leading edge. Attains 9.5 cm TL.

DISTRIBUTION WIO: Seychelles, Madagascar and Mauritius.

REMARKS Found near shore and on outer coral reefs, in 5–15 m.

Pomacentrus caeruleus Quoy & Gaimard 1825

Caerulean damsel

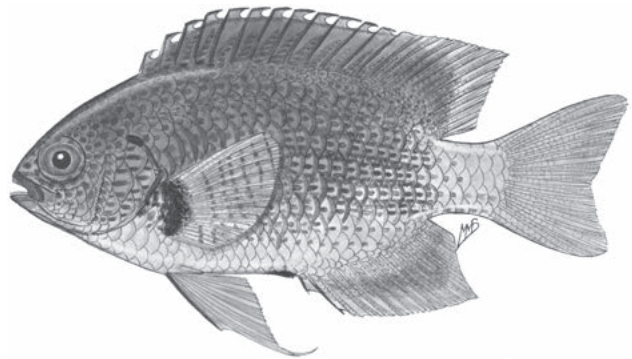
PLATES 48 & 50

Pomacentrus caeruleus Quoy & Gaimard 1825: 397, Pl. 64, Fig. 2 (Mauritius, Mascarenes); Smith 1960*; SSF No. 219.39*; Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Pomacentrus pulcherrimus Smith 1960: 344, Pl. 28a (Pinda, Mozambique).

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 15 or 16 rays; pectoral fins 17 or 18 rays. Body depth 2.4–2.8 in SL. GR 20–23. LL scales 17–19.

Body mostly bright blue, but yellow on belly, peduncle, anal fin and pelvic fins; several rows of blue spots usually present on transitional area between blue and yellow, just anterior to peduncle; leading edge of pelvic fins and distal edge of anal fin blue, and anal fin also with blue submarginal line. Attains 8 cm TL.



Pomacentrus caeruleus, 8 cm TL, holotype of *P. pulcherrimus* (N Mozambique). Source: SSF

DISTRIBUTION WIO: Oman to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka.

REMARKS Found near shore and on outer coral reefs, in 1–10 m.

Pomacentrus chrysurus Cuvier 1830

Whitetail damsel

PLATE 48

Pomacentrus chrysurus Cuvier (ex Broussonet) *in* Cuv. & Val. 1830: 423 (South Seas); Allen 1991*.

Dorsal fin 13 spines, 14–16 rays; anal fin 2 spines, 15 or 16 rays; pectoral fins 18 rays. Body depth 1.9–2.2 in SL. GR 18 or 19. LL scales 18 or 19.

Body purplish grey-brown, abruptly white at caudal fin; pectoral fins translucent, often with yellowish hue. Juveniles blue-grey, with broad band of yellow-orange covering upper part of head, dorsum, and most of dorsal fin; black ocellus on dorsal fin between spines and rays. Attains 8.5 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to Ryukyu Is., Palau, Australia, New Caledonia, Indonesia and New Guinea.

REMARKS Found in sandy areas of lagoons and on inshore reefs around rock or coral outcrops, to ~3 m deep.

Pomacentrus indicus Allen 1991

Indian damsel

PLATES 48 & 50

Pomacentrus indicus Allen 1991: 148, 229, Fig. (Villingili I., North Malé Atoll, Maldives); Heemstra *et al.* 2004.

Dorsal fin 14 spines, 13 or 14 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 17 or 18 rays. Body depth 1.8–2.1 in SL. GR 20–23. LL scales 17 or 18.

Body dark grey, with paler scale centres; scattered black spots on forehead; black spot covering pectoral-fin bases; fins dark grey, except pectoral fins translucent with dark rays. Juveniles with variable amount of yellow on head, back and belly, and with black ocellus between dorsal-fin spines and rays. Small juveniles often with entire head, breast, belly, nape and spinous dorsal fin bright yellow and remainder of body dark grey with paler scale centres. Subadults with bright yellow patch on dorsal midline between snout and dorsal-fin origin. Attains 11 cm TL.

DISTRIBUTION WIO: Seychelles, Rodrigues, Chagos, Maldives and Sri Lanka.

REMARKS Found in lagoons and on outer coral reefs, at 2–15 m.

Pomacentrus leptus Allen & Randall 1981

Slender damsel

PLATES 48 & 50

Pomacentrus leptus Allen & Randall 1981: 74, Figs. 48–49 (Towartit Reef, near Port Sudan, Red Sea); Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 13 or 14 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 16 or 17 rays. Body depth 2.3–2.7 in SL. GR 17–20. LL scales 14–16.

Body mostly brown or sometimes blue, darker posteriorly, with orange suffusion on anterior half of body, sometimes with slight bluish grey suffusion on anterior part of head; small black spot on upper edge of opercle and another at base of uppermost pectoral-fin rays; dorsal and anal fins mostly brown, dorsal fin yellowish posteriorly; pelvic and pectoral fins whitish to translucent; caudal fin white at base, grading to translucent with yellowish hue distally. Attains 7 cm TL.

DISTRIBUTION WIO: Red Sea to Oman and Persian/Arabian Gulf.

REMARKS Found on inshore coral reefs, in 1–10 m.

Pomacentrus nagasakiensis Tanaka 1917

Nagasaki damsel

PLATE 48

Pomacentrus nagasakiensis Tanaka 1917: 9 (fish market in Nagasaki, Japan); Allen 1991*.

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 16 or 17 rays; pectoral fins 17 or 18 rays. Body depth 1.9–2.2 in SL. GR 18–21. LL scales 17–19.

Body dark grey or bluish grey, with blackish scale margins forming network pattern; head slightly paler with many blue lines and spots; large black spot covering pectoral-fin bases; fins mostly grey to translucent bluish, with series of diffuse darker bands across caudal fin and dorsal- and anal-fin rays, and dorsal fin with series of black spots at spine tips. Juveniles mainly blue, with large ocellus on dorsal-fin rays. Attains 12 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to southern Japan, Melanesia, Australia and New Caledonia.

REMARKS Inhabits coral and rock outcrops surrounded by sand, in 5–30 m.

Pomacentrus pavo (Bloch 1787)

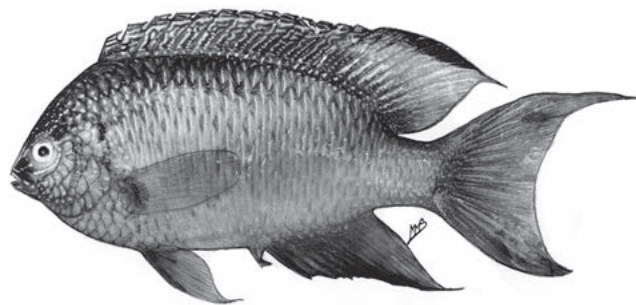
Blue damsel

PLATE 50

Chaetodon pavo Bloch 1787: 60, Pl. 198, Fig. 1 ('East Indies').
Pomacentrus pavo: Smith 1960*; SFSA No. 757*; SSF No. 219.40*;
Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 12–14 rays; anal fin 2 spines, 12–14 rays; pectoral fins 17 rays. Body depth 2.4–2.6 in SL. GR 23 or 24. LL scales 16 or 17.

Body pale blue to pale green; head with scattered blue spots and blackish 'ear' spot; body scales with vertical bluish streak; fins mostly bluish to pale green, median fins with bright blue to blackish margins. Attains 13 cm TL.



Pomacentrus pavo, 13 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Mauritius, Maldives, India and Sri Lanka; elsewhere to Andaman Sea, Indonesia, Taiwan, southern Japan, Marshall Is., Australia, Gilbert Is., Tuamotu Is. and Marquesas Is.

REMARKS Found inshore and in lagoons on coral patches surrounded by sand, in 1–16 m.

Pomacentrus philippinus Evermann & Seale 1907

Philippine damsel PLATE 51

Pomacentrus philippinus Evermann & Seale 1907: 91, Fig. 18 (Bacon, Sorsogon, Philippines); Allen 1991*.

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 14–16 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2 in SL. GR 23 or 24. LL scales 17 or 18.

Body dark grey, with narrow blackish scale margins; head with scattered blue lines and spots; large black spot covering pectoral-fin bases; caudal fin yellow. Western Pacific fish usually with orange dorsal- and anal-fin rays and caudal fin. Indian Ocean population possibly a distinct, undescribed species. Attains 10 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to Andaman Sea, Philippines, Ryukyu Is., Melanesia and Solomon Is.

REMARKS Inhabits reef passages and outer slopes, often in shadows of overhanging cliffs and ledges, to ~12 m deep.

Pomacentrus pikei Bliss 1883

Bluelip damsel PLATES 50, 51 & 53

Pomacentrus pikei Bliss 1883: 54 (Mauritius, Mascarenes); Allen 1991*; Heemstra *et al.* 2004; Fricke *et al.* 2009.
Pomacentrus sulfureus (non Klunzinger 1871): Smith 1960 [in part].

Dorsal fin 14 spines, 13 or 14 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2.1 in SL. GR 19–23. LL scales 16–18.

Body bright yellow, with vertical blue streaks on scales; pair of blue lines from snout to eyes, bluish lips, and scattered pale blue spots on head, as well as on dorsal and anal fins; small

black spot at base of upper pectoral-fin rays. Juveniles purplish grey, except yellow on head, anterodorsal portion of body and adjacent dorsal fin; prominent ocellus on dorsal fin between spines and rays; pelvic fins and anterior part of anal fin yellow; other fins translucent. Attains 10 cm TL.



Pomacentrus pikei, 8 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: endemic to Mascarenes.

REMARKS Known from coral or rocky reefs, in 1–6 m.

Pomacentrus proteus Allen 1991

Colombo damsel PLATES 52 & 53

Pomacentrus proteus Allen 1991: 156, 231, Fig. (Colombo, Sri Lanka).

Dorsal fin 14 spines, 13 or 14 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 19 rays. Body depth 1.8–1.9 in SL. GR 19 or 20. LL scales 19.

Body yellowish brown, with 1 or 2 blue spots or an elongate blue streak on most scales of head, body, and basal sheaths of median fins; blue-rimmed black spot posteriorly on dorsal fin; fins mostly brown to translucent, median fins and pelvic fins with narrow blue margins. Juveniles bluish on head and upper half of body, yellow on lower half; blue spots and streaks as described for adults, and pair of blue stripes above eyes; dorsal fin mostly brown, with blue bands and streaks, and large ocellus posteriorly; other fins yellow. Attains 10 cm TL.

DISTRIBUTION Indian Ocean: Sri Lanka and Andaman Sea.

REMARKS Inhabits silty coral and rubble reefs, in 2–10 m.

Pomacentrus rodriguesensis Allen & Wright 2003

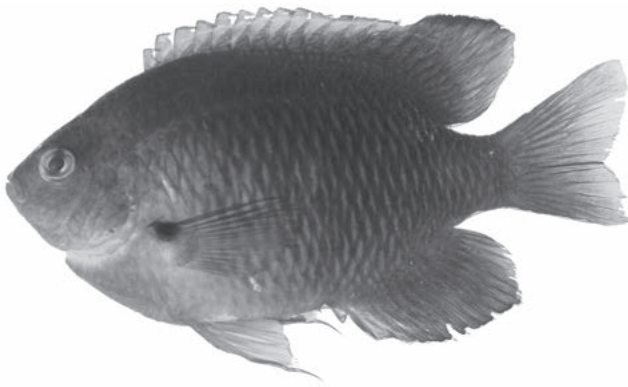
Rodrigues damsel

PLATE 51

Pomacentrus rodriguesensis Allen & Wright 2003: 134, Figs. 1–3
(Grand Pate, Rodrigues, Mascarenes); Heemstra *et al.* 2004.

Dorsal fin 14 (rarely 13) spines, 13 or 14 rays; anal fin 2 spines, 15 rays (some specimens with 12 or 16 rays); pectoral fins 17–19 (usually 18) rays. Body depth 1.9–2 in SL. GR 19–21. LL scales 17 or 18.

Body brown, with darker scale margins, and yellowish hue ventrally between pectoral- and pelvic-fin bases; dorsal fin brown with broad yellow margin; anal and caudal fins brown; pelvic fins yellow with dark brown filamentous tips; iris golden yellow. Attains 10.5 cm TL.



Pomacentrus rodriguesensis, 10 cm TL (Rodrigues).
PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Rodrigues.

REMARKS Known from silt-affected reef of lagoon with *Acropora* coral, at 9–18 m.

Pomacentrus similis Allen 1991

Similar damsel

PLATES 51 & 53

Pomacentrus similis Allen 1991: 157, 232, Fig. (Trincomalee, Sri Lanka).

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 14 rays; pectoral fins 17–19 rays. Body depth 2.4–2.6 in SL. GR 18–21. LL scales 18.

Body bright blue, with narrow dark scale margins; caudal fin and pelvic fins yellow, and pelvic fins with blue leading edge; peduncle with blue spots forming transverse lines;

caudal fin with narrow blue upper and lower margins. Attains 7 cm TL.

DISTRIBUTION Indian Ocean: Sri Lanka, Andaman Sea and Indonesia (northern Sumatra).

REMARKS Collected from coral reefs and silty harbours around wreckage and coral or rock outcrops, in 2–10 m.

Pomacentrus sulfureus Klunzinger 1871

Sulphur damsel

PLATE 51

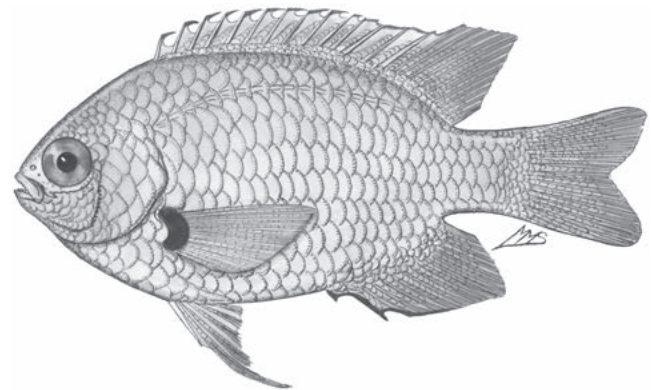
Pomacentrus sulfureus Klunzinger 1871: 521 (Al-Qusayr, Egypt, Red Sea); Smith 1960; Allen & Randall 1980*; Allen 1991*; Manilo & Bogorodsky 2003.

Pomacentrus grandidieri Steindachner 1891: 372, Pl. 11, Fig. 3
(Madagascar).

Pomacentrus scintillans Smith 1955: 895, Pl. 20a (Zanzibar, Tanzania).

Dorsal fin 14 spines, 13–15 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 17–19 rays. Body depth 2–2.1 in SL. GR 18–23. LL scales 14–17.

Body and fins bright yellow, except upper sides slightly dusky grey; prominent black spot covering pectoral-fin bases. Juveniles yellow, except sides pale grey with blue streak on each scale; fins yellow to translucent; dorsal fin with blue-edged black ocellus between spines and rays. Attains 11 cm TL.



Pomacentrus sulfureus, 8 cm TL (N Mozambique). Source: Smith & Smith 1963

DISTRIBUTION WIO (to ~21° S): Red Sea, Yemen, Kenya to Mozambique, Madagascar, Zanzibar (Tanzania), Comoros, Aldabra and Seychelles.

REMARKS Found mainly on inshore coral reefs, at 1–5 m.

Pomacentrus trichrourus Günther 1867

Paletail damsel

PLATES 51, 52 & 53

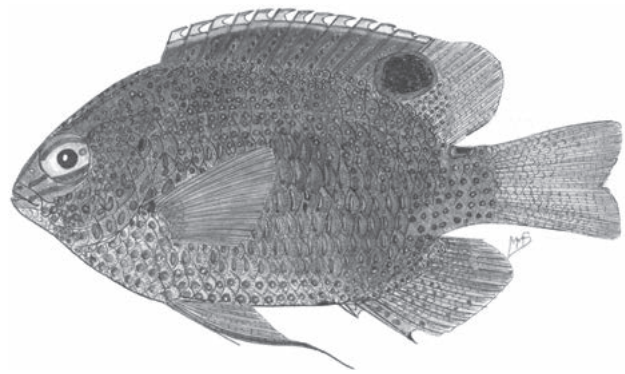
Pomacentrus trichrourus Günther in Playfair & Günther 1867: 146, Pl. 17, Fig. 5 (Zanzibar, Tanzania); Smith 1960*; Allen & Randall 1980*; SSF No. 219.41* [as *trichourus*]; Allen 1991*; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Dorsal fin 14 spines, 14–16 rays; anal fin 2 spines, 15–17 rays; pectoral fins 16 or 17 rays. Body depth 1.9–2 in SL. GR 19–24. LL scales 17 or 18.

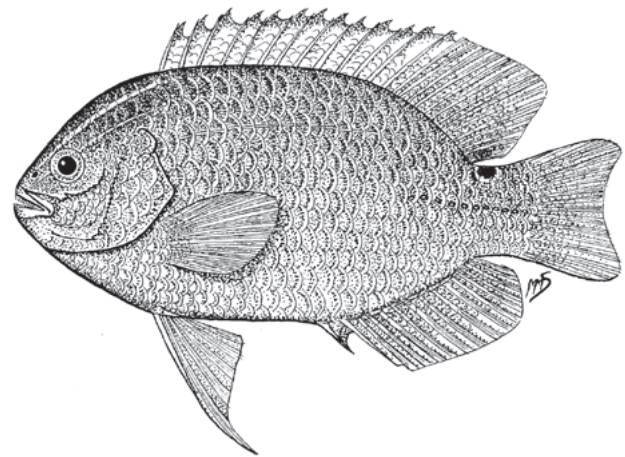
Body dark grey, with paler scale centres; peduncle darker than rest of body or with vertically ovate black spot; small blackish 'ear' spot on upper gill cover; black spot covering pectoral-fin bases; pectoral fins translucent; caudal fin abruptly white to pale yellowish; other fins dark grey. Juveniles blue dorsally on head and nape; blue-rimmed black ocellus at front of soft-rayed dorsal fin (sometimes persisting in adults). Attains 11 cm TL.

DISTRIBUTION WIO: Persian/Arabian Gulf, Red Sea, Oman to South Africa (Sodwana Bay), Tanzania (Zanzibar), Madagascar, Comoros and Mascarenes.

REMARKS Found on inshore and outer coral reefs, in 1–43 m (usually <15 m).



Pomacentrus trilineatus, 6 cm TL (N Mozambique). Source: SSF



Pomacentrus trilineatus, 10 cm TL (WIO). Source: SFSA

Pomacentrus trilineatus Cuvier 1830

Threeline damsel

PLATES 51 & 53

Pomacentrus trilineatus Cuvier (ex Ehrenberg) in Cuv. & Val. 1830: 428 (Red Sea); Allen & Randall 1980*; SSF No. 219.42*; Allen 1991*; Randall 1995; Manilo & Bogorodsky 2003.

Pomacentrus biocellatus Rüppell 1838: 127, Pl. 31, Fig. 3 (Massawa, Eritrea, Red Sea).

Pomacentrus tripunctatus (non Cuvier 1830): Smith 1960* [in part]; SFSA No. 756*.

Dorsal fin 13 spines, 14–16 rays; anal fin 2 spines, 15–17 rays; pectoral fins 17 or 18 rays. Body depth 1.9–2.1 in SL. GR 25–31. LL scales 16–19.

Body yellowish brown, dark brown or bluish grey, with darker scale edges, and frequently with small blue spots on scales of rear half of body; large pale spots on lower half of opercle; small blue-edged black spot on upper edge of peduncle, and rear of peduncle and adjacent fins usually paler than body. Juveniles yellow, with blue spot on most body scales; pair of bright blue bands dorsally on head extending along dorsal-fin base; large blue-rimmed black ocellus on dorsal fin between spines and rays. Attains 10 cm TL.

DISTRIBUTION WIO: Red Sea, central Oman, Kenya to Mozambique (Inhaca I.), Madagascar and Seychelles.

REMARKS Common on shallow reefs, to ~4 m.

Pomacentrus tripunctatus Cuvier 1830

Threespot damsel

PLATE 51

Pomacentrus tripunctatus Cuvier in Cuv. & Val. 1830: 421 (Vanikoro I., Santa Cruz Is.); Allen 1991*.

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 18 rays. Body depth 1.8–2 in SL. GR 20–22. LL scales 17 or 18.

Body dark greyish brown, with darker scale edges; small blackish 'ear' spot on upper opercle; black spot or saddle-like marking on upper half of peduncle, usually preceded by small blue spot; fins dark grey to translucent; pectoral-fin axil with black spot, base of uppermost rays whitish. Juveniles with blue-rimmed black ocellus posteriorly on dorsal fin. Attains 10 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Sri Lanka; elsewhere to Andaman Sea, Malaysia, Indonesia, Ryukyu Is., Melanesia, Santa Cruz Is., Australia and New Caledonia.

REMARKS Found close to shore in very shallow water, usually <1 m.

GENUS *Pomachromis* Allen & Randall 1974

Body elongate, depth 2.5–2.7 in SL; margins of opercular series smooth (except small flattened spine at upper edge of opercle); margins of suborbitals and preopercle smooth to weakly serrate; lachrymal and suborbitals naked; teeth incisiform, mainly uniserial (irregularly biserial at front of jaws in some specimens); dorsal fin 14 spines. Indo-Pacific; 4 species, 1 in WIO.

Pomachromis richardsoni (Snyder 1909)

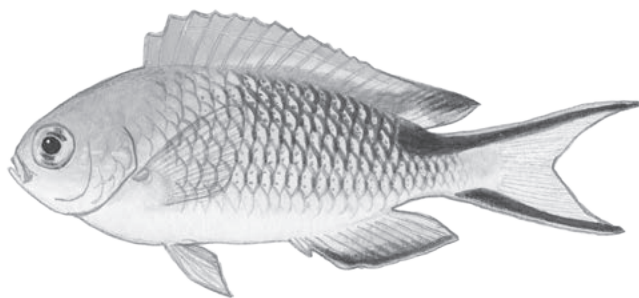
Black-edged reef damsel PLATE 53

Abudefduf richardsoni Snyder 1909: 600 (Naha, Okinawa I., Japan).

Pomachromis richardsoni: Allen 1991*; Fricke *et al.* 2009.

Dorsal fin 14 spines, 13 or 14 rays; anal fin 2 spines, 13 or 14 rays; pectoral fins 18 rays. Body depth 2.5–2.7 in SL. GR 24 or 25. LL scales 18 or 19.

Upper half of head and nape pale brown; upper sides pale blue-grey, with bluish scale margins; head and body white ventrally; upper half of peduncle blackish, this mark tapering posteriorly along caudal-fin upper margin, and less so along lower margin; fins generally pale brown to whitish, but soft-rayed dorsal and anal fins with darkish margins, and intensely white area at bases of dorsal-fin rays; black spot in pectoral-fin axils. Attains 8 cm TL.



Pomachromis richardsoni, 5 cm SL (Mauritius).

DISTRIBUTION Indo-Pacific (widespread, but scattered localities). WIO: Réunion and Mauritius; elsewhere to Taiwan, southern Japan, Great Barrier Reef, Loyalty Is., Fiji and Samoa.

REMARKS Collected from exposed outer reef, at 10–20 m.

GENUS *Pristotis* Rüppell 1838

Margins of lachrymal, subopercle and interopercle serrate; edge of suborbitals hidden under scales; predorsal scales extending to about middle of interorbital region; teeth on jaws uniserial; LSS <30; dorsal fin 13 spines. Two species, both in WIO.

KEY TO SPECIES

- | | | |
|----|--|-------------------------|
| 1a | LL scales 15–17 [Red Sea and Gulf of Aden] | <i>P. cyanostigma</i> |
| 1b | LL scales 19–20 [widespread in Indo-Pacific] | <i>P. obtusirostris</i> |

Pristotis cyanostigma Rüppell 1838

Blue-dotted damsel PLATES 52 & 53

Pristotis cyanostigma Rüppell 1838: 128, Pl. 31, Fig. 5 (Massawa, Eritrea, Red Sea); Smith 1960*; Allen & Randall 1980*; Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 11 or 12 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 17 or 18 rays. Body depth 2.4–2.6 in SL. GR 27–30. LL scales 15–17.

Body pale grey, except yellow swathe on top of head and dorsum; each scale on upper sides with blue spot, forming horizontal rows; fins pale bluish or yellowish to translucent. Attains 10 cm TL.

DISTRIBUTION WIO: Red Sea and Gulf of Aden.

REMARKS Found on coral reefs, in 5–10 m.

Pristotis obtusirostris (Günther 1862)

Gulf damsel PLATE 52

Pomacentrus obtusirostris Günther 1862: 24 [no locality given].

Pomacentrus jerdoni Day 1873: 237 (Chennai, India).

Pristotis judithae Tyler 1966: 1, Fig. 1 (off Mahé, Seychelles).

Pristotis jerdoni: Allen 1991*; Randall 1995*.

Pristotis obtusirostris: Randall 1995*; Carpenter *et al.* 1997*; Anderson *et al.* 1998; Manilo & Bogorodsky 2003.

Dorsal fin 13 spines, 12 or 13 rays; anal fin 2 spines, 12–14 rays; pectoral fins 17 or 18 rays. Body depth 2.5–2.9 in SL. GR 26–28. LL scales 19 or 20.

Body pale grey or whitish, sometimes with yellow swathe on top of head and dorsum; each scale on sides with blue spot, more noticeable on upper half of body; fins pale bluish or whitish to translucent. Attains 14 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman, Seychelles and Maldives; elsewhere to east coast of India, Indonesia, Philippines, Ryukyu Is., New Guinea, Australia and New Caledonia.

REMARKS Occurs mainly along continental margins, rarely at oceanic islands. Found on flat sandy or rubble bottom, around coral or rock outcrops, at 5–80 m.

GENUS *Stegastes* Jenyns 1840

Margins of suborbitals and preopercle with distinct serrations; no notch between lachrymal and suborbital series; teeth on jaws uniserial, relatively long and close-set; suborbitals scaly; snout scaly to nostrils; body depth 1.6–2.3 in SL; dorsal fin 12–14 spines. Atlantic and Indo-Pacific; ~33 species, 7 in WIO.

KEY TO SPECIES

- | | | |
|----|--|-------------------------|
| 1a | Dorsal fin 12 spines | 2 |
| 1b | Dorsal fin 13 or 14 spines | 5 |
| 2a | Lachrymal broad, its depth greater than eye diameter in fish >5 cm SL; 1½ scale rows between lateral line and base of middle dorsal-fin spines; GR 15–19 on lower limb of 1st arch | <i>S. punctatus</i> |
| 2b | Lachrymal narrower, its depth ~½–⅔ eye diameter in adults; 2½–3½ scale rows between lateral line and base of middle dorsal-fin spines; GR 10–15 on lower limb of 1st arch | 3 |
| 3a | Inner surface of pectoral-fin bases scaly | <i>S. albifasciatus</i> |
| 3a | Inner surface of pectoral-fin bases naked | 4 |
| 4a | Base of upper pectoral-fin rays with dark pupil-sized spot; dark spot (generally brown, often eye-sized) at base of last dorsal-fin rays; peduncle depth 2–2.4 in HL | <i>S. nigricans</i> |
| 4b | Base of upper pectoral-fin rays without dark spot; body generally black or dark brown, without dark spot at base of last dorsal-fin rays; peduncle depth 1.8–2 in HL | <i>S. limbatus</i> |

Continued ...

KEY TO SPECIES

- | | | |
|----|---|-------------------------|
| 5a | Dorsal fin 14 spines | <i>S. pelicieri</i> |
| 5b | Dorsal fin 13 spines | 6 |
| 6a | Scale rows 2½ between lateral line and middle dorsal-fin spines | <i>S. luteobrunneus</i> |
| 6b | Scale rows 3½ between lateral line and middle dorsal-fin spines | <i>S. obreptus</i> |

Stegastes albifasciatus (Schlegel & Müller 1840)

Whitebar gregory

PLATE 54

Pomacentrus albifasciatus Schlegel & Müller 1840: 21 (northeastern coast of Sulawesi, Indonesia).

Stegastes albifasciatus: Allen & Emery 1985*; Allen 1991*; Heemstra *et al.* 2004.

Dorsal fin 12 spines, 15 or 16 rays; anal fin 2 spines, 12 or 13 rays; pectoral fins 19 or 20 rays. Body depth 1.8–2.1 in SL. GR 19–26. LL scales 18–20.

Body dark grey-brown, scale centres pale grey to bluish; bluish streak below eyes; several large blue spots on opercle; broad white bar often present across body from last dorsal-fin spines to anterior part of anal fin; fins mainly dark grey to translucent; vertically ovate black spot preceded by white streak at bases of last dorsal-fin rays; black spot on upper part of pectoral-fin bases. Attains 11 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya, Mozambique, Seychelles, Mascarenes, St Brandon Shoals, Chagos, Maldives and Sri Lanka; elsewhere to Indonesia, Ryukyu Is., Wake Atoll, Australia, Tuamotu Is. and Line Is.

REMARKS Known from rubble and boulder areas exposed to wave action, to ~2 m deep.

Stegastes limbatus (Cuvier 1830)

Ebony gregory

PLATES 52 & 54

Glyphisodon limbatus Cuvier *in* Cuv. & Val 1830: 477 (Réunion, Mascarenes).

Pomacentrus pristiger Valenciennes *in* Cuv. & Val. 1833: 506 (Mauritius, Mascarenes).

Pomacentrus (Brachypomacentrus) ater Bleeker (ex Liénard) 1879: 5, Pl. 2 (Mauritius, Mascarenes).

Pomacentrus madagascariensis Sauvage 1882: 174 (Madagascar).

Stegastes limbatus: Allen & Emery 1985*; Allen 1991*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 12 (rarely 13) spines, 15–17 rays; anal fin 2 spines, 12–14 rays; pectoral fins 18–20 rays. Body depth 1.8–1.9 in SL. GR 20–23. LL scales 18–20.

Body bluish black, scale outlines black, and scales on nape and sides of head frequently blue; lips whitish; small black spot near lateral-line origin; fins bluish black, with narrow blue leading edges on pelvic fins and anal fin. Adults may have a broad white bar across middle of sides that can be quickly 'switched' on or off. Juveniles pale brown, darker dorsally; suborbital and opercle with small, scattered, pale blue spots; small black spot at bases of last dorsal-fin rays and another at bases of uppermost pectoral-fin rays. Attains 15 cm TL.

DISTRIBUTION WIO: Madagascar and Mascarenes.

REMARKS Known from inshore reefs and among boulders exposed to wave action, in 1–2 m.

Stegastes luteobrunneus (Smith 1960)

Indian gregory PLATES 51 & 54

Pomacentrus luteobrunneus Smith 1960: 343, Pls. 26f, 27f (Aldabra I., Seychelles); Fricke *et al.* 2009.

Pomacentrus craticulus Smith 1965: 31, Pl. 7b (Durban, KwaZulu-Natal, South Africa).

Stegastes fasciolatus (*non* Ogilby 1889): Allen & Emery 1985* [in part]; SSF No. 219.43*; Winterbottom *et al.* 1989; Allen 1991* [in part]; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

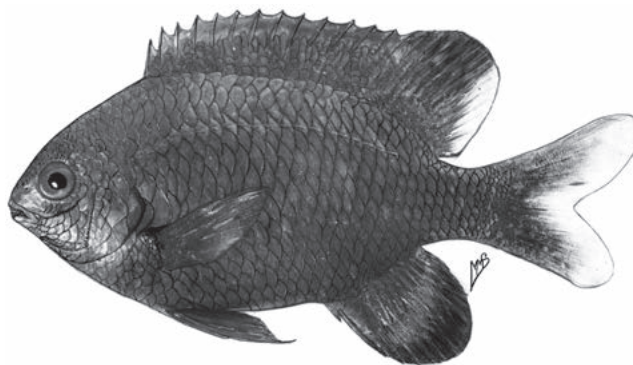
Dorsal fin 13 spines, 15–17 rays; anal fin 2 spines, 12–14 rays; pectoral fins 19–21 rays. Body depth 1.6–2.1 in SL. GR 15–19. LL scales 19–21.

Body generally dark brown, with dark scale margins; violet streak below eyes and scattered violet spots on head and lower sides; fins brown to tannish, except pectoral fins translucent with small black spot at base of uppermost rays. Juveniles greyish brown, with blue spot at centre of most body scales, and blue streak on snout and below eyes; black spot with yellow upper rim at beginning of dorsal fin; peduncle and caudal-fin base yellow. Attains 15 cm TL.

DISTRIBUTION Indian Ocean (widespread): Gulf of Aden to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes, Chagos and Sri Lanka; elsewhere to Andaman Sea and Cocos (Keeling) Is.

REMARKS Found on rocky and coral reefs exposed to moderate wave action, usually to ~5 m deep. Closely related to and previously confused with *S. fasciolatus* (Ogilby 1889) from

the Pacific; however, genetic evidence clearly separates the two populations (DR Robertson, pers. comm.).



Stegastes luteobrunneus, 12 cm TL, holotype (Seychelles).
Source: Smith 1960

Stegastes nigricans (Lacepède 1802)

Dusky damsel PLATE 52

Holocentrus nigricans Lacepède (ex Commerson) 1802: 332, 367 [no locality given: probably Mauritius].

Pomacentrus scolopseus Quoy & Gaimard 1825: 398 (Mauritius, Mascarenes).

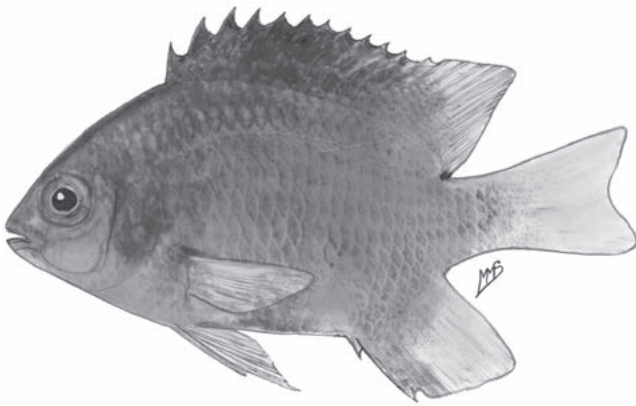
Pomacentrus taeniops Cuvier in Cuv. & Val. 1830: 423 (Mauritius; Bora Bora; Guam, Mariana Is.).

Pomacentrus nigricans: Smith 1960*.

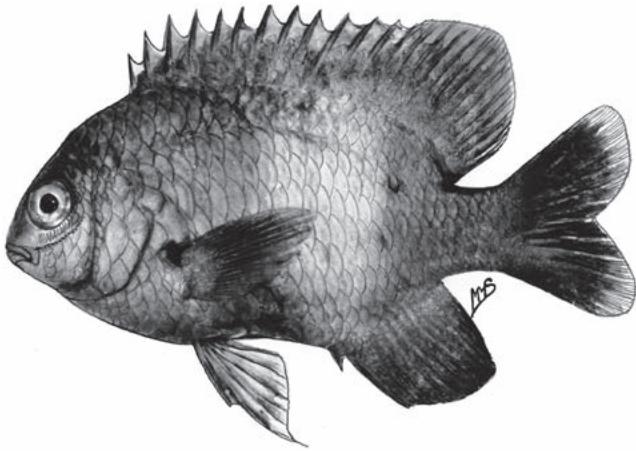
Stegastes nigricans: Allen & Randall 1980*; Allen & Emery 1985*; SSF No. 219.44*; Allen 1991*; Manilo & Bogorodsky 2003; Fricke *et al.* 2009.

Dorsal fin 12 spines, 14–17 rays; anal fin 2 spines, 12–14 rays; pectoral fins 18–20 rays. Body depth 1.9–2 in SL. GR 21–25. LL scales 18–20.

Body generally shades of brown, darker on dorsally on head and nape, grading to tan on breast and lower sides; body scales with dark brown margins and frequently with blue streak at centre; lips whitish; suborbital region mainly blue, and several scales of preopercle and opercle with blue centres; small dark brown spot near lateral-line origin; fins brownish, bases of last dorsal-fin rays sometimes with eye-sized dark brown or blackish spot; dark spot at base of uppermost pectoral-fin rays. Nest-guarding males with broad whitish bar across middle of sides. Juveniles mainly pale yellow to whitish, grading to black or brown anterodorsally, with small blackish spot at rear of dorsal-fin base and another at base of uppermost pectoral-fin rays. Attains 14 cm TL.



Stegastes nigricans, 6 cm TL (Kenya). Source: SSF



Stegastes nigricans, 11 cm TL (N Mozambique). Source: Smith 1960

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Somalia to Mozambique (Inhaca I.), Madagascar, Comoros, Seychelles, Mascarenes, Chagos and Maldives; elsewhere to Ryukyu Is., Australia, Tuamotu Is., Marquesas Is. and Line Is.

REMARKS Found in lagoons and on inshore coral reefs, often among dead *Acropora* staghorn coral, in 1–12 m.

Stegastes obreptus (Whitley 1948)

Western gregory

PLATE 52

Pomacentrus obreptus Whitley 1948: 275 (Monte Bello Is., Western Australia).

Stegastes obreptus: Allen & Emery 1985*; Allen 1991*.

Dorsal fin 13 spines, 14–16 rays; anal fin 2 spines, 12–14 rays; pectoral fins 18–20 rays. Body depth 1.7–2.2 in SL. GR 15–20. LL scales 19–21.

Body dark grey-brown to blackish, with black scale margins; fins mostly dark brownish, with black spot on membrane between 1st and 3rd dorsal-fin spines; leading edge of pelvic fins and anal fin bright blue; small black spot at base of uppermost pectoral-fin rays. Juveniles bright yellow, with dusky scale margins; scattered blue spots on preopercle and opercle; prominent blue-edged black ocellus between 1st and 6th dorsal-fin spines. Attains 15 cm TL.

DISTRIBUTION Indo-Pacific. WIO: India and Sri Lanka; elsewhere to Andaman Sea, Ryukyu Is. and Australia.

REMARKS Known from rocky and coral reefs of lagoons and inshore areas, in 2–6 m.

Stegastes pelicieri Allen & Emery 1985

Mauritian gregory

PLATES 52 & 54

Stegastes pelicieri Allen & Emery 1985: 27, Pl. 3, Figs. G–H (off Flic-en-Flac, Mauritius); Allen 1991*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 14 spines, 14–16 rays; anal fin 2 spines, 14 or 15 rays; pectoral fins 19–20 rays. Body depth 1.8–2 in SL. GR 19–24. LL scales 19–20.

Body dark brown, with narrow black scale margins; pectoral fins translucent; other fins mostly dark brown, except caudal fin lobes and dorsal fin rear margin broadly yellow, and leading edges of pelvic fins and anal fin bright blue. Juveniles and subadults with small blue spots scattered on sides. Attains 14 cm TL.



Stegastes pelicieri, 5 cm SL, juvenile (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: South Africa, Madagascar and Mascarenes.

REMARKS Found on rocky inshore reefs, in 2–10 m.

Stegastes punctatus (Quoy & Gaimard 1825)

Bluntnout gregory

PLATE 54

Pomacentrus punctatus Quoy & Gaimard 1825: 395, Pl. 64, Fig. 1 (Mauritius, Mascarenes); Fricke *et al.* 2009.

Pomacentrus lividus (non Forster 1801): Smith 1960*.

Stegastes lividus (non Forster 1801): Allen & Randall 1980*; Allen & Emery 1985; Allen 1991*; Manilo & Bogorodsky 2003.

Dorsal fin 12 spines, 14–16 rays; anal fin 2 spines, 12–14 rays; pectoral fins 18 or 19 rays. Body depth 1.9–2 in SL. GR 23–29. LL scales 17–19.

Body generally brown, lower part of head and breast paler; scales with dark margins and often with blue spot at centre (suborbital scales mostly blue); fins brown; fish from WIO also with pale-edged black ocellus at base of last dorsal-fin rays. Nest-guarding males with broad white stripe from mouth to pectoral region, and white bar on middle of sides. Juveniles orange-brown, with white-rimmed ocellus at base of last dorsal-fin rays. Attains 15 cm TL.



Stegastes punctatus, 15 cm TL (N Mozambique). Source: Smith 1960

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Kenya to Mozambique, Madagascar, Seychelles, Mascarenes, Maldives and Sri Lanka; elsewhere to Thailand, Ryukyu Is., Australia, Society Is. and Line Is.

REMARKS Found in lagoons and on inshore coral reefs, often among dead *Acropora* staghorn coral in 1–5 m. A pugnacious fish occurring in colonies. Previously referred to in the region as *S. lividus* (Forster 1801), which is endemic to Marquesas Is.

GENUS *Teixeirichthys* Smith 1953

Margins of suborbital series, preopercle, subopercle and interopercle serrate; lachrymal and suborbitals naked; predorsal scales extending to middle of interorbital region; teeth on jaws uniserial; LSS 43–48, LL scales 28–32; dorsal fin 13 spines. One species.

Teixeirichthys jordani (Rutter 1897)

Spotted damsel

PLATES 52 & 54

Pomacentrus jordani Rutter 1897: 77 (Shantou, China).

Pomacentrus polylepis Regan 1908: 229, Pl. 24, Fig. 3 (St Brandon Shoals).

Teixeirichthys mossambicus Smith 1953: 14, Fig. 1 (Mozambique Channel).

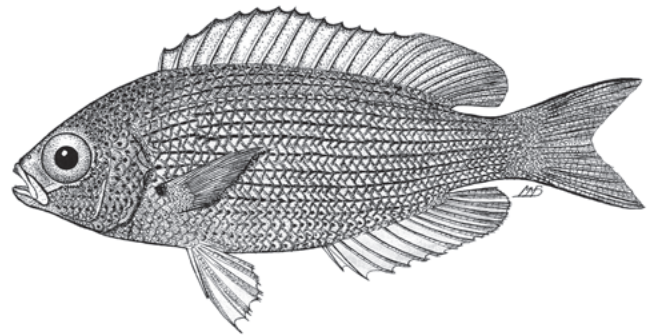
Teixeirichthys jordani: Allen & Randall 1980*; SSF No. 219.45*;

Allen 1991*.

Daya jordani: Manilo & Bogorodsky 2003.

Diagnosis as for genus. Dorsal fin 13 spines, 11–13 rays; anal fin 2 spines, 13 rays; pectoral fins 18 or 19 rays. Body depth 2.6–2.9 in SL. GR 27–31. LL scales 28–32.

Body pale blue-grey with silvery sheen, grading to white ventrally; scattered blue spots dorsally on head, blue stripes from snout to eyes, and thin blue stripes following scale rows on sides; fins mostly pale blue to whitish or translucent, median fins with faint blue stripes or streaks; upper part of pectoral-fin bases with pupil-sized black spot. Attains 13 cm TL.



Teixeirichthys jordani, 12 cm TL, holotype of *T. mossambicus* (S Mozambique). Source: Smith 1953

DISTRIBUTION Indo-Pacific (widespread, mainly along continental margins). WIO: Red Sea, Kenya to South Africa, Seychelles, St Brandon Shoals and Sri Lanka; elsewhere, Australia to China, Taiwan and Japan.

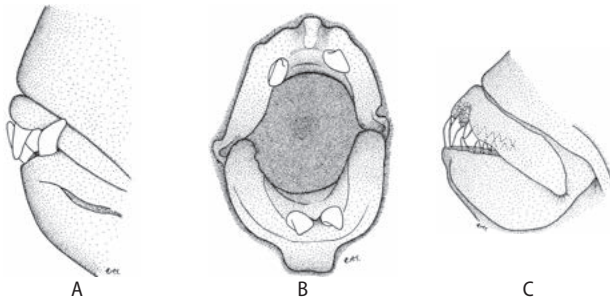
REMARKS Found in seagrass beds and on sandy-rubble bottom of trawling grounds, in 10–30 m.

FAMILY LABRIDAE

Wrasses

John E Randall and Benjamin C Victor

One of the most species-rich families in the Indo-Pacific region, second only to the Gobiidae, and the most diverse in body size and form. Body shapes vary from elongate to oblong, and slightly to strongly compressed; size varies from the slender *Minilabrus striatus* at 45 mm long, to the deep-bodied giant humphead wrasse *Cheilinus undulatus* at >2 m long. Dorsal fin continuous (except for some species of *Iniistius*), with 8–21 spines, 6–21 rays; anal fin 2 or 3 spines (except 4–6 in *Acantholabrus* and *Ctenolabrus*, not present in WIO), 7–14 rays; pelvic fins 1 spine, 5 rays. Mouth small to moderate, protractile, and terminal or occasionally with lower jaw projecting (as in some *Cheilinus*); lips often fleshy. Teeth in jaws conical, usually some canines at front, and specialised incisiform teeth in *Anampses* and *Pseudodax*; canine may be present at corners of mouth; usually no teeth on palate (rarely on vomer in a few species); paired upper pharyngeal bones and single lower pharyngeal plate (triangular, Y-shaped or T-shaped) with conical, nodular or molariform teeth. Branchiostegal rays 5 or 6. Lateral line continuous or interrupted. Scales cycloid; head often naked, or only cheeks and opercles scaly. Vertebrae 23–41 (with higher numbers in the temperate species).



Teeth of (A) *Choerodon robustus*; (B) *Anampses caeruleopunctatus*; (C) *Novaculichthys taeniourus*.

Most species are especially colourful and many have complex patterns; juveniles often differ in colour from adults, and many species exhibit sexual dichromatism, generally associated with a change in sex from female to male. The first colour form of those species with sex reversal is termed the initial phase (IP in picture captions), and is usually less colourful than the terminal male phase (TP in picture captions). The terminal male tends to establish a territory and maintain a harem of females, mating with one female at a time, typically after a rapid, upward spawning rush. Those species with both females and males in the initial phase usually spawn in aggregations. (Thus, a species may have two different styles of reproduction.) Unless sex

change is definitely known for a species, the terms ‘initial phase’ and ‘terminal male’ are not used here. A few temperate labrids build nests in seaweeds, but the great majority of wrasses produce numerous, tiny pelagic eggs.

Mainly shallow-water fishes, though some species of *Bodianus* and *Decodon* occur in deep water (200+ m). Most live on coral reefs or rocky substrate, a few in seagrasses or thick algal beds, and the razorfishes (*Cymolutes*, *Iniistius*, *Novaculops* and *Xyrichtys*) are found over open stretches of sand into which they dive when disturbed. Wrasses are carnivorous; some species, such as those of the genera *Cirrhilabrus*, *Paracheilinus* and *Pseudocoris*, feed on zooplankton, but most prey on a large variety of invertebrates, especially hard-shelled molluscs, sea urchins and crustaceans, which they crush with their pharyngeal teeth, and a few prey on small fishes. *Labroides* and the young of some other wrasses, e.g., *Bodianus*, *Pseudodax* and *Thalassoma*, feed in part on crustacean ectoparasites as well as the mucus of other fishes. *Labropsis*, *Labrichthys* and *Larabicus* are also well known as ‘cleaner wrasses’ in their juvenile stage, whereas the adults feed mainly on coral polyps. Wrasses are diurnal; many of the smaller species bury in sand at night, whereas others lodge tightly in the reef to sleep.

Priority has been given in the synonymies to publications that provide good illustrations of WIO fishes. The *Poissons de l’océan Indien et de la mer Rouge* by Marc Taquet and Alain Diringier (2012) is not cited because localities are not given. *Terelabrus flavocephalus* Fukui & Motomura 2016 was described from Maldives recently (but is not included here).

Labridae *sensu stricto* contains 556 species in 60 genera as of 2020 (reviewed in Parenti & Randall 2000, and updated in Parenti & Randall 2011 & 2018); 39 genera and 158 species in WIO.

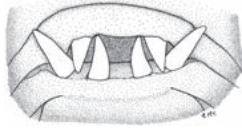
KEY TO GENERA

- | | | |
|----|---|----------------------|
| 1a | Dorsal fin 12 or 13 spines | 2 |
| 1b | Dorsal fin 8–11 spines | 4 |
| 2a | First 3 spines of dorsal fin much longer than remaining spines and almost separated from rest of fin; LL scales 50–52 | <i>Anchichoerops</i> |
| | | |
| 2b | First 3 spines of dorsal fin shorter than remaining spines and not separated from rest of fin; LL scales 29–46 | 3 |

Continued...

KEY TO GENERA

- 3a Second pair of canine teeth at front of lower jaw curved laterally; cheek scales not anterior to middle of eye; no scaly sheath at base of dorsal and anal fins *Choerodon*



- 3b Second pair of canine teeth at front of lower jaw not curved laterally; cheek scales extending forward to or almost to corner of mouth; prominent scaly sheath at base of dorsal and anal fins *Bodianus*

- 4a Scleral pupil of eye divided into 2 near-equal parts 5
4b Scleral pupil of eye not divided 8

- 5a Lateral line continuous, LL scales 22–24; median predorsal scales 4; body depth 2.2–2.7 in SL *Pteragogus*
5b Lateral line interrupted, LL scales 14–18 + 6–8; median predorsal scales 4–6; body depth 2.6–4.1 in SL 6

- 6a Dorsal fin 11 spines, 9 rays *Cirrhilabrus*
6b Dorsal fin 9 spines, 11 rays 7

- 7a Three pairs of large canines at front of upper jaw; snout length 3.3–4.7 in HL; branchiostegal rays 5 *Paracheilinus*
7b Two pairs of large canines at front of upper jaw; snout length 2.5–3.3 in HL; branchiostegal rays 6 *Pseudocheilinus*

- 8a Dorsal fin 8 spines 9
8b Dorsal fin 9–11 spines 11

- 9a Canine present posteriorly in upper jaw, at corners of mouth; teeth on sides of upper jaw rudimentary or absent; pectoral fins 14 rays; maximum size ~6 cm SL *Minilabrus*
9b No canine at corners of mouth; teeth well-developed on sides of upper jaw; pectoral fins 15–17 rays; maximum size 16–43 cm SL 10

- 10a Snout of adults elongate, 1.7–2 in HL; mouth extremely protrusile; 2 pairs of canines at front of jaws *Gomphosus*
10b Snout not elongate, 2.5–3.4 in HL; 1 pair of canines at front of upper jaw and 1 or 2 pairs at front of lower jaw *Thalassoma*

- 11a Dorsal fin 11 spines 12
11b Dorsal fin 9 spines 13

- 12a Dorsal fin 12 rays; anal fin 14 rays; pair of spatulate incisors at front of jaws, forming beak-like structure *Pseudodax*

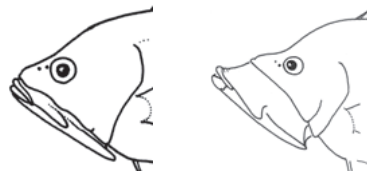
- 12b Dorsal fin 9 rays; anal fin 10 rays; dentition not as above *Decodon*

- 13a Pair of forward-projecting incisors at front of jaws, upper pair broader, usually with upcurved pointed tips; remaining teeth in jaws minute or absent, none at corners of mouth *Anampses*



- 13b Canines present at front of jaws; distinct conical teeth on sides of jaws (except *Pseudojuloides* with incisors); canine often present at corners of mouth 14

- 14a Jaws extremely protrusile; lower jaw very long, extending behind lower margin of opercle; preopercle margin scaly *Epibulus*



- 14b Jaws not extremely protrusile; lower jaw not extending behind eyes; preopercle margin without scales (except *Wetmorella*) 15

- 15a Body elongate, depth 5.5–8 in SL; lateral line continuous, sloping gradually from upper end of gill opening to midway onto caudal-fin base *Cheilio*

- 15b Body not elongate, depth 2.2–5.5 in SL; lateral line abruptly deflected downward below rear end of dorsal fin, or line divided into 2 parts 16

- 16a Lips modified: either plicate and forming short tube when mouth closed, or lower lip bilobed with U-shaped notch between lobes 17

- 16b Lips not modified, neither bilobed nor forming tube when closed 20

- 17a Lower lip bilobed, separated by U-shaped notch; body slender, depth 4.1–4.7 in SL *Labroides*

- 17b Lower lip not bilobed; lips plicate, forming short tube when mouth closed; body not slender, depth 2.6–3.3 in SL 18

Continued ...

KEY TO GENERA

- 18a Single pair of canines at front of upper jaw, followed by small teeth; pectoral fins 13 rays; body depth 1.8–2.3 in SL; top of head with scales to rear edge of eyes *Larabicus*
- 18b Two pairs of canines at front of upper jaw, and no small teeth on sides of jaw; pectoral fins 14 or 15 rays; body depth 2.6–3.8 in SL 19
- 19a LL scales 25–27; scales dorsally on head extending forward onto rear half of snout; body depth 2.6–3.2 in SL *Labrichthys*
- 19b LL scales 46–49; scales dorsally on head not extending forward to interorbital area; body depth 3.4–3.8 in SL *Labropsis*
- 20a Lateral line complete, LL scales continuous from upper end of gill opening to caudal-fin base 21
- 20b Lateral line interrupted, 1st series of LL scales from upper end of gill opening to below rear of dorsal fin, 2nd series midlaterally on rear part of body 31
- 21a LL scales 91–118; body slender, width 2.8–3.2 in depth; 2 pairs of large canines at front of jaws *Hologymnosus*
- 21b LL scales 27–78; body not slender, width 2–2.8 in depth; usually a single pair of large canines at front of jaws (2nd pair, if present, $\leq \frac{2}{3}$ length of anterior canines, or strongly recurved) 22
- 22a LL scales 47–78; first 2 dorsal-fin spines closer together than spacing between following spines 23
- 22b LL scales 25–27; all dorsal-fin spines equally spaced 24
- 23a Pair of canines at front of jaws, not laterally curved; canine present at corners of mouth (except *C. nigrotaenia*); caudal fin rounded (except truncate in large males of *C. formosa*); eyes closer to dorsal head profile than to ventral profile; large molars present on pharyngeal plates *Coris*
- 23b Pair of small canines at front of jaws, upper pair laterally curved; no canine at corners of mouth; caudal fin truncate to slightly emarginate; eyes positioned near centre of sides of head; no molars on pharyngeal plates *Pseudocoris*
- 24a Two pairs of canines at front of upper jaw, 1 pair in lower jaw, and no canine at corners of mouth; snout profile forming ~55° angle; colour in life blue, with narrow yellow stripe dorsally on body below dorsal-fin base *Frontilabrus*
- 24b Dentition not as above; snout profile forming <55° angle; colour in life not as above 25
- 25a Teeth on sides of jaws uniserial, incisiform and close-set; no canine at corners of mouth 26
- 25b Teeth on sides of jaws conical; canine present at corners of mouth 27

- 26a No canines at front of jaws; LL scales 25; scales on chest as large or larger than those on body; pectoral-fin base oblique (closer to horizontal than vertical); body depth 2.7–4.1 in SL.... *Stethojulis*



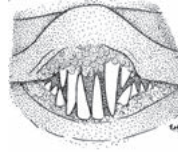
- 26b Canines present at front of jaws, and teeth on sides of jaws conical; LL scales 27; scales on chest much smaller than those on body; pectoral-fin base closer to vertical than horizontal; body depth 3.8–5.6 in SL *Pseudojuloides*
- 27a Lips thick and fleshy, lower lip vertically divided at midline; body depth 2.3–2.5 in SL; preopercle with near-vertical band of small scales *Hemigymnus*
- 27b Lips not thick and fleshy, lower lip not divided at midline; body depth 3–4.6 in SL; no near-vertical band of small scales on preopercle 28
- 28a Two pairs of canines at front of jaws, 2nd pair strongly curved laterally; pharyngeal plates without molars; body depth 4–4.7 in SL *Leptojulid*
- 28b One pair of canines at front of jaws; pharyngeal plates with molars; body depth 2.6–4.2 in SL 29
- 29a Dorsal-fin origin anterior to vertical at upper end of gill opening; anal fin 10 rays; rear free margin of preopercle short, not reaching level of ventral edge of eye (usually not above level of mouth), ventral margin barely extending beyond the rounded corner; lower pharyngeal plate with large molar flanked by only 1–3 small teeth and preceded by 4–9 small teeth *Macropharyngodon*
- 29b Dorsal-fin origin posterior to vertical at upper end of gill opening; anal fin 12 or 13 rays; rear free margin of preopercle extending to or above level of ventral edge of eye, ventral margin extending below or anterior to front of eye; lower pharyngeal plate with ≥ 1 large molars (but none as large as the largest of *Macropharyngodon*), flanked on each side by >3 small teeth, and preceded by ≥ 10 small teeth 30
- 30a Cheeks with small scales; opercles covered with large scales *Suezichthys*
- 30b Cheeks and opercles naked, except for dorsal patch of small scales in a few species *Halichoeres*

Continued...

KEY TO GENERA

- 31a No canines at front of jaws; head acutely pointed; preopercle margin scaly; maximum length ~6 cm SL *Wetmorella*
- 31b Canines present at front of jaws; head not acutely pointed; preopercle margin without scales; maximum length 8–170 cm SL 32
- 32a Dorsal fin without flexible spines; 2 pairs of canines at front of jaws; opercle fully scaly 33
- 32b Dorsal fin with 1st or more spines fin flexible; 1 pair of canines at front of jaws; opercle naked except for 1–4 scales dorsally 34
- 33a Body moderately deep, depth \geq HL, 2.3–3.1 in SL; lower jaw not protruding *Cheilinus*
- 33b Body more slender, depth <HL, 2.8–4 in SL; lower jaw protruding *Oxycheilinus*
- 34a LL scales 48–68 + 15–22; caudal fin 10 branched rays, and anal fin 2 or 3 spines *Cymolutes*
- 34b LL scales 13–15 + 5–9; caudal fin 11 or 12 (rarely 11) branched rays, and anal fin 3 spines 35
- 35a Pair of canines at front of jaws not curved posterolaterally; body depth 2.7–3 in SL; anal-fin rays notably longer than dorsal-fin rays *Novaculichthys*

- 35b Pair of canines at front of jaws curved posterolaterally; body depth 3.2–4 in SL; anal-fin rays not twice as long as dorsal-fin rays 36



- 36a Second pair of canines in jaws half length of 1st pair; head short, HL 3.4–3.7 in SL; body depth 3.4–4 in SL; dorsal and anal fins each with 13 rays; longest ray of dorsal fin about twice as long as longest spine *Novaculooides*
- 36b No 2nd pair of canines at front of jaws; HL 3.1–3.4 in SL; body depth 2.3–3.4 in SL; dorsal and anal fins each with 12 rays; longest ray of dorsal fin at most 1.5 times longest spine 37
- 37a Dorsal-fin origin over eyes or $< \frac{1}{2}$ eye diameter behind eyes; space between dorsal-fin spines 2 and 3 much greater than spaces between other spines; dorsal-fin membrane between spines 2 and 3 deeply incised or fully separated *Iniistius*
- 37b Dorsal-fin origin more than an eye diameter behind eyes; space between dorsal-fin spines 2 and 3 subequal to space between other spines; dorsal-fin membrane between spines 2 and 3 not incised 38
- 38a First spine of dorsal fin slender, flexible, and not sharp-pointed; suborbital depth 4–6 in HL; front of head without distinct sharp ridge; no scales on head *Novaculoops*
- 38b First spine of dorsal fin stiff and sharp-pointed; suborbital depth ~2 in HL; front of head with distinct sharp ridge; scales present on suborbital (presence unlikely in WIO) *Xyrichtys*

GENUS *Anampses* Quoy & Gaimard 1824

Single pair of forward-directed incisors at front of jaws, those in upper jaw broader, usually with slightly upcurved tips; other teeth minute to imperceptible; no molariform pharyngeal teeth. Dorsal fin 9 spines, 12 (rarely 11 or 13) rays; anal fin 3 spines, 12 (rarely 11 or 13) rays; pectoral fins 13 (rarely 12 or 14) rays; dorsal-fin spines and rays progressively longer, and rays slightly higher than spines, and membrane not notched; caudal fin rounded to emarginate. Lateral line continuous, deflected sharply downward below rear of dorsal fin to midlateral part of peduncle.

Species of *Anampses* forcefully strike the substrate with their forward-projecting incisors, and at the same time apply suction to obtain tiny crustaceans, molluscs, worms and foraminifera, together with sand and detritus. Thirteen species in Indo-Pacific, 4 in WIO. *Anampses viridis* Valenciennes 1840 was described from 2 dried specimens from Mauritius, distinct in having small scales on the nape. Barry Russell (pers. comm.)

considers this species is a synonym of *A. caeruleopunctatus*, as the scales on the nape of the dried specimens mistakenly resemble valid embedded scales. *Anampses geographicus* Valenciennes 1840, reported from Mauritius by Peters (1876: 443) only in a list, was probably a misidentification as it has not been recorded since and is not known elsewhere in WIO.

KEY TO SPECIES

- 1a LL scales 27; body depth 2.3–3.2 in SL; initial phase brown, with dark-edged blue spot on each scale, and head reddish brown, with blue lines radiating from eyes; terminal male olive-green, with vertical blue line on each scale, often with broad pale green bar beneath pectoral fins, and head with irregular, narrow, dark-edged blue bands *A. caeruleopunctatus*
- 1b LL scales 26; body depth 3–3.4 in SL; colour not as above 2

Continued...

KEY TO SPECIES

- 2a Caudal fin truncate (initial phase) to emarginate (terminal male); GR 18–20; initial phase dark brown, with small white spots on head, body, and dorsal and anal fins, and caudal fin uniformly bright yellow; terminal male dark brown, with dark-edged blue spot or line on each scale, and caudal fin dull orange, with dark-edged blue spots and whitish posterior crescent *A. meleagrides*
- 2b Caudal fin rounded; GR 14–19; colour not as above 3
- 3a GR 14–16; body orangish brown, with narrow, dark-edged, pale blue-green stripes along middle of scale rows; basal two-fifths of caudal fin white, rest of fin black with hyaline margin *A. lineatus*
- 3b GR 16–19; body brown, with scattered, small, dark-edged blue spots, shading to yellow on lower part of head, chest and abdomen; caudal fin pale red, with small dark-edged blue spots and pale blue margin *A. twistii*

Anampses caeruleopunctatus Rüppell 1829

Bluespotted tamarin

PLATE 55

Anampses caeruleopunctatus Rüppell 1829: 42, Pl. 10, Fig. 1 (Red Sea); Playfair & Günther 1867; Day 1877; Baissac 1953; Smith 1955*; Smith & Smith 1963*; SFSA No. 786; Randall 1972*, 1983, 1992, 1995*; Jones & Kumaran 1980; SSF No. 220.1*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; Heemstra *et al.* 2004; Lieske & Myers 2004.

Anampses diadematus Rüppell 1835: 21, Pl. 6, Fig. 3 (El Tur, Sinai, Egypt, Red Sea); Playfair & Günther 1867; Baissac 1953; Smith 1955; SFSA No. 785; Jones & Kumaran 1980.

Anampses lineolatus Bennett 1836: 208 (Mauritius, Mascarenes).

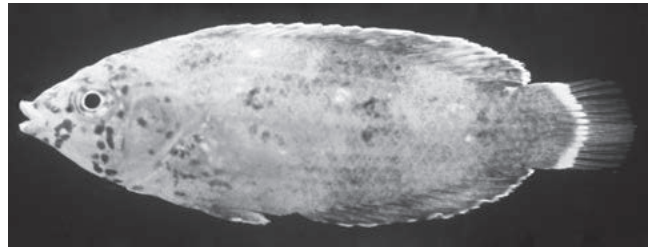
Anampses chlorostigma Valenciennes (ex Ehrenberg) in Cuv. & Val. 1840: 9 (Red Sea).

Anampses taeniatus Liénard in Sauvage 1891: 457 (Mauritius, Mascarenes).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays, pectoral fins 13 rays. Pair of forward-projecting incisors in both jaws, those in upper jaw broader, usually with upcurved pointed tips, lower pair down-curved and almost conical; remaining teeth tiny to imperceptible. Body depth 2.3–3 in SL; body width 2.3–2.7 in body depth; caudal fin rounded in juveniles, slightly rounded to truncate in adults; pelvic fins short, 2.1–2.5 in HL. GR 18–21. LL scales 27.

Females olivaceous to reddish brown or brownish yellow, with small, dark-edged blue spot on each scale; head with dark-edged blue lines, most radiating from eyes, and dark-edged blue spots or dashes on nape and opercle; median fins coloured like body, except more reddish, with outer blue margin and blackish submarginal line; dorsal and anal fins with row of blue dashes at base, dorsal fin with 2 or 3 irregular

rows of small dark-edged blue dots, anal fin with only one row; pectoral fins translucent yellowish with black spot at upper base; pelvic fins reddish with blue leading edge; males olive-green with dark-edged vertical blue line on each scale of body, and blue dashes or small spots on chest and abdomen; broad pale green bar often on body below base of 6th dorsal-fin spine; head with faint narrow, irregular, dark-edged blue lines and broad blue band across interorbital area; lips blue and pink. Juveniles more blackish, suffused with yellow dorsally, the spots and margin on dorsal and anal fins white; outer third of caudal fin bluish white. Attains 42 cm TL.



Anampses caeruleopunctatus, 3 cm SL, juvenile (South Africa). © T Harrison

DISTRIBUTION Indo-Pacific to eastern Pacific. WIO: Red Sea (including Gulf of Aqaba), Oman to South Africa (Aliwal Shoal; juveniles to Algoa Bay), Madagascar, Seychelles and Mauritius; elsewhere to Line Is. and Easter I.

REMARKS An inshore species of coral reefs or rocky coasts, especially areas exposed to surge; to 18 m deep.

Anampses lineatus Randall 1972

Lined tamarin

PLATE 55

Anampses melanurus lineatus Randall 1972: 172, Fig. 7 (Eilat, Israel, Gulf of Aqaba, Red Sea).

Anampses lineatus: Randall 1983, 1992, 1995*; SSF No. 220.2*; Goren & Dor 1994; Randall & Van Egmond 1994; Heemstra *et al.* 2004; Lieske & Myers 2004.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Dentition as in *A. caeruleopunctatus*. Body depth 3.2–3.4 in SL; body width 2.2–2.3 in body depth; pelvic fins 1.9–2.2 in HL; caudal fin rounded. GR 14–16. LL scales 26; no median predorsal scales.

Females dark orangish brown with slightly irregular, pale blue-green dashes following longitudinal scale rows; head and nape with small pale yellowish spots, becoming dots on nape; large black spot on opercular flap; dorsal fin dark yellowish brown with row of irregular whitish dashes along base and 3 or 4 longitudinal rows of small spots, margin narrowly blue;

anal fin dark brown grading to yellowish brown distally with irregular pale blue line at base and row of irregular, dark-edged, blue markings that resemble Arabic letters; caudal fin dark brown with broad transverse white bar near base and white rear margin; males with longitudinal series of blue dashes on body, irregular pale blue bands and spots on head, black opercular spot rimmed in blue; large irregular orange-yellow blotch on body beneath upper part of pectoral fin, and black bar at base of fin; dorsal fin as in female but row of markings basally in fin more irregular; anal fin with basal two-fifths bright blue, outer three-fifths yellow, bisected by median blue line, the margin blue; caudal fin like that of female but with narrower white bar; 24-mm juvenile dark brown with white bar from abdomen, broadening across body and anterior dorsal fin, and continuing as broad margin posteriorly on fin; head and body anterior to white bar with small yellow spots, becoming irregular dashes on opercle and chest; median dorsal fin pale yellow line on head; body behind white bar with 8 large, complex yellow markings and small yellow spots basally on median fins; caudal fin translucent whitish, with broad white bar at base. Attains 12 cm TL.



Anampses lineatus, 9 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indian Ocean. WIO: Red Sea (including Gulf of Aqaba) and southern Oman to South Africa (KwaZulu-Natal), Comoros, Mauritius, Seychelles and Maldives; elsewhere to Andaman Sea and Indonesia.

REMARKS Closely related to *Anampses melanurus* Bleeker 1862 of the Pacific. The extensive collections by Winterbottom *et al.* (1989) from Chagos did not include this species. Records from the Mascarenes by Harmelin-Vivien (1976) as *Anampses melanurus*, by Cornic (1987), by Fricke (1999), who listed the record of Guichenot (1863) of *A. cuvier* Quoy & Gaimard 1824 (a Hawaiian endemic that has rows of pale spots, not lines, on the body) as *A. lineatus*, and by the sight record for Rodrigues by Heemstra *et al.* (2004) for the Mascarenes, are all by name only (positive records for the Mascarenes should include a specimen or quality photograph). Known from 20–50 m.

Anampses meleagrides Valenciennes 1840

Yellowtail tamarin

PLATE 55

Anampses meleagrides Valenciennes in Cuv. & Val. 1840: 12 (Mauritius, Mascarenes); Baissac 1953; Munro 1955; Smith 1955; SFSA No. 786a; Randall 1972, 1983, 1992, 1995*; SSF No. 220.3*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Heemstra *et al.* 2004; Lieske & Myers 2004.

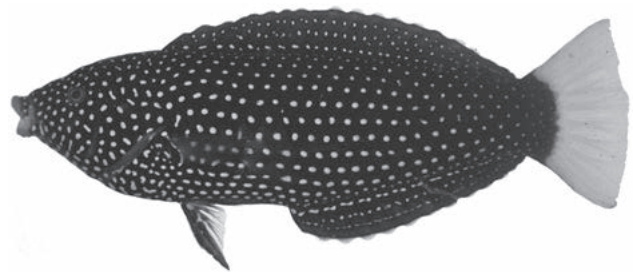
Anampses meleagris Günther 1862: 135 [unjustified emendation for *meleagrides*]; Playfair & Günther 1867.

Anampses amboinensis Bleeker 1857: 80 (Ambon I., Moluccas, Indonesia); Playfair & Günther 1867; Jones & Kumaran 1980.

Anampses lunatus Sauvage (ex Liénard) 1891: 459 (Mauritius, Mascarenes).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Dentition as in *A. caeruleopunctatus*. Body depth 3.1–3.4 in SL; pelvic fins 1.5–2 in HL; caudal fin of juveniles rounded, of adults truncate to emarginate. GR 18–20. LL scales 26.

Females dark brown, with round white spot on each scale of body; head with small white spots anteriorly and dorsally, becoming larger and more oval posteriorly and ventrally; dorsal and anal fins dark brown with 3 rows of white to pale blue spots, basal row oval, large ocellus posteriorly in fin, and narrow blue margin; caudal fin bright yellow; males orangish brown with vertical, dark-edged, blue-green line on each scale, becoming horizontal dark-edged dashes or oval spots ventrally; head with very irregular, dark-edged, blue-green lines; dorsal and anal fins with 3 or 4 rows of dark-edged blue lines (irregular on anal fin); caudal fin orange basally, with dark-edged blue spots to curved blue and black line forming anterior demarcation to crescentic transparent rear of fin, and upper and lower edges blue with black submarginal line. Attains 22 cm TL.



Anampses meleagrides, 12 cm TL, female (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Red Sea (including Gulf of Aqaba), southern Oman to South Africa (Sodwana Bay) and Mauritius; elsewhere to Andaman Sea, Indonesia, Ryukyu Is., Great Barrier Reef, Tuamotu Is. and Line Is.

REMARKS Often found in mixed coral rubble and sand, with coral patches; known from 1–60 m.

Anampses twistii Bleeker 1856

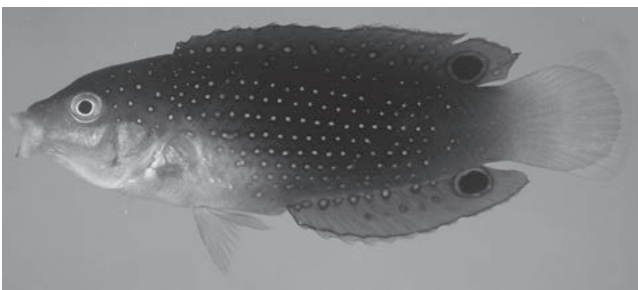
Yellowbreasted tamarin

PLATES 55 & 56

Anampses twistii Bleeker 1856: 56 (Ambon I., Moluccas, Indonesia); Lunel 1881; Baissac 1953; Smith 1955, 1957; Smith & Smith 1963*; Dor 1970; Randall 1972, 1992; Allen & Steene 1987; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; Heemstra *et al.* 2004; Lieske & Myers 2004; Fricke *et al.* 2009.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body depth 3–3.3 in SL; pelvic fins 1.8–2.3 in HL; caudal fin rounded. GR 16–19. LL scales 26.

Females dark brown dorsally on head and body, with small black-edged blue spot on each scale, grading to bright yellow ventrally on head, chest and abdomen, and to orangish posteriorly on body; black spot on opercular flap with small red and green spot dorsally on base of flap; dorsal and anal fins dark orangish brown with large blue-edged black spot posteriorly in each fin, scattered pale blue spots basally in fins, and blue margin and black submarginal line; caudal fin pale orange-red with small blue spots and rear pale blue margin that broadens toward corners; paired fins yellow; mature males with head and chest entirely yellow, without small blue spots; body dark brown, the small blue spots replaced with vertical blue lines or vertical rows of dots, that become isolated pink dots anterodorsally on body and nape; ocellus in dorsal and anal fins lost. Juveniles dusky orange, grading to bright yellow ventrally on head and abdomen, with numerous irregular black-edged bright blue spots and short irregular bands, some extending into dorsal and anal fins; deep blue spot, rimmed partly in yellow and paler blue, posteriorly in dorsal and anal fins; caudal fin transparent with broad white bar at base. Attains 18 cm TL.



Anampses twistii, 5 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific (widespread but uncommon).

WIO: Red Sea, Tanzania, Mozambique (Pinda), Rodrigues and Mauritius; elsewhere to Andaman Sea, Indonesia, French Polynesia (except Marquesas Is.) and Pitcairn Is.

REMARKS Occurs in areas of mixed coral, rubble and sandy bays, lagoons, and seaward reefs, in 1–30 m.

GENUS *Anchichoerops* Barnard 1927

Diagnosis as for the single species.

Anchichoerops natalensis

(Gilchrist & Thompson 1909)

Natal wrasse

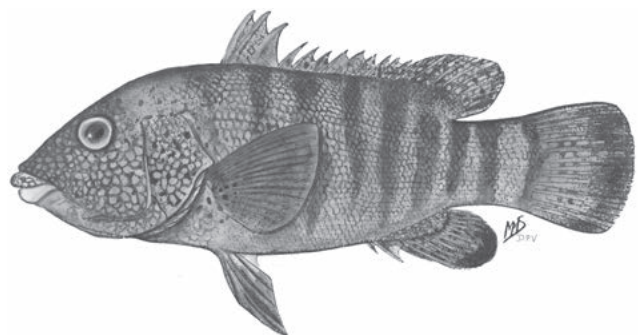
PLATE 56

Choerops natalensis Gilchrist & Thompson 1909: 250 (KwaZulu-Natal, South Africa).

Anchichoerops natalensis: Barnard 1927; SFSa No. 771; Van der Elst 1981; Gomon in Fischer & Bianchi 1984; Heemstra & Heemstra 2004*.

Dorsal fin 13 spines (first 3 spines longer than remaining spines, with deeply incised membranes, and almost separate from rest of fin), 9 rays; anal fin 3 spines, 10 or 11 rays; pectoral fins 17 rays; caudal fin rounded. Jaws with pair of prominent canines anteriorly on each side; small granular teeth on sides more or less coalesced into band; pharyngeal dentition well-developed; lips very thick and fleshy. Lateral line continuous, with 50–52 pored scales; postorbital part of head and cheeks with small scales; preopercle margin naked; well-developed scaly sheath at base of dorsal and anal fins.

Colour very variable: ground colour olivaceous to reddish or yellowish brown, densely spotted with small yellow to orangish spots, often with 8 or 9 pale bars on body that may be equal in width or narrower than interspaces; some individuals with scattered small blue spots on head and bright blue margins on median and pelvic fins; lower lip often bright yellow. The possible correlation of colour differences with sex remains to be determined. Attains 75 cm TL.



Anchichoerops natalensis, 65 cm TL (South Africa). Source: SSF

DISTRIBUTION WIO: endemic to South Africa (KwaZulu-Natal to Eastern Cape).

REMARKS Found on rocky reefs, to ~55 m deep. Not common. Seldom takes a hook; protected by law from being speared. Reported by Van der Elst (1981) to have a varied diet,

including sponges, ascidians, corals, crabs and crayfish (but the corals and sponges may have been ingested while preying on crustaceans).

GENUS *Bodianus* Bloch 1790

Two pairs of prominent canines at front of jaws, and usually 1 canine (rarely 2 or 3) posteriorly in upper jaw. Dorsal fin long-based and of uniform height, 12 (rarely 13) spines, 9–11 (usually 10) rays; anal fin 3 spines, usually 12 (rarely 11 or 13) rays. Lateral line smoothly curved, continuous, with 29–48 pored scales; scaly sheath at base of dorsal and anal fins. Forty-five species: 5 in Atlantic, 2 in eastern Pacific, 37 in Indo-Pacific, with at least 14 in WIO. Genus revised by Gomon (2006); of the 13 generic synonyms, he recognised 8 as subgenera and described 2 new subgenera. Gomon also noted that Baranes *et al.* (2017) documented *Bodianus rubrisos*, a western Pacific species, from the Red Sea, but this has still to be substantiated.

KEY TO SPECIES

- | | | |
|----|--|------------------------|
| 1a | Scales dorsally on head not extending forward of eyes | 2 |
| 1b | Scales dorsally on head extending forward of eyes | 9 |
| 2a | LL scales 36–46 | 3 |
| 2b | LL scales 29–32 | 5 |
| 3a | Snout of adults short, ~4 in HL, and profile steep, at >60° angle to horizontal axis of body; body deep, ~2.7 in SL (adults); caudal fin of adults truncate to double emarginate with produced lobes; no black spot on opercle; attains 82 cm TL | <i>B. macrognathos</i> |
| 3b | Snout of adults long, ~2.7–3 in HL, and profile sloping to >45° angle to horizontal axis of body; body slender, depth ~4–5 in SL; caudal fin truncate to slightly rounded; large black spot on opercle; attains 20 cm TL | 4 |
| 4a | LL scales 40–46; head and body with 3 broad red stripes alternating with white | <i>B. opercularis</i> |
| 4b | LL scales 36–40; body yellow, with 1 or 2 broken orange-red midlateral stripes anteriorly | <i>B. tanyokidus</i> |
| 5a | Pelvic fins of adults short, not extending to anus; caudal fin truncate to slightly rounded; blackish spot at caudal-fin base | 6 |
| 5b | Pelvic fins extending to or beyond anus; caudal fin of adults emarginate or double emarginate, fin of juveniles truncate; no blackish spot at caudal-fin base | 7 |

KEY TO SPECIES

- | | | |
|-----|---|--------------------------|
| 6a | Body depth 3.6–4 in SL; predorsal scales 8–10; scales above lateral line 3½; body yellow dorsally, above narrow orange-red band from eyes to black spot at caudal-fin base, mainly pink below; large blue-black opercular spot | <i>B. bimaculatus</i> |
| 6b | Body depth 3–3.4 in SL; predorsal scales 17–25; scales above lateral line 4–4½; colour not as above | <i>B. diana</i> |
| 7a | Scales present posteriorly on lower jaw, extending anterior to forward end of ventral preopercular edge (scales often embedded); adults with distinct black band encircling body posteriorly and black marginal stripe on anal fin | <i>B. macrourus</i> |
| 7b | Scales absent on lower jaw; not extending anterior to forward end of ventral preopercular edge; adults without black band encircling body posteriorly and black marginal stripe on anal fin | 8 |
| 8a | Head with posteriorly flared blackish stripe or series of spots directed posteriorly from corner of mouth | <i>B. bilunulatus</i> |
| 8b | Head without blackish markings; large black spot or smudge often below dorsal fin posteriorly, but not extending onto caudal peduncle | <i>B. atrolumbus</i> |
| 9a | Snout rounded; dorsal and ventral corners of caudal fin prolonged into filaments | <i>B. anthioides</i> |
| 9b | Snout sharply pointed; dorsal and ventral corners of caudal fin not prolonged into filaments | 10 |
| 10a | Prominent black spot distally on dorsal and anal fins immediately posterior to last spine; juveniles and some females with prominent large white spots, one on belly immediately anterior to anal-fin origin | <i>B. axillaris</i> |
| 10b | Adults without distinct black spot on dorsal and anal fins posterior to last spine; juveniles without large white spot on belly immediately anterior to anal-fin origin | 11 |
| 11a | Vomerine teeth absent; adults pale (rose red anterodorsally, yellow posteroventrally in life) without stripes or horizontal rows of spots; juveniles blackish with prominent white spots, including large horizontally elongate spot midlaterally posterior to pectoral-fin base and below lateral line | <i>B. neilli</i> |
| 11b | One or more canines on vomer; body in life with three or more interrupted red or black stripes or horizontal rows of spots | 12 |
| 12a | Four narrow red stripes on body, and 2 rows of black dots anteriorly between 2nd and 3rd stripes; large dark red to black spot anteriorly on dorsal fin and at pectoral-fin bases | <i>B. leucosticticus</i> |
| 12b | Five narrow red stripes on body; no black dots between 2nd and 3rd stripes, and no large dark red to black spot anteriorly on dorsal fin; narrow black bar at pectoral-fin bases | <i>B. trilineatus</i> |

Continued...

Bodianus anthioides (Bennett 1832)

Lyretail hogfish

PLATE 56

Crenilabrus anthioides Bennett 1832: 167 (Mauritius, Mascarenes).
Cossyphus boutoni Liénard in Sauvage 1891: 452 (Mauritius, Mascarenes).
Cossyphus bicolor Liénard in Sauvage 1891: 453 (Mauritius, Mascarenes).
Lepidaplois anthioides: Smith 1955, 1957; Smith & Smith 1963*;
SFSA No. 774a.
Bodianus anthioides: Bemert & Ormond 1981*.
Bodianus anthioides: Randall 1983; SSF No. 220.5*; Winterbottom *et al.*
1989*; Allen & Smith-Vaniz 1994; Heemstra *et al.* 2004; Lieske & Myers
2004; Gomon 2006.

Dorsal fin 12 spines, 9 or 10 rays; anal fin 3 spines, 10–12 rays; pectoral fins 15–17 rays; caudal fin deeply emarginate in adults, lunate in young. Preopercle margin coarsely serrate. Both jaws with 2 pairs of prominent canines at front, and upper jaw with 1 or 2 canines posteriorly on each side (as in other *Bodianus* spp.); snout short, ~4 in HL, profile steep, at ~70° angle to horizontal axis of body, and head profile smoothly convex. Total GR 16. Lateral line curved gradually (as in other *Bodianus* spp.); LL scales 30 or 31; predorsal scales ~36, extending to nostrils.

Adults white, with scattered small dark grey spots behind curved line from rear of spinous dorsal fin to front of anal fin, dark brownish orange in front of line, grading to bluish black anteriorly and ventrally on head; caudal fin with blackish upper and lower margins that continue as bands onto peduncle. Juveniles with head and anterior of body bright orange-yellow (except for white snout) to line from base of 4th dorsal-fin spine to pelvic-fin origins, white posteriorly with scattered small reddish black spots, those dorsally and ventrally on peduncle merging to form band that continues marginally onto lobes of caudal fin. Attains 21 cm TL.



Bodianus anthioides, 3 cm SL (Comoros). © R Winterbottom, ROM

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Tanzania to South Africa (Sodwana Bay), Comoros, Maldives and Mauritius; elsewhere to Marshall Is. and Tuamotu Is.

REMARKS Rare at most localities. Adults known from 20–60 m, juveniles as shallow as 6 m. Named for its resemblance to serranid fishes of the family Anthiadidae. Although its form suggests it should be a zooplankton-feeder, it is benthic, usually found over mixed sand and coral rubble near reefs. Feeds on benthic invertebrates, and often seen following foraging goatfishes; juveniles have been observed cleaning other fishes.

Bodianus atrolumbus (Valenciennes 1839)

Blackside hogfish

PLATE 56

Cossyphus atrolumbus Valenciennes in Cuv. & Val. 1839: 123 (Mauritius, Mascarenes).
Cossyphus nigromaculatus Gilchrist & Thompson 1908: 197 (KwaZulu-Natal, South Africa).
Chaeropsodes pictus Gilchrist & Thompson 1909: 260 (Durban market, KwaZulu-Natal, South Africa).
Lepidaplois perditio [in part]: Baissac 1953; Smith 1957; SFSA No. 776.
Bodianus perditio [in part]: Gomon in Fischer & Bianchi 1984; SSF No. 220.10*; Van der Elst & King 1990; Heemstra *et al.* 2004; Gomon 2006.
Bodianus atrolumbus: Randall & Victor 2013*.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 17 rays. Body depth 2.6–3.1 in SL; pelvic fins almost extending to anus in juveniles, to anal-fin origin in large adults; caudal fin of juveniles and subadults truncate, becoming double emarginate in large adults, with moderately elongated lobes. Total GR 19–23. LL scales 30 or 31; scales dorsally on head extending to rear edge of eyes; interorbital area naked; cheek scales extending slightly forward to corners of mouth; lower jaw naked; well-developed scaly sheath at base of dorsal and anal fins.

Juveniles brown on head and anterior part of body, as far as white bar in middle of body extending to tip of 8th dorsal-fin spine, followed by broad black zone to anterior of peduncle that extends broadly into base of soft-rayed portions of dorsal and anal fins; peduncle brown with white midlateral spot; lobes of caudal fin yellow; with growth body becomes more yellow overall, black zone regressing dorsally. Adults with spindle-shaped pinkish white bar in middle of body across LL; body anterior to bar with dense yellow spots, becoming short irregular yellow bands on head; lower jaw pale yellow to white without spots; body posterior to pinkish white bar lavender-pink, grading to blue dorsally and ventrally, all scales strongly bordered by black; elliptical black patch of variable size at base of soft-rayed portion of dorsal fin. Attains at least 46 cm SL, ~57 cm TL (Gomon 2006), but possibly 80 cm TL.



Bodianus atrolumbus, 18 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Mozambique and South Africa (KwaZulu-Natal), Mascarenes, Walters Shoals and St Brandon Shoals.

REMARKS Occurs on coral or rocky reefs, in 10–50+ m. Closely related to and long considered a synonym of *Bodianus perditio* (Quoy & Gaimard 1834). Randall & Victor (2013) consider the two are valid species, differentiated by colour and strong genetic differences. Adults of *B. atrolumbus* have a whitish bar near the midbody; *B. perditio* lacks this bar, having instead a large yellow blotch dorsally on the body. Feeds on hard-shelled invertebrates, such as sea urchins, crabs and gastropod molluscs (Van der Elst 1981).

Bodianus axillaris (Bennett 1832)

Turncoat hogfish

PLATE 57

Labrus axillaris Bennett 1832: 166 (Mauritius, Mascarenes).

Cossyphus axillaris: Valenciennes in Cuv. & Val. 1839; Playfair & Günther 1867; Day 1877.

Cossyphus octomaculatus Liénard in Sauvage 1891: 454 (Mauritius, Mascarenes).

Lepidaplois axillaris: Barnard 1927; Baissac 1953; Smith 1955, 1957; Smith & Smith 1963*; SFSa No. 775*.

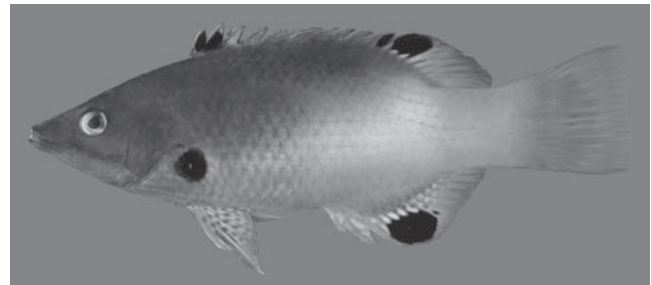
Lepidaplois albomaculatus Smith 1957: 101, Fig. 1 [based on Col. Pike's illustration of female] (Mauritius, Mascarenes).

Bodianus axillaris: Randall 1983*; Gomon in Fischer & Bianchi 1984; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; Randall 1995*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004; Gomon 2006.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 or 13 rays; pectoral fins 15–17 rays. Body depth 2.8–3.3 in SL; caudal fin truncate (slightly rounded in small juveniles). GR 15–18. LL scales 29 or 30; predorsal scales 28–35, extending in front of nostrils; scales on cheeks extending below nostrils; scaly sheath at base of dorsal and anal fins 2½–3 scales in height.

Juveniles black, with white snout and chin, 3 large white spots dorsally and 3 ventrally on body, and smaller white spot dorsally and ventrally at caudal-fin base (in the Pacific, the

dark white-spotted phase appears to be confined to juvenile stage); caudal, pectoral and posterior portion of dorsal and anal fins transparent with reddish rays. Females dark reddish brown with same white spots, grading on peduncle to dark brassy yellow with narrow grey stripes separating longitudinal scale rows; caudal fin and soft-rayed portion of dorsal and anal fins with brownish yellow rays and transparent membranes; large black spot in front of soft-rayed portion of dorsal and anal fins, spinous portion of dorsal fin, and pectoral-fin bases. Males dark purplish grey anterior to diffuse oblique line from rear dorsal-fin base to anterior abdomen, white posteriorly; fins coloured as in females, with same 4 large black spots. Attains 20 cm TL.



Bodianus axillaris, 10 cm SL; 16 cm TL (Seychelles). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Red Sea (including Gulf of Aqaba) to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes, Maldives and Chagos; elsewhere to Pitcairn Is. and Line Is.

REMARKS Known from 3–40 m. Adults feed mainly on small crustaceans, gastropods, bivalves and worms; juveniles are usually found in caves, and are often seen cleaning other fishes.

Bodianus bilunulatus (Lacepède 1801)

Saddleback hogfish

PLATE 57

Labrus bilunulatus Lacepède 1801: 454, 526, Pl. 31, Fig. 2 (Indian Ocean [probably Mauritius]).

Cossyphus bilunulatus: Playfair & Günther 1867.

Lepidaplois hirsutus (*non* Lacepède 1801): Barnard 1927; Baissac 1953; Smith 1957; Smith & Smith 1963*; SFSa No. 773*.

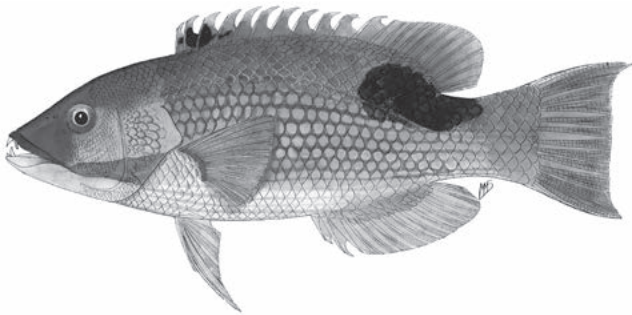
Bodianus bilunulatus: SSF No. 220.7*; Allen & Steene 1987; Anderson *et al.* 1998; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Gomon 2006.

Bodianus bilunulatus bilunulatus: Gomon in Fischer & Bianchi 1984; Winterbottom *et al.* 1989*; De Bruin *et al.* 1994.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 or 13 rays; pectoral fins 16 or 17 rays; pelvic fins almost extending to anus (sometimes slightly beyond); caudal fin truncate in juveniles, emarginate to double emarginate in adults, and

lobes moderately produced in large adults. No small canines posteriorly on upper jaw. Total GR 17–21. LL scales 30–32; scales dorsally on head extend forward to rear edge of eyes; scales on cheeks extending slightly in front of corners of mouth; scales on interopercle not extending anterior to preopercle; scaly sheath at base of dorsal and anal fins usually 2½–3 scales in height.

Juveniles bright yellow above oblique line from lower lip and snout through eyes to most of spinous portion of dorsal fin; head and body below line white with red lines separating longitudinal scale rows; very broad, slightly oblique, black bar across rear of body, covering most of anal fin, soft-rayed portion of dorsal fin, and anterior part of peduncle. Adults pink dorsally, grading to white on side and pale blue ventrally, with orange-red lines following longitudinal scale rows and vertical lines creating serial cubical pattern of scales; large elliptical blue spot below rear dorsal fin, extending anteriorly onto peduncle; broad white band across cheek and opercle, bordered ventrally by blue; large black spot on membrane between 2nd and 3rd dorsal-fin spines; dorsal and ventral margins of caudal fin yellow, with yellow continuing dorsally onto peduncle. Attains 44 cm TL.



Bodianus bilunulatus, 30 cm TL. Source: SFSA

DISTRIBUTION Indo-Pacific. WIO: Somalia to South Africa (KwaZulu-Natal), Seychelles, Mauritius, Walters Shoals, Chagos and Sri Lanka; elsewhere to Indonesia, Japan and Australia.

REMARKS Van der Elst (1981) reported its occurrence in KwaZulu-Natal, South Africa, on deeper coral and rocky reefs, feeding mainly on gastropods, limpets, sea urchins and crabs, crushing the hard parts with its pharyngeal plates and rejecting inedible fragments.

Bodianus bimaculatus Allen 1973

Twospot hogfish

PLATE 57

Bodianus bimaculatus Allen 1973: 386, Fig. 1 (Palau); Allen & Steene 1987; Cornic 1987; Randall & Anderson 1993; Gomon 2006.

Dorsal fin 12 spines, 9 or 10 rays; anal fin 3 spines, 12 rays; pectoral fins 16 rays. Body elongate, depth 3.6–4 in SL; snout short, 3.7–4.2 in HL; eyes large, diameter slightly greater than snout length in juveniles, shorter in adults; pelvic fins short, not extending to anus; caudal fin rounded. GR 14–16. LL scales 30 or 31; predorsal scales 8–10, not extending in front of interorbital area.

Adults yellow above narrow red stripe from eyes to caudal-fin base, pink below this and with indistinct narrow yellow bars; irregular ocellated black spot posteriorly on opercle over red stripe; pupil-sized dark brown spot on caudal-fin base at end of red stripe (spot relatively large and rimmed with pale blue in young). Attains 8 cm TL.



Bodianus bimaculatus, 4 cm TL, juvenile (South Africa).

PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Red Sea, South Africa (Aliwal Shoal), Madagascar, Mauritius and Maldives; elsewhere to Indonesia, Japan, Palau, Australia, New Caledonia and northern New Zealand.

REMARKS Collected from deep reefs, often on vertical drop-offs, in 30–65 m.

Bodianus diana (Lacepède 1801)

Diana's hogfish

PLATE 58

Labrus diana Lacepède 1801: 450, 522, Pl. 32, Fig. 1 (Indian Ocean).

Cossyphus diana: Günther 1862; Playfair & Günther 1867; Day 1877.

Cossyphus spilotes Guichenot 1863: C-13 (Réunion, Mascarenes); Sauvage 1891.

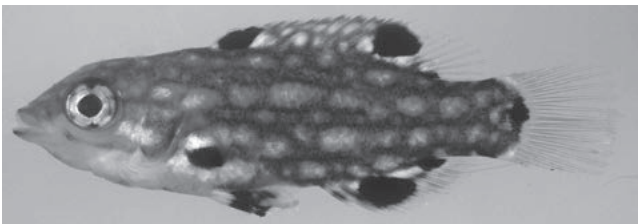
Lepidaplois diana: Barnard 1927; Baissac 1953; Smith 1955, 1957; SFSA No. 774*.

Lepidaplois aldabrensis Smith 1955: 932, Pl. 24a (Aldabra).

Bodianus diana: Randall 1983, 1992, 1995*; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.8*; Allen & Steene 1987; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Heemstra & Heemstra 2004*; Lieske & Myers 2004; Gomon 2006.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 15–17 rays. Body elongate, depth 3.1–3.4 in SL; head pointed, dorsal profile straight, at ~30° angle to horizontal axis of body; pelvic fins not extending to anus; caudal fin slightly rounded in juveniles, slightly rounded to truncate or slightly double emarginate in adults. Total GR 15–18. LL scales 30; scales dorsally on head extending forward to above middle of eyes; cheek scales extending to corners of mouth; scaly sheath at base of dorsal and anal fins maximum 2½ scales high.

Adults red to brownish or purplish red on head, blue ventrally, with black line curved ventrally from corner of mouth; red dorsally on head continuing on body above LL, with series of 4 small irregular white spots, each scale on rear half with prominent black spot; side of body broadly yellow to peduncle, each scale with red rear rim; ventral and rear of body lavender-pink, scales still red-rimmed; dorsal and anal fins red, the membranes transparent posteriorly; caudal fin lavender-pink with pupil-sized black spot near midbase; pelvic fin anterior half bright red with pink leading edge, posterior half pale yellow. Juveniles dark reddish brown, with longitudinal rows of white dashes alternating with rows of white dots; dorsal and anal fins with large ocellated black spot in front of soft-rayed portion; caudal fin as in adults; pelvic fins largely black. Attains 20 cm TL.



Bodianus diana, 2 cm SL (South Africa). © R Winterbottom, ROM

DISTRIBUTION Indian Ocean. WIO: Red Sea to South Africa (Aliwal Shoal; juveniles to Eastern Cape), Madagascar, Comoros, Maldives, Réunion, Aldabra and Chagos; elsewhere to Andaman Sea, Cocos (Keeling) Is. and Christmas I.

REMARKS Occurs on coral and rocky reefs, in 1–80 m. Feeds mainly on hard-shelled molluscs, crabs and sea urchins. Swims using both pectoral fins and caudal fin (Van der Elst 1981). Juveniles are active cleaners of other fishes, and often found near gorgonians or black corals. Closely resembles *B. dictynna* Gomon 2006 of the Pacific, but distinguished from that species by Gomon (2006).

Bodianus leucosticticus (Bennett 1832)

Lined hogfish

PLATE 58

Labrus leucosticticus Bennett 1832: 166 (Mauritius, Mascarenes).

Cossyphus leucosticticus: Günther 1862.

Lepidaplois leucostictus: Baissac 1953; Smith 1957.

Lepidaplois bourbonni Fourmanoir & Guézé 1961: 7,

Fig. 1 (Réunion, Mascarenes).

Bodianus leucostictus: Baissac 1976; SSF No. 220.9*.

Bodianus leucosticticus: Gomon 2006; Baranes *et al.* 2017.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 16 rays. One or more canines on vomer. Body depth 2.9–3.2 in SL; pelvic fins almost extending to anus in large adults; caudal fin truncate to slightly rounded. Total GR 16–19. LL scales 30; scales dorsally on head extending in front of nostrils; cheek scales extending anterior to corners of mouth; low scaly sheath at base of dorsal and anal fins.

Body orange-yellow, shading to white or pale yellow ventrally, with 4 or 5 red, or red and black lines on body, upper 3 extending to eye (lines may be broken into segments, or the black part may be a series of spots or dashes superimposed on the red); black spot on pectoral-fin base present or absent (appears to be reduced to small red spot or disappears with age); black or red dots on body in irregular rows between lines (also seem to disappear with age). Attains 23 cm TL.



Bodianus leucosticticus, 23 cm TL (Myanmar). © Alveheim, IMR © FAO

DISTRIBUTION Indo-Pacific. WIO: Réunion and Mauritius; elsewhere, Myanmar, Taiwan and Japan.

REMARKS Usually found at moderate depths (~50 m). *Bodianus bourbonni* (Fourmanoir & Guézé 1961) from Réunion was mistakenly considered valid in Parenti & Randall (2018) based on Baranes *et al.* (2017), but it was listed as a synonym of *B. leucosticticus* in that paper.

Bodianus macrognathos (Morris 1974)

Giant hogfish

PLATE 58

Lepidaplois macrognathos Morris 1974: 632, Figs. 1–2 (Kanyika I., Kenya).
Bodianus macrognathos: Gomon in Fischer & Bianchi 1984; Randall 1995*;
Manilo & Bogorodsky 2003; Lieske & Myers 2004; Gomon 2006.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 17 rays. Body depth 2.6–3.1 in SL, proportion changing with growth; snout profile increasingly steep with growth, at ~80° angle in large adults; upper jaw protruding; lower jaw massive in adults; membranes of spinous dorsal and anal fins deeply incised; pelvic fins almost extending to anus in large adults; caudal fin slightly rounded in juveniles, double emarginate in large adults, with elongate lobes. Total GR 16–19. LL scales 40–42; predorsal scales 17 or 18; scales above lateral line 6½; scales dorsally on head extending to posterior part of interorbital area; small scales on cheeks extending to below eyes; well-developed scaly sheath at base of dorsal and anal fins.

Juveniles and initial-phase adults white, scale edges dark, with broad black stripe from front of snout (except white lips), through eye, and on sides of body above pectoral fins, expanding in caudal fin; median black stripe on nape, continuing dorsally on body and entire dorsal fin, except posterior 3 or 4 rays. Head of adult males dark greenish to purplish grey, lower jaw varying from dark blue-green to dark purple; body pale yellowish grey, scale edges dark, with very broad dark bar or double bar across middle of body and double bar posteriorly, centred on rear dorsal-fin base, both continuing into adjacent fins; caudal fin and rear of peduncle dark purplish to greenish grey. Females without dark head and bars. Attains 83 cm TL; 78-cm-TL specimen from Gulf of Oman weighed 7.3 kg.

DISTRIBUTION WIO: Kenya to Oman, Pakistan and India.

REMARKS Observed in Oman in shallow water along rocky shores, to 65 m deep (Randall 1995).

Bodianus macrourus (Lacepède 1801)

Black-banded hogfish

PLATE 58

Labrus hirsutus Lacepède 1801: 429, 473, Pl. 20, Fig. 1 (Mauritius, Mascarenes).
Labrus rubrolineatus Lacepède 1801: 433, 480 (Madagascar; Réunion, Mascarenes).
Labrus macrourus Lacepède 1801: 438, 493, Pl. 9, Fig. 3 (Indian Ocean).
Crenilabrus croceus Lesson 1828: 407 (Mauritius, Mascarenes).
Crenilabrus chabrolii Lesson 1829: 133 (Mauritius, Mascarenes).

Labrus pilonotus Bennett 1836: 207 (Mauritius, Mascarenes).
Cossyphus maldat Valenciennes in Cuv. & Val. 1839: 114 (Mauritius, Mascarenes).

Lepidaplois hirsutus: Baissac 1953; Smith 1957; SFSA No. 774.
Bodianus macrourus: Gomon in Fischer & Bianchi 1984; Heemstra *et al.* 2004; Gomon 2006.
Bodianus hirsutus: Cornic 1987.
Bodianus macrurus: Allen & Steene 1987.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 17 rays. Body depth 2.8–3.3 in SL; pelvic fins long, extending to anus in juveniles, and to base of 3rd anal-fin spine in large adults; caudal fin of juveniles and subadults truncate, becoming double emarginate with moderately elongate lobes in large adults. Total GR 17–21. LL scales 30–32; scales dorsally on head extending to posterior edge of eyes; interorbital area naked; cheek scales extending slightly in front of corners of mouth; scales present posteriorly on lower jaw (often embedded); well-developed scaly sheath at base of dorsal and anal fins.

Juveniles yellow, with white bar as broad as orbit diameter across middle of body, followed by black bar 2–2.5 times broader than white, extending broadly onto dorsal and anal fins. Adults brownish red dorsally with curved lines of blue dashes following scale rows to just below LL, white below, with yellow longitudinal lines separating scale rows (the scales appear like series of white squares); very broad black bar across rear of body, covering posterior part of soft-rayed portion of dorsal fin and ending at base of about posterior 5 rays of anal fin, the irregular rear margin less than half length of bluish white peduncle; snout and posterior part of head orange with narrow pale blue bands that link to every other row of pale blue dashes on body; ventral part of head bluish white with irregular orange-yellow bands; large black spot covering most of first 3 membranes of dorsal fin; pectoral fins translucent whitish; pelvic fins black. Attains 33 cm TL.



Bodianus macrourus, 23 cm SL (Mauritius). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Madagascar, Réunion, Mauritius and St Brandon Shoals.

REMARKS Inhabits coral reefs, in ~13–40 m. Lacepède (1801) described this species under three separate names. Gomon (2006) explained that Günther (1862) was the first subsequent author to clearly provide an opinion for selecting *B. macrourus*.

Bodianus neilli (Day 1867)

Neill's hogfish

PLATES 58 & 59

Cossyphus neilli Day 1867: 560 (Chennai, India).

Cossyphus axillaris var.: Day 1877.

Bodianus luteopunctatus (non Smith 1957): Burgess & Axelrod 1973.

Bodianus neilli: Anderson 1996; Gomon 2006.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 17 rays. Vomer with at least one small canine. Body depth 2.9–3.7 in SL, deeper with growth; pelvic fins short, usually not extending to anus; caudal fin truncate to slightly rounded. Total GR 17–19. LL scales 30–32; predorsal scales 25–31; predorsal midline scales reaching forward to about nostril; cheek scales extending forward to corners of mouth, on some specimens to below nostrils; scales posteriorly on lower jaw may be embedded; well-developed scaly sheath at base of dorsal and anal fins.

Juveniles dark brown to black, with 2 rows of large white spots (a dorsal row with 2 spots below dorsal fin and one at upper caudal-fin base, and lateral row of 2 large subrectangular spots, one on upper pectoral-fin base and extending below fin, and one in midbody, followed by smaller one on lateral line anteriorly on peduncle, and one at lower caudal-fin base); head black, abruptly pale yellowish grey ventrally, with mid-dorsal row of 4 small white spots, white spot above opercle and 2 spots below eye; large ocellated black spot in front of soft-rayed portion of dorsal and anal fins; pelvic fins white with large black spot. Adults greyish pink on head and anterodorsally on body, abruptly pale lavender ventrally on head, grading posteriorly on body to brownish and yellowish grey, and ventrally to bluish grey; unscaled anterior soft-rayed portion of dorsal and anal fins with broad bright red band, rays pale yellow posteriorly with translucent membranes; caudal fin with pink rays, translucent membranes and red dorsal and ventral margins; pelvic fins pale yellow. Attains 21 cm TL.

DISTRIBUTION Indian Ocean. WIO: Maldives, India to Sri Lanka; elsewhere, Andaman Sea.

REMARKS Satapoomin *in* Kimura *et al.* (2009) found this species on coastal reefs in southwestern Thailand, in 2–25 m. Owing to the similarity of this species to *Bodianus axillaris*, Day (1877) reclassified *Cossyphus neilli* as a variety of *C. axillaris*.

Bodianus opercularis (Guichenot 1847)

Red-striped hogfish

PLATE 59

Cossyphus opercularis Guichenot 1847: 283 (Madagascar).

Trochocopus opercularis Günther 1862: 100 (Mauritius, Mascarenes?)

[subjectively invalid].

Cheiliopsis bivittatus Steindachner 1863: 1113, Pl. 24, Figs. 1–1c (Mauritius, Mascarenes).

Bodianus opercularis: Baissac 1976; Randall 1981; Cornic 1987;

Allen & Smith-Vaniz 1994; Khalaf & Disi 1997; Lieske & Myers 2004;

Gomon 2006.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 16 or 17 rays. No teeth on vomer. Body elongate, depth 4.1–4.8 in SL; snout pointed, 2.8–3 in HL; caudal fin slightly rounded. GR 15–17. LL scales 40–46; scales dorsally on head extending to behind edge of eyes, those on cheeks not reaching corners of mouth; low scaly sheath at base of dorsal and anal fins.

Body white to pale yellow, with 3 broad red stripes: 1st dorsally on body, expanding posteriorly onto dorsal-fin base and to upper edge of peduncle; 2nd from front of snout through eye to caudal-fin base, then narrowing to end of caudal fin; 3rd stripe from ventrally on head, through lower pectoral-fin base to ventral part of peduncle, then converging obliquely and narrowing to almost join midlateral caudal stripe; prominent semicircular black spot dorsally on opercle within middle red stripe; first 2 red stripes may be joined by red bar basally in caudal fin; dorsal fin with broad submarginal red stripe ending in middle of soft-rayed part of fin; anal fin with broad basal red stripe. Attains 18 cm TL.

DISTRIBUTION Indian Ocean. WIO: northern Red Sea, Kenya, Madagascar and Mauritius; elsewhere, Christmas I.

REMARKS Found on steep seaward reef slopes and drop-offs, in 35–80 m; usually solitary. The type locality was resolved by Bauchot & Blanc (1961) who listed the locality for both of Guichenot's syntypes as Madagascar.

Bodianus tanyokidus Gomon & Madden 1981

Ear-ring hogfish

PLATE 59

Cossyphus opercularis (non Guichenot 1847): Gudger 1929.

Lepidaplois sanguineus (non Jordan & Evermann 1903): Fourmanoir 1955.

Bodianus tanyokidus Gomon & Madden 1981: 122, Figs. 2–3 (Mauritius,

Mascarenes); Gomon 2006.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 17 rays. No teeth on vomer. Body elongate,

depth 3.9–4.3 in SL; snout pointed, length ~2.8–3 in HL; head profile at ~20° angle to horizontal axis of body; pelvic fins short, not extending to anus; caudal fin slightly rounded. GR 12–17. LL scales 36–41; predorsal scales 11 or 12; scales on head extending to rear edge of eyes, those on cheeks not reaching corner of mouth; lower jaw naked; low scaly sheath at base of dorsal and anal fins.

Adults with diffuse orange-red band, approximately eye diameter in width, below dorsal fin, ending dorsally on peduncle, grading to yellow on side and ventrally, with broken orange-red line extending back from upper end of gill opening, ending below middle of soft-rayed portion of dorsal fin; snout and head behind eyes orange-red, grading to yellow ventrally; irregular, vertically elliptical black spot, more than orbit diameter in height, posteriorly on opercle at level of eye; iris yellow; fins yellow, outer part of spinous membranes of dorsal fin translucent; small orange-red spot at caudal-fin base. Attains 21.5 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Comoros and Mauritius; elsewhere, southern Japan.

REMARKS The story of this unique species began with a painting by Col. Nicolas Pike of a specimen from Mauritius. Gudger (1929) misidentified it as *Cossyphus opercularis* Guichenot 1847, followed by additional misidentifications by Fourmanoir (1955) and Gushiken (1972) of specimens they obtained. Masuda *et al.* (1975) reported two specimens from Okinawa, Japan, taken by handline in >100 m as *Bodianus* sp. Gomon & Madden (1981) described the species as new, and differentiated it from *B. sanguineus* and *B. opercularis*. The few records of this species are undoubtedly due to its deep-reef habitat and being too small to be sought by fishermen.

Bodianus trilineatus (Fowler 1934)

Threeline hogfish

PLATE 59

Lepidaplois trilineatus Fowler 1934: 492, Fig. 47 (KwaZulu-Natal, South Africa); Smith 1957; SFSA No. 772.

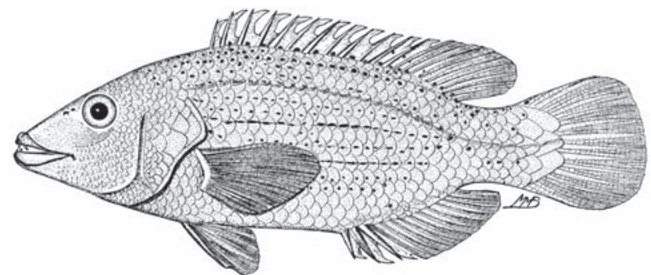
Lepidaplois luteopunctatus Smith 1957: 102, Pl. 1a (Maputo Bay, Mozambique); Smith & Smith 1963*.

Bodianus trilineatus: Smith in Bruton & Cooper 1980; Heemstra & Heemstra 2004*; Gomon 2006; Baranes *et al.* 2017.

Dorsal fin 12 spines, 10 rays; anal fin 3 spines, 12 rays; pectoral fins 15 or 16 rays. Vomer with ≥1 canines. Body depth 2.6–3.1 in SL; pelvic fins not extending to anus; caudal fin usually slightly rounded. Total GR 17–19. LL scales 29 or 30; predorsal scales 19–33, scales dorsally on head extending from

above eyes to anterior nostrils; cheek scales extending slightly anterior to corners of mouth; low scaly sheath at base of dorsal and anal fins.

Body orange-red dorsally, grading through yellow to pale blue or lavender ventrally on head, chest and abdomen, with 5 longitudinal orange-red lines on body, upper 3 heavily superimposed with black and converging anterior of eyes; fins pale yellow to orange-yellow; curved dark red to black bar at pectoral-fin base; subadults with large elliptical black spot in dorsal fin at juncture of spines and rays, and smaller spot in anal fin; black spot at end of 3rd black line at midcaudal-fin base. Attains 27 cm TL.



Bodianus trilineatus, 27 cm TL, holotype of *Lepidaplois luteopunctatus* (S Mozambique). Source: Smith 1957

DISTRIBUTION WIO: Gulf of Aden, Somalia, southern Mozambique to South Africa (Park Rynie).

REMARKS Reported from off Somalia and in the Gulf of Aden (where the sea is cooler from upwelling). Heemstra & Heemstra (2004) give the depth range as 25–200 m, and Gomon (2006) as 50–80 m. Van der Elst (1981) reported feeding mainly on gastropod and bivalve molluscs and noted that it is a popular aquarium fish.

GENUS *Cheilinus* Lacepède 1801

Single pair of prominent canines at front of jaws, none at back of upper jaw; dorsal fin long-based, with 9 spines, 9–14 rays (except *Cheilinus chlorourus* with 10 spines, 9 rays); anal fin 3 spines, 8–12 rays; pectoral fins 12 rays (except *C. quinquecinctus* with 11 rays). Mouth terminal or with lower jaw slightly projecting. Lateral line interrupted, with 15 or 16 scales in upper part, ending beneath soft-rayed part of dorsal fin, and 6 or 7 pored scales midlateral on peduncle; scaly sheath at base of dorsal and anal fins. Eight species, all in WIO and/or Red Sea, and 5 ranging to Pacific.

KEY TO SPECIES

- 1a Dorsal fin 10 spines, 9 rays; caudal fin strongly rounded, adult males with filamentous uppermost principal ray, some with lower ray also elongate; body dark brown to dark olive, with red, pink or white dots on head, body and fins, those on body often as 2 or 3 in vertical alignment on scales; large ovate bluish or greenish spot on opercle *C. chlorourus*
- 1b Dorsal fin 9 spines, 9–11 rays; colour not entirely as above 2
- 2a Adults with prominent fleshy hump on forehead, deep-bodied (body depth ~2.2–2.3 in SL) and strongly compressed; greyish to yellowish green, with narrow, spindle-shaped, dark brown vertical bands on scales behind pectoral fins; irregular narrower dark brown bands and lines anteriorly; fine reticular pattern on cheeks and opercles; scattered white markings and wavy lines sometimes present on nape; 2 long, close-set, black lines extending back from eye, and often double dark band from eye to corner of mouth; maximum size >170 cm TL *C. undulatus*
- 2b No prominent hump on forehead of adults; colour not as above; maximum length ~40 cm TL 3
- 3a Head profile concave from mouth to above eyes; caudal fin rounded; body usually red to reddish brown, with numerous bright red to white dots on head and body; 2 or 3 close-set, square, dark brown spots on each side of upper lip; 3 or 4 black spots (at most pupil-sized) in midlateral row posteriorly on body, last spot at caudal-fin base *C. oxycephalus*
- 3b Head profile straight or convex from mouth to above eyes; caudal fin rounded, truncate or double emarginate, with or without one or more filamentous rays; no prominent dark brown spots on sides of upper lip, and no midlateral row of black spots posteriorly on body 4
- 4a Pelvic fins of adults elongate, in males almost twice length of pectoral fins, extending beyond anal-fin spines; caudal fin slightly rounded, each branch of principal rays of adult males greatly elongated as filament; 6th dorsal-fin ray and 5th anal-fin ray the central ray of lobed portion, up to half caudal-fin length in adult males; adult females green, with 4 double dark olive bars on body, scales with long vertical pink lines (as well as green lines within the dark bars); both sexes with scattered pink dots on head; lips and chin bright blue, pectoral fins bright yellow, and vertically elongate black spot on opercular flap containing irregular yellow mark; body of adult males behind pectoral fins dark olive, with vertical pink and green lines on scales; irregular yellow bar beneath pectoral fins *C. lunulatus*
- 4b Pelvic fins of males not long; caudal fin with rays exerted only in *C. abudjubbe* (free rays $\frac{1}{2}$ caudal-fin length); colours not as above 5

Continued ...

KEY TO SPECIES

- 5a Pelvic fins barely extending to anus; anterior third of body orange (including chest and pectoral fins), body pale brownish grey to dark grey posteriorly, with 5 narrow whitish bars, extending and expanding onto bases of dorsal and anal fins; many scales on body with narrow, spindle-shaped, vertical black streaks 6
- 5b Pelvic fins extending beyond anus, often to or beyond anal-fin origin; colour not as above 7
- 6a Caudal fin of adults deeply emarginate, caudal concavity up to half of HL; pectoral fins 12 rays; longest dorsal-fin ray 2.2–2.4 in HL; orange-red lines radiating from lower half of eyes *C. fasciatus*
- 6b Caudal fin of adults truncate, with one to several elongate rays, none longer than quarter of HL; pectoral fins 11 rays; longest dorsal-fin ray 1.6–1.8 in HL; no orange-red lines radiating from lower half of eyes (Red Sea) *C. quinquecinctus*
- 7a Caudal fin of adult males rounded with numerous elongate rays, fin length without elongate rays subequal to HL; longest dorsal-fin ray 1.4–1.7 in HL; pelvic fins of adult males extending well beyond anal-fin origin; scales of anterior half of body with red and pale green dots, red mostly in vertical series of 3; scales of posterior half of body with vertical red and pale green lines; pink lines radiating in all directions from eyes *C. abudjubbe*
- 7b Caudal fin of adult males rounded, only the uppermost and lowermost principal rays elongated as filament, fin length without filaments ~1.5 in HL; longest dorsal-fin ray 1.8–2.4 in HL; pelvic fins of adult males just extending to or slightly behind anal-fin origin; scales of body with vertical magenta and pale green lines (no dots); pink lines extending only above and in front of eyes *C. trilobatus*

Cheilinus abudjubbe Rüppell 1835

Abudjubbe

PLATE 59

Cheilinus abudjubbe Rüppell 1835: 18 (Jeddah, Saudi Arabia, Red Sea); Randall 1983 [photograph is of *C. trilobatus*]; Gomon in Fischer & Bianchi 1984; Field & Field 1998*; Lieske & Myers 2004.

Cheilinus trilobatus (non Lacepède 1801): Dor 1984.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth of adults 2.3–2.5 in SL; snout length 3.2–3.6 in HL; snout profile in adults straight, at ~45° angle; rear margin of dorsal fin of adults angular, longest ray 1.4–1.7 in HL; pelvic fins of adult males extending beyond anal-fin origin; caudal fin of adult males rounded, rays becoming elongate and free of membrane with growth (uppermost principal ray first to become longer and generally longest); caudal-fin length without elongate rays subequal to HL. GR 12 or 13. LL scales 14 or 15 + 7 or 8.

Body dark olive-brown, scales of anterior half of body with red and pale green dots, red mostly in vertical series of 3; scales of posterior half of body with vertical red and pale green lines; head green with pink lines radiating in all directions from eyes; series of prominent white blotches of variable size dorsally and ventrally on body; numerous small white spots on median fins. Attains 40 cm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) and Gulf of Aden.

REMARKS Usually found on shallow silty reefs of sheltered bays and lagoons, in 2–30 m. Solitary; juveniles and females secretive, males swim more in the open but are difficult to approach. Replaced in remainder of Indo-Pacific by the similar-looking *Cheilinus trilobatus*.

Cheilinus chlorourus (Bloch 1791)

Floral wrasse

PLATES 59 & 60

Sparus chlorourus Bloch 1791: 24, Pl. 260 (Japan).

Cheilinus punctatus Bennett 1832: 167 (Mauritius, Mascarenes); Playfair & Günther 1867.

Cheilinus punctulatus Valenciennes in Cuv. & Val. 1840: 87, Pl. 396 (Seychelles).

Cheilinus chlorurus: Bleeker 1874; Barnard 1927; Munro 1955; Jones & Kumaran 1980; Gomon in Fischer & Bianchi 1984; Allen & Smith-Vaniz 1994.

Thalliurus chlorurus: Smith 1957; Smith & Smith 1963*; SFSA No. 818.

Cheilinus chlorourus: SSF No. 220.12*; Randall 1992; Fricke 1999; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Dorsal fin 10 spines, 9 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 2.3–2.8 in SL, less deep with growth; snout profile straight to slightly concave, dorsal profile slightly convex on rest of head and nape; snout length ~3 in HL; pelvic fins of adult males elongate, extending at least to anal-fin origin; caudal fin strongly rounded, upper ray and to lesser extent lower ray elongate in large adult males. LL scales 15 + 5–8; head scaly dorsally anterior to eyes.

Body dark brown to olivaceous, with numerous, orange-pink to red dots, often with 2–4 per scale; head more densely dotted; no red lines radiating from eyes (but may be a few short, broad red dashes anterior and dorsal to eyes); ovate bluish grey spot almost eye-sized on opercular flap; median and pelvic fins with numerous whitish dots; bluish black blotch on 1st or 2nd interspinous membranes of dorsal fin; caudal fin with large middle bluish black zone, preceded by broad irregular whitish bar, followed by very broad orangish border, entire fin finely flecked with white; pectoral-fin rays whitish, membranes transparent. Attains 36 cm TL.



Cheilinus chlorourus, 18 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Arabian Sea, Kenya to Mozambique, Seychelles, Rodrigues and Mauritius; elsewhere to Japan, Micronesia and French Polynesia.

REMARKS Inhabits coral reefs and seagrass beds, in 1–30 m. Feeds mainly on hard-shelled benthic invertebrates.

Cheilinus fasciatus (Bloch 1791)

Redbreasted wrasse

PLATE 60

Sparus fasciatus Bloch 1791: 18, Pl. 257 (Japan).

Labrus enneacanthus Lacepède 1801: 433, 480 [no locality given].

Sparus bandatus Perry 1810: no page number, Pl. 8 ('Eastern Ocean').

Cheilinus fasciatus: Valenciennes in Cuv. & Val. 1840; Playfair & Günther 1867; Bleeker 1874; Day 1877; Baissac 1953; Smith 1957; Smith & Smith 1963*; Jones & Kumaran 1980; Winterbottom *et al.* 1989*; Randall 1992 [photograph is of *C. quinquecinctus*]; De Bruin *et al.* 1994; Heemstra *et al.* 2004.

Cheilinus fasciatus fasciatus: Gomon in Fischer & Bianchi 1984; Fricke 1999.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 2.3–2.8 in SL, less deep with growth; head profile straight in juveniles, becoming convex in adults; snout length 2.2–2.6 in HL; margin of soft-rayed portion of dorsal fin rounded, longest ray ~2.5 in HL; anal fin acutely pointed, longest ray ~1.2–1.4 in HL; pelvic fins short, not extending to anus, length ~2.2 in HL; caudal fin slightly rounded in juveniles, lunate in adult males, with caudal concavity ~2 in HL. GR 12–15. LL scales 14–16 + 7–9; head scaly dorsally anterior to eyes.

Body greenish grey, grading to orange anteriorly on body (covering pectoral fins and including chest), with vertical, spindle-shaped black bar on scales; body crossed by 6 narrow, curved white bars that expand into adjacent dorsal and anal fins, 1st beneath pectoral fins and ending anteriorly on abdomen, last on peduncle; head olive-green to green, grading

to orange behind eyes and expanding onto opercles; 2 curved white bars on nape, most anterior bar ending on eye; orange lines radiating from lower half of eyes; caudal fin white with broad black bar in middle of fin and black on middle of rear margin. Attains 33 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Tanzania, Mozambique, Madagascar, Mascarenes, Maldives and Chagos; elsewhere to Indonesia, Ryukyu Is., Micronesia, Great Barrier Reef, Lord Howe I. and Samoa.

REMARKS More common on lagoonal than on seaward reefs; seemingly the least wary species of the genus. Replaced in the Red Sea by the similar-looking *C. quinquecinctus* (once considered a subspecies).

Cheilinus lunulatus (Forsskål 1775)

Broomtail wrasse

PLATE 60

Labrus lunulatus Forsskål in Niebuhr 1775: 37, xi (Red Sea).

Cheilinus lunifer Nichols 1923: 3, Fig. 3 (Djibouti, Gulf of Aden).

Cheilinus lunulatus: Smith 1957; Klausewitz & Nielsen 1965; Randall 1983, 1995*; Dor 1984; Carpenter *et al.* 1997*; Field & Field 1998*; Lieske & Myers 2004.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 2.4–2.7 in SL, less deep with growth; head profile of juveniles almost straight, at ~45° angle; snout progressively steeper with growth, to ~60° angle in large males; snout length of adults 2.6–2.9 in HL (to 3.5 in juveniles); pelvic fins of adults very long, in males almost twice length of pectoral fins, extending beyond anal-fin spines; dorsal- and anal-fin lobes elongate, with 6th dorsal-fin ray and 5th anal-fin ray the central rays respectively, and extending back as much as half the caudal-fin length in adult males; caudal fin slightly rounded, each branch of principal rays of adult males greatly elongated as filament up to half total fin length. GR 10–12. LL scales 15 or 16 + 8 or 9; head scaly dorsally anterior to eyes.

Adult females green, with 4 double dark olive bars on body, scales with long vertical pink lines (as well as green lines within the dark bars); both sexes with scattered pink dots on head; lips and chin bright blue, pectoral fins bright yellow, and vertically elongate black spot on opercular flap, containing irregular yellow mark (sometimes looking like a bent question mark). Adult males dark olive on body behind pectoral fins, with vertical pink and green lines on scales; irregular yellow bar anteriorly on body, passing beneath pectoral fins. Males attain 50 cm TL

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) to Gulf of Oman and Persian/Arabian Gulf.

REMARKS Found on coral reefs and adjacent habitats, to ~30 m deep; solitary and difficult to approach. Feeds primarily on benthic invertebrates, especially molluscs and crustaceans. Males maintain a harem and are strongly territorial.

Cheilinus oxycephalus Bleeker 1853

Snooty wrasse

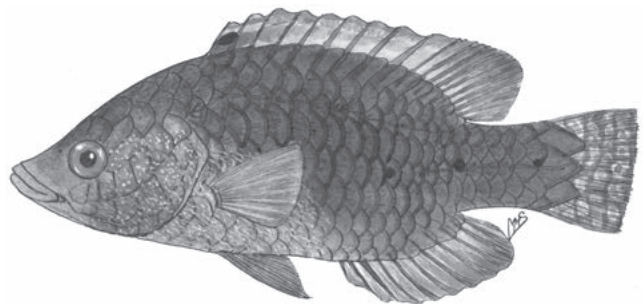
PLATE 60

Cheilinus oxycephalus Bleeker 1853: 349 (Ambon I., Moluccas, Indonesia); Smith 1957; Smith & Smith 1963*; SSF No. 220.14*; Winterbottom *et al.* 1989*; Randall 1992; Fricke 1999.

Cheilinus calophthalmus Günther in Playfair & Günther 1867: 90, Pl. 11, Fig. 4 (Zanzibar, Tanzania).

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 2.4–3 in SL; head profile concave from mouth to above eyes; snout short, length 3.1–3.7 in HL; pelvic fins short, length subequal to pectoral fins and usually just reaching anus; soft-rayed portions of dorsal and anal fins not acutely pointed; caudal fin rounded in all stages. LL scales 15 or 16 + 6 or 7; head scaly to above middle of eyes.

Colour variable, usually brownish red, but may be bright red or olive mottled with small whitish spots; juveniles and subadults often with 4 irregular narrow whitish bars across body; 3 or 4 dark brown spots of about pupil-sized midlaterally on posterior half of body, last at midcaudal-fin base; each side of upper lip usually with 2 or 3 close-set, square, dark brown spots; often 2 dark lines diverging behind eye; dark brown or black spot of pupil size or larger on membrane between first 2 dorsal-fin spines, partly bordered in red, sometimes extending onto 2nd membrane. Attains 17 cm TL.



Cheilinus oxycephalus, 12 cm SL (N Mozambique). Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Aliwal Shoal), Tanzania (Zanzibar), Madagascar, Comoros, Seychelles, Mauritius, Maldives and Chagos; elsewhere to Indonesia, Ryukyu Is., Great Barrier Reef, Tuamotu Is. and Line Is.

REMARKS Shelters on coral reefs; among the most difficult of reef fishes to approach. Two older names for this species were *C. ketlitzii* Valenciennes 1840 and *C. sanguineus* Valenciennes 1840, both described from specimens from the Caroline Is. (M Westneat, pers. comm.). Randall & Parenti (1999) successfully petitioned for suppression of these names to conserve *C. oxycephalus*.

Cheilinus quinquecinctus Rüppell 1835

Whitebarred wrasse

PLATE 61

Cheilinus quinquecinctus Rüppell 1835: 19, Pl. 6, Fig. 1 (Jeddah, Saudi Arabia, Red Sea).

Chilinus fasciatus (non Bloch 1791): Klunzinger 1871.

Cheilinus fasciatus quinquecinctus Klauswitz 1967: 59 (Sarso I., Red Sea); Gomon in Fischer & Bianchi 1984.

Cheilinus fasciatus (non Bloch 1791): Bemert & Ormond 1981; Randall 1983; Dor 1984; Field & Field 1998*.

Cheilinus quinquecinctus: Lieske & Myers 2004.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 11 rays. Body depth 2.4–2.6 in SL; snout length 2.2–2.6 in HL; head profile of juveniles almost straight, at ~30° angle; head profile of adults straight to above eyes, at ~45° angle, then convex to dorsal-fin origin; rear margin of dorsal and anal fins angular; pelvic fins short, not extending to anal-fin origin; caudal fin slightly rounded in juveniles, truncate in females, and rays in adult males free of membranes posteriorly (uppermost principal ray first to elongate). GR 12–15. LL scales 14–16 + 7–10.

Juveniles brown with 3 white bars that cross body and extend into adjacent fins, bars broader and brighter anteriorly; faint 4th bar at front of peduncle, and 2 faint short bars on nape; short oblique white band from eye to across preopercle; white band at caudal-fin base; midlateral row of small black spots, and large black spot anteriorly on dorsal fin; females with same white bars as juveniles, with additional fainter bar between first 2 bars, ending posteriorly on abdomen; vertical black lines or rows of small black spots on scales anteriorly on body and on head behind eyes; postorbital part of head and anterior body suffused with orange; caudal fin broadly white basally, followed by slightly broader black zone, the outer fifth pale grey; males with vertically elongate, spindle-shaped black streaks on scales at margins of white bars on body, and much heavier orange-red pigment overlying front of body, especially abdomen, beneath pectoral fins, and variably onto head. Attains ~35 cm TL.

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Occurs on both sheltered and seaward reefs, in 4–40 m, often in adjacent sand and rubble areas. Has been observed following foraging goatfishes to take advantage of exposed hard-shelled invertebrates. Differs somewhat in colour from *C. fasciatus* from Indo-Pacific, and in having elongate caudal-fin rays in males. Parenti & Randall (2000, 2011, 2018) considered this species a synonym of *C. fasciatus*.

Cheilinus trilobatus Lacepède 1801

Tripletail wrasse

PLATE 61

Cheilinus trilobatus Lacepède (ex Commerson) 1801: 529, 537, Pl. 31, Fig. 3 (Madagascar; Réunion and Mauritius, Mascarenes); Valenciennes in Cuv. & Val. 1840; Günther 1862; Playfair & Günther 1867; Day 1875; Smith 1957; Smith & Smith 1963*; SFSA No. 816*; Baissac 1968; Jones & Kumaran 1980; Gomon in Fischer & Bianchi 1984; SSF No. 220.15*; Winterbottom *et al.* 1989*; Randall 1992; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Fricke 1999.

Cheilinus sinuosus Quoy & Gaimard 1824: 278 (Madagascar; Mariana Is.).

Cheilinus fasciatopunctatus Steindachner 1863: 1114, Pl. 23 (Red Sea).

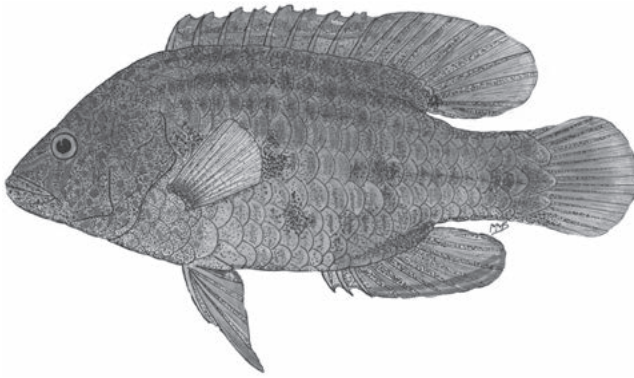
Chilinus trilobatus: Peters 1877.

Julis trilobata: Sauvage 1891.

Cheilinus chlorurus (non Bloch 1791): Cornic 1987.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 2.3–2.6 in SL; head profile straight to above eyes, then slightly convex; pelvic fins of adults long, extending to near anal-fin origin; posterior dorsal- and anal-fin rays of adult females forming rounded margin, longest dorsal-fin ray 1.8–2.4 in HL, but these fins in adult males acutely pointed, longest anal-fin ray ~1.5 in HL; caudal fin rounded, upper and lower rays of adult males elongate, giving fin trilobed shape. GR 10 or 11. LL scales 14–16 + 7 or 8; head scaly dorsally to above middle of eyes.

Adults olive-green, with narrow, vertical, pink to magenta lines on scales of body, spindle-shaped posteriorly; head green with numerous pink dots; pink lines extending anteriorly and ventrally from eyes; lower lip and chin blue; 2 broad white bars often present on adults, one anteriorly on peduncle, other at caudal-fin base; broad middle zone of caudal fin with black membranes and green rays; distal part of fin pink to magenta; scaly basal part of dorsal and anal fins with linear pattern like body; margin of fins pink to magenta, with submarginal line of same colour; base and rays of pectoral fins yellow, membranes transparent. Attains 40 cm TL.



Cheilinus trilobatus, 12 cm TL, juvenile (S Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Sodwana Bay), Madagascar, Seychelles, Réunion, Mauritius, Maldives and Chagos; elsewhere to Indonesia, Ryukyu Is., Mariana Is., New Caledonia, Austral Is. and Tuamotu Is.; not known from Red Sea.

REMARKS Found on coral reefs and adjacent habitats. At Madagascar feeds heavily on gastropods, followed by crabs, bivalve molluscs and hermit crabs (Harmelin-Vivien 1979).

Cheilinus undulatus Rüppell 1835

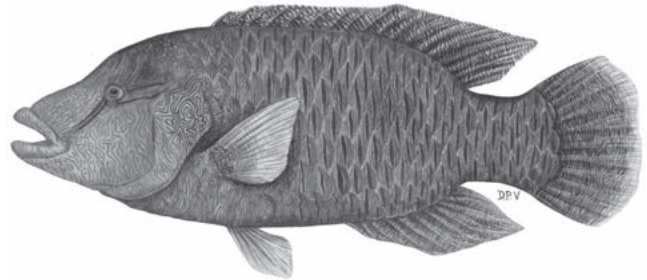
Humphead wrasse or Napoleonfish PLATES 61 & 62

Cheilinus undulatus Rüppell 1835: 20, Pl. 6, Fig. 2 (Jeddah, Saudi Arabia, Red Sea); Playfair & Günther 1867; Smith 1957; Smith & Smith 1963*; SFSA No. 817a*; Randall 1983, 1992; Gomon in Fischer & Bianchi 1984; SSF No. 220.16*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Field & Field 1998*; Lieske & Myers 2004.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth to 2.7 in SL in juveniles, to 2.3 in SL in large adults; head profile of juveniles straight, profile of adults straight to eyes and then convex, large adults develop fleshy hump on forehead that protrudes anterior to eyes; mouth terminal, with thick lips; snout length 2–2.7 in HL, proportion increasing with growth; pelvic fins of adults extending well behind anus; dorsal and anal fins of adults acutely pointed, extending up to half distance to end of caudal fin; caudal fin rounded. GR 19–21. LL scales 14–16 + 7 or 8; low scaly sheath at base of dorsal and anal fins.

Juveniles pale greenish grey, with vertically elliptical black spot on each scale, except for 3 vertical white bars across body that extend onto dorsal fin, and narrower white bar on nape at dorsal-fin origin; head with many black spots and pair of irregular black lines extending anteriorly and behind eye; median fins greenish to yellowish grey, crossed by irregular

black bands. Subadults olive- to blue-green with vertical, spindle-shaped, dark brown band on each scale; 2 closely parallel black lines extending back across head from eye and 2 obliquely downward from each eye to end of maxilla. Adults with dark bands on scales, becoming narrower, with irregular vertical dark lines developing in interspaces; fine reticulated pattern develops on head; rays of median fins crossed by fine striation of yellow and dark brown; caudal-fin margin pale, submarginal band dark. Attains at least 170 cm TL.



Cheilinus undulatus, 60 cm TL (Zanzibar). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Red Sea to Mozambique (Inhaca I.), Madagascar, Mauritius, Maldives, Maldives and Chagos; elsewhere to Japan, Australia, New Caledonia, Pitcairn Is. and Hawaii.

REMARKS The largest of the wrasses. Solitary or occasionally in pairs, adults active on reefs by day; benthopelagic, in 2–60 m. Feeds on gastropods, crabs and other crustaceans, sea urchins, bivalve molluscs and fishes, with lesser amounts of brittlestars and sea stars (Randall *et al.* 1978). Choat *et al.* (2006) estimated an age of 23 years for a 140-cm-TL specimen from otolith rings. Sadovy *et al.* (2003) reviewed the biology and discussed the threat from overfishing. IUCN Red List conservation status Endangered.

GENUS *Cheilio* Lacepède 1801

Genus diagnosis as for the single species.

Cheilio inermis (Forsskål 1775)

Cigar wrasse

PLATE 62

Labrus inermis Forsskål in Niebuhr 1775: 34, xi (Al-Mukha, Yemen, Red Sea).

Cheilio auratus Lacepède (ex Commerson) 1802: 432, 433 (Mauritius, Mascarenes).

Cheilio fuscus Lacepède (ex Commerson) 1802: 432, 433 (Mauritius, Mascarenes).

Labrus fusiformis Rüppell 1835: 7, Pl. 1, Fig. 4 (Jeddah, Saudi Arabia, and Massawa, Eritrea, Red Sea).

Cheilio cyanochloris Valenciennes in Cuv. & Val. 1839: 346, Pl. 382 (Mauritius, Mascarenes).

Cheilio bicolor Bianconi 1857: 100 (Mozambique).

Cheilio inermis: Günther 1862; Playfair & Günther 1867; Bleeker 1874; Sauvage 1891; Gilchrist & Thompson 1908; Barnard 1927 [as *Chilio inermis*]; Baissac 1953, 1968; Smith 1955, 1957; Smith & Smith 1963*; SFSA No. 770*; Jones & Kumaran 1980; Randall 1983; Gomon in Fischer & Bianchi 1984; SSF No. 220.17*; Winterbottom *et al.* 1989*; Randall & Anderson 1993; Allen & Smith-Vaniz 1994; Field & Field 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004; Fricke *et al.* 2009.

Cheilio cyanochloris: Guichenot 1863.

Dorsal fin 9 spines, 12–14 rays; anal fin 3 spines, 11 or 12 rays; pectoral fins 12 rays. Jaws with pair of canines at front, followed by row of small conical teeth. Body elongate and little compressed, depth 5.5–7.9 in SL; snout long and pointed, 2.2–2.4 in HL; caudal fin rounded to slightly rhomboid. Lateral line continuous, gently curved, LL scales 45–59; head naked except for 1 row of scales on preopercle and a few scales dorsally on opercle; no scaly sheath at base of dorsal and anal fins.

Colour varying from shades of green, brown to bright yellow, often with narrow midlateral dark stripe, with body below stripe sometimes silvery; males with a few small orange to pink blotches, sometimes with black spots on side of body behind pectoral fins. Attains 50 cm TL.



Cheilio inermis, 10 cm SL (Comoros). © R Winterbottom, ROM

DISTRIBUTION Indo-Pacific to eastern Pacific (widespread). WIO: Red Sea to South Africa, Madagascar, Comoros, Seychelles, Mascarenes and Chagos; elsewhere to Indonesia, southern Japan, Australia, Lord Howe I., Rapa Iti, Hawaii and Easter I.

REMARKS Typically found in seagrasses or dense algal beds. Feeds on gastropods, bivalve molluscs, hermit crabs, crabs, sea urchins and shrimps (Randall 1985).

GENUS *Choerodon* Bleeker 1847

Two pairs of strong canines at front of jaws, 2nd pair in lower jaw curved laterally in some species (including both species in WIO); sides of jaws with row of close-set conical teeth, those in front may be joined into a ridge; small canine present posteriorly on each side in upper jaw. Dorsal fin 12 or 13 spines, 7 or 8 rays; anal 3 spines, 9 or 10 rays; pectoral fins 13–15 rays. Body depth 2.2–3 in SL; head profile of adults steep and convex; caudal fin varying from slightly emarginate to slightly convex. Lateral line continuous, smoothly curved, 24–29 pored scales; cheeks and opercles at least partly scaly; no scaly sheath at base of dorsal and anal fins. Twenty-seven species, all in Indo-Pacific, possibly 4 in WIO, but 2 to be confirmed. *Choerodon anchorago* (Bloch 1791) ranges from Sri Lanka to the western Pacific.

KEY TO SPECIES

- 1a Pectoral fins 14 or 15 rays; body depth ~3 in SL; females orange-brown dorsally, with indistinct orange-red stripe on body above pectoral-fin bases, body below stripe yellowish white; large lavender area on cheeks and opercles, grading to yellow ventrally, with 2 angular violet streaks; large blue-green spot dorsoposteriorly on opercle; males dark grey-green dorsally, pale bluish grey ventrally, with 2 parallel stripes of close-set purplish blue spots, one per scale (1st stripe from above middle of pectoral fins to upper part of caudal-fin base; 2nd stripe from ventral edge of pectoral fins to midpart of caudal-fin base; head mainly blue-green, grading to yellow ventrally, with narrow blue stripe from eye to upper lip, and narrow blue stripe just below eye *C. gymnogenys*
- 1b Pectoral fins 16 rays; body depth 2.5–2.6 in SL; curved dark brown band from upper part of pectoral-fin base to below rear part of dorsal-fin base, broadly bordered below by white band; body above band yellowish grey, and pale yellowish below band, with pale blue rims on scales, becoming narrow longitudinal blue bands on peduncle and continuing irregularly onto caudal fin; no blue band from eye to maxilla *C. robustus*

Choerodon gymnogenys (Günther 1867)

Purple-lined tuskfish

PLATE 62

Xiphochilus gymnogenys Günther in Playfair & Günther 1867: 85, Pl. 12, Fig. 4 (Zanzibar, Tanzania).

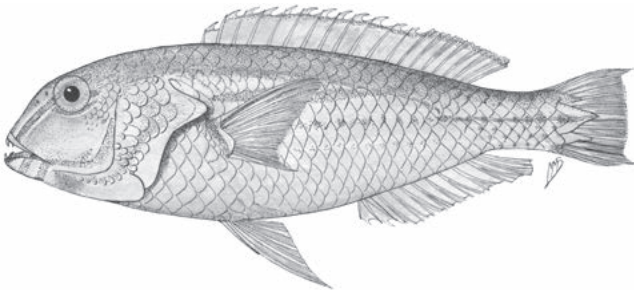
Peaolopesia matthaei (non Valenciennes 1839): Smith 1957.

Peaolopesia gymnogenys: SFSA No. 776a*.

Dorsal fin 12 spines, 8 rays; anal fin 3 spines, 10 rays; pectoral fins 14 or 15 rays. Front of jaws with pair of stout well-separated canines, 2nd pair laterally curved; sides of jaws with

row of stout, close-set conical teeth, anterior teeth coalesced into ridge. Dorsal and anal fins each continuous, soft-rayed parts almost uniform in height; pectoral-fin margins concave, ray conspicuously elongate; pelvic fins pointed, extending to anus; caudal fin relatively small, varying from slightly rounded to slightly emarginate or double emarginate. Lateral line gently curved posteriorly, straight on peduncle, LL scales 29; large scales on opercle; a few small scales on cheeks.

Females with indistinct orange-red stripe on body above pectoral-fin bases, body above stripe dull orange-red, suffused with lavender, and body below stripe lavender-grey with yellow in pectoral region; large lavender area on cheeks and opercles, grading to yellow ventrally, with 2 angular violet streaks; large blue-green spot dorsoposteriorly on opercle. Males dark grey-green dorsally, pale bluish grey ventrally, with 2 parallel stripes of close-set purplish blue spots, one per scale, 1st from above middle of pectoral fins to upper edge of caudal fin, 2nd from ventral edge of pectoral fins to midpart of caudal-fin base; head mainly blue-green, grading to yellow ventrally, where crossed by 2 oblique bright blue bands, rear band almost 3 times length of front band; narrow blue stripe from eye to blue upper lip, and narrow blue stripe just below eye; oblique blue band at pectoral-fin bases; dorsal fin orange; caudal and anal fins yellow. Individuals of both sexes from deeper depths more red overall. Attains 20 cm TL.



Choerodon gymnogenys, 15 cm TL, male (WIO). Source: SFSA

DISTRIBUTION WIO: Tanzania (Zanzibar), southern Mozambique, Seychelles Bank, and St Brandon Shoals.

REMARKS Known from 43–60 m. The specimens reported as *Choerodon gymnogenys* from Japan by Yamakawa *in* Masuda *et al.* (1984) and by Shen *et al.* (1993) from Taiwan are *Choerodon japonicus* (Kamohara 1958), described from a market specimen at Kochi City, Japan. *Choerodon skaiopygmaeus* Gomon 2017 (with no species account or photograph) is known only from 7 specimens collected off Somalia in 25–60, with live colours unknown; it is in the same species complex (with falcate pectoral fins) as *C. gymnogenys*, but has a more expansively scaled cheek.

Choerodon robustus (Günther 1862)

Robust tuskfish

PLATE 62

Xiphochilus robustus Günther 1862: 98 (Mauritius, Mascarenes); Playfair & Günther 1867; Klunzinger 1871.

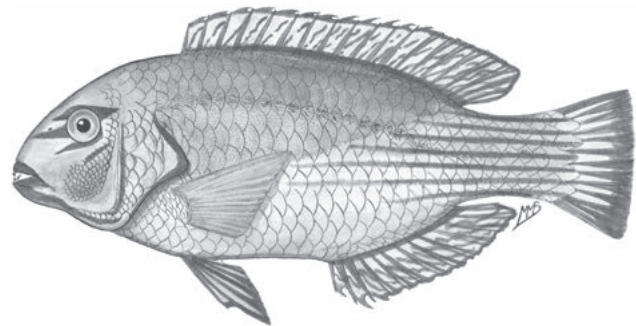
Cossyphus maxillosus Guichenot 1863: C-23 (Réunion, Mascarenes).

Choerops dodecanthus Bleeker 1868: 275 (Réunion, Mascarenes).

Choerodon robustus: Baissac 1953; Smith 1957; Gomon *in* Fischer & Bianchi 1984; Randall 1995*; Fricke 1999; Fricke *et al.* 2009.

Dorsal fin 13 spines, 8 rays; anal fin 3 spines, 10 rays; pectoral fins 16 rays. Dorsal fin interspinous membranes incised; 6th dorsal-fin ray longest, ~1.5 times longest dorsal-fin spine; caudal fin truncate. LL scales 29, gently curved backwards to straight on peduncle; large scales on opercle, small scales on cheek.

Females with oblique brown band from upper pectoral-fin base to rear dorsal-fin base, with broader white band adjacent and ventral; body above brown band orangish brown, becoming grey-brown dorsally and on head; body below white band yellowish, scales with pale blue vertical line except on peduncle where they become spots or join to form longitudinal blue lines; head with blue markings around eyes; upper lip with blue stripe; lower jaw yellow with broad blue stripe; lower edge of opercle blue; median fins yellow with longitudinal blue bands, corners of caudal fin blue. Males similar in colour, white band changing to orange, blue markings on body and fins disappearing, and ventral part of head and chest becoming blue. Attains 35 cm TL.



Choerodon robustus, 21 cm TL, male (Zanzibar). Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea (including Gulf of Aqaba), Tanzania (Zanzibar), Oman to Mozambique, Seychelles, Réunion and Mauritius; elsewhere to Indonesia, Taiwan and Ryukyu Is.

REMARKS Known from 20–250 m. Feeds on hard-shelled invertebrates, such as crustaceans, molluscs and sea urchins (Khalaf & Disi 1997). *Choerodon cypselurus* Gomon 2017, known only from a single collection on Saya de Malha Bank of the Seychelles, from preserved specimens only, is distinguished from *C. robustus* by an emarginate caudal fin.

Three pairs of canines at front of upper jaw that are progressively longer, more outflaring and recurved posteriorly; single pair of small canines at front of lower jaw; small conical teeth in single row on side of jaws; no tooth at corner of mouth; scleral cornea of pupil modified to form a double pupil (Springer & Randall 1974 suggested that the round anterior part may serve as a close-up lens for feeding on small prey such as copepods); dorsal fin 11 spines, 9 (rarely 8 or 10) rays; anal fin 3 spines, 9 or 10 rays; LL interrupted, scales 15–18 + 4–11; median predorsal scales 4–6; margin of preopercle serrate. Juveniles of known species red overall, with prominent black spot on upper half of peduncle and white marking dorsally on snout. Genus with 61 species, all in Indo-Pacific, 8 in WIO.

Two newly described species, *Cirrhilabrus africanus* Victor 2016 (Plate 62), from coastal East Africa, Mozambique and South Africa (KwaZulu-Natal), and *C. rubeus* Victor 2016 (Plate 64), from the Maldives and Sri Lanka, were separated from *C. rubriventralis*, but too late for inclusion here, as it was for *C. wakanda* (see under *Cirrhilabrus blatteus*).

KEY TO SPECIES

[Adult males]

- 1a Caudal fin rhomboid to lanceolate 2
- 1b Caudal fin rounded to double emarginate 4

- 2a Caudal fin rhomboid; 3.2–3.7 in SL; head and body bright red anterior to curved line ending at anal-fin origin, scales posteriorly on head, chest, and anteriorly on body to pectoral-fin tips rimmed with deep magenta; remainder of body yellow *C. rubrisquamis*
- 2b Caudal fin lanceolate, 2.4–3.3 in SL; colour not as above 3

- 3a Caudal-fin length 2.9–3.3 in SL; beige with broad yellow bar across body before anal-fin origin, containing irregular, oblique, red triangle extending two-thirds distance to anal-fin origin; head orange, yellow ventrally; caudal fin multicoloured *C. sanguineus*
- 3b Caudal-fin length 2.4–2.9 in SL; body tan above and white below midlateral, irregular, narrow magenta stripe; 2nd magenta stripe at dorsal-fin base, continuing dorsally onto peduncle; caudal fin with large triangular bright yellow area covering more than basal half of fin *C. blatteus*

Continued ...

KEY TO SPECIES

- 4a Pelvic fins broad and very long, extending beyond base of anal-fin spines; cirri of first 2 dorsal-fin spines elongated as long filaments; caudal fin rounded, corners slightly elongate; pelvic and anal fins largely bright red; no black spot on peduncle *C. rubriventralis*
- 4b Pelvic fins not extending to anal-fin origin; caudal fin double emarginate, corners extending middle of fin; pelvic and anal fins not red; large oval to semicircular black spot on peduncle just above lateral line *C. exquisitus*

Cirrhilabrus blatteus Springer & Randall 1974

Purple-boned fairy wrasse

PLATE 63

Cirrhilabrus blatteus Springer & Randall 1974: 48, Figs. 2–3 (Eilat, Israel, Gulf of Aqaba, Red Sea); Dor 1984; Randall 1995; Lieske & Myers 2004; Tea *et al.* 2019.

Dorsal fin 11 spines, 9 rays; anal fin 3 spines, 10 rays; pectoral fins 15 rays. Body depth 3.1–3.5 in SL; HL 3–3.5 in SL; snout length 3.8–4.5 in HL; caudal fin rhomboid in females, lanceolate in large males, fin length in males 2.4–2.9 in SL; pelvic fins short, not extending to anal-fin origin. GR 17–19. LL scales 15–17 + 6 or 7; median predorsal scales 5.

Females pinkish tan, white ventrally, with midlateral row of vertically elongate magenta spots; preopercle margin magenta; a broad oblique orange band dorsally on opercle, narrowing at pectoral-fin base; iris red; basal scaly area of caudal fin pale yellow with broad blue-edged red zone in outer part. Males tan above and white below a midlateral, narrow, irregular, magenta stripe; 2nd magenta stripe at dorsal-fin base, continuing onto peduncle; large white-bordered, red area on opercle, with oblique band to pectoral-fin base; caudal fin with large triangular bright yellow area, bordered by pink extending into narrowing median rear filament. Attains 16.5 cm TL.

DISTRIBUTION WIO: northern Red Sea.

REMARKS Type specimens collected from 43–46 m; reported to 70 m on mesophotic coral reefs. The scientific name *blatteus*, Latin for purple, is in reference to the colour of some of the bones and scales. Recently, a related species, *Cirrhilabrus wakanda* Tea, Pinheiro, Shepherd & Rocha 2019, was described from mesophotic reefs off Tanzania. Males have prominent purple lateral scales and share the purple bones of *C. blatteus*.

Cirrhilabrus exquisitus Smith 1957

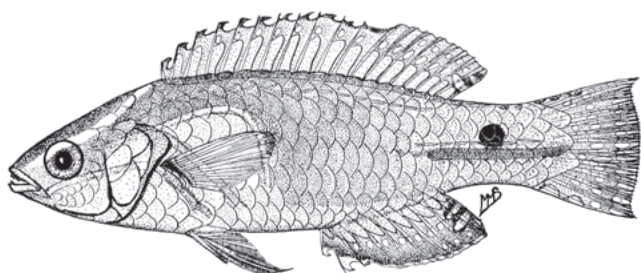
Exquisite fairy wrasse

PLATE 63

Cirrhilabrus exquisitus Smith 1957: 109, Fig. 4, Pl. 2e (Pinda, Mozambique); Smith & Smith 1963*; Burgess & Axelrod 1973; Jones & Kumaran 1980; SSF No. 220.19*; Cornic 1987; Winterbottom *et al.* 1989; Allen & Smith-Vaniz 1994; Randall & Van Egmond 1994; Randall 1995; Heemstra & Heemstra 2004*.

Dorsal fin 11 spines, 9 rays (rarely 8); anal fin 3 spines, 9 rays; pectoral fins 14–16 rays. Body depth 3.2–3.5 in SL; HL 2.9–3.2 in SL; snout length 3.8–4.4 in HL; caudal fin of females truncate to slightly rounded, of adults double emarginate, lobe tips of fin of mature males extending beyond rounded middle part of fin. GR 17–22. LL scales 16–18 + 5–7; median predorsal scales 5; horizontal scale rows on cheek 2.

Adults complexly coloured, variable with locality, but 2 markings are common to all: large, oblong black spot on upper half of peduncle, lower edge (which may be straight) adjacent to lateral line, and narrow, wedge-shaped black bar, bordered in blue, on pectoral-fin base; narrow blue band usually from corner of mouth, below eye to upper end of black bar at pectoral-fin base. Attains 11 cm TL.



Cirrhilabrus exquisitus, 9 cm TL, holotype (N Mozambique).
Source: Smith 1957

DISTRIBUTION Indo-Pacific. WIO: Mozambique, South Africa (Sodwana Bay), Comoros, Maldives and Seychelles; elsewhere to Japan, Great Barrier Reef, Tuamotu Is. and Line Is.

REMARKS Occurs in aggregations on reefs, in 6–32 m. Males maintain large harems, exhibiting brilliant hues during courtship. Feeds on zooplankton. Part of a broad Indo-Pacific species-complex with both colour pattern differences and distinctly divergent mtDNA lineages, not yet divided taxonomically. The type population is from the African coast and thus the name here will not change.

Cirrhilabrus rubrisquamis Randall & Emery 1983

Strawberry fairy wrasse

PLATE 63

Cirrhilabrus rubrisquamis Randall & Emery 1983: 21, Fig. 1 (Peros Banhos Atoll, Chagos); Randall & Anderson 1993; Randall 1995.

Dorsal fin 11 spines, usually 9 (rarely 8) rays; anal fin 3 spines, 9 rays; pectoral fins 14–16 rays. Body depth 3.1–3.5 in SL; HL 2.8–3 in SL; snout length 3.5–3.7 in HL; dorsal and anal fins elevated in mature males, longest dorsal-fin spine 1.7–2.2 in HL; longest anal-fin ray 1.4–2 in HL; caudal fin slightly rounded in juveniles, strongly rounded in adults, sometimes slightly rhomboid in males, 3.2–3.7 in SL; pelvic fins not extending to anus in females, extending to or slightly beyond anus in males, 1.4–1.9 in HL. GR 15–18. LL scales 15–17 + 5 or 6; median predorsal scales 4 or 5; horizontal scale rows on cheek 2.

Juveniles orange-red on head and about anterior third of body, pale greenish grey posteriorly, with series of 4 broken whitish lines from top of head along upper third of body, often containing white spots or double spots; lower part of head, chest and abdomen pale blue with purple marks; base of scales in pectoral region with arc of magenta; iris yellow with circle of pink; females similar, with fewer whitish lines, head and anterior of body more pink, scales broadly rimmed with orange and magenta, body pale greenish yellow posteriorly; caudal fin blue with magenta rays and submarginal blue and dark purple V-shaped mark; dorsal and anal fins pink with broad blue margin; males red anteriorly, with magenta rims on scales, grading to pale lavender ventrally on head and with purple rims on scales; posterior two-thirds of body pale orangish with faint magenta longitudinal lines; median fins pale orange with purple rays, soft-rayed parts of dorsal and anal fins with pale blue margin, caudal fin with pale blue submarginal band. Attains 10 cm TL.

DISTRIBUTION Indian Ocean. WIO: Chagos, Maldives and Sri Lanka.

REMARKS Described from one 40.6-mm specimen from Chagos, collected from a cave in a vertical drop-off, in 41–48 m. Reported by Randall & Anderson (1993) from the Maldives from 6 adult specimens collected on seaward side of North Malé Atoll, in 52 m. The species has entered the aquarium trade from the Maldives. Hiroyuki Tanaka (pers. comm.) reported the species as rare in Sri Lanka.

Cirrhilabrus rubriventralis Springer & Randall 1974

Social fairy wrasse

PLATES 63 & 64

Cirrhilabrus rubriventralis Springer & Randall 1974: 52, Figs. 4–5 (Eilat, Israel, Gulf of Aqaba, Red Sea); Randall 1983, 1995*.

Dorsal fin 11 spines, 9 rays; anal fin rays 3 spines, 9 rays; pectoral fins 15 rays. Body depth 3.1–3.4 in SL; snout pointed, length 3.2–3.7 in HL (longer in males); head profile of males almost straight, profile of females convex to above eyes and then straight to dorsal-fin origin; cirri of first 2 dorsal-fin spines of males elongated as long filaments, 2nd generally more than twice length of 1st, extending to caudal-fin base when fully developed and intact; caudal fin rounded, corners slightly elongate in males. GR 14–16. LL scales 15–17 + 5–7; median predorsal scales 4 or 5; single horizontal row of scales on cheeks below eyes.

Juveniles orangish pink, with 5 longitudinal, dark-edged, pale blue lines or rows of small spots, one per scale (lateral line appears as row of dashes), abruptly white below level of lower pectoral-fin base; dark brown spot approximately pupil-sized posteriorly on peduncle above lateral line, and prominent white spot mid-dorsally on snout, extending onto upper lip; large yellow spot in axil of pectoral fins; females lose basicaudal dark spot and white spot on snout, and pale blue lines become dusky purple and progressively fainter; males red to mottled red, abruptly pale yellow on head below level of eyes and white on body; dorsal and anal fins red with blue margin, black submarginal line, and usually row of blue spots (mid-height in dorsal fin, basal in anal fin); caudal fin dark blue with bright pale blue spots along rays; pelvic fins red, black at base. Attains 8 cm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) and Oman.

REMARKS Common in the Gulf of Aqaba, but only a single individual was seen in many days of diving off Port Sudan. Usually found in aggregations feeding on zooplankton over substrata of mixed sand and coral rubble with patches of live coral, taking refuge as needed within the rubble. Males display in courtship by elevating the dorsal fin, lowering the long pelvic fins, and fluttering the bright blue caudal fin. Females mature by 38.5 mm SL. Victor (2016) confirmed this species is limited to the Red Sea and Oman, and described the sister species *C. africanus* from Kenya, Mozambique and South Africa (Plate 62) and *C. rubeus* from Maldives and Sri Lanka (Plate 64).

Cirrhilabrus sanguineus Cornic 1987

Red-blotched fairy wrasse

PLATE 64

Cirrhilabrus sanguineus Cornic 1987: 140, Fig. (Mauritius, Mascarenes); Randall 1995.

Dorsal fin 11 spines, 9 rays; anal fin rays 3 spines, 9 rays; pectoral fins 15 rays. Body depth 3.2–3.6 in SL; HL 2.9–3 in SL; head profile convex; snout length 3.6–3.9 in HL; dorsal and anal fins not elevated; 7th dorsal-fin ray longest, 1.8–2.1 in HL; caudal fin of males rhomboid to slightly lanceolate, 2.9–3.3 in SL; pelvic fins just extending to anus in adult males. GR 16–19. LL scales 15–17 + 5–7; median predorsal scales 5; horizontal rows of scales on cheek 2.

Body pinkish beige with broad pale yellow bar across body anterior to anal-fin origin, and irregular, oblique, red triangle extending two-thirds distance to anal-fin origin; head orange, grading to yellow ventrally, with narrow mid-dorsal yellow stripe, narrowing onto nape; anal fin, pelvic fins, and spinous portion of dorsal fin yellow with magenta spines and pink rays; caudal fin and soft-rayed portion of dorsal fin with green and blue membranes and magenta rays; outer margin of soft-rayed part of median fins blue. Attains 9 cm TL.

DISTRIBUTION WIO: Mauritius and Réunion.

REMARKS Known from 42–52 m. Originally briefly described in a small guidebook, with no type specimens designated. Randall (1995) provided a complete description and designated a neotype.

GENUS *Coris* Lacepède 1801

Front of jaws with single pair of strong, slightly recurved canines, followed on side of jaws by an outer row of close-set conical teeth and with a few irregular rows of small molars medially; small canine present or absent at corners of mouth; dorsal fin 11 spines, 11–13 rays; anal fin 3 spines, 11 or 12 rays; pectoral fins 12–15 (usually 13 or 14) rays; lateral line continuous, deflected sharply downward below rear of dorsal fin, with 47–96 pored scales; no scales on head. Twenty-seven species, 2 in eastern Atlantic and 25 in Indo-Pacific, 7 in WIO.

KEY TO SPECIES

- 1a Dorsal and anal fins 11 rays; narrow black bar across pectoral-fin base 2
- 1b Dorsal and anal fins 12 rays; no narrow black bar across pectoral-fin base 3

Continued...

KEY TO SPECIES

- 2a Body depth 3.3–3.6 in SL; adults with series of 7 dusky orange bars dorsally on body (plus 2 on nape) much broader than pale interspaces; males without numerous small black spots on body *C. latifasciata*
- 2b Body depth 3–3.1 in SL; adults with series of 7 vertical broken white lines on body above lateral line; males with numerous small, irregular, black spots on body below lateral line *C. variegata*
- 3a Pectoral fins 14 rays; hump on forehead of adults (very pronounced on large males); caudal fin of adults with very elongate rays; maximum 60 cm TL *C. aygula*
- 3b Pectoral rays 13; no hump on forehead; caudal fin without elongate rays; maximum 16.3–44.3 cm TL 4
- 4a LL scales 47–52 5
- 4b LL scales 70–84 6
- 5a Canine tooth at corner of mouth (on upper jaw); anterior LL scales with 2 pores; first 2 dorsal-fin spines with filamentous extensions at tips *C. caudimacula*
- 5b No canine tooth at corner of mouth; anterior LL scales with single pore; first 2 dorsal-fin spines without filamentous extensions, spines progressively longer posteriorly *C. nigrotaenia*
- 6a Nape with scales dorsally; chest with scales; no black spots or dark bars on body or fins; head green with 2 broad, curved, slightly oblique dark reddish or purple bands across cheek and lower opercle; males with narrow pale green bar on side of body above origin of anal-fin origin *C. cuvieri*
- 6b Nape with narrow, naked zone mid-dorsally; chest with broad, naked area anteroventrally; body and base of caudal and dorsal fins with small blackish spots (initial-phase adult) or body with dark bars (terminal-male phase); no broad near-horizontal bands across lower half of head *C. formosa*

Coris aygula Lacepède 1801

Clown coris

PLATE 64

Coris aygula Lacepède 1801: 96, 97, Pl. 4, Fig. 1 (Mauritius, Mascarenes); Günther 1862; Day 1877; Baissac 1953; Randall 1983, 1992, 1995*, 1999; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.20*; Winterbottom *et al.* 1989; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Fricke 1999; Lieske & Myers 2004.

Coris angulatus Lacepède (ex Commerson) 1801: 96, 99, Pl. 4, Fig. 2 [no locality given].

Labrus cingulum Lacepède (ex Commerson) 1801: 448, 517, Pl. 28, Fig. 1 (Mauritius, Mascarenes).

Labrus aureomaculatus Bennett 1830: no page number, Pl. 20 (Sri Lanka).

Julis ruppelii Bennett 1831: 128 (Gulf of Setie, Red Sea).

Julis gibbifrons Quoy & Gaimard 1834: 707, Pl. 19, Fig. 3 (Mauritius, Mascarenes).

Julis semipunctatus Rüppell 1835: 12, Pl. 3, Fig. 3 (Al Muwaylih, Saudi Arabia, Red Sea).

Coris angulata: Smith 1955, 1957; Fourmanoir & Guézé 1961; Smith & Smith 1963*; SFS No. 806*.

Dorsal fin 9 spines (flexible in adults, and first 2 spines closer together than remaining spines), 12 or 13 rays; anal fin 3 spines, 12 rays; pectoral fins 14 rays. Mouth terminal; pair of strong protruding canines at front of jaws, followed by progressively smaller teeth, inner row of small nodular teeth and 1 or 2 teeth on upper jaw at corner of mouth of adults (dentition comparable in other *Coris* spp.). Body depth 2.6–3.4 in SL (depth increasing with growth); adults developing hump on forehead that becomes very pronounced in large males; caudal fin rounded in young and females, almost truncate in males, with elongated rays. LL scales 59–67, all with single pore, sharply deflected downward below rear of dorsal fin; head naked except nape (as other *Coris*).

Juveniles whitish with small black spots on head and front of body; 2 large, semicircular orange-red spots on back, with large, ocellated black spot above each in dorsal fin. Small females with body pale yellowish, scales narrowly dark-edged, except for white bar across body just in front of anal fin; head with dark red spots; median fins green, with dark red spots and yellow outer margins. Adult females olive-green, the white bar pale green, spots on head pink and those on fins and chest orange; head and anterior body paler with red spots. Adult males deep green to blue-green (may appear black underwater), often with 1 and sometimes 2 pale greenish bars on side of body. Attains 60 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Oman to South Africa (Eastern Cape), Mauritius and Sri Lanka; elsewhere to Indo-Malayan region (few records), Japan (Sagami Bay), Australia, Pitcairn Is. and Line Is.

REMARKS Found on coral reefs, especially adjacent rubble and sand habitat, in 1–50 m. A major predator of shelled molluscs and hermit crabs, which it crushes with its pharyngeal teeth; also feeds on brachyuran crabs and echinoids (including *Echinometra* and *Diadema*), occasionally on tunicates. Has been observed turning over rocks to expose invertebrate prey.

Coris caudimacula (Quoy & Gaimard 1834)

Spottail coris

PLATE 65

Julis caudimacula Quoy & Gaimard 1834: 710, Pl. 15, Fig. 2 (Mauritius, Mascarenes); Valenciennes *in* Cuv. & Val. 1839; Harmelin-Vivien 1976.

Halichoeres multicolor Rüppell 1835: 15, Pl. 4, Fig. 3 (Jeddah, Saudi Arabia, Red Sea).

Coris caudimacula: Günther 1862; Playfair & Günther 1867; Barnard 1927; Smith 1955, 1957; Smith & Smith 1963*; SFSA No. 807; Randall 1983, 1995*, 1999; SSF No. 220.21*; Field & Field 1998*; Heemstra *et al.* 1999; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Hemicoris caudimacula: Bleeker 1873.

Coris multicolor: Barnard 1927; SFSA No. 808*.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Canine at corners of mouth. Body depth 3.4–4.2 in SL, depth increasing with growth; space between dorsal-fin spines of females equidistant, spines progressively longer; space between first 2 spines of males narrower than between remaining spines, 1st spine, including filamentous tip, ~1.5 times longer than 2nd spine; caudal fin rounded; pelvic fins 1.6–2.1 in HL in juveniles, to 1.2–1.5 in HL in adults. GR 17–22. LL scales 50–52, anterior scales with 2 pores.

A 61-mm-TL juvenile was reddish orange dorsally, pale yellow ventrally, with broad pink stripe on side rimmed with yellow dorsally and containing yellow streaks and spots; head yellow dorsally with 2 lavender-pink lines, one from upper lip through eye and ending at lateral line, the other from chin under eye across opercle, then curved upward to form anterior margin of black and yellow spot on opercular flap. The pattern of these 2 pink lines links a variety of colour patterns that would otherwise be suggestive of several species: the posterior end of the lower pink line (can be blue-green in males) becomes a hook in adults (photograph of a 15-cm-TL female can be linked to the juvenile, and a 19.7-cm-TL specimen with greater blue colouration is a male); other juveniles can be yellowish green or pink, with or without a dark stripe; the stripe with growth can break into a series of 6 dark squares or rectangles. Attains at least 19.5 cm TL.



Coris caudimacula, 15 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indian Ocean. WIO: northern Red Sea, southern Oman to South Africa (East London; juveniles to Mossel Bay), Madagascar, Comoros, Seychelles and Mauritius; elsewhere, isolated population off Western Australia.

REMARKS Seen most often in sandy or algal-rich areas near reefs or in seagrass beds; to 57 m deep. Feeds on crustaceans, molluscs, worms and brittlestars. One of a complex of five Indo-Pacific species that exhibit a bewildering display of colour variation. The others are *C. debueni* Randall (Easter I.), *C. dorsomacula* Fowler (western Pacific), *C. roseoviridis* Randall (Pitcairn Is. to Rarotonga) and *C. venusta* Vaillant & Sauvage (Hawaii). Heemstra & Heemstra (2004) illustrate some of the colour variation of *C. caudimacula*.

Coris cuvieri (Bennett 1831)

Cuvier's coris

PLATE 65

Julis cuvieri Bennett 1831: 128 (Mauritius, Mascarenes).

Julis stellatus Valenciennes *in* Cuv. & Val. 1839: 499 (Mauritius, Mascarenes).

Coris cuvieri: Günther 1862; Playfair & Günther 1867; Baissac 1953; Smith & Smith 1963*; Fricke 1999; Randall 1999; Heemstra *et al.* 2004; Lieske & Myers 2004.

Coris gaimard (*non* Quoy & Gaimard 1824): Smith 1955; SFSA No. 809; Randall 1983.

Coris gaimard africana Smith 1957: 119, Pls. 1a–2a, Fig. 1 (Mahé, Seychelles); Gomon *in* Fischer & Bianchi 1984; Winterbottom *et al.* 1989*.

Coris africana: SFSA No. 809*; De Bruin *et al.* 1994; Randall 1995*.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Small canine at corners of mouth in males, none in females. Body depth 3.1–3.7 in SL, depth increasing with growth; dorsal-fin spines of juveniles firm and sharp, of adults flexible; first 2 dorsal-fin spines of adults elongate and close together; caudal fin rounded, 1.4–1.6 in HL of adults; pelvic fins of large males extending at most to base of 1st anal-fin ray. GR 16–20. LL scales 71–84, all with single pore; median dorsal zone of nape scaly, becoming naked in large males.

Juveniles orange, shading to dark brown anteriorly on head and ventrally on body, with 3 large, vertically elongate, broadly black-edged, white spots dorsally on body (2 anterior spots extending into dorsal fin) and 2 similar but small elongate spots dorsally on head; large oval black spot near middle of dorsal fin. Adults reddish on body, each scale with narrow green mark at base; head green with broad reddish bands, most conspicuous from corner of mouth across lower preopercle to edge of subopercle and interopercle, and one above and approximately parallel to it from snout through lower part of eye to edge of opercle. Males with pale green bar on body above anal-fin origin. Attains at least 35 cm TL.



Coris cuvieri, 30 cm TL, holotype head (Seychelles). Source: Smith 1957

DISTRIBUTION Indian Ocean. WIO: northern Red Sea, Kenya, Mozambique, South Africa (Aliwal Shoal), Seychelles, Mascarenes and Chagos; elsewhere to Andaman Sea.

REMARKS Smith (1957) proposed the subspecies *Coris gaimard africana* for the WIO, with the more colourful *C. gaimard gaimard* from central and western Pacific; he was followed by Gomon in Fischer & Bianchi (1984). In SFSA, Smith elevated *africana* to species, unaware that in 1831 ET Bennett had named specimens from Mauritius *C. cuvieri*. In addition to colour differences between *C. gaimard* and *C. cuvieri*, there is a modal difference in number of LL scales and gill rakers (Randall 1999).

Coris formosa (Bennett 1830)

Queen coris

PLATE 66

Labrus formosus Bennett 1830: no page number, Pl. 16 (Sri Lanka).

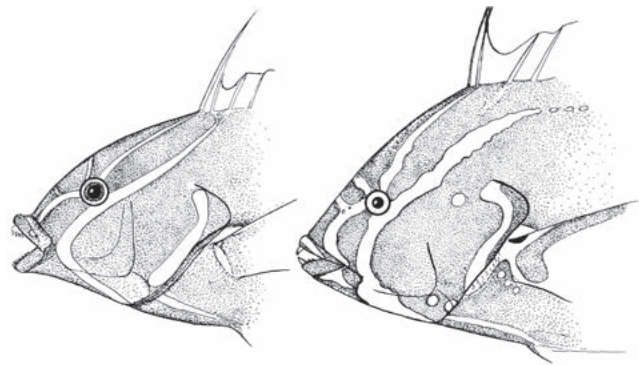
Coris frerei Günther in Playfair & Günther 1867: 101, Pl. 13 (Zanzibar, Tanzania); Smith 1957*; Smith & Smith 1963*; Jones & Kumaran 1980; Randall 1992, 1994, 1995*; De Bruin *et al.* 1994; Anderson 1996.

Coris gaimard (non Quoy & Gaimard 1824): SFSA No. 809* [Pl. 58, middle figure].

Coris formosa: Playfair & Günther 1867; SFSA No. 809a; Kotthaus 1977; Jones & Kumaran 1980; Gomon in Fischer & Bianchi 1984; SSF No. 220.22*; Winterbottom *et al.* 1989*; Fricke 1999; Lieske & Myers 2004.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Small canine (sometimes 2) at corner of mouth (on upper jaw). Body depth 2.3–3.3 in SL, increasing with growth; first 2 dorsal-fin spines of adults greatly elongate (slightly elongate on large juveniles), space between them less than between remaining spines; caudal fin rounded, becoming truncate in large males; pelvic fins extending to or beyond anal-fin origin. LL scales 70–78, all with single pore; narrow naked zone mid-dorsally on nape; no naked area anteroventrally on chest.

Juveniles orange-red with 5 large black-edged white spots dorsally on head and body (1st on snout, 2nd above and behind eye, 3rd across front of dorsal fin and narrowing across body to abdomen, 4th from soft part of dorsal fin to middle of body, and the last dorsally on peduncle); dorsal fin with large black spot narrowly rimmed in yellow between 8th spine and 3rd ray. Females grey on body and scaly caudal-fin base, with scattered black spots smaller than eye (few in front of anal-fin origin); head yellow, grading to grey posteriorly, with 2 oblique blue bands, narrow 1st band from front of snout through front of eye to dorsal-fin origin, 2nd band approximately parallel, through rear of eye, curved upward on head to join submarginal yellow to red band that extends back on opercle; dorsal and anal fins grey basally with small black spots, mainly orange distally with narrow olive-green band and very narrow, pale blue margin; broad naked central part of caudal fin orange-red, followed by broad white margin. Males densely dotted with small green spots and crossed by 10 purplish grey bars narrower than interspaces; green dots at front of body above pectoral fins larger, many yellow, forming irregular oblique rows; head grey with bands similar to those of females, but green, more irregular, some grading posteriorly to yellow; dorsal and anal fins complexly banded and spotted, with narrow pale blue margin, filamentous 1st ray of dorsal fin orange; caudal fin purplish blue, with numerous small green spots, and orange-red margin. Attains at least 44 cm TL (Seychelles), possibly ~60 cm TL.



Coris formosa, 29 cm TL (left); ~38 cm TL (right). Source: Smith 1957

DISTRIBUTION WIO: southern Red Sea, Oman to South Africa (KwaZulu-Natal), Seychelles, Mauritius, Maldives, Chagos and Sri Lanka.

REMARKS Known from 2–40 m; usually found on sand and rubble adjacent to coral reefs. Randall (1999) used the name *Coris frerei* Günther 1867, based on the male, instead of *Labrus formosus* Bennett 1851, based on the female, but the latter is invalid as it is a homonym of *Labrus formosa* Shaw 1803.

Coris latifasciata Randall 2013

Broad-barred coris

PLATE 66

Coris variegata (non Rüppell 1835): Allen & Steene 1987; Winterbottom *et al.* 1989*.

Coris batuensis (non Bleeker 1856): Randall 1992, 1999; Randall & Anderson 1993.

Coris latifasciata Randall 2013: 2, Figs. 1–3 (Peros Banhos Atoll, Chagos).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 (rarely 15) rays. Canine at corners of mouth. Body depth 3.3–3.6 in SL; 1st dorsal spine 3.7–3.9 in HL; 9th spine 2.3–2.5 in HL; caudal fin slightly rounded to truncate, 1.3–1.5 in HL; pelvic fins of adults almost or just extending to anus, 1.4–1.6 in HL. GR 19–22. LL scales 50–52, +1 on caudal-fin base; most anterior scales with 2 pores, remainder with 1; predorsal scales to above vertical preopercle margin on sides of nape.

Juveniles green dorsally, grading to pale blue ventrally and on head, with scattered small red spots on postorbital part of head and body, larger on head and abdomen; black line on side of snout and black markings dorsally on head; ocellus in dorsal fin centred on 2nd dorsal-fin ray, with a smaller ocellus posteriorly. Adults pale blue to blue-green, centre of each scale whitish, especially on abdomen; 6 dusky orange bars dorsally on body, much broader than whitish interspaces, and 2 small bars on nape; broadest bar below 4th–8th dorsal-fin spines, curved backward ventrally; head pale green with oblique pink bands; scattered small orange spots posteriorly on body of females, and pink spots dorsoposteriorly on males; ocellated black spot between 1st and 2nd dorsal-fin rays; black spot at upper base of pectoral fin, continuing as narrowing line across the base. Attains 11.5 cm TL.

DISTRIBUTION WIO: Chagos and Maldives.

REMARKS Usually found on coral reefs and adjacent habitats, in 10–30 m. One of a complex of three species, with 11 dorsal- and anal-fin rays (the remaining species of the genus with 12); the other two are *C. variegata*, endemic to the Red Sea and western Gulf of Aden, and *C. batuensis* from the Andaman Sea to Indonesia, the Marshall Is. and Tonga. Formerly identified as *C. batuensis*, but differentiated by smaller eyes, fewer LL scales (*batuensis* with 52–55), more GR (*batuensis* with 17–20), and size (*C. batuensis* attains 14.5 cm SL, compared to 9.4 cm SL for *C. latifasciata*; one fully mature female of *C. latifasciata* measures only 6.8 cm SL).

Coris nigrotaenia Mee & Hare 1995

Blackbar coris

PLATES 66 & 67

Coris nigrotaenia Mee & Hare 1995: 248, Figs. 1–3 (Oman); Randall 1995*.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 or 14 rays. No canine at corners of mouth. Body depth 2.7–3.4 in SL, terminal male deeper-bodied (depth to 2.7 in SL), snout profile steep, at ~65° angle; dorsal-fin spines sharp-tipped, the 1st spine shortest, space between first 2 spines of adults $\frac{1}{2}$ – $\frac{2}{3}$ space between 2nd and 3rd spines; caudal fin slightly rounded to truncate with rounded corners; pelvic fins long and filamentous (extending beyond anal-fin spines), 1.2–2 in HL. GR 21–25. LL scales 47–50, all with single pore; predorsal scales extending to above preopercle margin.

Juveniles brownish grey with 4 large, irregular white blotches along back and 4 along ventral part of body; large black blotch below outer part of pectoral fins between dorsal and ventral white blotches; black spot almost as large as eye on caudal-fin base just above lateral line; head mainly yellowish brown dorsally and white ventrally; dorsal and anal fins with alternate zones of black and pale whitish; caudal fin whitish. Females yellowish brown dorsally on body, scales rimmed with pale blue-green, changing about midlaterally on body to pale yellow with rows of pale blue-green spots, one per scale; broad oblique blackish bar on upper half of body, centred below base of 7th dorsal-fin spine; head yellowish grey-brown, with irregular pale blue-green lines and spots, grading to pale yellowish ventrally; dorsal and anal fins mustard yellow with blue margin, dorsal fin strongly dotted with pale blue-green, anal with irregular blue lines; caudal fin dark yellowish grey with irregular vertical blue lines and blue upper and lower margins. Attains 43 cm TL.

DISTRIBUTION WIO: Oman (Dhofar coast and Masirah I.); not known from Gulf of Oman.

REMARKS Observed along exposed rocky shores, in 1.5–20 m.

Coris variegata (Rüppell 1835)

Dapple coris

PLATE 67

Halichoeres variegata Rüppell 1835: 14, Pl. 4, Fig. 2 (Massawa, Eritrea, Red Sea).

Julis variegata: Valenciennes *in* Cuv. & Val. 1839.

Coris variegata: Günther 1862; Smith 1957; Randall 1983, 1999; Field & Field 1998*; Lieske & Myers 2004.

Coris (*Hemicoris*) *variegata*: Kossmann & Rüber 1877.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 rays. Canine at corners of mouth; anterior canines twice length of 2nd tooth in jaws. Body depth 3–3.1 in SL (deeper with growth); dorsal-fin spines sharp-tipped and progressively longer, 1st spine 1.5–1.6 in length of 9th spine, space between first 2 spines of adults $\sim\frac{3}{4}$ space between 2nd and 3rd spines; caudal fin slightly rounded to truncate, 1.3–1.4 in HL; pelvic fins short, usually not extending to anus, length 1.5–1.8 in HL. GR 21–25. LL scales 51–53, anterior scales with 2 pores; predorsal scales extending to rear edge of interorbital area.

Juveniles pale blue-green, finely and densely spotted with grey dorsally, on side of body by dull orange spots that merge to form irregular lines, and by 2 irregular rows of small orange-red spots ventrally; grey spots on lateral line almost completely merged to solid line; 8 narrow irregular white bars dorsally on nape and body, and 2 longitudinal rows of 5 or 6 irregular white spots on side of body; yellow and black band on side of snout bordered above by irregular white band that passes above eyes onto nape; 3 ocelli in dorsal fin, anterior ocellus on soft-rayed part of fin largest; irregular black line at pectoral-fin base. Females similar, with same 8 narrow white bars dorsally on nape and body and 3 ocelli in dorsal fin, but more pale blue on side and ventrally, and more numerous and smaller red spots on lower side of body (but fewer on abdomen); head pale green with irregular pale pink bands; front of snout yellow. Males dull blue-green with same narrow white bars dorsally on body; sides and ventral part of body densely spotted with black and pale red; head pale yellowish green, with irregular pale red bands, and vertical black mark behind eyes; ocelli in dorsal fin either lost or vestigial. Attains 15 cm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) and western Gulf of Aden.

REMARKS Recently found in western Gulf of Aden (JM Rose, pers. comm.). Usually found on sand and rubble areas of coral reefs.

GENUS *Cymolutes* Günther 1861

Mouth terminal, front of jaws with pair of long, slender canines projecting beyond lips when mouth closed; conical teeth in band at side of jaws, those of outer row largest; no canine at corners of mouth; dorsal fin 9 spines, 12–15 rays; anal fin 2 or (usually) 3 spines, 11–13 rays; caudal fin 10 branched rays. Body slender and compressed, depth 4–4.8 in SL; head profile strongly convex; eyes near dorsal profile; dorsal fin low and continuous; pelvic fins short; caudal fin slightly rounded; paired fins short. Lateral line interrupted; head naked. Three

Indo-Pacific species, as diagnosed by Schultz *in* Schultz *et al.* (1960), 2 in WIO; the third species, *C. lecluse* (Quoy & Gaimard 1824), is endemic to Hawaii.

KEY TO SPECIES

- 1a Dorsal fin 13 rays; submarginal black line on 1st membrane of dorsal fin; no oblique black band behind head of males *C. praetextatus*
- 1b Dorsal fin 12 rays; no submarginal black line on 1st membrane of dorsal fin; oblique band (or double band) behind head, ending beneath pectoral-fin base *C. torquatus*

Cymolutes praetextatus (Quoy & Gaimard 1834)

Knifefish

PLATE 67

Julis praetextata Quoy & Gaimard 1834: 712, Pl. 15, Fig. 4 (Mauritius, Mascarenes).

Cymolutes praetextatus: Günther 1862; Playfair & Günther 1867; Day 1877; SSF No. 220.24*; Randall & Anderson 1993; Allen & Smith-Vaniz 1994; Fricke 1999.

Cymolutes lecluse (*non* Quoy & Gaimard 1824): Baissac 1953; Smith 1957; SFSA No. 820*; Jones & Kumaran 1980; Winterbottom *et al.* 1989*.

Dorsal fin 9 spines, 13 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body moderately compressed, depth 4.1–4.6 in SL; snout profile of adults steep, $\geq 60^\circ$ angle; dorsal fin spines progressively longer posteriorly; caudal fin truncate to slightly rounded. LL scales 48–68 + 15–22.

Females pale bluish grey dorsally, grading to white ventrally, large individuals with ~ 12 faint bluish bars equal in width to pale interspaces posteriorly on body, from above anal-fin origin; slightly oblique, white-edged, submarginal black line on 1st dorsal-fin membrane; iris violet with inner yellow ring; individuals less than ~ 8 cm with small black spot dorsally at caudal-fin base. Males olive, scale edges darker, except broadly white over chest and abdomen, with ~ 12 indistinct orangish brown bars posteriorly on side of body; small white-edged black spot sometimes present on body at level of eyes below 6th or 7th dorsal-fin spines; front of head with yellowish grey enclosing eye; cheek and opercle whitish; margin of opercle broadly yellowish grey; median fins olive, dorsal fin with broad dull-orange margin; paired fins pale grey, with yellowish grey bar at base of pectoral fins. Attains 12 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (KwaZulu-Natal), Seychelles, Mauritius, Maldives, Chagos, India and Sri Lanka; not known from Red Sea; elsewhere to Indonesia, Marshall Is. and Society Is.

REMARKS Inhabits open stretches of sand bottom; dives head-first into sand when approached.

Cymolutes torquatus (Valenciennes 1840)

Collared knifefish

PLATES 67 & 68

Xyrichthys torquatus Valenciennes in Cuv. & Val. 1840: 54, Pl. 392 (Surinam [probably Indonesia]).

Cymolutes praetextatus (non Quoy & Gaimard 1834): Günther 1862; Day 1877.

Cymolutes lecluse (non Quoy & Gaimard 1824): Munro 1955.

Cymolutes torquatus: Heemstra *et al.* 2004.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 11 or 12 rays; pectoral fins 12 rays. Body moderately compressed, depth 4.2–4.5 in SL; snout of adults steep, at 60° angle; dorsal-fin spines progressively longer posteriorly; caudal fin slightly rounded. LL scales 56–69 + 16–22.

Females pale brown dorsally, shading to white ventrally, posterior two-thirds of body with narrow near-vertical brown bars, most joined dorsally by narrow dark brown stripe; vertical dark brown streak on rear of opercle, oblique blue line from behind eyes almost to corners of mouth; dorsal fin with faint red and green bands. Males pale green, the lines on body broader and orange; narrow oblique black streak with pale centre anteriorly on body, from lateral line to below front of pectoral fin; head greenish dorsally, shading to yellowish ventrally, with oblique blue line below eyes and blue-edged vertical orange streak posteriorly on opercle; dorsal fin red, with green reticulum; caudal fin with broad red margin. Attains 20 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya, Mozambique, Mauritius and Rodrigues; elsewhere to Indonesia, southern Japan, Australia and New Caledonia.

REMARKS Occurs on sand flats or sand and sparse seagrasses; dives into sand as a refuge. Clark & Petzold (1998) documented the spawning behaviour.

GENUS *Decodon* Günther 1861

Each side of front of upper jaw with 2 prominent canines of about equal length, followed by 5–13 lesser canines in irregular row; lower jaw also with 2 prominent canines on each side, 2nd longer, followed by lesser canines; teeth on vomer present or absent. Dorsal fin 11 spines, 9 or 10 rays; anal fin 3 spines, 9 or 10 rays; pectoral fins 16–18 rays. Lateral line continuous

and gently curved, LL pored scales 27–30; predorsal scales ~20, extending forward to slightly in front of nostrils; cheek scales not extending to corner of mouth; no scaly sheath at base of dorsal and anal fins. GR 12–19. Vertebrae 28. Four species (1 in Atlantic, 1 in eastern Pacific, and 2 in Indo-Pacific), 1 in WIO.

Decodon grandisquamis (Smith 1968)

Largescale wrasse

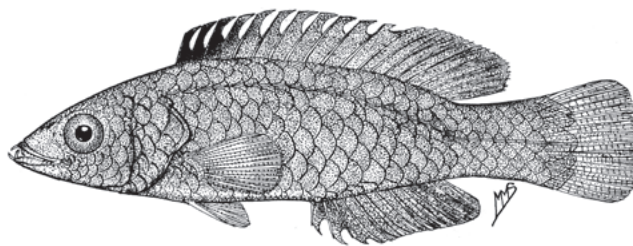
PLATE 68

Lepidaplois (Pariolanthus) grandisquamis Smith 1968: 343, Figs. 1–2 (Ponta da Barra Falsa, Mozambique).

Decodon grandisquamis: Gomon in Fischer & Bianchi 1984; SSF No. 220.25*; Gomon 1997.

Dorsal fin 11 spines, 9 or 10 rays; anal fin 3 spines, 10 rays; pectoral fins 16 rays. Two prominent canines anteriorly on each side of both jaws, outer flaring laterally; 1–3 canines at corner of mouth. Body depth 3.7 in SL; head moderately pointed, profile slightly and evenly convex, at ~30° angle; 1st dorsal spine subequal to eye diameter, next 4 spines gradually increasing in length, remaining spines equal; membranes of spinous portion of dorsal and anal fins deeply incised; caudal fin truncate to slightly rounded; pectoral fins rounded, 1.8 in HL; pelvic fins very short, 2.7 in HL. Preopercle margin with ~35 serrae. GR 6/11. LL scales 26.

Spinous dorsal fin pale reddish orange with large blackish area anteriorly, soft dorsal-fin whitish with fin rays yellow distally; anal and pelvic fins whitish; pectoral fins hyaline reddish; caudal fin whitish proximally, yellow distally; peduncle, dorsal head and body reddish orange; head with yellow band below eyes and yellowish, ventral head and body silvery pink to whitish. Attains at least 19 cm TL.



Decodon grandisquamis, 19 cm TL, holotype (S Mozambique).

Source: Smith 1968

DISTRIBUTION Known only from the holotype taken by trawl in 200 m off Mozambique at 23° S, and 2 juveniles from 50 m off Kosi Bay (South Africa).

GENUS *Epibulus* Cuvier 1815

Jaws extremely protrusible, capable of being extended forward by $< \frac{1}{2}$ HL; 2 large canines at front of each jaw, none at corners of mouth. Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 or (rarely) 9 rays. Lateral line interrupted, LL scales 14 or 15 + 6–8. Two species, 1 in WIO.

Epibulus insidiator (Pallas 1770)

Slingjaw wrasse

PLATE 68

Sparus insidiator Pallas (ex Schlosser) 1770: 41, Pl. 5, Fig. 1 (Java, Indonesia).

Epibulus insidiator: Valenciennes in Cuv. & Val. 1839; Playfair & Günther 1867; Smith 1957; Smith & Smith 1963*; SFSA No. 817b*; Jones & Kumaran 1980; Randall 1983*, 1992; Gomon in Fischer & Bianchi 1984; Winterbottom *et al.* 1989*; Letourneur *et al.* 1993; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Field & Field 1998*; Fricke 1999; Heemstra *et al.* 2004; Lieske & Myers 2004; Carlson *et al.* 2008.

Epibulus incidiator: Baissac 1953.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 or (rarely) 9 rays; pectoral fins 12 rays. Pair of prominent canines at front of jaws, upper teeth forward-projecting; mouth oblique, lower jaw extending back to lower edge of opercle; rear part of dorsal and anal fins of adults prolonged, especially the anal fin, extending to or slightly beyond end of caudal fin in mature males; caudal fin of juveniles rounded, of subadults truncate, of females slightly emarginate, and of adult males lunate; pelvic fins of adults extending well beyond anal-fin origin. No free preopercle margin (covered by scales). Lateral line interrupted. Scales large; LL scales 14 or 15 + 6–8; scales dorsally on head to above eyes.

Juveniles dark brown with 2 narrow, dark-edged, white bars across middle of body, and 2 at each end of peduncle; 4 narrow dark-edged white bands radiating from eye; 2 black spots in dorsal fin and 1 in anal fin crossed by white line. Females with 2 colour phases: brown or yellow, both usually with vertical black line on each scale except chest and abdomen; narrow blue margin to orbit, often blue mark anteriorly on dorsal fin followed by 1 or 2 orange stripes; males variable in colour, may be dark brown to dark olive with black edges to scales; often with pale grey head and irregular narrow black band from eyes across back of head; short, thin black line extending forward from eyes, and very short oblique line up and back from eyes; a common variant has orange above pectoral fins, with vertical zone of yellow behind pectoral fins, and remainder of body green, with black scale edges. Attains at least 54 cm TL (usually 40 cm TL).



Epibulus insidiator, 23 cm SL, mouth extended (Rodrigues).
PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to Mozambique (Maputo Bay), Madagascar, Comoros, Seychelles, Mauritius, Rodrigues, Maldives, Chagos and Lakshadweep; elsewhere to Indonesia, southern Japan, New Caledonia, Tuamotu Is. and Hawaii.

REMARKS Found on coral reefs, and more often in lagoons and bays than exposed reefs, in 2–40 m. Capable of extremely rapid protrusion of jaws to capture prey (Westneat & Wainwright 1989). Adults are difficult to approach; small juveniles are cryptic and rarely seen. Feeds on small fishes, crabs and shrimps.

GENUS *Frontilabrus* Randall & Condé 1989

Genus diagnosis as for the single species.

Frontilabrus caeruleus Randall & Condé 1989

Blue wrasse

PLATE 68

Frontilabrus caeruleus Randall & Condé 1989: 90, Figs. 1–3 (North Malé Atoll, Maldives).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Mouth terminal; single pair of canines at front of upper jaw, none posteriorly on jaw; 2 pairs of canines at front of lower jaw, lateral pair largest and slightly recurved; teeth on side of jaws laterally compressed and blunt. Body moderately elongate, depth 3.7 in SL, and moderately compressed, width 2.3 in body depth; head profile steep, snout profile at $\sim 50^\circ$ angle to horizontal axis of body, and only slightly convex (becoming strongly convex on nape), HL 3 in SL; eyes moderately large, eye diameter 4.9 in HL; spines of dorsal fin progressively longer posteriorly, 9th spine 2.6 in HL; caudal

fin slightly rounded, length 1.6 in HL; pelvic fins short, 2.5 in HL. GR 18. Lateral line continuous, deflected ventrally below soft-rayed portion of dorsal fin to midlateral on peduncle; LL scales 25; head naked, 5 rows of oblique scales on side of nape; 2 rows of large scales between lateral line and dorsal fin; circumpeduncular scales 16; scales on chest three-quarters height of largest scales on sides of body; no scaly sheath at base of dorsal and anal fins. Vertebrae 25.

Freshly dead specimen: dorsal half of body blue, edges of scales grey, ventral half grey, 3 scales a deeper blue in oblique row above pectoral fin, in line with 6th dorsal-fin spine; head olivaceous anteriorly, suffused with blue posteriorly, with oblique pale grey band (bright yellow in life), bordered by blue, extending dorsally from eye, and curved on nape to continue along dorsal-fin base; iris yellow with narrow outer blue ring; median fins yellowish grey, broadly blue basally; pectoral fins translucent; pelvic fins white. Attains at least 11 cm TL.

DISTRIBUTION Known only from the holotype collected in the Maldives.

REMARKS Caught by an aquarium fish collector and sent, live, to the aquarium in Nancy, France, where it was observed to feed on shrimps; unfortunately, the live colour was not photographed.

GENUS *Gomphosus* Lacepède 1801

Two species currently recognised: *G. varius* in the Pacific and *G. caeruleus* in the Indian Ocean. Klausewitz (1962) divided *G. caeruleus* into 2 subspecies: *G. caeruleus klunzingeri* for the Red Sea population, and *G. caeruleus caeruleus* for the remainder of the Indian Ocean. Further study might result in the elevation of these subspecies to species. *Gomphosus* differs from *Thalassoma* primarily in having an elongate snout. A genetic study by Bernardi *et al.* (2004) showed *Gomphosus* nested within *Thalassoma*, and Randall & Allen (2004) described a hybrid of *G. varius* and *T. lunare*.

Gomphosus caeruleus Lacepède 1801

Blue bird wrasse

PLATES 68 & 69

Gomphosus caeruleus Lacepède (ex Commerson) 1801: 100, 101, Pl. 5, Fig. 1 (Mauritius, Mascarenes); Shaw 1803; Valenciennes *in* Cuv. & Val. 1840; Playfair & Günther 1867; Day 1877; Harmelin-Vivien 1976; Randall 1983, 1992; SSF No. 220.27*; De Bruin *et al.* 1994; Anderson 1997; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Gomphosus fuscus Bennett 1828: no page number, Pl. 3 (Sri Lanka).

Gomphosus varius (*non* Lacepède 1801): Playfair & Günther 1867; Baissac 1953; Smith 1955; SFSA No. 784*.

Gomphosus caeruleus: Bleeker 1874; Barnard 1927; Baissac 1953; Smith 1955; SFSA No. 783*; Jones & Kumaran 1980; Winterbottom *et al.* 1989*.

Gomphosus tricolor (*non* Quoy & Gaimard 1824): Smith 1957.

Gomphosus caeruleus caeruleus: Klausewitz 1962; Gomon *in* Fischer & Bianchi 1984.

Gomphosus caeruleus klunzingeri: Klausewitz 1962; Gomon *in* Fischer & Bianchi 1984; Field & Field 1998*.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 15 rays. Pair of moderate, recurved canines at front of jaws; remaining teeth progressively smaller. Body depth ~3.5 in SL in juveniles, to ~4 in adults; snout of adults elongate and tubular, its length < ½ HL, gape of jaws ~½ snout length; caudal fin slightly rounded in juveniles, truncate in initial phase, and slightly rounded to truncate with elongate lobes in terminal male; dorsal-fin spines progressively longer, and rays progressively shorter; pelvic fins small. Preopercle without free ventral margin. Lateral line deflected downward below rear of dorsal fin, LL scales 25 or 26, +2 on caudal-fin base; head naked except for a few small scales dorsally on opercle; scales basally on dorsal and anal fins.

[Indian Ocean fish] Juveniles pale green, grading to blue anterodorsally on body, with black spot on each scale; greenish white on abdomen, chest and ventrally on head; narrow black stripe from front of snout through eyes, dividing into 2 broken lines behind eyes; large black spot at front of dorsal fin, with yellow and red outer margin. Initial phase pale yellowish green, with black spot on each scale, except on chest and lower abdomen, suffused with blackish pigment dorsally on posterior half of body; broad reddish black stripe from front of snout through eyes; anal fin green with broad black margin; caudal fin dark olive with hyaline rear margin and broad black submarginal band; paired fins pale, with black spot dorsally on pectoral-fin base. Terminal male deep blue-green; unscaled part of dorsal and anal fins green; caudal fin coloured as for body except for large blue-green outer crescent. Attains 28 cm TL.

[Red Sea fish] Juveniles similar to Indian Ocean form in colour. Initial phase deep blue dorsally on body, pale green ventrally, with purplish spots or streaks along midlateral part of body, grading to near-white on abdomen and chest, and to yellow posteriorly on peduncle; head purplish grey dorsally, suffused with blue-green behind eyes, abruptly white ventrally at level of lower third of eyes; dorsal fin dark blue-green with yellow at tips of anterior 2 membranes, grading to yellowish posteriorly; anal, caudal and pelvic fins yellow; pectoral fins translucent with black spot at upper base and axil.



Gomphosus caeruleus, 5 cm SL (Comoros). PC Heemstra © NRF-SAIAB

DISTRIBUTION Red Sea (*G. c. klunzingeri*); and Indian Ocean (*G. c. caeruleus*): Gulf of Oman to South Africa (Aliwal Shoal; juveniles to Eastern Cape), Madagascar, Comoros, Seychelles, Mascarenes, Maldives, India and Sri Lanka; elsewhere to Andaman Sea and Indonesia (Sumatra and Bali).

REMARKS Inhabits coral-rich areas of lagoon and seaward reefs; a solitary species.

GENUS *Halichoeres* Rüppell 1835

Mouth terminal, relatively small, maxilla not reaching vertical at front edge of orbit; pair of moderate canines at front of jaws, followed by row of progressively smaller conical teeth, with a few small medial teeth at front of jaws; canine at back of upper jaw at corners of mouth in adults (except in females of 1 species); pharyngeal dentition well-developed; dorsal fin continuous, with 9 spines, 11–14 rays; anal fin 3 spines, 11–13 rays (in WIO species); caudal fin slightly to moderately rounded, and double emarginate in large adults of a few species, with 14 principal rays. Scales cycloid; lateral line complete, abruptly bent downward below rear of dorsal fin to straight on peduncle, LL pored scales 25–29; head naked except for nape and patch of small scales dorsally on opercle of a few species (1 species with narrow band of scales behind eyes); scales on chest distinctly smaller than those on body; no scaly sheath at base of dorsal and anal fins. The number of suborbital pores (from behind middle of eye to below anterior margin of orbit) is useful for separation of some species. The largest genus of the family, with 80 species: 16 in the Atlantic, 12 in the eastern Pacific, and 52 in the Indo-Pacific; at least 21 in WIO.

KEY TO SPECIES

- | | | | | | |
|----|--|----------------------|----|---|-----------------------|
| 1a | LL scales 26 | 2 | 5a | Pectoral fins usually 15 (rarely 14 or 16) rays | 6 |
| 1b | LL scales 27–29 | 4 | 5b | Pectoral fins usually 13 or 14 (rarely 12 or 15) rays | 7 |
| 2a | Isolated small patch of scales on opercle; no elongate horseshoe-shaped green mark on cheek; no small green circle above and behind eyes | 3 | 6a | LL scales 27; suborbital pores 8–12; 9th dorsal-fin spine 2.7–2.9 in HL; small triangular black spot at upper pectoral-fin base; males without prominent U-shaped black mark above pectoral fins | <i>H. dussumieri</i> |
| 2b | No isolated small patch of scales on opercle; elongate horseshoe-shaped green band on cheek, open end at chin | <i>H. zulu</i> | 6b | LL scales 28; suborbital pores 6 or 7; 9th dorsal-fin spine 2.8–3.2 in HL; no black spot at upper pectoral-fin bases; males with prominent blackish, U-shaped mark between lateral line and pectoral-fin tips | <i>H. stigmaticus</i> |
| 3a | Near-vertical band of small scales behind eye; suborbital pores of adults 20–40; no dark stripe on body; adults with series of black-edged square white blotches following scale rows; yellow spot on body at base of 4th and 5th dorsal-fin spines, followed by large black blotch | <i>H. hortulanus</i> | 7a | Pectoral fins usually 14 (rarely 13 or 15) rays | 8 |
| 3b | No band of small scales behind eyes; suborbital pores of adults 9–11; dark stripe from eyes to upper part of caudal-fin base (zigzagged on body of adults); no series of dark-edged white spots following scale rows; no yellow or black spot at dorsal-fin base | <i>H. scapularis</i> | 7b | Pectoral fins usually 13 (rarely 12 or 14) rays | 12 |
| 4a | Dorsal fin 13 or 14 rays; females dark brown with longitudinal yellow lines separating scale rows, caudal fin white; males dark green with dark purple spot on each scale; nape and dorsoanterior part of body with yellowish lines separating scale rows; head orangish with narrow oblique blue-green bands; caudal fin crossed by broad curved purple band, dotted with green | <i>H. marginatus</i> | 8a | Body slender, depth 4–4.3 in SL; 1st dorsal-fin spine 1.3–1.6 in length of 9th spine; females orangish brown, with white stripe from chin and just below lateral line to caudal-fin base, and black spot on fin base; broken whitish line from eyes following lateral line dorsally on body (males with same stripe, but green); body above stripe orange with blue spot on each scale, suffused dorsally with green; first 2 dorsal membranes mainly black, followed by yellow on next 2 membranes | <i>H. signifer</i> |
| 4b | Dorsal fin 11 or 12 (rarely 13) rays; colour not as above | 5 | 8b | Body not slender, depth 3–3.6 in SL; 1st dorsal-fin spine 1.6–2.8 in length of 9th spine; colour not as above | 9 |

Continued...

KEY TO SPECIES

- 9a Suborbital pores 16–23; anterior LL scales with 3–9 pores; body with 5 vertical rows of indistinct blotches (formed by dark edges on scales), arranged in 3 longitudinal series *H. pardaleocephalus*
- 9b Suborbital pores 6–14; anterior LL scales with 1–3 pores; colour not as above 10
- 10a Dorsal and anal fins 11 rays; suborbital pores 10–14; 1st dorsal-fin spine 1.6–1.9 in 9th spine; mottled dark green dorsally on body; females with large rectangular pink area on posterior half of abdomen (reduced to oblong spot in males, followed by pink to orange bars above anal fin); both sexes with large oval black spot anteriorly on soft-rayed portion of dorsal fin, rimmed in yellow in females and irregular with blue edge in males *H. nebulosus*
- 10b Dorsal and anal fins 12 rays; suborbital pores 6–8; 1st dorsal-fin spine 2.3–3.3 in 9th spine; colour not as above 11
- 11a First dorsal-fin spine 2.3–2.8 in 9th spine; pelvic fins of males short, not extending to anus, 1.7–2 in HL; females olivaceous to grey-brown, with longitudinal series of green dashes following scale rows; 5th and 7th rows midlateral on body, with larger white dash separating every third green dash; 6 dark bars on body interrupted by lateral line; dark brown stripe on side of snout broadly bordered in white; males orange, with round green spot rimmed in dark blue on each scale (those on lateral line may coalesce into zigzag pattern); head salmon-pink, with large irregular yellow-green bands; median fins orange, with rows of dark-edged yellow-green spots, and narrow blue margin; no large yellow area at pectoral-fin bases, but with black spot at upper part of base *H. argus*
- 11b First dorsal-fin spine 3–3.8 in 9th spine; pelvic fins of males long, extending to anal-fin origin, 1.2–1.4 in HL; females with alternating blue and yellow stripes following longitudinal scale rows; males salmon-pink to yellow, with longitudinal rows of blue-green bell-shaped spots following longitudinal scale rows; 4 short green bars dorsally on posterior half of body; pectoral-fin bases included in large bright yellow spot with triangular black spot at upper part of base *H. vrolikii*
- 12a No canine tooth at corners of mouth; body depth 3.8–4.4 in SL; colour of females pale green with narrow mid-dorsal dusky pink stripe, midlateral dusky orange stripe, ending in small black spot at caudal-fin base, irregular ventral stripe passing through pectoral-fin base, and scattered pink spots between first 2 stripes, some on lateral line (colouration of males unknown) *H. leptotaenia*
- 12b Canine tooth at corners of mouth on upper jaw; body depth 2.4–4 in SL; colour not as above 13
- 13a Anterior LL scales with 1 pore; small black spot at upper pectoral-fin bases; females with broad yellow or orange stripe extending from eyes to scaly part of caudal-fin base 14
- 13b Anterior LL scales with 2–5 pores; no black spot at upper part of pectoral-fin bases; females without broad yellow or orange stripe in life 15
- 14a Caudal fin of males rounded; body blue-green, with purple band from corner of mouth to eyes, expanding broadly behind eyes and continuing along upper half of body, scales with salmon-pink spot, narrowing on peduncle and scaly caudal-fin base, and ending in broad transverse purplish bar; caudal-fin margin broadly blue-green; dorsal fin black, with narrow blue-green stripe at base *H. pelicieri*
- 14b Caudal fin of males slightly double emarginate; head and front of body to beneath pectoral fins blue-green, with 2 oblique pink bands extending forward and upward from eyes; orange stripe suffused with black, especially posteriorly, with irregular margins finely spotted with blue, extending back from below pectoral-fin tips; large irregular blue-edged black spot on body above pectoral-fin tips *H. zeylonicus*
- 15a No median dorsal scales on nape, no median ventral scales on chest; body depth 2.8–3.3 in SL; snout profile of adults steep, at ~60° angle to horizontal axis of body 16
- 15b Median dorsal scales present on nape and chest (though scales on nape may be embedded); body depth 3.3–4.1 in SL; snout profile of adults not steep, at ≤45° angle to horizontal axis of body 17
- 16a Third and 4th dorsal-fin spines slightly longer than 5th and 6th spines; 3rd anal-fin spine 3.2–3.5 in HL; females olivaceous to reddish brown with numerous small white spots dorsally on body, irregular white bars or vertical rows of white spots ventrally, 3 vertical rows of large black spots on side of body below lateral line; cheek and opercle white, crossed by 3 oblique dark bars, the 1st curved behind eye; males dark salmon-pink with numerous, irregular, dark-edged, green bands and spots, and large irregular black spot above pectoral fins *H. lapillus*
- 16b Third and 4th dorsal-fin spines shorter than 5th and 6th spines; 3rd anal-fin spine 3.7–3.9 in HL; males deep red (appear black underwater), colour of females unknown *H. melas*
- 17a Dorsal and anal fins each with 11 rays; body with alternating stripes of salmon-pink and green that converge onto head, uppermost green stripe branching to eye; males with 4 large, irregular blue-green spots on posterior half of upper 3 green stripes that may enlarge to form bars *H. cosmetus*
- 17b Dorsal and anal fins each with 12 rays; colour not as above 18

Continued...

KEY TO SPECIES

- 18a Females with dark brown body, except for reddish band along base of dorsal fin, 2–3 scales wide, to base of anal fin; brown continuing into middle of caudal fin, where encircled by red band; head and chest orange, grading to blue-green on nape, with narrow green bands that converge onto snout; black and yellow spot behind eye; dorsal fin yellowish white with black spot on 1st membrane; males with head more yellow, and green bands more irregular, forming W-shaped mark on head behind eyes incorporating eye and black spot *H. iridis*
- 18b Colours not as above 19
- 19a Females with dorsal half of head and body bright yellow, including scaly adjacent part of caudal fin; ventral half white, suffused with pale blue-green, especially on chest and abdomen; dorsal fin yellow with 3 ocelli; small black spot in outer yellow basal part of caudal fin; males with same basic pattern, scale centres in ventral white part of body with pale pink spot; ventral part of head pale green with 12 yellow stripes; dorsal fin with 3 black spots (not ocellated), joined in lower part of fin with orange stripe; anal fin with blue-green stripe; lower part of caudal fin translucent orange with oblique blue-green stripe *H. leucoanthus*
- 19b Females pink dorsally, grading to white ventrally, with dorsal row of 4 black dots, 1st on nape, last below middle of dorsal fin; narrow red-edged pale blue stripes on head, 3 on snout (one passing above eye, one below, and one midlateral), 2 extending back from eye; 3 ocellae on dorsal fin, 1st covering anterior 3 membranes; caudal fin with 2 or more ocellated black spots on dorsal basal half of fin; broad crescentic yellow submarginal band; males pinkish white with narrow pale green stripe from lower lip across head just below eye and one extending back from upper part of eye; 2 red lines extending back from eye; anterior ocellus on dorsal fin reduced in size and more ovate, other 2 ocelli absent; caudal fin coloured similar to that of females *H. trispilus*

Halichoeres argus (Bloch & Schneider 1801)

Argus wrasse

PLATE 69

Labrus guttatus Bloch 1791: 149, Pl. 287, Fig. 2 [no locality given]
[name preoccupied by *Labrus guttatus* Bonnaterre 1788 and
Labrus guttatus Gmelin 1789].

Labrus argus Bloch & Schneider 1801: 263 (Australia).

Labrus guttulatus Lacepède 1801: 446, 514 [unjustified emendation of
Labrus guttatus].

Julis (*Halichoeres*) *leparensis* Bleeker 1853: 730 (Lepar I., western Sumatra,
Indonesia).

Halichoeres argus: Bleeker 1862.

PlatyGLOSSUS leparensis: Day 1877.

Halichoeres argus: Jordan & Seale 1907; De Beaufort 1940; Jones &
Kumaran 1980.

Dorsal fin 9 spines, 11 or 12 (usually 12) rays; anal fin 3 spines 12 (rarely with 11 or 13) rays; pectoral fins 14 (rarely 13) rays. Canine (sometimes 2) present at corners of mouth (generic except for *H. leptotaenia*); front of jaws with pair of projecting, slightly recurved canines, followed by 2nd recurved pair $\sim\frac{3}{4}$ as long. Body depth 2.9–3.4 in SL; 1st dorsal-fin spine 3–3.3 in length of 9th spine; caudal fin rounded; pelvic fins short and not extending to anus, 1.2–1.3 in HL. GR 17–19. LL scales 27 (rarely 26), anterior scales with 1–3 (usually 2) pores; suborbital pores 6–8; no median naked zone on nape, scales extending at most to vertical at rear edge of eyes.

Females olivaceous to grey-brown with longitudinal series of green dashes following scale rows; 5th and 7th rows midlateral on body with larger white dash after every third green dash; 6 dark bars on body interrupted by lateral line; dark brown stripe on side of snout broadly bordered in white. Males orange with round green spot rimmed in dark blue on each scale (those on lateral line may coalesce into zigzag pattern); head salmon-pink with large irregular yellow-green bands; median fins orange with rows of dark-edged yellow-green spots and narrow blue margin; no large yellow area at pectoral-fin bases, and no triangular black spot dorsally at pectoral-fin base. Attains \sim 11 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Lakshadweep and Sri Lanka; elsewhere to Andaman Sea, Philippines, Indonesia, Ryukyu Is., Taiwan, Great Barrier Reef, Fiji and Tonga.

REMARKS Usually found in shallow sheltered waters of bays and lagoons, especially in seagrass beds or areas with heavy algal growth, but over sand substrates as well. One collection of 25 specimens was made by beach seine, in Trincomalee Harbour, in 1–1.5 m.

Halichoeres cosmetus Randall & Smith 1982

Adorned wrasse

PLATES 69 & 70

Halichoeres cosmetus Randall & Smith 1982: 15, Pls. 6c & 7a–b

(North Malé Atoll, Maldives); SSF No. 220.28*; Cornic 1987;

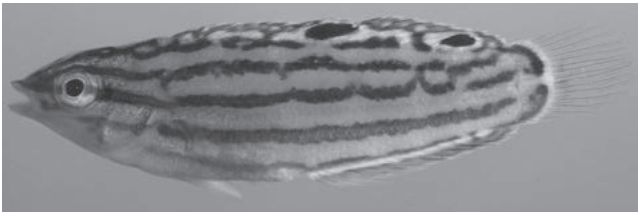
Winterbottom *et al.* 1989; Randall 1992; Randall & Van Egmond 1994;

Fricke 1999; Heemstra *et al.* 2004.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12–14 rays. Body depth 3.3–4.1 in SL; caudal fin rounded. GR 17–20. LL scales 26–28, anterior scales with 2–4 (usually 3) pores; suborbital pores 8–11; head naked, except for triangular zone of small scales on sides of nape.

Females green to blue-green, with 5 narrow yellow stripes, 3rd and 4th dividing, then rejoining as they converge onto head; same 2 stripes curved to form U-shape and end on

upper and lower caudal-fin base; 3rd stripe dividing just before reaching eye, then rejoining just behind eye; vertical black mark behind eye; vertical rows of faint whitish spots in green of body; dorsal fin orange-pink with dark-edged blue-green spots and bands, large ocellus in front of soft-rayed part and smaller ocellus on rear of fin. Terminal male blue-green, green on head, with same basic striped pattern, but stripes yellow on body, pink on head and dorsoanteriorly on body; posterior 4 vertical pairs of whitish spots replaced by larger blue spots, which may merge to form bars that interrupt yellow stripes. Attains at least 11 cm TL.



Halichoeres cosmetus, 3 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Gulf of Oman, Kenya to South Africa (Park Rynie), Comoros, Seychelles, Mascarenes, Chagos and Maldives.

REMARKS Kemp (2000) reported the species from the northeastern Gulf of Oman, and it has been photographed off Lamu, Kenya. Specimens were collected from coral or rocky reefs, in 5–31 m. Member of a complex of four species of similar appearance; the others are *H. ornatus* (Garrett 1863), *H. orientalis* Randall 1999 and *H. claudia* Randall & Rocha 2009.

Halichoeres dussumieri (Valenciennes 1839)

Bubblefin wrasse

PLATE 70

Julis dussumieri Valenciennes in Cuv. & Val. 1839: 478, Pl. 387 (Malabar coast, India).

PlatyGLOSSUS (LeptoJulis) dubius Steindachner 1864: 37 (Zanzibar, Tanzania).

PlatyGLOSSUS dussumieri: Playfair & Günther 1867; Day 1877.

PlatyGLOSSUS roseus Day 1888: 264 (Karachi, Pakistan).

PlatyGLOSSUS maculatus Jatzow & Lenz 1898: 520, Pl. 36, Fig. 16 (Zanzibar, Tanzania).

Halichoeres dianthus Smith 1947: 802 (Inhaca I., Mozambique); SFSA No. 739*.

Halichoeres nigrescens (non Bloch & Schneider 1801): Smith 1957; SFSA No. 791*.

Halichoeres dussumieri: Randall & Smith 1982*; SSF No. 220.29*; De Bruin *et al.* 1994; Randall 1995*; Carpenter *et al.* 1997*.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 14 or 15 rays. Body depth 2.9–3.6 in SL; 9th dorsal-fin spine 2.7–2.9 in HL; membranes between 3rd and 5th dorsal-fin spines higher than rest of fin in large adult males; caudal fin rounded. GR 18–22. LL scales 27, anterior scales with 2–5 pores; suborbital pores 8–12; head naked.

The most variable in colour among WIO species of *Halichoeres*. One unique colour feature helps to link the different colour phases: a large, irregular, S-shaped pink mark in oblique position, with upper part of S behind the eye and lower part at edge of opercle at level of pectoral-fin base; also, all have pink band at pectoral-fin base, with dark blue to black triangular spot at upper edge. Juveniles with ocellated black spot on soft-rayed dorsal fin between 4th and 5th rays. Females pale green to greenish grey, with 7 or 8 irregular chain-like bars on upper three-quarters of body from dark magenta or blackish bars at edges of scales that enclose green areas dorsally, branch ventrally, with some interconnection by oblique bars from spots on scales; midlateral series of white spots larger than pupil often present on body; some females with midlateral blackish stripe from snout to caudal-fin base (may enclose white spots along ventral edge); dorsal and anal fins with row of pale green to yellow spots near base that may join to form stripe. Terminal male yellowish green, with same barred pattern on body; head below level of lower edge of eye greenish yellow with 3 oblique, blue-edged, pink bands, 1st from upper lip to eye; dorsal fin often with black spot of near-pupil size on 5th membrane; caudal fin crossed by broad purplish crescent covering most of fin, upper and lower edges of crescent bright blue. Attains 14 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Gulf of Oman, Tanzania (Zanzibar), Mozambique, South Africa (KwaZulu-Natal), Pakistan, India and Sri Lanka; not known from Red Sea; elsewhere to Andaman Sea, Indo-Malayan region and Hong Kong.

REMARKS Inhabits shallow-water shorelines of continents and large islands, generally not on coral reefs. Often identified as *H. nigrescens* (Bloch & Schneider 1801), but this name is based on a drawing (no extant specimen) that cannot be convincingly linked to any known species of *Halichoeres*, as explained by Parenti & Randall (2000).

Halichoeres hortulanus (Lacepède 1801)

Checkerboard wrasse

PLATE 71

Labrus hortulanus Lacepède (ex Commerson) 1801: 449, Pl. 29, Fig. 2 (Indian Ocean).

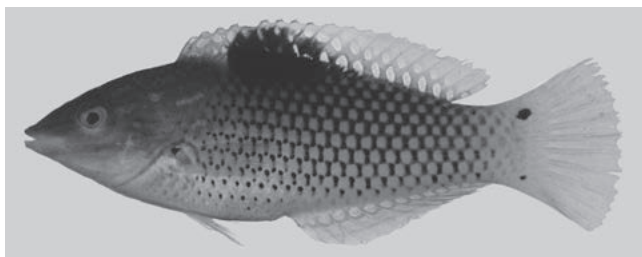
Labrus centiquadrus Lacepède 1801: 437, 493 (Madagascar; Réunion and Mauritius, Mascarenes).

Julis semidecorata Lesson 1828: 403 (Mauritius, Mascarenes).

Sparus decussatus Bennett 1829: no page number, Pl. 14 (Sri Lanka).
Halichoeres eximius Rüppell 1835: 16, Pl. 5, Fig. 1 (Red Sea).
Julis corbis Valenciennes in Cuv. & Val. 1839: 435 [no locality given].
PlatyGLOSSUS hortulanus: Günther 1862; Playfair & Günther 1867; Day 1877.
Halichoeres centriquadrus: Baissac 1953; Smith 1955; Fourmanoir & Guézé 1961; Smith & Smith 1963*; SFSa No. 793*; Jones & Kumaran 1980; Bemert & Ormond 1981.
Halichoeres hortulanus: Harmelin-Vivien 1976; Randall & Smith 1982; SSF No. 220.30*; Winterbottom *et al.* 1989*; Randall 1992, 1995*; Allen & Smith-Vaniz 1994; Anderson 1996; Field & Field 1998*; Heemstra *et al.* 2004; Lieske & Myers 2004.
Halichoeres hortulanus centriquadrus: Gomon in Fischer & Bianchi 1984.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 (rarely 13) rays. Two pairs of canines at front of upper jaw, 2nd pair strongly recurved, lower jaw with single pair. Body depth 2.7–3.7 in SL, deeper with growth; caudal fin truncate to slightly rounded. GR 20–25. LL scales 26, anterior scales with 1 pore; suborbital pores increasing with age, from 12 in juveniles (3–4 cm) to 40 in adults; head with scales dorsally to interorbital area; patch of small scales on upper part of opercle, and near-vertical band of small scales in 2 or 3 rows just behind eye.

Juveniles broadly and irregularly marked with black and white, with yellow-edged black spot in middle of dorsal fin. Females white to pale green, the purple margins of the scales on posterior of body forming squares, rimmed as faint purple bars, and longitudinal series of small dark purple dots; yellow spot developing with growth on back below 4th and 5th dorsal-fin spines and extending into fin; head pale green with oblique pink bands that break into short segments, and irregular rows of spots on head behind eyes and nape; caudal fin orange-yellow with small blackish spot dorsally at base. Males with green body, scales formed into squares by bluish purple bars and faint longitudinal purplish bands; bright yellow spot dorsally on back larger, and followed by large dark purplish spot; dorsal and caudal fins purple, sometimes shading to red distally, with rows of green spots that are progressively smaller toward outer margin; head colouration similar to females. Attains 27 cm TL.



Halichoeres hortulanus, 9 cm SL (South Africa). © RE Stobbs

DISTRIBUTION Indo-Pacific. WIO: Red Sea, southern Oman to South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles, Mascarenes, Maldives, Chagos, Lakshadweep

and Sri Lanka; elsewhere to Andaman Sea, Indonesia, Japan, Australia, Line Is. and Tuamotu Is.

REMARKS Found on coral reefs and adjacent sand and rubble, in ~1–30 m; sometime follows foraging goatfishes and steals the prey they have exposed. Feeds on bivalves, gastropods, hermit crabs, unidentified crustaceans, polychaetes and chitons, along with foraminifera and bits of sand. Easily approached underwater. Often identified as *Halichoeres centriquadrus* and described by Lacepède in the same volume as *H. hortulanus*; Valenciennes in Cuv. & Val. (1839), as first reviser, selected the latter as the senior synonym. The Pacific population differs in having a second yellow spot at dorsal-fin base on 5th–6th rays.

Halichoeres iridis Randall & Smith 1982

Rainbow wrasse

PLATE 71

Halichoeres iridis Randall & Smith 1982: 17, Pl. 7c–e (Mauritius, Mascarenes); SSF No. 220.31*; Cornic 1987; Winterbottom *et al.* 1989; Randall 1994, 1995*; Lieske & Myers 2004*.

Dorsal fin 9 spines, 12 (rarely 13) rays; anal fin 3 spines, 12 rays; pectoral fins 13 (rarely 14) rays. Pair of canines at front of jaws, next tooth half as long. Body depth 3.5–3.9 in SL; caudal fin moderately rounded, length 1.4–1.6 in HL; pelvic fins short, not extending to anus. GR 15–19. LL scales 27, anterior scales with 3–5 pores; suborbital pores 9–12; head naked except for triangular area of small scales on side of nape; scales dorsally on nape almost reaching vertical at rear edge of eye (anterior scales may be embedded).

Juvenile, female and male colour phases unusually similar: body mainly dark brown; head orange-yellow with green bands, dark spot behind eye, and black spot anteriorly on dorsal fin. Juveniles dark brown, grading dorsally on body and dorsal fin to brownish red, fin with broad pale yellow margin and 3 ocelli, 2 largest with deep blue centres; head greenish yellow, grading to red on opercle, with 2 narrow green stripes across head below eye; greenish black, quadrangular spot behind eye, and black dot at front of snout. Females with broad red band dorsally on body that curves around extension of dark brown onto caudal-fin base; head yellow, grading posteriorly to orange, with same 2 green ventral stripes, but more distinct faint mid-dorsal green band on snout ending in blue area dorsally on nape; faint green stripe from front of snout through upper part of eye, and C-shaped green mark on opercle; dark spot behind eye rimmed behind with yellow; dorsal fin pale yellow. Terminal male almost entirely dark brown; head and chest bright orange with irregular green bands, one enclosing black spot behind eye; dorsal fin

white with faint pale yellow middle stripe; basal half of anal fin red, outer half grey, bordered in blue; caudal fin broadly blue distally with large orange-red C-shaped band. Attains 11 cm TL.



Halichoeres iridis, 5 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: southern Red Sea, Oman to South Africa (Aliwal Shoal), Madagascar, Seychelles, Mauritius and Chagos.

REMARKS Known from 6–43 m (usually >20 m).

Halichoeres lapillus Smith 1947

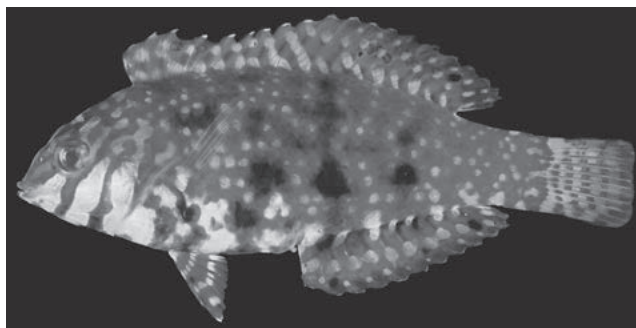
Jewelled wrasse

PLATES 71 & 72

Halichoeres lapillus Smith 1947: 801 (Inhaca I., Mozambique); SFSA No. 790*; Randall & Smith 1982; SSF No. 220.32*; Cornic 1987; Randall 1995*; Heemstra & Heemstra 2004*.

Dorsal fin 9 spines (spines 2–4 slightly longer than spines 5–6), 11 rays; anal fin 3 spines, 11 rays; pectoral fins 13 rays. GR 17–21. LL scales 27, anterior scales with 2–5 pores; suborbital pores 7–10; median dorsal zone of nape naked, scales on each side extending forward to vertical from upper end of preopercle margin; median ventral region of chest naked.

Females olive-brown dorsally, shading to reddish brown ventrally, with many small white spots dorsally and larger white spots ventrally, especially on abdomen and chest, and 2 longitudinal rows of irregular black spots, about eye size midlaterally on body; head olive dorsally, shading to white, with 5 diagonal reddish to yellowish brown bands, broader posteriorly, first 3 bands passing through or at edge of eye. Males dusky red-orange, with rows of dark-edged green spots, those on ventral half of body large and irregular; large black spot flecked with yellow on body just behind upper end of gill opening; head orange-red with diagonal green bands; black spots on lateral and ventral parts of body (in 1 specimen from Oman) so enlarged that only scattered small green and whitish spots remained. Attains 14 cm TL.



Halichoeres lapillus, 6 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: southern Oman, Mozambique, South Africa (Aliwal Shoal), Madagascar, Réunion and Mauritius.

REMARKS Usually found on rocky bottom or reefs dominated by algae, in 5–15 m.

Halichoeres leptotaenia Randall & Earle 1994

Thin-striped wrasse

PLATE 72

Halichoeres leptotaenia Randall & Earle 1994: 288, Pls. 1 & 3 (southern Persian/Arabian Gulf); Randall 1995*; Carpenter *et al.* 1997.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 13 rays. Single pair of canines at front of jaws; no canine at corners of mouth. Body slender, depth 3.8–4.4 in SL; caudal fin slightly rounded; pelvic fins short, not extending to anus. GR 15–20. LL scales 27, all with single pore; suborbital pores 6–10; head naked except for partially embedded scales on nape that extend to rear part of interorbital area; median ventral region of chest naked.

Juveniles pale greenish grey dorsally, white ventrally, with midlateral yellow stripe from front of snout, through eye, ending in small black spot on caudal-fin base. Females pale green, with 3 salmon-pink stripes containing varying amount of brown pigment: 1st from dorsally on snout, across nape and along dorsal-fin base; 2nd from front of upper lip through eye to caudal-fin base; 3rd more irregular and partly broken into spots ventrally on head and continuing on lower side of body. Male colour unknown.

DISTRIBUTION WIO: Persian/Arabian Gulf and Oman.

REMARKS The status of this species is uncertain. Randall & Earle (1994) reported that it appears very similar to the widespread *Halichoeres zeylonicus*, with which it co-occurs. The name on the photograph of the fresh holotype was subsequently changed to *H. zeylonicus* by Randall (1995). No male has been identified. The underwater photographs

from the description show a different-looking fish – with a dark stripe across the snout and a mid-dorsal-fin spot, which may represent juvenile *H. stigmaticus*.

Halichoeres leucoxanthus Randall & Smith 1982

Yellowback wrasse

PLATE 72

Halichoeres leucoxanthus Randall & Smith 1982: 20, Pl. 8c–d (Java, Indonesia); Allen & Steene 1987; Randall 1992.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Single pair of canines at front of jaws, almost twice as long as next teeth in jaws. Body depth 3.6–3.9 in SL; caudal fin moderately rounded; pelvic fins small, not extending to anus. GR 16–18. LL scales 27, anterior and descending scales with 2 or (usually) 3 pores; suborbital pores 9–11; head naked except for partially embedded scales on nape that extend in front of rear margin of preopercle, about half distance to vertical at rear edge of eye; largest scales on chest about half size of those on body.

Females with at least upper half of head and body bright yellow, abruptly white to pinkish white below, this pattern extending onto scaly caudal-fin base; vertically elongate greenish black spot behind eye, bordered behind by brighter yellow bar; faint pink stripe sometimes visible across cheek below eye; oval black spot smaller than pupil in outer yellow basal part of caudal fin; dorsal fin yellow with 3 ocelli, one in front of soft-rayed part of fin about twice as large. Males similar in colour pattern, differing in having cheek pale green with 2 yellow stripes (the ventral one obscure), 3 small black spots in place of ocelli in dorsal fin, faintly joined by orange stripe; anal fin with green stripe near middle of fin, and lower half of caudal fin with oblique green band; large males lose dorsal-fin spots, have alternating green and pink stripes ventrally on head, and pink anal fin with central green stripe. Attains 12 cm TL.

DISTRIBUTION Indian Ocean: few island localities at Maldives, Andaman Sea and Indonesia.

REMARKS Generally found at <30 m deep (one record to 50 m). Most often found on small patch reefs, usually well isolated by stretches of open sand bottom. Closely related to the all-yellow *Halichoeres chrysus* Randall 1981 from the western Pacific. Randall & Smith (1982) were unable to distinguish the two except by colour; Allen & Steene (1988) reported them as sympatric at Christmas I.

Halichoeres marginatus Rüppell 1835

Dusky wrasse

PLATES 72 & 73

Halichöres marginatus Rüppell 1835: 16 (Al Muwaylih, Saudi Arabia, Red Sea).

Julis lamarii Valenciennes in Cuv. & Val. 1839: 481 (Mauritius, Mascarenes).

PlatyGLOSSUS marginatus: Day 1877.

Halichoeres notopsis: Smith 1955, 1957, 1961; Smith & Smith 1963*; SFSA No. 792b*; Jones & Kumaran 1980.

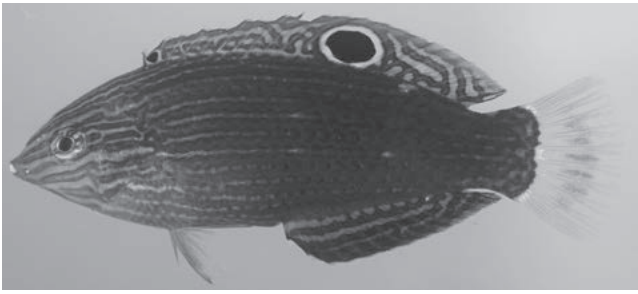
Halichoeres ianthinus Fourmanoir 1955: 217 (Anjouan I., Comoros).

Halichoeres virescens Fourmanoir & Guézé 1961: 13 (Réunion, Mascarenes).

Halichoeres marginatus: Baissac 1953; Smith 1955, 1957; Smith & Smith 1963*; Jones & Kumaran 1980; Randall & Smith 1982; Randall 1983, 1992, 1995*; Allen & Steene 1987; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; Anderson 1996; Carpenter *et al.* 1997; Field & Field 1998*; Heemstra *et al.* 2004; Lieske & Myers 2004.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 13–15 rays. Body depth 2.6–3.3 in SL; caudal fin slightly rounded; pelvic fins of adult males long, extending beyond anal-fin origin. GR 17–20. LL scales 27–29, anterior scales with 2–4 pores; suborbital pores 10–14; head naked except area of small scales on sides of nape extending to above rear edge of eyes.

Juveniles black with 5 longitudinal white to pale yellow lines, some broken into dashes or spots; 3 ocelli in dorsal fin, middle ocellus very large, flanked by white spot that links to 1st pale yellow line on body. Females olive-brown with dark purplish brown longitudinal lines following centres of scale rows; head paler bluish or greenish brown, with more irregular, narrow, dark brown lines; dorsal and anal fins olivaceous with dark-edged reddish longitudinal bands that become more irregular and broken into segments or spots on soft-rayed portion, dorsal fin with same 3 ocelli as juvenile. Head of males orange-red anteriorly, grading to orange posteriorly, with narrow blue and green bands, mainly longitudinal, that continue on body as dark green stripes (consisting of series of large contiguous dark green spots, 1 per scale); orange on body restricted to narrow lines between green stripes anteriorly, disappearing posteriorly; caudal fin coloured as for body on basal fifth, followed by pale green crescent, broad transverse dark green band dotted with pale green, and outer pale olive margin; dorsal and anal fins dark green with numerous small pale green spots. Attains 17 cm TL.



Halichoeres marginatus, 5 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Gulf of Oman, Red Sea, Yemen, Mozambique and South Africa (Umhlanga: underwater photograph of subadult), Madagascar, Comoros, Aldabra, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to Andaman Sea, Christmas I., Indonesia, Japan, Australia, Pitcairn Is. and Hawaii.

REMARKS Usually found along edges of well-developed coral reefs in constant search for prey, reported mainly as small crustaceans, gastropods and polychaete worms. Juveniles secretive, often in narrow crevices or near sea urchins. Regional populations look different and differ in mtDNA sequences by several percent. The type population from the Red Sea has marked differences. After the complex is split, the species in the remaining WIO would be *H. lamarii*.

Halichoeres melas Randall & Earle 1994

Black wrasse

PLATE 73

Halichoeres melas Randall & Earle 1994: 296, Pl. 8 (Sawda I., Khuriya Muriya Is., Oman).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 13 rays. Body depth 2.8–3 in SL; head profile straight and steep to above eyes, at ~55° angle to horizontal axis of body; dorsal-fin origin anterior to gill opening (2nd spine in vertical alignment with upper end of gill opening); caudal fin slightly rounded; pelvic fins extending to or slightly behind anus. GR 16–19. LL scales 27 or 28, each with 2 or 3 (rarely 4) pores; suborbital pores 10–12; head naked; no median predorsal or pre-pelvic scales (ventroanterior half of chest naked); scales on sides of nape progressively smaller anteriorly, ending above free end of preopercle margin; no scales on opercle.

Colour in life black (as viewed underwater); iris yellow. Colour upon capture (males): dark red; iris mainly red; few scales posteriorly on body with 2-mm dark blue-green spot; soft-rayed portion of dorsal fin with broad median, somewhat iridescent, blue-green band; caudal fin with large, faint, dark blue-green central area and 2 tiny blue-green spots (one above other) in centre of fin. Attains 12 cm SL.

DISTRIBUTION Known only from three type specimens (males) collected at Oman.

REMARKS Taken from a reef in 9–10 m. Individuals were observed to forage over an unusually wide area. No other fish of different colour were observed in the area that might have been the female of the species, so it may also be black. From this behaviour, the body shape, and dark colouration, this fish was first thought to be a species of *Macropharyngodon*. However, the dentition is typical of *Halichoeres*. Of the species of *Halichoeres*, *H. melas* is closest to *H. lapillus*, sharing the same meristic data, anterior-set dorsal-fin origin, and half naked chest. These 2 species appear to be a link between *Halichoeres* and *Macropharyngodon*.

Halichoeres nebulosus (Valenciennes 1839)

Picture wrasse

PLATE 73

Julis nebulosus Valenciennes in Cuv. & Val. 1839: 461 (Mumbai, India).

PlatyGLOSSUS nebulosus: Day 1877.

Halichoeres kawarin (non Bleeker 1852): Baissac 1953; Smith 1955*, 1957; Smith & Smith 1963*; SFSA No. 792a*; Kotthaus 1977; Jones & Kumaran 1980.

Halichoeres margaritaceus (non Valenciennes 1839): SFSA No. 792.

Halichoeres melanurus (non Bleeker 1851): Harmelin-Vivien 1976.

Halichoeres nebulosus: Kuitert & Randall 1981*; Randall & Smith 1982; Randall 1983*, 1992, 1995*; Winterbottom *et al.* 1989*; Field & Field 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Dorsal fin 9 spines, 11 (rarely 12) rays; anal fin 3 spines, 11 rays; pectoral fins 14 (rarely 13 or 15) rays. Anterior pair of canines projecting and slightly recurved; 2nd pair of teeth in jaws almost as long and more strongly recurved. Body depth 3–3.6 in SL; caudal fin moderately rounded; pelvic fins of males barely extending to anus. GR 17–21. LL scales 27, anterior scales with 1–3 pores; suborbital pores 10–14; no scales on head; narrow median zone of nape naked, except for a few embedded scales anterior to dorsal fin; scales on sides of nape not extending to rear edge of eyes.

Females green to olivaceous dorsally, grading to pale green or white ventrally, with grey to brown stripes following scale rows on upper half of body, along with scattered whitish spots of pupil size; very large, irregular, double black spot midlateral on body, anterior part with irregular dorsal extension onto dorsal-fin base; large squarish pink spot posteriorly on abdomen over anal-fin origin, crossed by oblique bluish white line, with parallel line at anterior margin; reddish stripe from upper lip through lower part of eye, expanding posteriorly and ventrally; vertically elongate black mark behind eye, followed by irregular whitish mark; boomerang-shaped pink band on cheek; top of head with fine reticulations of reddish brown; dorsal and anal fins with

oblique olivaceous to reddish bands; large yellow-edged black spot on outer anterior soft-rayed part of dorsal fin, with smaller ocellus anteriorly; unscaled part of caudal fin without spots or bands. Males variable in colour, more green overall, some with each scale on upper half of body covered by vertically oval dark green spot (blackish on spots in middle of body); large pink area of abdomen of female smaller and orangish pink, followed by irregular orangish bars; other males with irregular reddish bands and large, branching black area in middle of body; head green, grading to yellowish green ventrally, with salmon-pink bands, one from corner of mouth through lower edge of eye, branching broadly behind eye (black mark largely absent; replaced by black spot, edged in front of blue or yellow within large branching pink band on rear of opercle); ocellus in dorsal fin replaced by large irregular black spot, and oblique bands more as spots; caudal fin with short vertical to oblique rows of small dark red spots. Attains 11 cm TL.



Halichoeres nebulosus, 7 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Oman to South Africa (Algoa Bay), Madagascar, Seychelles, Réunion, Mauritius Chagos and eastern India; elsewhere to Christmas I., Ryukyu Is. and Australia.

REMARKS A common inshore species (often in <1 m) on exposed coral reefs or rocky substrates; juveniles more in sandy areas.

Halichoeres pardaleocephalus (Bleeker 1849)

Lineblotch wrasse

PLATE 73

Julis (Halichoeres) pardaleocephalus Bleeker 1849: 8 (Bali, Indonesia).
Halichoeres pardaleocephalus: Bleeker 1862; Randall & Smith 1982.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 or 15 (usually 14) rays. Anterior pair of canines projecting and slightly recurved; 2nd pair of teeth in upper jaw two-thirds length of outer pair; 2nd canines in lower jaw almost as long as 1st. Body moderately deep, ~3.2 in SL; snout profile straight, at ~35° angle to horizontal axis of body, and nape profile slightly convex; caudal fin slightly rounded; pelvic

fins not extending to anus. GR 20–21. LL scales 27, anterior scales with 3–9 pores; suborbital pores 16–23; no scales on head; no narrow median naked zone on nape; scales on sides of nape almost or extending to vertical at rear edge of eyes.

Small female olive-green, with longitudinal brownish orange stripes separating scale rows; some scales of double rows of orange stripes on sides of body with dark brown to black spot, resulting in clusters of small dark spots; vertical yellow line behind eye with adjacent black blotch; dorsal and anal fins deep pink with rows of green-edged yellow spots, dorsal fin with large oval blue spot, rimmed in black and yellow, basally between 1st and 4th rays. Large female more green overall, narrow bands on head orange-yellow, those below eye and across opercle narrowly edged with dark and pale blue; vertical spot behind eye mainly blue with dark-edged orange line anterior and posterior; ocellus on dorsal fin smaller and hemispherical. Males very similar. Attains 13 cm TL.

DISTRIBUTION WIO: southern India (Kovalam and Visakhapatnam); elsewhere, Indonesia (Sumatra, Java and Bali).

REMARKS Specimens from India were collected from rock and sand bottom, in 0–2 m, and a large tidepool.

Halichoeres pelicieri Randall & Smith 1982

Pelicier's wrasse

PLATES 73 & 74

Halichoeres pelicieri Randall & Smith 1982: 12, Pls. 5c–d & 6a–b (Mauritius, Mascarenes); Randall & Steene 1984; SSF No. 220 [in key]; Baissac 1990; Fricke 1999; Victor 2016: 18, Figs 6–8.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 13 rays. Anterior pair of canines projecting and slightly recurved; 2nd pair of teeth in jaws only half as long. Body depth 3.6–4 in SL; caudal fin slightly rounded; pelvic fins not extending to anus. GR 18–2. LL scales 27, anterior scales with 1–3 pores; suborbital pores 8–11; no scales on head; narrow median zone of nape naked, except for a few embedded scales anterior to dorsal fin; small scales on sides of nape extending forward almost to vertical at rear edge of eyes; small scales on caudal-fin base.

Juveniles and females salmon-pink with a broad yellow midlateral band ending in a rounded black spot at the base of the caudal fin, often blackened scales in band before spot. Males overall green with a bright blue green stripe above and behind the eye, a black dorsal fin, a black spot on upper pectoral axil and a black moustache. Midlateral band becomes wider posteriorly and darker yellowish green with scalloped edges and a row of yellowish spots above the band. Caudal and anal fins with a distal yellow band. Attains 11 cm TL.

DISTRIBUTION WIO: Mauritius and Réunion.

REMARKS The seven type specimens were females collected in 20–35 m, on sand and rubble substrates. Males were discovered more recently in deeper water. Victor (2016) described the related new species *Halichoeres gurrobyi* Victor 2016 also from deep reefs in Mauritius. Immatures and females have two lateral yellow stripes and a large black blotch over the caudal peduncle (Plates 70 & 71). Males develop a larger posterior black blotch, and a bright yellow cheek overlying a blue isthmus.

Halichoeres scapularis (Bennett 1832)

Zigzag wrasse

PLATE 74

Julis scapularis Bennett 1832: 167 (Mauritius, Mascarenes).

Halichoeres coeruleovittatus Rüppell 1835: 14, Pl. 4, Fig. 1 (Jeddah, Saudi Arabia, Red Sea).

Julis leschenaulti Valenciennes in Cuv. & Val. 1839: 453 (Réunion, Mascarenes).

PlatyGLOSSUS scapularis: Playfair & Günther 1867; Day 1877; Gilchrist & Thompson 1917.

PlatyGLOSSUS (Güntheria) pagenstecheri Kossmann & Räuber 1877: 407, Pl. 3, Fig. 5 (Red Sea).

PlatyGLOSSUS (Güntheria) scapularis: Bleeker 1879.

Halichoeres scapularis: Baissac 1953; Smith 1955*; SFSA No. 795*; Kotthaus 1977; Jones & Kumaran 1980; Smith in Bruton & Cooper 1980; Allen & Steene 1987; Winterbottom *et al.* 1989*; Randall 1992, 1995; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Field & Field 1998*; Fricke 1999; Heemstra *et al.* 2004; Lieske & Myers 2004.

Pseudojuloides trifasciatus (*non* Weber 1913): Allen & Steene 1987.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 rays. Two pairs of canines at front of jaws, 2nd pair almost as large as 1st and more strongly recurved. Body depth 2.4–3.9 in SL, deeper with growth; snout short; caudal fin slightly to moderately rounded; pelvic fins of large adult males extending to anal-fin origin. GR 17–21. LL scales 26, anterior scales with 1 pore; suborbital pores 9–11; head naked except for patch of 9–12 small scales dorsally on opercle; no median naked zone on nape, scales extending forward to vertical at rear edge of eyes.

Juveniles white, with yellow stripe from eye to caudal-fin base above LL, very broad and irregular behind eye, progressively narrower on body as series of contiguous black blotches about half pupil diameter for most of body, then progressively smaller and more separated, ending as dots on tiny yellow spots on peduncle. Females similar, becoming pale green dorsally on body, yellow stripe now evident on side of snout to eye, the black blotches of dark stripe larger and well joined, except on peduncle where separate and smaller than

pupil; median fins pale yellowish; pink stripe on dorsal fin near base, and outer stripe, submarginal in soft-rayed part of fin; anal-fin base white with pink stripe. Large females pale blue-green dorsally, black stripe broader and in zigzag pattern. Terminal male greenish yellow on head, with irregular large pink bands and spots; body pale blue-green, grading ventrally to white, with vertically elongate, irregular, pink bands on scales; zigzag line along lateral line broader and pink, overlaid with blackish pigment anteriorly, enlarged to irregular black spot covering 3 or 4 scales below middle of spinous dorsal fin; dorsal and anal fins pale green with 2 pink stripes; caudal fin pale blue-green in broad central part, with irregular, vertical, interconnected pink bands, becoming broadly yellow posteriorly and narrowly yellow on upper and lower margins. Attains 20 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa (KwaZulu-Natal), Madagascar and Mascarenes; elsewhere to Indonesia, southern Japan, Palau, Great Barrier Reef and New Caledonia.

REMARKS Typically found in bays or lagoons, on sand, rubble or seagrasses, and generally near reefs or rocky areas, in 1–20 m. Often follows goatfishes to find invertebrates exposed by their rooting in sand. Terminal males in Red Sea and Gulf of Aden appear to be smaller in size and differ in colour: the dorsum is yellow, instead of green, and the interspaces between pink bands on the head are blue or blue-green instead of green; the caudal fin often has a large central blackish area obscuring the pink bands, as seen on the species elsewhere.

Halichoeres signifer Randall & Earle 1994

Flag wrasse

PLATE 74

Halichoeres signifer Randall & Earle 1994: 292, Pls. 5–7 (Masirah I., Oman); Randall 1995.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 13–15 rays. Single pair of canines at front of jaws, 2nd tooth almost as large in some individuals; canine at corners of mouth. Body slender, depth 4–4.3 in SL; caudal fin slightly rounded; pelvic fins short, not extending to anus. GR 17–21. LL scales 27–29, anterior scales with 3–5 pores; suborbital pores 6–13; broad median naked zone on nape; scales on sides of nape extending forward almost to vertical at rear margin of preopercle; no scales on opercle or cheek.

Juveniles green, scale edges reddish brown, grading anteriorly to reddish brown, with white stripe from chin through lower part of eye, across lower side of body, ending as faint pale streak in caudal fin; oblique oval black spot at

caudal-fin base (adjacent to white stripe); whitish line from upper part of eye following dorsoanterior part of lateral line; median fins mainly red. Females similar but more green and lacking black basicaudal spot. Males dusky orange, with blue spot on each scale, paler to near-white ventrally, with narrow pale green stripe across body, commencing above pectoral-fin base and continuing onto scaly caudal-fin base; head dull orange dorsally grading to yellowish ventrally, with irregular oblique pale blue lines; dorsal fin orange with row of blue spots, one per membrane, at base; first 2 membranes mainly bluish black, next 2 with large yellow area distally; caudal fin orange with 4 vertical rows of blue spots, progressively darker distally; upper and lower margins narrowly blue. Attains 10 cm TL.

DISTRIBUTION WIO: Oman.

REMARKS Seen at the interface of low rocky reef and sand, in 3–12 m. Forages both on reefs and adjacent sand. Males maintain a harem of ~10 females, the male often seen elevating the dorsal fin to display the black and yellow anterior portion; this courtship is more typical of species of *Leptojulius* than *Halichoeres*. The molariform pharyngeal teeth less-developed than those of other *Halichoeres* spp. is an additional similarity with *Leptojulius*.

Halichoeres stigmaticus Randall & Smith 1982

U-spot wrasse

PLATES 74 & 75

Halichoeres stigmaticus Randall & Smith 1982: 7, Pl. 3a–b (Bahrain, Persian/Arabian Gulf); Randall 1995*; Carpenter *et al.* 1997*.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 (rarely 11 or 13) rays; pectoral fins 14–16 (usually 15) rays. Pair of projecting, slightly recurved canines at front in both jaws, followed by 2nd recurved pair ~ $\frac{3}{4}$ as long. Body depth 3.4–3.8 in SL; caudal fin slightly to moderately rounded; pelvic fins short, not extending to anus. GR 18–21. LL scales 28 (rarely 27 or 29), anterior scales with 3–5 pores; suborbital pores 6 or 7; head naked, except for triangular patch of small scales on sides of nape, extending forward to or slightly anterior of vertical at upper end of preopercle margin.

Females pale green on upper quarter of nape and body, scale centres pale pink; next quarter of body pink with pale green spot on each scale (forming irregular green to blue-green lines in pink zone on head behind eye); below this, just above pectoral-fin base, narrow, pale yellow zone rimmed with irregular blue-green line; ventral third of body whitish; large blackish U-shaped mark on side of body above pectoral-fin tip, obscured by 4 curved, pale yellow streaks (conspicuous

in preservative); ventral third of body whitish, with faint pale blue spots; head pale orange-pink, grading to pale yellow on cheek, with oblique pale blue lines; tip of snout, including front of upper lip, blue; dorsal fin mainly salmon-pink, the first 2 membranes mainly deep blue and yellow. Males similar, but with black 'V' of 5 or 6 scales below anterior of dorsal fin. Attains 13 cm TL.

DISTRIBUTION WIO: Persian/Arabian Gulf (common) and Gulf of Oman (rare).

REMARKS Known from 3–25 m.

Halichoeres trispilus Randall & Smith 1982

Triplespot wrasse

PLATE 75

Halichoeres trispilus Randall & Smith 1982: 18, Pl. 8a–b (North Malé Atoll, Maldives); SSF No. 220 [in key]; Baissac 1990; Lieske & Myers 1994; Randall & Van Egmond 1994; Winterbottom & Anderson 1997; Fricke 1999.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Pair of projecting, slightly recurved canines at front of jaws, almost twice as long as teeth behind. Body depth 3.4–3.6 in SL; caudal fin slightly rounded; pelvic fins short, not extending to anus. GR 16–18. LL scales 27, anteriormost and descending scales with 2 or 3 pores; suborbital pores 9–11; head naked, except for triangular zone of partially embedded small scales on sides of nape extending almost to vertical at rear edge of eyes.

Females pale pink, scales barely evident from near-white centres; head pale red dorsally, pinkish white ventrally; upper lip bright red, crossed by bluish white line that extends to front of eye; narrow bluish white band, bordered narrowly by pale red, extending from corner of upper lip below end of opercle; 2 similar bands from behind eye across back of head; oblique, red-edged, broken, pale greenish white line curved over eye and extending faintly across remainder of head; median dorsal part of head with intricate pattern of curved whitish lines and dots; series of 4 small, pale-edged, brown spots from side of nape above and parallel to lateral line, ending in middle of body; dorsal fin with 3 large ocelli, 1st full height of fin, next 2 about half as large, well-separated in soft-rayed part of fin; naked part of caudal fin bluish white, with cluster of ocellated black spots on upper basal half of fin, uppermost larger than pupil, and yellow crescent in outer half of fin. Males brighter pale pink; 2 greenish white lines extending back on snout from upper half of eye and across head behind eyes; narrow greenish white band extending from lower lip, below eye, across head; 2 bright red lines extending back from eye in spaces between

pale greenish white lines; narrow red bar at pectoral-fin base; only anterior ocellus remaining in dorsal fin, rimmed in blue, with yellow line across the top; outer half of caudal fin bright yellow, broadly bordered in blue; basal half bluish white, with few small dark bluish spots dorsally (vestiges of the ocelli of females). Attains 10 cm SL.



Halichoeres trispilus, 10 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indian Ocean. WIO: South Africa, Seychelles and Maldives; elsewhere, Andaman Is. and Indonesia (Sumatra and Java).

REMARKS Inhabits rubble and sand areas adjacent to coral reefs, in 15–50 m.

Halichoeres vrolikii (Bleeker 1855)

Pinstriped wrasse

PLATE 75

Julis (Halichoeres) vrolikii Bleeker 1855: 323 (Batu Is., Sumatra, Indonesia).

Halichoeres hoevenii (non Bleeker 1851): Randall & Smith 1982.

Halichoeres vrolikii: Randall 1992*; Randall & Anderson 1993.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 (rarely 11 or 13) rays; pectoral fins 14 (rarely 13) rays. Pair of projecting, slightly recurved canines at front of jaws, followed by pair of recurved teeth $\sim\frac{3}{4}$ as long. Body depth 3–3.4 in SL; 1st dorsal-fin spine 3–3.3 in length of 9th spine; caudal fin rounded; pelvic fins of males long, extending to anal-fin origin, length 1.2–1.3 in HL. GR 19–21. LL scales 27 (rarely 26), anterior scales with 1–3 pores; suborbital pores 6 or 7; no median naked zone on nape, scales extending to or slightly anterior to vertical at rear edge of eyes.

Females orange-yellow, with 10 or 11 narrow blue lines that converge, progressively narrower, onto head; median fins orange-yellow, dorsal fin with irregular blue line at base, black ocellus anteriorly on soft-rayed part of fin (sometimes with

blue spot in centre), narrow median blue stripe that arches over ocellus, and narrow blue margin; anal fin with blue line along base, 2nd line one-third from base, faint broken narrow blue-green line two-thirds from base, and blue margin; caudal fin with curved blue line at end of scaly fin base, blue margin, sometimes with scattered small blue spots in orange unscaled part of fin. Males orange dorsally, green ventrally, with longitudinal series of 11 or 12 green stripes, consisting of series of bell-shaped spots, one per scale; bright orange dorsoanteriorly on body forming irregular lines; 4 dark-edged bright green bars of variable length dorsally on body below base of soft-rayed portion of dorsal fin; head green with irregular, blue-edged pink bands; ventral part of head and chest suffused with blue; median fins dusky orange with rows of dark-edged green spots; pectoral-fin axil and base bright yellow, with triangular black spot at dorsal edge. Attains 13 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to Andaman Sea, Indonesia and Philippines.

REMARKS Found mainly on sheltered coral reefs and adjacent habitats, generally in <15 m. Often confused with the very similar *Halichoeres melanurus* (Bleeker 1851) from the East Indies. Bleeker (1851) described the female of that species (as *Julis hoevenii*) and male (as *Julis melanurus*) in the same paper from specimens from the Banda Is., Indonesia, unaware of the dramatic change in colour from female to male. He described *Julis chrysotaenia* Bleeker 1853, another blue and yellow thin-striped female wrasse, from Java in 1853, and *Julis vrolikii* in 1855. In *Atlas Ichthyologique* Bleeker (1862: 112) placed *J. chrysotaenia* in the synonymy of *PlatyGLOSSUS hoevenii*. Allen & Erdmann (2012) regarded *H. chrysotaenia* as the senior synonym, believing it to be the initial phase of *H. vrolikii* (and the older name). Their photograph of the initial phase shows *H. cosmetus*, from WIO. Gerald Allen (pers. comm.) argues that *H. melanurus* (and hence its female *H. hoevenii*) is not known from the Java Sea. That might be true today, where the sea north of Java is muddy brown up to 50 km offshore, but the Java Sea off Batavia (present-day Jakarta) was very different in 1851 to what it is today. Furthermore, the first of eight Indonesian localities listed for *H. melanurus* by Bleeker in *Atlas Ichthyologique* (1862: 109) is Bawean I., which lies in the Java Sea. We follow Bleeker and regard *H. chrysotaenia* as unavailable as a senior synonym and continue to use *H. vrolikii* for this species; the holotype of *H. chrysotaenia* has not been found, a situation that also favours this decision.

Halichoeres zeylonicus (Bennett 1833)

Goldstriped wrasse

PLATES 75 & 76

Julis zeylonicus Bennett 1833: 183 (Sri Lanka).*Halichöres bimaculatus* Rüppell 1835: 17, Pl. 5, Fig. 2 (Massawa, Eritrea, Red Sea).*PlatyGLOSSUS zeylonicus* Günther 1862: 158 [unjustified emendation of *zeylonicus*].*PlatyGLOSSUS bimaculatus*: Day 1877.*Pseudojulis trifasciatus* (non Weber 1913): Kuronuma & Abe 1972.*Halichoeres zeylonicus*: Randall & Smith 1982*; Dor 1984; SSF No. 220 [in key]; Randall & Anderson 1993; De Bruin *et al.* 1994; Randall 1995*; Victor 2016.*Halichoeres zeylanicus*: Cornic 1987.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 13 rays. Pair of projecting, slightly recurved canines at front of jaws, about twice as long as adjacent following teeth. Body depth 3.7–4 in SL; caudal fin slightly rounded, becoming slightly double emarginate in large males; pelvic fins short, not extending to anus. GR 17–21. LL scales 27, all with single pore; suborbital pores 6 or 7; head naked, except for partially embedded small scales on sides of nape extending forward of vertical at upper end of preopercle margin, some almost to rear edge of eyes.

Females bluish grey dorsally, pale grey ventrally, with irregular yellow stripe, suffused with brown, $\frac{1}{2}$ – $\frac{3}{4}$ eye diameter in width, from behind eye to small black spot at end of scaly caudal-fin base; 2nd, more irregular yellow stripe from beneath pectoral fin, breaking into series of spots for posterior three-quarters of its length; narrow, irregular, orange-yellow band from above eye to below front of dorsal fin; oblique yellow stripe from eye to upper lip, and another curved from eye across corner of mouth to chin; blackish blotch on upper side below 8th dorsal-fin spine, between lateral line and yellow midlateral stripe; pectoral fins with yellow band at base and small, blue-edged, black spot at upper edge; median fins whitish, dorsal fin with faint orangish yellow stripe beginning at base of origin of fin, rising to $\sim\frac{1}{3}$ height of fin centrally, then descending; anal fin with faint yellow and blue basal band; caudal fin with faint orange-yellow cross bands. Males green, yellow markings of head and band at pectoral-fin base replaced by lavender; yellow stripe on body more orange, mixed with lavender, and bordered above by pale blue-green line that arcs over black spot below 8th dorsal-fin spine; series of ~ 6 lavender bars below stripe in middle of body; dorsal fin with 2 longitudinal series of blue spots and blue submarginal line; anal fin with narrow blue stripe near base; caudal fin blue with submarginal crescentic yellow band and transverse, black-edged, pale blue-green lines. Attains 20 cm TL.

*Halichoeres zeylonicus*, TP (Tanzania). M Mwale © NRF-SAIAB

DISTRIBUTION Indian Ocean. WIO: Persian/Arabian Gulf, Red Sea, Oman to Tanzania (Zanzibar), South Africa, Seychelles, Mauritius, Maldives, India and Sri Lanka; elsewhere to Bali, Indonesia.

REMARKS Found over open sand or rubble bottom, and near isolated rocks or coral heads; usually in 20–35 m. Difficult to approach underwater, especially large males. A close relative of *Halichoeres hartzfeldii* (Bleeker 1852) of the western Pacific.

Halichoeres zulu Randall & King 2010

Zulu wrasse

PLATE 76

Halichoeres zulu Randall & King 2010: 19, Fig. 1, Pl. 1a, g–j (Umhlanga Rocks, KwaZulu-Natal, South Africa).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 (rarely 13) rays. Pair of jutting, slightly recurved canines at front of jaws, remaining teeth on sides relatively small, except small canine at rear in upper jaw. Body depth 3–3.5 in SL, deeper with growth; caudal fin rounded; pelvic fins short, not extending to anus. GR 19–21. LL scales 26, anterior scales with 3–5 pores; suborbital pores 6 or 7; no scales on head; median dorsal zone on nape naked; scales on sides of nape progressively smaller and more embedded anteriorly, extending to half orbit diameter behind eyes.

Females red on nape and anterodorsally on body, soon grading ventrally to pale lavender-pink, with 3 irregular, pale green stripes that zigzag posteriorly and contain brown spots; abdomen lavender-pink, crossed by 2 triangular patches of pale greenish yellow lines; head pale orange dorsally, pale lavender-grey ventrally; green lines above and behind eye, forming irregular quadrangle; green band behind to eye leading to and enclosing semicircular dark spot on opercle; elongate horseshoe-shaped green band across lower part of head, open end anterior, upper green band ending at corner of mouth; median fins green, dorsal fin with irregular dark red bands forming reticular pattern, and oblong black spot between 2nd and 4th rays; anal fin green with dark red zigzag stripe at base, and rows of dark red spots distally; caudal fin green, with

irregular vertical rows of small dark red spots. Males with same basic colour pattern, the ground colour more orange, lines and spots brighter and darker blue-green; green spot on opercular flap with yellow mark, as well as semicircular black spot. Attains 15 cm TL.



Halichoeres zulu, 14 cm SL, male holotype (South Africa). © DR King

DISTRIBUTION WIO: South Africa (Kosi Bay to northern Eastern Cape) and Madagascar.

REMARKS The paucity of specimens is probably a result of its living along exposed rocky shores in <2 m deep, to being extremely elusive, and to its long being misidentified as *Halichoeres nebulosus*, with which it is sympatric. The two species can be separated by LL scale count (26 for *H. zulu*, 27 for *H. nebulosus*), cheek colouration (pink with green horseshoe-shaped mark for *H. zulu*, green with boomerang-shaped pink band for *H. nebulosus*), and maximum size (13.5 cm SL for *H. zulu*, 8.6 cm SL for *H. nebulosus*).

GENUS *Hemigymnus* Günther 1861

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays. Lateral line continuous, abruptly curved downward below rear part of dorsal fin, to straight on peduncle; LL scales 27 or 28. Mouth relatively small; pair of protruding canines at front of jaws; lips large and fleshy, lower divided medially into 2 lobes. Body deep, 2.3–2.6 in SL. Three species, in Indo-Pacific, all in WIO, 1 endemic to Red Sea. All species especially variable in colouration, from juvenile to female to male, and variable with growth within each phase. Schultz (1960) indicated inter-population differences of *Hemigymnus fasciatus* in the Pacific, which warrants further study.

KEY TO SPECIES

- 1a Body pale anteriorly, blackish posterior to line between dorsal- and anal-fin origins; total GR 26–29 *H. melapterus*
- 1b Body black, with 5 narrow white bars; total GR 20–24 2

Continued...

KEY TO SPECIES

- 2a Head yellow to green, with prominent pink bands on cheek and opercle; no curved black bar from nape to eye; first 2 white bars on body do not broaden ventrally; GR 22–24 *H. fasciatus*
- 2b Head white, without prominent pink bands on cheek and opercle; curved black bar from nape to eye (which may contain irregular orange-yellow spots); first 2 white bars on body broaden ventrally; GR 20–23 (rarely 23) *H. sexfasciatus*

Hemigymnus fasciatus (Bloch 1792)

Barred thicklip wrasse

PLATE 76

Labrus fasciatus Bloch 1792: 6, Pl. 290 (Japan).

Labrus fuliginosus Lacepède 1801: 437, 493, Pl. 22, Fig. 3 (Madagascar; Réunion and Mauritius, Mascarenes).

Labrus malapteronotus Lacepède 1801: 450, 518, Pl. 31, Fig. 1 (probably Mauritius).

Scarus quinquefasciatus Bennett 1830: no page number, Pl. 23 (Sri Lanka).

Thalassoma bilaterale Von Bonde 1934: 454, Pl. 23, Fig. 7 (Zanzibar, Tanzania).

Hemigymnus fasciatus: Günther 1861; Playfair & Günther 1867; Day 1877; Baissac 1953; Munro 1955; Smith 1955*, 1957; Smith & Smith 1963*; SFSA No. 787*; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.36*; Allen & Steene 1987*; Winterbottom *et al.* 1989*; Randall 1992, 1995*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Heemstra *et al.* 2004.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 rays. Single pair of strong, projecting canines at front of jaws, upper pair slightly outcurved, followed by row of ~8 small blunt conical teeth, and canine at corners of mouth. Mouth relatively small; lips thick and fleshy, lower lip deeply incised in middle to form 2 lobes. Body depth 2.3–2.6 in SL; dorsal fin continuous, rays little higher than spines, and increasing only slightly in height posteriorly; anal fin comparable; caudal fin slightly to moderately rounded. GR 22–24. LL scales 27; scales on nape extending forward at most to above middle of eye, anterior scales small and embedded; triangular patch of small scales on cheek at corner of preopercle; opercle to lower jaw naked.

Juveniles dark brown, with 6 narrow white bars, 1st across nape and chest, last at caudal-fin base; head with whitish lines radiating from eyes; lips whitish. Females black, with 6 white bars, broader and more curved than on juvenile; head pale green with broad irregular pink bands; caudal fin black or orange, grading to yellowish green posteriorly (may have pupil-sized black spot basally in orange part of fin). Males with black body and pale green bars, narrow dorsally and broad ventrally; head pale yellowish green dorsally, pale yellow ventrally, with irregular broad pink bands around and below eye, and large deep blue irregular spot ventrally; occasional males may be observed with a reversal of the green and colour pattern of the

body, believed to be courtship colouration. Reportedly attains 80 cm TL, but likely only to >40 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Oman to South Africa (KwaZulu-Natal), Aldabra, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Andaman Sea, Indonesia, Japan, Australia, Tahiti and Pitcairn Is.

REMARKS Usually solitary on sand and rubble near coral reefs, more in protected than exposed areas, generally in <20 m. Juveniles secretive, often near long-spined sea urchins. Feeds mainly by taking mouthfuls of sand and gravel, releasing sand from the gill opening, sorting the small animal prey, and ejecting the larger inorganic material from the mouth. The stomach contents of an adult examined by JE Randall contained gastropods, gammarid amphipods, isopods, crabs (including xanthids and portunids), shrimps, galatheids, isopods, polychaetes and foraminiferans, all very small. Adults feed on larger prey, especially crabs, echinoids and molluscs.

Hemigymnus melapterus (Bloch 1791)

Blackeye thicklip wrasse

PLATE 77

Labrus melapterus Bloch 1791: 137, Pl. 285 (Japan).

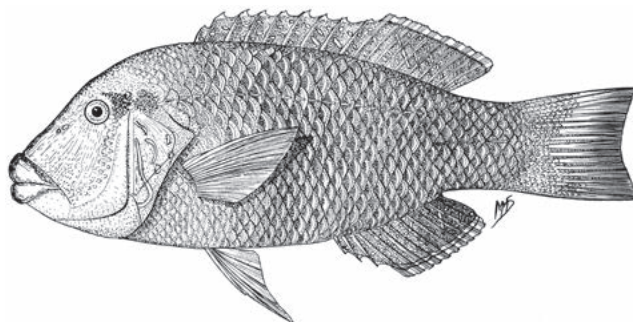
Labrus malapterus Bloch 1792: 29, Pl. 296, Fig. 2 (Japan) [misspelling of *Labrus melapterus*].

Hemigymnus melapterus: Playfair & Günther 1867; Day 1877; Peters 1877; Baissac 1953; Smith 1955*, 1957; Smith & Smith 1963*; Randall 1983*, 1992, 2013*; Gomon in Fischer & Bianchi 1984; SSF No. 220.37*; Allen & Steene 1987*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Carpenter & Niem 2001*; Lieske & Myers 2004; Fricke *et al.* 2009.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 rays. Mouth small, with thick fleshy lips, the lower lip deeply incised in middle to form 2 lobes; dentition as in *H. fasciatus*. Body depth 2.3–2.7 in SL; caudal fin rounded in juveniles, slightly rounded to truncate in adults; dorsal- and anal-fin spines and rays almost uniform in height; pelvic fins of large males may extend to anal-fin origin. GR 26–29. LL scales 25; head naked except for triangular patch of small scales, at most in 3 rows, on corner of preopercle.

Small juveniles dark brown, green on snout and interorbital, with slightly oblique white bar from front of dorsal fin to abdomen and 2 narrow, pale yellowish bars below soft-rayed dorsal fin, that fade ventrally; larger juveniles with white bar from dorsal-fin origin, beneath pectoral fins onto abdomen; head and body in front of bar greyish green, behind bar black; rear peduncle and caudal fin yellow, often with 1 or 2 small black spots centrally near base. Females dark green beyond

curved line between origins of dorsal and anal fins, grading almost to black posteriorly, with blue-green line or spot on each scale; body anterior to line green dorsally, grading to pale blue-green ventrally; nape green with vertical pale green line on each scale, and short black vertical line between scales; large complex marking within pale blue area behind eye, consisting of vertically elongate blackish spot of about eye size or larger, with very irregular dusky pink band extending up, down and back (entire marking may be obscure blackish). Males dark green, with scattered pale blue-green dots, each scale with narrow pale blue-green and black rear margin; smaller scales on nape more yellowish green; chest and abdomen pinkish white with pale blue-green margin on scales of abdomen, and pale blue-green spot on scales of chest; upper half of head mainly green with bright blue ring around eye, blue-green on snout with irregular green bands and spots; large greenish yellow area on cheek devoid of markings; opercle pale pink with narrow blue-green bands and small spots; lips and lower part of head mainly pale blue. Attains 50 cm TL.



Hemigymnus melapterus, 45 cm TL (WIO). Source: SFSA

DISTRIBUTION Indo-Pacific. WIO: Red Sea to Mozambique (Pomene), Madagascar, Maldives, Seychelles, Réunion and Mauritius; elsewhere to Indonesia, Ryukyu Is., Micronesia, Marshall Is., Australia, Samoa and Society Is.

REMARKS Known from 1–30 m. Observed to feed in the same unique way as *H. fasciatus*.

Hemigymnus sexfasciatus (Rüppell 1835)

Red Sea thicklip wrasse

PLATES 77 & 78

Halichoeres sexfasciatus Rüppell 1835: 18, Pl. 5, Fig. 3 (Jeddah, Saudi Arabia, Red Sea).

Hemigymnus fasciatus (non Bloch 1792): Klunzinger 1871; Roux-Estève & Fourmanoir 1955; Randall 1983*; Dor 1984; Field & Field 1998*.

Hemigymnus sexfasciatus: Günther 1867; Kossman & Räuber 1877; Kuiter 2002*; Lieske & Myers 2004; Randall 2013*.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 rays. Mouth small; lips very thick and fleshy, lower lip deeply incised in middle to form 2 lobes; dentition as in *H. fasciatus*. Body depth 2.4–2.7 in SL; caudal fin rounded in juveniles, slightly rounded to truncate in adults; dorsal- and anal-fin spines and rays almost uniform in height; pelvic fins of large males extend to or nearly to anal-fin origin. GR 20–23 (rarely 23). LL scales 25; head naked except for triangular patch of small scales at corner of preopercle.

Juveniles dark green, mottled with pale yellowish green, with white bar from dorsal-fin origin to abdomen, faint narrower bars posteriorly, and 2 ventrally on chest; pale yellowish green bars radiating from orbit. Small females black, with 6 white bars, progressively narrower posteriorly, first 2 expanding ventrally; snout and forehead dull green; black bar from nape to rear edge of eye; remainder of head and chest white. Large females black, scale edges dark olive-green, with 4 white bars that broaden ventrally, progressively narrower and more obscure posteriorly (the last on peduncle barely visible); snout, head behind head, and body to 1st white bar dark olive green, with narrow white bar from in front of dorsal-fin origin broadening ventrally to chest and anteriorly over entire opercle and cheek; scales on nape and dorsal half of 1st dark bar of body with irregular orange spots (those on body mostly as irregular narrow vertical bands); irregular dull red bands extending from eye; upper lip yellow, grading to white on margin; snout and nape green anteriorly median fins dark greenish grey, spotted with black, anal fin with red margin and blue submarginal line; pelvic fins with narrow blue and orange bands parallel to rays; pectoral fins transparent with yellow rays. Males dark green, and spindle-shaped scales rimmed in pale green; anterior two-thirds of body with 3 pale greenish grey bars that broaden ventrally, small scales of abdomen and chest with orange centres and pale blue edges; head green dorsally with curved band from nape through eye to front of snout, dorsal part of this band and 1st dark bar on body with scale centres bright orange-yellow, strongly rimmed in dark green; irregular narrow green bands on snout and to eye; large area of cheek and opercle white; ventral part of head pale greyish blue; upper lip mainly greenish yellow; paired fins as in females, pectoral-fin base in large deep blue spot. Large breeding males may exhibit a reversal of the dark and pale barred pattern (Field & Field 1998). Attains 50 cm TL.

DISTRIBUTION WIO: Red Sea and Gulf of Aden.

REMARKS Feeding mode as for other two species of the genus. Found on coral reefs and adjacent sand a coral rubble, in 1–20 m.

GENUS *Hologymnosus* Lacepède 1801

Dorsal fin 9 spines, 12 rays, spines thin and flexible; anal fin 3 spines, 12 rays. Two pairs of canines at front of jaws, anterior pair largest and more projecting; no canine at corners of mouth. Body elongate and compressed, depth 3.3–5.4 in SL (larger individuals generally deeper-bodied), body width 1.9–2.7 in its depth. Lateral line continuous, deflected downward below 9th dorsal-fin spine; LL scales 91–118; head naked except nape. Four species in Indo-Pacific (Randall 1982), 2 in WIO. The WIO species have been confused by many authors because of the large variation in colour. The identity of many records cannot be determined because of inadequate colour descriptions. Günther (1862), Day (1875–1878) and Sauvage (1891) considered *Hologymnosus* a junior synonym of *Coris*. Günther (1862) treated *Coris doliatus* and *C. annulatus* as colour varieties of *C. annulata*, whereas Sauvage (1891) identified them as colour varieties of *C. doliata*.

KEY TO SPECIES

- 1a Pectoral-fin length 1.7–1.9 in HL; caudal fin emarginate, maximum caudal-fin concavity of large males about 5 in HL. Juveniles yellow, with red line on back and broad black stripe on lower side of head and body; females brown to olivaceous with numerous dark brown bars on body, and whitish crescent posteriorly in caudal fin; males green to blue-green with purplish red bars on side of body, and without broad pale bar in pectoral-fin region (pale bar, if present, narrow and centred above anal-fin origin) *H. annulatus*
- 1b Pectoral-fin length 1.9–2.1 in HL; caudal fin double emarginate, maximum caudal fin concavity of large males ~11 in HL. Juveniles white, with 3 narrow orange-red stripes (breaking into series of red spots in subadults); females pale blue-green to pink with dark bars, and without conspicuous whitish crescent in caudal fin; males pale blue-green to pale red with numerous lavender-blue bars and broad pale zone across body in pectoral-fin region, bordered by purple *H. doliatus*

Hologymnosus annulatus (Lacepède 1801)

Ring wrasse

PLATE 78

Labrus annulatus Lacepède (ex Commerson) 1801: 455, 526, Pl. 28, Fig. 3 [Mauritius?].

Labrus semidiscus Lacepède (ex Commerson) 1801: 429, 473, Pl. 6, Fig. 2 (Indian Ocean).

Julis annulatus: Valenciennes in Cuv. & Val. 1839.

Hologymnosus fasciatus (non Lacepède 1801): Bleeker 1862.

Coris elongata Günther 1862: 201 (Mauritius, Mascarenes).

Coris semipartita Günther 1862: 203 (Mauritius, Mascarenes).

Coris annulata: Playfair & Günther 1867.

Hologymnosus semipartitus: Bleeker 1874.

Hologymnosus semidiscus: Baissac 1953; Jones & Kumaran 1980.

Hologymnosus annulatus: Randall 1982*; Gomon in Fischer & Bianchi 1984; SSF No. 220 [in key]; Allen & Steene 1987*; Winterbottom *et al.* 1989*; Randall & Anderson 1993; De Bruin *et al.* 1994; Randall & Van Egmond 1994*; Field & Field 1998*; Heemstra *et al.* 2004; Lieske & Myers 2004.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Two pairs of canines at front in both jaws; no canine at corners of mouth. Body elongate, depth 3.3–5.1 in SL, deeper-bodied with growth; pectoral fins of adults 1.7–1.9 in HL; pelvic fins short; dorsal- and anal-fin spines and rays uniformly high; caudal fin slightly rounded in juveniles, emarginate in adults, caudal concavity of large males ~5 in HL. GR 18–23. LL scales 100–118; head naked.

Juveniles pale yellow, with broad dark brown stripe on lower sides and head, covering lips and lower two-thirds of eye, extending onto caudal fin; dark red to black line from front of snout along back above lateral line. Females usually pale grey-brown to olivaceous (but may be bluish, greenish or pinkish grey), with 17–22 dark bars on body, narrower than interspaces; small bicoloured spot on opercular membrane; black spot on side of lips, larger on lower; median fins dark brown with white margins, caudal fin with large white crescent. Males green, sometimes shading to blue ventrally, with 17–22 purplish red bars, often with narrow pale yellowish bar across body above anal-fin origin; head with green bands radiating from eye, one forward onto snout expanding broadly to large quadrangular area; lips pale blue to blue-green with large spot or band of deep blue or purple; caudal fin purplish blue, upper and lower margins pale blue, with pale rear crescent. Attains 40 cm TL.



Hologymnosus annulatus, 20 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Kenya to South Africa (Sodwana Bay), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Indonesia, Japan, Australia, Pitcairn Is. and Line Is.

REMARKS Found on coral reefs and adjacent sand and rubble habitat, in 1–25 m. Unusual for a wrasse in feeding mainly on fishes (JE Randall opened the stomachs of 18 adult specimens: three were empty, 11 contained only fish remains, and the remainder shrimps, crabs and unidentified

crustaceans). Juveniles transform to females at ~10–12 cm SL; juveniles are reported to mimic the juvenile stage of *Malacanthus latovittatus*, which feeds on benthic invertebrates.

Hologymnosus doliatus (Lacepède 1801)

Pastel ring wrasse

PLATES 78 & 79

Labrus doliatus Lacepède (ex Commerson) 1801: 429, 473, Pl. 6, Fig. 3 (Indian Ocean).

Hologymnosus fasciatus Lacepède 1801: 556, 557, Pl. 1, Fig. 3 (Indian Ocean).

Coris (*Hologymnosus*) *doliata*: Sauvage 1891.

Coris annulata: Gilchrist & Thompson 1909.

Hologymnosus semidiscus (*non* Lacepède 1801): Barnard 1927; Baissac 1953; Fourmanoir & Guézé 1961; Smith & Smith 1963*; SFSA No. 810*.

Hologymnosus doliatus: Randall 1982*; Gomon in Fischer & Bianchi 1984*; Randall & Anderson 1993; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Randall 1995*; Winterbottom & Anderson 1997; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Two pairs of canines at front of jaws, 1st pair largest and more projecting; no canine at corners of mouth. Body elongate, depth 3.8–5.4 in SL, deeper-bodied with growth; dorsal- and anal-fin spines and rays almost uniform in height; pelvic fins short; caudal fin of juveniles and small females rounded, becoming double emarginate in large adults, maximum caudal concavity in large males ~11 in HL. GR 18–22. Lateral line deflected sharply downward below 9th dorsal-fin ray; LL scales 97–112; head naked.

Juveniles near-white with 3 narrow orange-red stripes that break into series of spots in subadults. Females lavender or pale bluish, greenish, or pinkish grey, with 20–23 orangish or yellowish brown bars on body, narrower than interspaces. Males pale blue-green to pale red with 20–23 lavender-blue bars, and broad pale yellowish to whitish bar, bordered by dark blue bars, in pectoral region; head green, yellow, or lavender with 2 parallel blue bands extending behind eye, first from eye to corner of mouth, second on snout; large irregular blue patches on cheek and opercle; small yellow and black spot on opercular flap. Reported to 50 cm TL; largest specimen examined 38 cm TL.



Hologymnosus doliatus, 34 cm SL, TP (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: southern Red Sea (Zubayr Is.: photograph of juvenile) and Gulf of Aden, Tanzania to South Africa (Aliwal Shoal), Madagascar, Seychelles, Mauritius, Chagos, Maldives and Sri Lanka; elsewhere to southern Japan, Australia, Lord Howe I., Samoa and Line Is.

REMARKS Juveniles transform to females at ~7.5–10 cm SL. Diet includes mostly crustaceans and fishes, but also brittlestars and polychaetes. The lack of hard-shelled invertebrate prey, such as echinoids and molluscs, is correlated with the lack of well-developed molariform teeth in the pharynx. Found on seaward reefs over mixed sand, coral and rubble, in 5–30 m.

GENUS *Iniistius* Gill 1862

Dorsal fin 9 spines, 12 rays, first 2 spines more flexible, longer, and closer together than remaining spines, membrane between 2nd and 3rd spines deeply incised or spines fully separated; anal fin 3 spines, 12 (rarely 13) rays. Body deep, 2.3–3.3 in SL,

strongly compressed, width ~ $\frac{1}{3}$ body depth; snout steep, approaching vertical in adults, front of snout narrowing to form ridge (the basis for the common name razorfish). Single pair of long, slender, recurved, and slightly outflaring teeth at front of jaws; no canine at corners of mouth. Lateral line interrupted, LL pored scales 19–22 + 4–6. Inhabit open stretches of sand into which they quickly bury themselves when threatened.

Potential undescribed species of the genus may exist in WIO. One was photographed by RC Anderson at Peros Banhos Atoll (Winterbottom & Anderson 1997); and 2 unknown types from Réunion are known from a single specimen of each. The western Pacific species *Hemipteronotus melanopus* (Bleeker 1857) was reported by Dor & Fraser-Brunner (1977) from one specimen from Eritrea, and Khalaf & Disi (1997) described and illustrated a specimen from Gulf of Aqaba (“as *Xyrichtys melanopus*”); however, both specimens have been lost and the Red Sea representatives remain to be documented. Twenty-one species, none in the Atlantic, 21 in the Indo-Pacific, including 1 reaching the eastern Pacific, and at least 8 in WIO (7 described here; see Remarks under *Iniistius pentadactylus*).

KEY TO SPECIES

- | | |
|--|---|
| <p>1a First 2 dorsal-fin spines completely separate from remainder of fin; 1st dorsal-fin spine of adults almost twice as long as longest ray (3 times longer in juveniles); adults with scale-size black spot, partly rimmed with pale blue, half on 8th LL scale and half of scale obliquely above (below base of 6th dorsal-fin spine) <i>I. pavo</i></p> <p>1b First 2 dorsal-fin spines joined by membrane to remainder of fin (though deeply incised); 1st dorsal-fin spine of adults at most slightly longer than longest ray; no black spot on lateral line below dorsal-fin base (black spot, if present, larger, more diffuse, and below lateral line) 2</p> <p>2a Dorsal-fin origin anterior of vertical at rear edge of orbit; both sexes with numerous orange or yellow dots at corners of scales on side of body, including many on lateral line; males with series of dark red spots, larger than pupil, behind eye (usually 1 just behind eye and 4 or 5 anteriorly on lateral line); females with large whitish patch dorsally over abdomen (partly overlapped by pectoral fin), with oblique orange or red lines and dots following scale rows within white patch..... <i>I. pentadactylus</i></p> <p>2b Dorsal-fin origin above or behind vertical at rear edge of orbit; colour not as above 3</p> <p>3a Column of small scales from below eye to behind corner of mouth; penultimate dorsal-fin ray long, 1.3–2.2 in HL; pelvic fins long, extending behind anus in males, 1–1.3 in HL 4</p> <p>3b One to 5 horizontal rows of small scales on cheek from below middle of eye to short distance behind eye; penultimate dorsal-fin ray short, 2.8–4 in HL; pelvic fins not extending to anus, 1.6–2 in HL. 5</p> | <p>4a Scales on cheek in up to 8 oblique rows, from below rear half of orbit to behind corner of mouth; males with black blotch as large as or larger than eye on body below pectoral-fin tips <i>I. bimaculatus</i></p> <p>4b Scales on cheek in single oblique row of 2–7 scales from below rear half of orbit to behind lower part of orbit; males without black blotch on side of body below pectoral-fin tips <i>I. cyanifrons</i></p> <p>5a Dorsal-fin origin well behind rear edge of orbit (slightly behind upper edge of preopercle); body scales of males with vertical, pale blue line; very large white blotch centred below pectoral-fin tips, preceded by large yellow or yellowish brown spot; 4 large dark blotches below dorsal-fin base, often continuing as dusky bars on body (as dark bars in juveniles), followed by roundish dark blotch on side of peduncle <i>I. aneitensis</i></p> <p>5b Dorsal-fin origin above rear edge of orbit; colour not as above 6</p> <p>6a Penultimate dorsal- and anal-fin rays longest, 3 in HL; caudal fin short, 4.9 in SL; body depth 2.7 in SL; GR 17; upper 3 pectoral-fin rays with black edges; body red above anal fin and lower half of peduncle; no blue-edged black spots above pectoral-fin tips; males without oblique, black-spotted, pale blue band across nape <i>I. brevipinnis</i></p> <p>6b Fifth and 6th dorsal- and anal-fin rays longest, 2.5–2.6 in HL; caudal fin not short, 4.7–4.9 in SL; body depth 2.5–2.6 in SL; GR 19 or 20; upper 3 pectoral-fin rays without black edges; blue-edged black spots on body above tip of pectoral fin; males with broad, oblique, black-spotted, pale blue band across nape <i>I. griffithsi</i></p> |
|--|---|

Iniistius aneitensis (Günther 1862)

Whitepatch razorfish

PLATE 79

Novacula aneitensis Günther 1862: 176 (Aneityum, Vanuatu); Playfair & Günther 1867.

Xyrichtys sp.: Winterbottom *et al.* 1989.

Xyrichtys aneitensis: Randall & Anderson 1993.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body depth at pelvic-fin origin 2.4–3.1 in SL, deeper-bodied with growth; body compressed, width 3.3–4 in body depth; head profile of adults almost vertical to level of eyes; dorsal-fin origin slightly behind vertical at rear edge of eyes; first 2 dorsal-fin spines flexible, 2–3 times longer than 3rd spine, 1st spine curved and not longer than longest ray; space between 2nd and 3rd dorsal-fin spines about twice that between first 2 spines, membranes between 2nd and 3rd spines notched half or more of length of 3rd spine; dorsal- and anal-fin rays of juveniles progressively shorter posteriorly, rays of adults subequal; caudal fin rounded, ~1.7 in HL; pelvic fins short, ~2 in HL. GR 19–23 (usually 20 or 21). LL scales 19–22 + 4–6; oblique row of small scales from below middle of eye to behind lower part of eye (some individuals with 1–4 rows of small scales below 1st row); no scales basally on dorsal and anal fins.

Males pale grey, with vertical blue line or spindle-shaped pale blue streak on each scale; large white patch on side of body centred below pectoral-fin tips, usually preceded by yellow or yellowish brown area; 4 dark blotches below dorsal-fin base (one below 4th and 5th dorsal-fin spines darkest), often continuing as dusky bars on body (as dark bars in juveniles); near-round blackish blotch on side of peduncle. Females similar to males, with large blackish blotch anterior and dorsal to large white patch on side of body, that continues as broad dusky band obliquely upward to base of 4th and 5th dorsal-fin spines. Juveniles variable in colour, usually whitish with 3 dark brown bars on body, broader ventrally, and one at caudal-fin base; 2 narrow oblique orangish brown bars across head, one ventral from eye, and one from nape across opercle. Another juvenile phase dark brown with white streak medially at front of head and white caudal fin. Attains 23 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: Tanzania (Zanzibar), Maldives and Chagos; elsewhere to Indonesia, Ryukyu Is., Great Barrier Reef, New Caledonia, Vanuatu, Lord Howe I., Samoa, Marshall Is. and Hawaii.

REMARKS Found on open sand, generally near reefs, in 12–92 m.

Iniistius bimaculatus (Rüppell 1829)

Two-spot razorfish

PLATE 79

Xyrichtys bimaculatus Rüppell 1829: 43, Pl. 10, Fig. 2 (Massawa, Eritrea, Red Sea); Gomon *in* Fischer & Bianchi 1984; Randall 1995*; Carpenter *et al.* 1997.

Novacula punctulata Valenciennes *in* Cuv. & Val. 1840: 73 (Mumbai, India); Day 1877.

Iniistius bimaculatus: Manilo & Bogorodsky 2003.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body depth at pelvic-fin origins 2.7–3.1 in SL, deeper-bodied with growth; body compressed, width 3.3–4 in body depth; head profile of adults almost vertical to level of eyes; dorsal-fin origin slightly behind vertical at rear edge of eyes; first 2 dorsal-fin spines flexible, 2–3 times longer than 3rd spine, space between 2nd and 3rd spines about twice that between first 2 spines, and membranes notched half or more length of 3rd spine; dorsal- and anal-fin rays progressively longer posteriorly, penultimate ray of large males almost twice length of 1st ray; caudal fin strongly rounded; 1st ray of pelvic fins of males filamentous and extending to anus, length ~1.5 in HL. GR 17–22. LL scales 19 or 20 + 4 or 5; column of small scales from below eyes to behind corners of mouth, upper row of 7–9, lower row of 2–4 scales; 2 small scales anterodorsally on opercle; no scales basally on dorsal and anal fins.

Males pale grey, edges of scales slightly darker, with blackish blotch at least as large as eye midlateral below pectoral-fin tips; scales around spot and on peduncle may have vertical white or pale blue dash; white area, sometimes partly yellowish before spot, beneath about outer half of pectoral fin; front of head with median blue line; iris orange-red and yellow; fins translucent yellowish, anal fin often with irregular blue lines. Females without lateral blackish spot. Attains 18 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea, Tanzania (Zanzibar), Réunion, Chagos and India; elsewhere to Andaman Sea, Indonesia and New Guinea.

REMARKS Occurs on sand flats of lagoons and bays, in 3–50 m.

Iniistius brevipinnis Randall 2013

Shortfin razorfish

PLATE 79

Iniistius brevipinnis Randall 2013: 10, Fig. 6 (off Port Edward, South Africa).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body depth 3.1 in SL; body compressed, width ~2.7 in body depth; snout profile above upper lip to level of

ventral edge of eye at ~80° angle to horizontal axis of body, then broadly rounded to dorsal-fin origin; dorsal-fin origin above rear edge of eyes; first 2 dorsal-fin spines slender and flexible, 1st spine slightly longer (~3 in HL), 3rd spine 4.8 in HL, space between first 2 spines 2.3 in space between 2nd and 3rd spines, and membrane deeply notched between 2nd and 3rd spines; caudal fin slightly rounded and short, 1.8 in HL; pelvic fins short and not approaching anus, 1.7 in HL. GR 17. LL scales 21 + 5; cheeks mostly naked, except for 3 curved oblique rows of small scales from behind to below eyes, and upper row of 7 scales from below anterior third of eyes to behind lower quarter of eyes; 2nd row of 5 small scales, and 3rd row of 1 scale; 1 or 2 small scales dorsoanteriorly on opercle; no scales basally on dorsal and anal fins.

Male (fresh specimen): greenish grey, except for broad bright red zone above anal fin and on ventral half of peduncle, including peduncular LL scales; scales above lateral line with green margin and faint pale red spot, scales below with vertically elliptical violet spot, except in red area; midlateral series of 3 faint red blotches on body; oblique reddish bar directly behind eye; narrow blue median band on snout and nape; 2 parallel violet lines from ventrally on chin, across lips, and fading about half distance to eye; dorsal fin blue with irregular greenish yellow margin except anteriorly; anal fin blue with yellow margin and irregular middle yellow stripe; caudal fin blue with yellow rays; pectoral fins translucent, except for black margins on upper 3 rays; pectoral-fin base with violet bar, preceded and followed by broad lavender-pink arc; pelvic fins blue; iris yellow with broad lavender-pink ring. Attains at least 17 cm TL.



Iniistius brevipinnus, 16 cm TL (S Mozambique). O Alvheim © IMR

DISTRIBUTION Known only from the holotype collected in South Africa, and a photograph from southern Mozambique.

REMARKS Caught by hook and line in ~46 m.

Iniistius cyanifrons (Valenciennes 1840)

Indian razorfish

PLATES 79 & 80

Xyrichtys cyanifrons Valenciennes in Cuv. & Val. 1840: 46 (Puducherry, India).

Novacula rufa Day 1873: 238 (Chennai, India).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body depth at pelvic-fin origins 2.7–3 in SL, deeper-bodied with growth; body compressed, width 3.3–4 in body depth; head profile of adults almost vertical to level of eyes; dorsal-fin origin varying from slightly anterior of to slightly behind vertical at rear edge of eyes; first 2 dorsal-fin spines flexible, 2–3 times longer than 3rd spine, space between 2nd and 3rd spines about twice that between first 2 spines, membranes notched half or more length of 3rd spine; caudal fin asymmetrically rounded, length 1.5–1.7 in HL; pelvic fins with filamentous 1st ray extending to anus in females, and slightly beyond anal-fin origin in males. GR 16–19. LL scales 19 or 20 + 4 or 5; single oblique curved row of 2–7 small scales from below rear 5th of eye to behind lower edge of eye (last scale may be elongate flap, perhaps from fusion of 2 or more scales); 2 small, partly embedded scales anterodorsally on opercle; no scales basally on dorsal and anal fins.

Colour variable; the illustrated male and female obtained from fishermen in India (male from Tuticorin, and female from Vizhinjam) are not remarkable in colour, both with blue line on anterior edge of head, dark-edged blue line at anal-fin base, and pale yellow caudal fin crossed by irregular dark-edged blue lines or close-set rows of dark-edged blue spots; male with additional blue dots on spinous part of dorsal fin, and irregular blue lines on anal fin. Attains 18 cm TL.

DISTRIBUTION Indian Ocean: southwestern and east coasts of India.

REMARKS Valenciennes described the colour of the type specimens as vivid: red dorsally, yellow ventrally, with red spot around anus. Day (1873) described *Novacula rufa* from the east coast of India as rosy dorsally, yellowish ventrally. The difference in colour can be explained in terms of the colour of the substrate sediments where the fish are found.

Iniistius griffithsi Randall 2007

Griffiths' razorfish

PLATE 80

Iniistius griffithsi Randall 2007: 10, Figs. 1–3 (Mauritius, Mascarenes).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body depth 2.5–2.6 in SL; body compressed, width 2.8 in body depth; snout profile almost vertical above upper lip to lower edge of eyes, then broadly rounded to interorbital region, and almost straight on nape; dorsal-fin origin above rear edge of eyes; first 2 dorsal-fin spines slender and flexible, 1st slightly longer, 2.5–2.6 in HL, 3rd spine 4.7–4.9 in HL, space between 2nd and 3rd spines about twice that between first 2 spines, and membrane deeply notched between 2nd

and 3rd spines; caudal fin slightly rounded and short, 1.8–2.2 in HL; pelvic fins almost or just extending to anus, length 1.7–1.8 in HL. GR 19 or 20. LL scales 19 or 20 + 5 or 6; cheeks naked except for curved oblique row of 6 small scales from behind to below eye; 1 or 2 small scales dorsoanteriorly on opercle; no scales basally on dorsal and anal fins.

Body yellowish grey, scale centres pale blue; cluster of 3–6 blue-edged black spots about pupil size above pectoral-fin tips; males with broad oblique pale blue zone from nape to behind eye with many small black spots; head olivaceous with vertical blue bands, one median dorsal, 2 below eye, and 1 on opercle; broad streak of orange sometimes seen midlateral on peduncle; median fins mainly blue; pectoral fins orange, grading to yellow distally. Attains 16 cm TL.

DISTRIBUTION Indian Ocean. WIO: Mauritius and northern Madagascar; elsewhere, Andaman Is. and Christmas I.

REMARKS Described from three specimens (males) caught by handline in 120 m. Two underwater photographs were taken at Loky Bay, northern Madagascar (GR Allen): one male and one a presumed female as it lacked the broad oblique black-spotted band across the nape. Allen & Erdmann (2012) cited records for the Andaman Is. and Christmas I., and gave the depth range as 5–20 m.

Iniistius pavo (Valenciennes 1840)

Peacock razorfish

PLATE 80

Xyrichtys pavo Valenciennes in Cuv. & Val. 1840: 61, Pl. 394 (Mauritius, Mascarenes); Allen & Steene 1988; Winterbottom *et al.* 1989.

Novacula tessellata Valenciennes in Cuv. & Val. 1840: 74 (Mauritius, Mascarenes).

Novacula immaculata Valenciennes in Cuv. & Val. 1840: 75 (Mauritius, Mascarenes).

Novacula pavo: Playfair & Günther 1867.

Novacula (Hemipteronotus) immaculata: Sauvage 1891.

Novacula temporalis Regan 1905: 392, Pl. 6, Fig. 3 (Réunion, Mascarenes).

Iniistius pavo: Baissac 1953; Smith 1957; Fourmanoir & Guézé 1961;

Smith & Smith 1963*; SFSA No. 811*; Jones & Kumaran 1980.

Xyrichtys pavo: Dor 1984; Gomon in Fischer & Bianchi 1984;

SSF No. 220.67*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994;

Anderson *et al.* 1998; Field & Field 1998*.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body depth 2.3–3.3 in SL, deeper-bodied with growth; dorsal-fin origin above rear half of eyes; first 2 dorsal-fin spines flexible (all spines may be flexible in adults),

separated by broad gap from 3rd spine, 1st spine slightly curved, twice as long as longest ray in adults (~3 times longer in juveniles, with distal membranous flap); pelvic fins short in adults. GR 17–21. LL scales 19–22 + 4–6; oblique row of 1–6 small scales (often embedded and sometimes absent) extending back from below middle of eyes; 1 or 2 small scales dorsally on opercle.

Adults grey dorsally, grading to near-white ventrally, with 3 indistinct, broad, darker grey bars on body, and 1 across caudal-fin base; small blue-edged black spot on 8th LL scale and scale above; males with blue lines and dots on lower part of dark bars on body; median fins with blue submarginal line, dorsal fin with irregular oblique blue lines. Juveniles with more distinct dark bars, 2 extending onto dorsal fin where they contain ocellated black spot; other juveniles (and occasional adults) totally black except outer transparent part of caudal fin. Attains 35 cm TL.



Iniistius pavo, 7 cm TL, juvenile (Seychelles). © JE Randall, Bishop Museum

DISTRIBUTION Indo-Pacific to eastern Pacific (widespread). WIO: Red Sea and Lessepsian migrant to Aegean Sea (Corsini *et al.* 2006), Kenya to South Africa (Richards Bay), Madagascar, Seychelles, Réunion, Mauritius and Sri Lanka; elsewhere to Japan, Lord Howe I., Pitcairn Is., Hawaii and Gulf of California to Panama and Galápagos Is.

REMARKS Inhabits open stretches of sand, usually not far from reefs, in 3–100 m (generally >20 m); juveniles hold the detached anterior part of the dorsal fin forward over the head and mimic a drifting blackened leaf (Randall & Randall 1960). The black phase was regarded as a distinct species, *Xyrichtys niger* (Steindachner 1900), until placed in synonymy of *I. pavo* by Randall & Earle (2002).

Iniistius pentadactylus (Linnaeus 1758)

Five-finger razorfish

PLATES 80 & 81

Coryphaena pentadactyla Linnaeus 1758: 261 (India).

Coryphaena quinquemaculata (non Lacepède 1801): Shaw 1803.

Novacula sexmaculata Valenciennes in Cuv. & Val. 1840: 72
(Mumbai, India).

Novacula pentadactyla: Klunzinger 1871; Day 1877.

Novacula (Hemipteronotus) pentadactyla: Sauvage 1891.

Hemipteronotus pentadactylum: Barnard 1927.

Hemipteronotus quinquemaculatus: Smith 1957.

Hemipteronotus pentadactylus: Baissac 1976.

Xyrichtys pentadactylus: Gomon in Fischer & Bianchi 1984;
SSF No. 220.68*; De Bruin *et al.* 1994.

Dorsal fin 8 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Body depth 2.8–3 in SL, deeper-bodied with growth; dorsal-fin origin over rear half of eyes; first 2 dorsal-fin spines flexible, about twice as long as 3rd spine, space between bases of 2nd and 3rd spines more than twice space between first 2 spines, and membranes between 2nd and 3rd spines notched less than half spine length; caudal fin slightly rounded; pelvic fins short. GR 18–20. LL scales 19 or 20 + 4 or 5; horizontal rows of small scales on cheeks below eyes, extending ventrally with progressively fewer scales per row to behind corners of mouth; upper part of opercle with a few small scales.

Both sexes pale greenish to yellowish grey with orange dot on many scales, mainly on lateral line, posteriorly on body, and caudal-fin base; anal fin with alternating irregular orange and blue bands (brighter in male); females with blackish blotch of eye size or larger on side of body between pectoral-fin tips and lateral line; large white or pale pink area on sides of body, partly overlapped by pectoral fins, and crossed by broken oblique orange lines and dots on scale edges, adult males with blackish blotch on sides more diffuse; large white area, if present, without orange markings; series of prominent dark red spots (appear black underwater) at least as large as pupil, 1st behind eye and next 3–5 on lateral line (1 per scale); iris magenta, with inner ring of yellow. Attains ~25 cm TL.



Iniistius pentadactylus, 13 cm SL (Madagascar).
E Heemstra © NRF-SAIAB/AV2010

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa (Umbogintwini, KwaZulu-Natal), Madagascar, Comoros, Mauritius, India and Sri Lanka; elsewhere to Indonesia, southern Japan, Guam, Great Barrier Reef and Line Is.

REMARKS Typically found in sheltered sandy areas, most often with sparse growth of the seagrass *Halophylla*, in 2–20 m. An additional related species, *Iniistius naevus* Allen & Erdmann 2012, described from the Andaman Islands, occurs in East Africa and Seychelles. A member of the *Iniistius melanopus* (Bleeker 1857) complex, males have a dark spot on the upper mid-body overlying prominent blue-edged scales in a white patch on a yellow background (Plate 80).

GENUS *Labrichthys* Bleeker 1854

Diagnosis as for the single species.

Labrichthys unilineatus (Guichenot 1847)

Tubelip wrasse

PLATE 81

Cossyphus unilineatus Guichenot 1847: 284 (Guam, Mariana Is.).

Labrichthys cyanotaenia Bleeker 1854: 331 (Flores I., Lesser Sunda Is., Indonesia); Smith 1955*, 1957; Smith & Smith 1963*; Harmelin-Vivien 1977.

Labrichthys unilineatus: Randall & Springer 1973*; Gomon in Fischer & Bianchi 1984; SSF No. 220.39*; Allen & Steene 1987*; Winterbottom *et al.* 1989*; Randall 1992.

Dorsal fin 9 spines, 11 or 12 rays; anal fin 3 spines, 11 or 12 rays; pectoral fins 14 or 15 (rarely 15) rays. Upper jaw with 2 pairs of recurved canines at front, single canine posteriorly in jaw, and no teeth inbetween; lower jaw with 1 pair of canines at front, followed by 3–5 small teeth; lips thick and fleshy, forming tube when mouth closed. Body depth 2.6–3.5 in SL; caudal fin strongly rounded; pelvic fins of males very long. Lateral line continuous and deflected downward below rear of dorsal fin, LL pored scales 25–27; head fully scaly.

Small juveniles dark brown with 2 bluish white lines, 1 midlateral and 1 on lower sides; larger juveniles lose lower line, and lateral line becomes yellow. Females yellowish brown on body, grading to yellowish or greenish brown posteriorly with blue line along centre of each scale row; head progressively more yellow or green anteriorly, lips bright yellow; blue lines on head thicker and more irregular anteriorly, ending in one that encircles base of lips; caudal fin with bright blue rear margin, broader at corners. Males dark olive, suffused with yellow or orange anteriorly on head, and

bright blue longitudinal lines on body following scale rows; broad pale yellow bar beneath and extending above pectoral fin; blue lines on head more irregular and thicker anteriorly, ending in one around lips and continuing as broad irregular band ventrally on head; fins dull orange-red with irregular blue lines basally, narrow blue margin and black submarginal line; pectoral fins with bright yellow rays. Attains 18 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (KwaZulu-Natal), Aldabra, Comoros, Chagos and Maldives; elsewhere to Indonesia, Philippines, southern Japan, Mariana Is., Micronesia, Great Barrier Reef, Lord Howe I. and Samoa.

REMARKS Occurs on shallow coral reefs in sheltered areas, generally in >20 m. Feeds on coral polyps.

GENUS *Labroides* Bleeker 1851

Dorsal fin 9 spines, 10–12 rays; anal fin 3 spines, 9–11 rays; pectoral fins 13–15 rays; caudal fin 13 principal rays. Single pair of recurved canines at front of jaws, upper pair fitting inside widely spaced lower pair when mouth closed; remaining teeth small, except for anteriorly directed large canine at rear in upper jaw. Body depth 3.3–4.7 in SL, deeper with growth, and moderately compressed; snout pointed; mouth small, with thick lips: upper lip with shallow median groove, lower lip divided into 2 prominent, anteriorly projecting lobes separated by broad U-shaped notch. Lateral line complete, angling downward below rear of dorsal fin to straight on peduncle, LL pored scales either 28, or 52 or 53; small scales on cheek, opercle and nape.

All species are active in removing ectoparasites (mainly copepods and larval gnathiid isopods) from fishes; they freely enter the mouth and penetrate the gill opening of host fishes. The 2 lobes of the lower jaw serve to direct their parasitic prey like a scoop into the mouth, along with much mucus. Gorlick (1980) reported that the cleaner wrasses show a preference for host fishes with much mucus, and that mucus is an important part of the nutrition. At least 5 species (Randall 1958; Randall & Springer 1975), all Indo-Pacific, 2 in WIO.

KEY TO SPECIES

- 1a LL scales 52 or 53; adults pale blue, with black stripe broadening posteriorly; juveniles black with narrow, bright blue stripe dorsally on head and body *L. dimidiatus*
- 1b LL scales 28; females grey anteriorly, with black mid-dorsal and lateral stripes, pale yellow posteriorly; caudal fin blue with submarginal black band; males with grey replaced by blue; juveniles black with bright yellow dorsal stripe from front of snout, above eye, dorsally on body, ending on peduncle *L. bicolor*

Labroides bicolor Fowler & Bean 1928

Bicolour cleaner wrasse

PLATE 81

Labroides bicolor Fowler & Bean 1928: 224, Pl. 18 (Philippines);

Smith 1955*; Randall 1958, 1992, 1995*; Harmelin-Vivien 1976;

Smith *in* Bruton & Cooper 1980; Gomon *in* Fischer & Bianchi 1984;

SSF No. 220.40*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994;

Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Fowlerella bicolor: Smith 1957.

Fowlereria bicolor: Harmelin-Vivien 1976.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 10 rays; pectoral fins 13 rays. Body depth 3.7–4.5 in SL; head strongly pointed, dorsal and ventral profiles almost straight; dorsal-fin spines increasing in length posteriorly, 1st spine about eye-sized, 9th about twice as long, 1st ray ~½ HL, and remaining rays progressively shorter; caudal fin slightly rounded. Lateral line deflected downward below rear of dorsal-fin base to straight on peduncle; LL scales 26, +2 on caudal-fin base; small scales on cheek, opercle and nape.

Juveniles black, grading to whitish ventrally, with brilliant yellow stripe from front of snout, above eye, along back and expanding dorsally in caudal fin. Subadults pale grey to almost white, with black lateral stripe from front of snout, on sides of body, breaking into blackish dots posteriorly. Females grey anteriorly with black mid-dorsal and lateral stripes on head and anteriorly on body, pale yellow posteriorly; caudal fin pale blue with curved black submarginal band; males with essentially same colour pattern, but grey of head and front of body replaced by blue. Attains 14 cm TL.



Labroides bicolor, 5 cm SL (South Africa). © R Winterbottom, ROM

DISTRIBUTION Indo-Pacific. WIO: Oman, Kenya to South Africa (Sodwana Bay), Madagascar, Comoros, Mascarenes and Chagos; elsewhere to Andaman Sea, Philippines and Pacific Ocean; not known from Red Sea, Persian/Arabian Gulf and Hawaii.

REMARKS Feeds on ectoparasites and mucus of fishes; moves over a reef territory in quest of host fishes, in contrast to other species of the genus that establish cleaning stations where they remain resident. Found in lagoons and seaward reefs, to at least 40 m.

Labroides dimidiatus (Valenciennes 1839)

Striped cleaner wrasse

PLATES 81 & 82

Labrus latovittatus Rüppell 1835: 7 (El Tur, Egypt, Gulf of Aqaba, Red Sea) [preoccupied by *Labrus latovittatus* Lacepède 1801].

Cossyphus dimidiatus Valenciennes in Cuv. & Val. 1839: 136 (Mauritius, Mascarenes).

Labroides dimidiatus: Playfair & Günther 1867; Day 1877; Peters 1877; Barnard 1927; Randall 1958, 1983*, 1992*, 1995*; Harmelin-Vivien 1976; Kotthaus 1977; Van der Elst 1981*; Gomon in Fischer & Bianchi 1984; SSF No. 220.41*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Anderson 1996; Carpenter *et al.* 1997; Field & Field 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Fissilabrus dimidiatus: Baissac 1953; Smith 1955*; SFSA No. 805*.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 10 rays; pectoral fins 13 rays. Body depth 4.1–4.7 in SL; lips thick, lower strongly bilobed, with broad U-shaped notch separating lobes; caudal fin truncate to slightly rounded. LL scales 52 or 53; cheek, opercle and nape with small scales.

Juveniles black with narrow bright blue stripe from tip of snout through upper part of eye, ending dorsally on caudal fin. Adults bluish grey dorsally on head, progressively more blue posteriorly, with mid-dorsal black stripe on head and nape, and lateral black stripe from corner of mouth, broadening posteriorly to end of caudal fin; spinous portion of dorsal fin black, except tips of spines and membranes pale blue, black becoming progressively narrower near base of soft-rayed part; anal fin bluish white, with black stripe near base that broadens posteriorly; ventral edge of peduncle black, continuing submarginally into ventral part of caudal fin, sometimes joining curved ventroposterior part of broad black stripe in caudal fin; short irregular black bar extending down from pectoral-fin bases. Population differences over the broad range are suggested by different patterns of black colouration, especially in the caudal fin. Attains 12 cm TL.



Labroides dimidiatus, 6 cm SL (South Africa). © R Winterbottom, ROM

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Oman to South Africa (Chalumna River), Madagascar, Comoros, Aldabra, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Indonesia, Japan, Australia, Lord Howe I., Line Is. and Pitcairn Is.

REMARKS Inhabits coral reefs, in 1–30 m. Establishes cleaning stations around prominent coral formations that are visited by many different species of fishes for removal of crustacean ectoparasites, primarily copepods and larval gnathiid isopods; mucus is also ingested, facilitated by the scoop formed from the bilobed lower lip. Also freely enters the mouth and gill chamber of large fishes in quest of parasites. Advertises its role by up-and-down movements of rear of body. Mimicked by the fin-nipping blenny *Aspidontus taeniatus* Quoy & Gaimard 1834, which lurks near cleaning stations (Randall & Randall 1960). Kuwamura (1981, 1984) studied the reproduction and early life history in Japan. Males maintain a harem of 2–12 females; change of sex from female to male usually takes place shortly before age 3 years.

GENUS *Labropsis* Schmidt 1931

Small-sized, rarely exceeding 10 cm SL. Dorsal fin 9 spines, 10–12 rays; anal fin 3 spines, 9–11 (rarely 9) rays; pectoral fins 13–15 (usually 14) rays. Upper jaw with 2 pairs of recurved canines anteriorly, single canine at corners of mouth, and no teeth inbetween; lower jaw with single pair of recurved canines anteriorly, followed by 1–4 progressively shorter canines. Mouth terminal and small; lips thick and plicate, forming short tubular structure when mouth closed. Body depth 3.1–3.8 in SL; caudal fin usually rounded (may be emarginate in some males). Lateral line complete, LL pored scales 27–49. Six species, all in Indo-Pacific, 1 in WIO.

Labropsis xanthonota Randall 1981

Yellowback tubelip

PLATE 82

Labropsis sp.: Shepard & Meyer 1978.

Labropsis xanthonota Randall 1981: 138, Pl. 2a–c (Tutuila, American Samoa); Gomon in Fischer & Bianchi 1984; Cornic 1987; Allen & Smith-Vaniz 1994; Randall & Van Egmond 1994.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 10 rays; pectoral fins 14 or 15 rays. Upper jaw with 2 pairs of recurved canines at front, 2nd pair half as large as 1st, single large canine at back, and no teeth inbetween; lower jaw with single pair of recurved canines at front, followed by 2 or 3 lesser canines; lips thick and fleshy, forming tube when mouth closed. Body depth 3.4–3.8 in SL; caudal fin rounded in juveniles, slightly rounded in females, and emarginate in males. LL scales 46–49; head behind and below eyes scaly; cheek, opercle and nape with small scales.

Juveniles bluish black, with very narrow, pale blue to white stripes on head and body, becoming dotted posteriorly; dorsal fin largely pale yellow with black anterior spot. Females similar,

but narrow stripes replaced by finely dotted, pale blue lines; scales dorsally on body with yellowish brown spot. Males with dark brown head, broad deep blue reticulum, and broad bright yellow edge on opercle; body dark brown with yellow dot on each scale, including those on base of median fins; outer part of caudal fin dark grey with V-shaped central rear part, pale blue to white anteriorly, grading to darker blue posteriorly. Attains 13 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: East Africa, Seychelles, Mascarenes and Maldives; elsewhere (fewer records) to southern Japan, Micronesia, Great Barrier Reef, New Caledonia and Samoa.

REMARKS Inhabits coral reefs, in 7–55 m. Protogynous hermaphrodites. Adults feed on coral polyps; juveniles observed cleaning other fishes.

GENUS *Larabicus* Randall & Springer 1973

Genus diagnosis as for the single species.

Larabicus quadrilineatus (Rüppell 1835)

Fourline wrasse

PLATE 82

Labrus quadrilineatus Rüppell 1835: 6, Pl. 2, Fig. 1 (Massawa, Eritrea, Red Sea).

Cossyphus taeniatus Valenciennes (ex Ehrenberg) in Cuv. & Val. 1839: 134 (Massawa, Eritrea, Red Sea).

Labroides quadrilineatus: Günther 1862; Kossmann & Räuber 1877.

Labrichthys cousteaui Roux-Estève in Roux-Estève & Fourmanoir 1955: 199 (Abu Latt, Saudi Arabia, Red Sea); Clark *et al.* 1968.

Larabicus quadrilineatus: Randall 1983*; Dor 1984; Gomon in Fischer & Bianchi 1984; Allen & Steene 1987*; Field & Field 1998*; Lieske & Myers 2004.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 10 rays; pectoral fins 13 rays. Single pair of large recurved canines at front of jaws, followed by progressively smaller slender teeth in ~3 rows at front of upper jaw and in 2 rows in lower jaw; lips fleshy, forming tube when mouth closed. Body compressed, depth 2.9–3.3 in SL, width 1.8–2.3 in depth; snout pointed; caudal fin rounded. GR 11–13. LL scales 26 or 27, +1 or 2 on caudal-fin base; head scaly dorsally to behind interorbital area, ventrally to behind corners of mouth; scales covering basal third of dorsal and anal fins, and basal half of caudal fin.

Females dark blue with 2 pale blue stripes, one from upper lip, passing above eye, along upper side of body, ending dorsally in caudal fin; 2nd, narrower stripe from chin through lower edge of eye, along lower side of body, ending near middle of caudal fin; dorsal and anal fins dark blue with large black spot posteriorly; caudal fin with broad hyaline whitish rear margin and broader black submarginal band. Males dark purplish blue, head suffused with olive-green, with boomerang-shaped blue-green band on cheek, upper edge of angle just below eye; dorsal and anal fins with broad olive-green margin and pale blue submarginal line; caudal fin coloured as for body, except for translucent white rear crescent. Attains 11 cm TL.

DISTRIBUTION WIO: endemic to Red Sea and Gulf of Aden.

REMARKS Usually seen in close association with live corals; to ~22 m deep. Adults feed on coral polyps for which their fleshy lips and tubular mouth are adapted; subadults and juveniles often seen picking at other fishes.

GENUS *Leptojulius* Bleeker 1862

Dorsal fin 9 spines, 11 or 12 rays; anal fin 3 spines, 10–12 (rarely 10) rays; pectoral fins 12–14 (usually 13) rays. Two pairs of large canines at front of jaws, 2nd pair strongly recurved and slightly outcurved; row of moderate, close-set, conical teeth on sides of jaws; strong canine tooth (rarely 2) at back of upper jaw (sometimes absent in juveniles); no large molars on pharyngeal plates. Body moderately elongate, depth 3.7–4.9 in SL; caudal fin varying from slightly rounded to slightly rhomboid or double emarginate; pelvic fins from ~2.5 in HL to slightly longer than head. Lateral line continuous and deflected sharply downward below base of 9th dorsal-fin ray to straight on peduncle; LL pored scales 27 or 46, scales with single pore; scales present on caudal-fin base. Five species, in Indo-Pacific, 2 in WIO.

KEY TO SPECIES

- | | |
|----|---|
| 1a | Body elongate, depth 4–4.6 in SL; HL ~3–3.5 in SL; snout profile at ~25° angle to horizontal axis of body; anterior canines strongly forward-projecting; GR 19–22 <i>L. cyanopleura</i> |
| 1b | Body not elongate, depth 3.7–4; HL ~3 in SL; snout profile at ~45° angle to horizontal axis of body; anterior canines not strongly forward-projecting; GR 16–18 <i>L. chrysotaenia</i> |

Leptojulius chrysotaenia Randall & Ferraris 1981

Jaggedband wrasse

PLATES 82 & 83

Leptojulius chrysotaenia Randall & Ferraris 1981: 91, Figs. 3–4 (Phuket, Thailand); Randall 1996*; De Bruin *et al.* 1994.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 or 13 (rarely 12) rays. Body depth 3.7–4 in SL; head profile evenly convex, snout forming ~45° angle to horizontal axis of body; caudal fin slightly rounded in females, slightly double emarginate in males, 1.5–1.6 in HL; pelvic fins short, 2–2.2 in HL. GR 16–18. LL scales 27; head naked; scales on sides of chest about two-thirds height of those on body; small scales on sides of nape extending forward slightly anterior to dorsal end of preopercle margin.

Juveniles pale grey; narrow lateral dark brown stripe with irregular margins from eye to caudal-fin base; pale yellow spot above and below end of stripe; lips orange, followed by orange band to eye; dark brown line from dorsally on snout to nape. Females pinkish grey, with broad midlateral orange stripe with irregular margins, rear three-quarters with dark brown pigment in stripe, and large green blotches along lower margin; narrow, broken dark brown band dorsally on body; head pale green with oblique salmon-pink bands. Males green, with broad pink lateral stripe with irregular margins, red spots on scales of back, except dorsally where every 4th or 5th scale lacks a spot and appears as a green spot; irregular orange bands extending ventrally from pink lateral stripe on body. Attains 11 cm TL.

DISTRIBUTION Indian Ocean. WIO: southwestern India and Sri Lanka; elsewhere to Andaman Is., Thailand and Indonesia.

REMARKS The holotype was collected from rubble bottom, in 16 m, off Phuket, Thailand, and two paratypes from silty sand and rocky bottom, in ~15 m, at Sri Lanka. A third paratype (probably a male, 92 mm SL) was purchased at a fish market in Lombok, Indonesia. An underwater photograph was taken by JE Randall, in ~4 m, off Bali, Indonesia. Allen & Erdmann (2012) reported the species in 15–30 m from the Andaman Is. and parts of Indonesia.

Leptojulius cyanopleura (Bleeker 1853)

Shoulderspot wrasse

PLATE 83

Julis finlaysoni Valenciennes *in* Cuv. & Val. 1839: 471 (Sri Lanka)
[*nomen oblitum*: Randall & Parenti 1999].

Julis purpureolineatus Valenciennes *in* Cuv. & Val. 1839: 471 (Sri Lanka)
[*nomen oblitum*: Randall & Parenti 1999].

Julis (Halichoeres) cyanopleura Bleeker 1853: 489 (Jakarta, Java, Indonesia).
Leptojulius cyanopleura: Bleeker 1862; Günther 1862; Randall & Ferraris 1981*; Randall *et al.* 1994*; Randall 1995*, 1996*; Anderson *et al.* 1998.

Dorsal fin 9 spines, 11 (rarely 12) rays; anal fin 3 spines, 10–12 (rarely 10 or 12) rays; pectoral fins 12–14 (usually 13) rays. Body slender, depth 4–4.6 in SL; snout profile at ~25° angle to horizontal axis of body; caudal fin slightly rounded in females, slightly double emarginate in large males, 1.3–1.6 in HL; pelvic fins short, 2.1–2.5 in HL. GR 19–22. LL scales 27; head naked; scales on sides of chest about two-thirds height of those on body; small scales on sides of nape not reaching vertical at end of preopercle margin.

Juveniles whitish to pale grey, with 2 narrow dark brown stripes, one from mid-dorsal on snout along dorsal-fin base and ending dorsally on caudal fin, one from upper lip through eye to caudal-fin base. Females vary from pale greenish grey to pinkish grey dorsally, with same 2 stripes, but midlateral stripe more irregular on margins, often appearing as zigzag; row of brownish orange spots, one per scale, may be present in scale row above midlateral stripe, as well as dark V-shaped mark mid-dorsally on nape, apex of the V posterior. Males bluish or greenish grey dorsally, pale blue ventrally, with orange-yellow stripe from upper lip through eye, across body above midline, to caudal fin; adjacent pair of scales black within stripe, centred below 5th and 6th dorsal-fin spines, 2 scales obliquely above also black or partly black, all edged in front with pale blue; pink stripe from lower lip across cheek; oblique pink border on opercle; V-shaped black mark within pale blue area dorsoposteriorly on nape; dorsal fin pale blue with yellow stripe anteriorly, breaking up into row of spots, one on or adjacent to each spine or ray, progressively lower in fin; outer row of larger but fainter orange spots on rear three-quarters of fin; caudal fin blue with 3 oblique orange-yellow bands above and below median orange stripe, divided into 2 narrow adjacent stripes. Attains 13 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Gulf of Oman, Maldives (photograph) and Sri Lanka; elsewhere to Indonesia, Australia and Solomon Is.

REMARKS Known only from continental seas, except a single record from Ari Atoll, Maldives, based on a photograph by Anderson *et al.* (1998). Allen & Erdmann (2012) reported it as occurring throughout Indonesia. Collected in 4–45 m. Feeds on zooplankton in small aggregations, on or near reefs, usually where the sea is somewhat turbid and rich in plankton.

GENUS *Macropharyngodon* Bleeker 1861

Dorsal fin 9 spines, usually 11 rays; anal fin 3 spines, usually 11 rays (dorsal and anal fins each with 12 rays in 1 species from Australia); pectoral fins usually 12 rays (13 rays in 1 species from Australia). Upper jaw with 2 pairs of large canines at front (1st pair strongly projecting, 2nd pair recurved), and large canine at back that projects obliquely anteroventrally; lower pharyngeal plate with large medial molar with concave occlusal surface; paired upper pharyngeal plates with 2 moderately large molars, one before the other, and other teeth on both plates very small. Preopercle with short free ventral margin, extending little beyond rounded corner. Body moderately deep, 2.4–3.1 in SL; dorsal-fin origin in front of upper end of gill opening. Lateral line complete and angling downward below rear of dorsal fin to straight on peduncle; LL scales 27, +1 scale on caudal-fin base; no scales on head; no median predorsal scales; small scales on sides of nape; no scales on dorsal- and anal-fin bases. Twelve species, all Indo-Pacific, 5 in WIO. Some species are difficult to distinguish except by colour. Randall (1978) revised the genus, recognising 9 species, one of which was divided to 2 subspecies (from Red Sea and WIO); Randall (2013) subsequently elevated these to species.

KEY TO SPECIES

- 1a Anterior LL scales with 8–18 pores. Females orange-red, with large dark brown or black spot of about eye size, narrowly rimmed in pale blue, between upper end of gill opening and base of 4th dorsal-fin spine; cheek and opercle pale yellowish below dark orange-red line from upper lip to opercular flap; large ocellus posteriorly in dorsal fin, and small ocellus usually present posteriorly in anal fin. Males magenta dorsally, pink ventrally, with large purplish area dorsoposteriorly on opercle and adjacent body containing irregular blue lines dorsally and preceded ventrally by elliptical yellow spot larger than eye; snout and cheeks below eyes bright yellow *M. vivianae*
- 1b Anterior LL scales with 2 or 3 pores; colour not as above 2
- 2a Females dark brown, grading to yellow anteriorly on head, with small pale blue spot on each scale; reticular pattern of dark-edged pale blue lines on chest and head, except snout; caudal fin and outer spinous dorsal fin pale yellow. Males yellowish brown with dark-edged blue spot at corner of each scale; head as in females, except reticular pattern not on snout; outer half of first 2 membranes of dorsal fin pale yellow, and dorsal corner of caudal fin white *M. cyanoguttatus*
- 2b Colour not as above 3

Continued ...

KEY TO SPECIES

- 3a Females reddish anteriorly, shading to blackish posteriorly, with greenish yellow spots edged in blue and black (one per scale) on body, and comparable spots and irregular bands on head; males similar in colour, but less blackish *M. ornatus*
- 3b Females orange-red with white spots, except for large black area anteroventrally on body with irregular pale blue markings; head greenish yellow with narrow, oblique, black-edged orange band on snout and cheek, and irregular black markings on head behind eyes and opercle; median fins orange with rows of white spots; pelvic fins black with 2 white transverse bands; males green with 4 oblique, dark-edged, violet bands dorsally on head, continuing horizontally on body to above anal-fin origin, then becoming vertically oriented, irregular spots and bars, ending in irregular band that continues onto caudal fin 4
- 4a Body depth 2.9–3.2 in SL; dorsal-fin spines 3–6 subequal, 7th spine only slightly longer; GR 15–19; males with 2 large pale pink to yellow areas dorsoposteriorly on body, one beneath soft-rayed dorsal fin and the other on peduncle *M. bipartitus*
- 4b Body depth 2.6–3 in SL; dorsal-fin spines progressively longer; GR 14–17; males either without 2 large pale areas dorsoposteriorly on body, or these areas very small if present *M. marisrubri*

Macropharyngodon bipartitus Smith 1957

Vermiculate wrasse

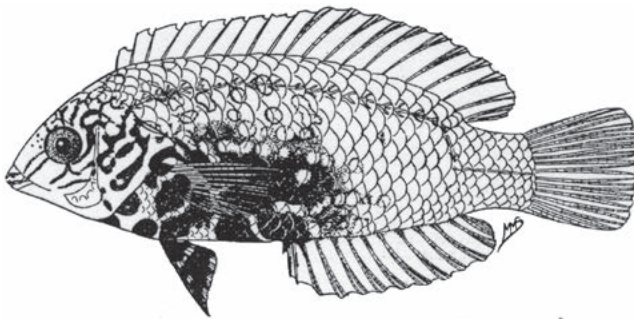
PLATE 83

Macropharyngodon geoffroy (non Quoy & Gaimard 1824): Smith 1955.*Macropharyngodon bipartitus* Smith 1957: 104, Fig. 2, Pl. 2b (Pinda,Mozambique); Smith & Smith 1963*; Smith in Bruton & Cooper 1980; SSF No. 220.42*; Allen & Steene 1987*; Randall 1992*, 1995*; Randall & Van Egmond 1994; Heemstra *et al.* 2004.*Macropharyngodon variolus* Smith 1957: 105, Fig. 3, Pl. 2a (Pinda, Mozambique); Smith & Smith 1963*.*Macropharyngodon* sp.: Harmelin-Vivien 1976.*Macropharyngodon bipartitus bipartitus*: Randall 1978*; Gomon in Fischer & Bianchi 1984; Winterbottom *et al.* 1989*; Baissac 1990; Fricke 1999.*Macropharyngodon cyanoguttatus* (non Randall 1978): Allen & Steene 1987*.

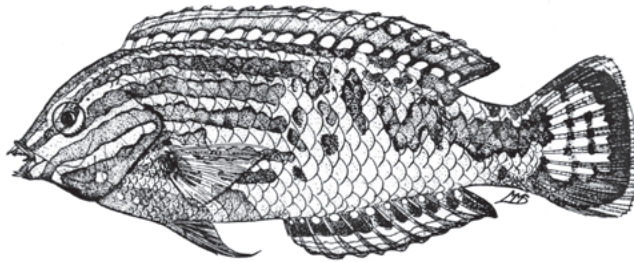
Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 rays. Body depth 2.6–3.1 in SL; caudal fin rounded. LL scales 27, anterior scales with 2 or 3 pores; head naked; no median predorsal scales.

Juveniles white with 3 white-spotted orange bars, 2nd and 3rd continuing into dorsal and anal fins, bearing ocellus;

underwater photograph shows black area beginning to form on abdomen. Females with orange-red body with white spots of variable size (small and closely spaced dorsally, larger and more widely spaced ventrally), except for large black area with bold, bright blue reticulum covering chest and abdomen, and pectoral fins, and extending to behind anal-fin origin. Males green with 4 oblique, dark-edged, violet bands on head that continue horizontally on body to above anal-fin origin, then become vertical irregular spots and bars, ending in irregular stripe that continues onto caudal fin; large triangular dark orangish to purplish brown area above anal fin, half body depth anteriorly, narrowing to end ventrally on peduncle; caudal fin almost black with 2 or 3 large, interconnected, blue-green bars centrally on fin, pale blue-green rear margin, and hyaline corners. Attains 13 cm TL.



Macropharyngodon bipartitus, 7 cm TL, IP, holotype of *M. varialvus* (Mozambique). Source: Smith 1957



Macropharyngodon bipartitus, 10 cm TL, male holotype (Mozambique). Source: Smith 1957

DISTRIBUTION WIO: Gulf of Aden and southern Oman to Mozambique and South Africa (Aliwal Shoal), Seychelles, Mascarenes, Chagos and Maldives.

REMARKS Usually seen on sand and coral-rubble bottom adjacent to coral reefs, from calm shallows to at least 25 m deep. Feeds on benthic invertebrates, especially shelled molluscs that are crushed with its exceptionally large pharyngeal molars. Males maintain a territory with a harem of females.

Macropharyngodon cyanoguttatus

Randall 1978

Bluespotted wrasse

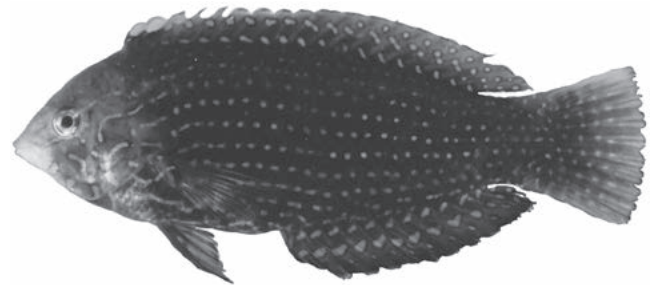
PLATES 83 & 84

Macropharyngodon cyanoguttatus Randall 1978: 749, Figs. 3c–d

(Mauritius, Mascarenes); Smith in Bruton & Cooper 1980; Gomon in Fischer & Bianchi 1984; SSF No. 220.43*; Letourneur *et al.* 1993.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 rays. Body depth 2.6–3 in SL; dorsal-fin spines progressively longer, 9th spine 3–3.4 in HL; caudal fin slightly rounded; pelvic fins barely extending to anus. LL scales 27, anterior scales with 2 or 3 pores; head naked; no median predorsal scales.

Juveniles black below anterior part of lateral line, with small blue spots that alternate with slightly larger pale blue-green spots along longitudinal scale rows; body above lateral line dull yellow with white blotches of near pupil size; opercle coloured as for lower body; rest of head bright yellow, interorbital and postorbital regions with irregular whitish vertical bands and spots; caudal fin transparent with pinkish grey rays. Females dark brown, with small blue spot on each scale, grading to dull yellow anteriorly on head; dark-edged blue lines radiating from eye, and irregular dark-edged blue lines on cheek, opercle and chest; dorsal and anal fins yellowish brown with 3 rows of dark-edged blue spots, many oblong or irregular; distal dorsal fin yellow, broader and brighter anteriorly; caudal fin in life white, lightly tinged with pink. Males yellowish brown, with black-edged bright blue spot at corner of each scale; head and chest with coarse reticular pattern of dark-edged blue lines; dorsal fin blackish with 2 or 3 rows of dark-edged blue spots, outer part of first 2 membranes bright pale yellow. Attains 12 cm TL.



Macropharyngodon cyanoguttatus, 9 cm SL (South Africa).

PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: South Africa (Sodwana to Aliwal Shoal), Réunion and Mauritius.

REMARKS Relatively rare; collected in 10–23 m. Only two males were sighted (by JE Randall and MM Smith) in two weeks of fieldwork at Réunion and Mauritius in 1973. A record from the Maldives by Allen & Steene (1987) is a misidentification of *M. bipartitus*.

Macropharyngodon marisrubri Randall 1978

Red Sea vermiculate wrasse PLATE 84

Macropharyngodon bipartitus (non Smith 1957): Dor 1970; Randall 1983*; Field & Field 1998*; Lieske & Myers 2004.

Macropharyngodon bipartitus marisrubri Randall 1978: 759, Fig. 5a–b (Taba, Egypt, Gulf of Aqaba, Red Sea).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 rays. Body depth 2.6–3.1 in SL; caudal fin rounded. LL scales 27, anterior scales with 2 or 3 pores; head naked; no median predorsal scales; small scales on sides of nape.

Juveniles white, with 3 white-spotted orange bars, 2nd and 3rd continuing into dorsal and anal fins, each with ocellus on fins; underwater photograph shows black area beginning to form on abdomen. Females orange-red, with white spots of variable size (small and closely spaced dorsally, larger and more widely spaced ventrally), except for very large black area with bold, bright blue reticulum covering chest and abdomen, and pectoral fins, and extending to anal-fin origin. Males green, with 4 oblique, dark-edged, violet bands on head that continue horizontally on body to above anal-fin origin, then become vertically oriented, irregular spots and bars, ending in irregular stripe that continues onto caudal fin; caudal fin almost black with 2 or 3 large, interconnected, blue-green bars centrally on fin, rear margin pale blue-green, corners hyaline; no pale pink to yellow saddle-like spots dorsoposteriorly on body. Attains 13 cm TL.

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Usually seen on sand and coral-rubble bottom adjacent to coral reefs, from calm shallow water to at least 25 m deep. Feeds on benthic invertebrates, especially shelled molluscs that are crushed with its exceptionally large pharyngeal molars. Males maintain a territory with a harem of females. Randall (1978) divided *M. bipartitus* into two subspecies, one in the Red Sea (*marisrubri* for Red Sea), based on different gill-raker counts (GR 14–17, mean 15.3, for the Red Sea population; GR 15–19, mean 16.8, for the Indian Ocean) and differences in male colour. Following further study

with additional specimens, the subspecies have been treated as species (Randall 2013).

Macropharyngodon ornatus Randall 1978

Ornate wrasse PLATES 84 & 85

Macropharyngodon ornatus Randall 1978: 753, Figs. 3g–h (Ambon I., Moluccas, Indonesia); Smith *in* Bruton & Cooper 1980; Gomon *in* Fischer & Bianchi 1984; SSF No. 220 [in key]; Randall & Anderson 1993.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 rays. Body depth 2.7–3 in SL; dorsal-fin spines progressively longer, 9th spine 3.3–3.7 in HL; caudal fin slightly rounded; pelvic fins short, not extending to anus. GR 15–18. LL scales 27, anterior scales with 2 or 3 pores; head naked; no median predorsal scales.

Females orange, grading to blackish posteriorly, with dark-edged green spots of pupil size or larger, one per scale, in longitudinal rows; spots merging to form irregular longitudinal bands on chest and abdomen; head orange with irregular dark-edged yellow and green bands (2 long bands on cheek and opercle; and short bands radiating from eye, 2 converging onto lips); median fins orange, variably blackish at base, with rows of dark-edged yellow-green spots, anal fin with zigzagged median yellow-green band; margins of fins (except rear edge of caudal fin) narrowly blue with black submarginal line; pectoral fins translucent with oblong black spot at base. Males show same basic pattern, but ground colour blackish red; dorsal and anal fins blackish red with row of green spots, edged in blue and black, at base, and wavy median stripe of same colour; first 3 membranes of dorsal fin black with large, bright orange spot on about outer two-fifths of each membrane, except for thin bluish white margin and black submarginal line. Attains 14 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere, Indonesia (Kai Is. and Moluccas) and Western Australia (Dampier Archipelago and North West Cape).

REMARKS Usually found in habitats marginal to coral reefs, especially coral rubble and sand, in 2.5–18 m. A specimen from Maputo Bay, Mozambique, reported by Smith (1957) as *Macropharyngodon meleagris* was tentatively re-identified as *M. ornatus* by Randall (1978). A more definitive record for the east coast of Africa was provided by Smith (1980) from northern KwaZulu-Natal, South Africa.

Macropharyngodon vivienae Randall 1978

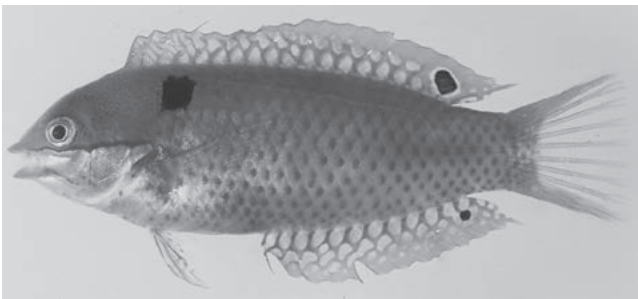
Vivien's wrasse

PLATE 85

Macropharyngodon vivienae Randall 1978: 764, Fig. 6 (Toliara, Madagascar); Smith *in* Bruton & Cooper 1980; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.44*.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 rays. Body depth 2.8–3.2 in SL; dorsal-fin spines progressively longer, 9th spine almost twice as long as 1st; caudal fin rounded; pelvic fins extending to anus. LL scales 27, anterior scales with 8–12 pores; head naked; no median predorsal scales.

Females pale orange-red, with darker orange-red spot basally on each scale; dark brown or black spot of about eye size, narrowly rimmed in pale blue, between upper end of gill opening and base of 4th dorsal spine; cheek and opercle pale yellowish below irregular dark brownish red line from upper lip to opercular flap; head above line and anterior body (to large black spot) brownish red, finely pale-dotted; dorsal and anal fins orange-red with rows of pale yellowish spots, largest obliquely oval at base, progressively smaller and flatter distally; large ocellus on rear of dorsal fin, and small ocellus usually present on rear of anal fin. Males magenta dorsally, pink ventrally, with large purplish area on opercle and adjacent body containing irregular blue lines dorsally, and preceded ventrally by irregular yellow spot larger than eye; snout and cheek below eye bright yellow; head and nape above eye green with small lavender-grey spots; caudal fin dark green with broad magenta upper and lower lobes. Attains 11 cm TL.



Macropharyngodon vivienae, 5 cm SL, female (South Africa).
PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: southern Mozambique to South Africa (Aliwal Shoal) and southern Madagascar.

REMARKS Known from 17–24 m.

GENUS *Minilabrus* Randall & Dor 1981

Diagnosis as for the single species.

Minilabrus striatus Randall & Dor 1981

Striped minute wrasse

PLATE 85

Minilabrus striatus Randall & Dor 1981: 155, Figs. 1–3 (Um Aabak, Dahlak Archipelago, Eritrea, Red Sea); Gomon *in* Fischer & Bianchi 1984; Lieske & Myers 2004.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 12 rays; pectoral fins 14 rays. Upper jaw with pair of anterior canines that project forward and curve laterally, canine at corners of mouth in adults, and no teeth on sides, or only a few rudimentary teeth; lower jaw with pair of forward-projecting canines, followed by series of slender conical teeth. Body slender, depth 3.8–4.4 in SL; caudal fin truncate; pelvic fins short, not extending to anus. GR 15–18. LL scales 27; scales between lateral line and dorsal-fin origin 5; head naked; no median dorsal scales.

Females yellowish grey, with 5 purple stripes on upper two-thirds of head and body, narrowing posteriorly and disappearing on peduncle; narrow uppermost stripe extending from dorsally on snout, along dorsal-fin base, ending in ocellus in front of soft-rayed dorsal fin and on adjacent body; stripes on body separated by zones of about equal width and varying from white to pale blue, blue-green or lavender; median fins with orange rays, translucent membranes. Males with broad middle blue zone, bordered above by brown, from eye to caudal-fin base, containing double orange stripe from eye, ending in short yellow bar that borders rectangular black spot in middle of body; single orange stripe then continues midlaterally from black spot to caudal-fin base; snout and ventral part of head orange-yellow, changing to blue with orange stripe for remaining ventral part of body; dorsal fin orange-red with blue line at base; caudal fin orange with blue line paralleling rays, and blue upper and lower margins. Attains 6 cm TL.

DISTRIBUTION WIO: endemic to Red Sea (southern Egypt to Eritrea).

REMARKS Occurs in aggregations over coral reefs, feeding on zooplankton, ~0.5 m above substrate; inhabits exposed outer reefs in 10–12 m, as well as sheltered reefs as shallow as 1.5 m. The Gulf of Aden record for the species by Lieske & Myers (2004) is an error (RF Myers, pers. comm.).

GENUS *Novaculichthys* Bleeker 1861

Genus diagnosis as for the single species.

Novaculichthys taeniourus Lacepède 1801

Rockmover wrasse

PLATE 85

Novaculichthys taeniourus Lacepède (ex Commerson) 1801: 448, 518, Pl. 29, Fig. 1 (Madagascar); Smith 1957*; Smith & Smith 1963*; SFSA No. 814*; Baissac 1976; Harmelin-Vivien 1976; Jones & Kumaran 1980; Randall 1983*, 1992*, 1995*; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.46*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Field & Field 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Sparus hemisphaerium Lacepède 1802: 53, 160 (Madagascar).

Sparus brachion Lacepède 1802: 54, 160 (Madagascar).

Xyrichthys altipinnis Rüppell 1835: 22, Pl. 7, Fig. 1 (Jeddah, Saudi Arabia, Red Sea).

Julis bifer Lay & Bennett 1839: 64, Pl. 18, Fig. 2 (Oahu I., Hawaii); Smith 1957.

Xyrichthys taeniurus: Valenciennes *in* Cuv. & Val. 1840.

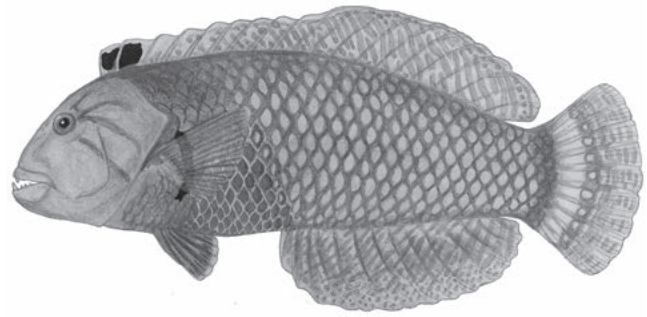
Novacula taeniurus: Playfair & Günther 1867.

Novaculichthys taeniurus: Bleeker 1874; Baissac 1953.

Hemipteronotus taeniourus: Cornic 1987.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Single pair of large canines at front of jaws, none at corners of mouth. Body depth 2.7–3 in SL; first 2 dorsal-fin spines flexible, elongate in juveniles; caudal fin rounded. Lateral line interrupted, LL scales 19 or 20, +5 or 6 scales on caudal-fin base; head naked except for 2 scales dorsally on opercle and near-vertical row of small scales behind eyes; scales not extending onto bases of dorsal and anal fins.

Adults dark brown, with vertically elongate white to pale yellow spot on each scale; abdomen red in females with white edges on scales, coloured as for remainder of body in males; head pale grey, females with and males without narrow dark bands radiating behind and below eye; small yellow spot usually present at upper pectoral-fin base, and pale-edged black spot largely covered by pectoral fin; dorsal fin dark brown with irregular, oblique, greenish yellow lines; anal fin dark brown with numerous close-set spots that are smaller distally; caudal fin with white bar after scaly base, followed by black bar of almost equal width and hyaline rear border. Juveniles variable in ground colour; body with 3 narrow dark bars extending into adjacent fins, and vertical row of 3 irregular white spots between bars; head with dark and pale bands radiating from eye. Attains 30 cm TL.



Novaculichthys taeniourus, 22 cm TL, IP (Mauritius). Source: CFSA

DISTRIBUTION Indo-Pacific (widespread). Throughout WIO; elsewhere to Hawaii, Gulf of California, Panama and Galápagos Is.

REMARKS Generally found in rubble and sand areas adjacent to coral reefs, in 3–25 m. Well known for the ability of adults to overturn surprisingly large rocks to expose invertebrates, such as molluscs, crabs, brittlestars and polychaete worms; a pair were observed by R Kuitert to cooperate by one fish moving the rock to expose prey to the other, then reversing roles. Juveniles effectively mimic small drifting masses of algae.

GENUS *Novaculoides* Randall & Earle 2004

Diagnosis as for the single species.

Novaculoides macrolepidotus (Bloch 1791)

Seagrass wrasse

PLATE 86

Labrus macrolepidotus Bloch 1791: 135, Pl. 284, Fig. 2 [no locality given].

Novacula macrolepidota: Günther 1862; Playfair & Günther 1867.

Novaculichthys macrolepidotus: Bleeker 1862; Smith 1957*; Smith & Smith 1963*; SFSA No. 813*; Kotthaus 1977; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.45*; Allen & Steene 1987*; Winterbottom *et al.* 1989; Baissac 1990; Allen & Smith-Vaniz 1994; Winterbottom & Anderson 1997.

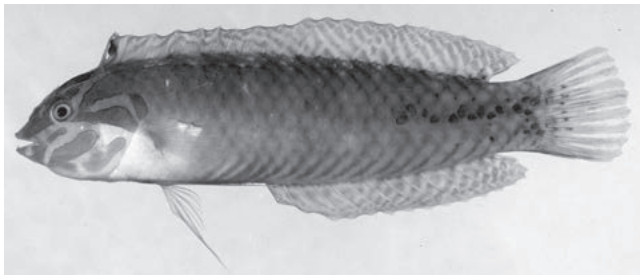
Hemipteronotus macrolepidotum: Barnard 1927.

Novaculoides macrolepidotus: Randall & Earle 2004*; Randall & Spreinat 2004.

Dorsal fin 9 spines, 12–14 rays; anal fin 3 spines, 12–14 rays; pectoral fins 12 rays. Two pairs of canines at front of jaws, each curved laterally; no canine at back in upper jaw. Body depth 3.4–3.9 in SL; head profile evenly convex, at ~45° angle to horizontal axis of body; dorsal-fin origin above rear margin

of preopercle; longest dorsal-fin ray more than twice height of shortest spine; caudal fin rounded. Lateral line interrupted, LL scales 19 or 20 + 4–6; head naked except for 1–3 oblique rows of small scales extending to well below eyes.

Colour variable, from green to brownish yellow or dark brown; females with irregular, midlateral, dark brown stripe or row of spots; males with small midlateral dark spots only posteriorly, 2 curved dark brown bands from eye across upper part of opercle; dark band or double line often present from eye to front of snout; black spot on 1st membrane of dorsal fin; large black spot usually present midventrally on chest; dorsal and anal fins with dull pink spots or bands. Attains ~16 cm TL.



Novaculoides macrolepidotus, 8 cm SL (Comoros). © R Winterbottom, ROM

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Réunion and Chagos; elsewhere to Ryukyu Is., Australia, Lord Howe I., Mariana Is. and Tonga.

REMARKS Found in seagrass beds and on substrates with heavy algal growth, in 2–15 m; hides quickly in vegetation when approached. Randall & Spreinat (2004) reported the subadult as a mimic of species of the venomous waspfish genus *Ablabys*.

GENUS *Novaculops* Schultz 1960

Genus described in a footnote by Schultz in Schultz *et al.* (1960: 143) for *Novaculichthys woodi* Jenkins, from Hawaii, usually classified in *Xyrichtys*. Seven species, in Indo-Pacific, 1 in WIO.

Novaculops alvheimi Randall 2013

St Brandon's sandy

PLATE 86

Novaculops alvheimi Randall 2013: 20, Fig. 15 (St Brandon Shoals).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays. Mouth small and slightly oblique; pair of recurved,

outflaring canines at front of jaws, no canine at back in upper jaw. Body depth ~3.2 in SL, and moderately compressed, width 3–3.3 in body depth; head profile evenly convex, at ~45° angle to horizontal axis of body; suborbital depth short, less than eye diameter, 5.3–5.5 in HL; dorsal-fin origin one eye diameter behind rear margin of orbit; 1st dorsal-fin spine slender and flexible (~3.5 in HL), remaining spines stiff and sharp-pointed; space between first 2 dorsal-fin spines ~¾ space between following pairs of spines. GR 18–21. Lateral line interrupted, LL scales 20 + 5; no scales on head; no median predorsal scales.

Females purplish pink, with 2 broad white longitudinal bands on lower side, narrowing posteriorly, and ending before peduncle; 10 close-set, oblique, white lines crossing abdomen from lower white band; broad, oblique, dark purplish red band from nape to upper operculum; fins pale yellowish to orangish; large black spot in axil of pectoral fins. Males with series of indistinct longitudinal bands: orangish brown below dorsal-fin base, pale blue in zone along lateral line, LL pores white; pale blue suffused with yellow in broad zone midlaterally, and blue and white ventrally; snout and nape orangish grey with oblique deep orange band behind eye; remainder of head yellowish white; iris bright red; spinous dorsal fin blue with deep blue spot ventrally on each membrane; remaining median and pelvic fins pale orange; pectoral fins pale yellow with large bluish black spot in axil. Attains at least 11.5 cm TL.

DISTRIBUTION Known only from two type specimens from St Brandon Shoals.

REMARKS A mature male and female, taken by trawl from the research vessel *Dr Fridtjof Nansen*, in 58–60 m.

GENUS *Oxycheilinus* Gill 1862

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 or 13 (usually 12) rays; caudal fin 13 principal rays. Mouth moderately large; pair of strong canines at front of jaws; no enlarged tooth at back in upper jaw. Body depth 2.7–4 in SL; head pointed; caudal fin varying from slightly emarginate or double emarginate to slightly rounded or rhomboid with dorsal filament; paired fins short. Preopercle margin smooth. Branchiostegal rays 5; GR 10–16. Lateral line interrupted, LL scales 12–16 + 5–9; head mostly scaly, except for anterior interorbital area, snout, zone around eyes, along preopercle margin, and on chin. Vertebrae 23. Primarily piscivorous. Westneat (1993) established *Oxycheilinus* as a genus distinct from *Cheilinus*. Ten species, in Indo-Pacific, 5 in WIO.

KEY TO SPECIES

- 1a Body depth 2.6–3.2 in SL 2
 1b Body depth 3.3–4 in SL 4
- 2a Snout profile to above eyes convex; caudal fin of females rounded, of males rhomboid to lanceolate with filament from upper corner; black spot smaller than eye on side of body between pectoral-fin tips and lateral line *O. bimaculatus*
 2b Snout profile to above eyes slightly concave to straight; caudal fin of adults slightly rounded to slightly double emarginate; no black spot on side of body below lateral line 3
- 3a Caudal fin of adults slightly emarginate to slightly double emarginate; GR 12–14; narrow midlateral blackish stripe on body (may be present in young as series of long dashes); no parallel lines on cheek and opercle at right angle to lines extending back from and above eye; bluish black spot basally on first 2 membranes of dorsal fin *O. arenatus*
 3b Caudal fin of adults slightly rounded to truncate; GR 15 or 16; no midlateral blackish stripe on body; series of ~8 parallel purple lines on cheek and opercle at right angle to pink lines extending obliquely above and behind eye; no bluish black spot anteriorly on dorsal fin *O. digramma*
- 4a Median predorsal scales 6; anterior LL scales 14–16; GR 12–16 (usually 13–15); no midlateral orange-yellow to red stripe on head and body *O. mentalis*
 4b Median predorsal scales 5, preceded by pair of slightly smaller scales; anterior LL scales 12–14; GR 10–13 (usually 11 or 12); broad, midlateral, orange-yellow to red stripe from front of snout to caudal-fin base *O. orientalis*

Oxycheilinus arenatus (Valenciennes 1840)

Blackstripe wrasse

PLATE 86

Cheilinus arenatus Valenciennes in Cuv. & Val. 1840: 101, Pl. 397 (Réunion, Mascarenes); Günther 1862; Bleeker 1874; Baissac 1953; Smith 1957; Smith & Smith 1963*; Gomon in Fischer & Bianchi 1984; Randall & Anderson 1993.
Oxycheilinus arenatus: Winterbottom & Anderson 1997; Lieske & Myers 2004.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 or 13 rays. Mouth large, maxilla almost extending to vertical at front of eyes, lower jaw projecting. Body depth 2.8–3.3 in SL; head profile straight to above eyes, slightly concave in large adults, then slightly convex on nape; dorsal-fin rays only slightly higher than spines; caudal fin slightly rounded in juveniles, truncate to slightly double emarginate in adults; pelvic fins short, not extending to anus. LL scales 15 or 16 + 7 or 8; predorsal scales 6, extending to above middle of eyes; low scaly sheath at base of dorsal and anal fins.

Body pale reddish brown, whitish ventrally, stippled with brownish red over head, body (denser dorsally), and basally on caudal fin; narrow blackish stripe midlaterally on body, extending from behind gill opening to caudal-fin base, and continuing faintly to eye (may be broken into 5 long dashes on body in young); large bluish black spot basally on first 2 membranes of dorsal fin and extending partly onto 3rd membrane; caudal fin yellowish green, white basally, upper and lower edges mottled orangish brown. Attains 21 cm TL.



Oxycheilinus arenatus, 19 cm TL. Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to Mozambique, Seychelles, Réunion, Mauritius, Chagos and Maldives; elsewhere to Taiwan and east to Marshall Is. and Society Is.; not known from Australia and New Caledonia.

REMARKS Inhabits deep seaward reefs, often on drop-offs and in caves, in 25–60 m. Roux-Estève & Fourmanoir's (1955) first record of *Cheilinus arenatus* from the Red Sea was a misidentification of *C. mentalis* (Randall 1981).

Oxycheilinus bimaculatus (Valenciennes 1840)

Two-spot wrasse

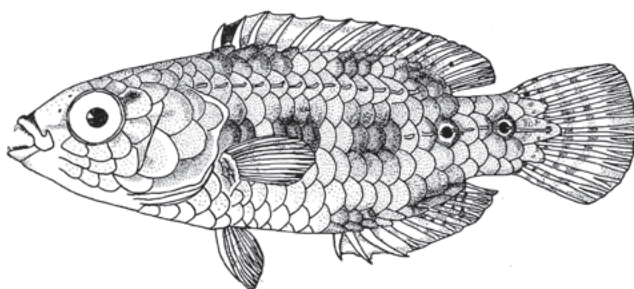
PLATES 86 & 87

Cheilinus bimaculatus Valenciennes in Cuv. & Val. 1840: 96 (Réunion, Mascarenes); Smith 1957; SFSA No. 815*; Gomon in Fischer & Bianchi 1984; SSF No. 220.11*; Cornic 1987; Allen & Steene 1987*; Randall & Van Egmond 1994.
Cheilinus mossambicus Günther 1862: 127 (Mozambique); Playfair & Günther 1867.
Oxycheilinus bimaculatus: Allen & Smith-Vaniz 1994; Randall 1995*; Heemstra & Heemstra 2004.

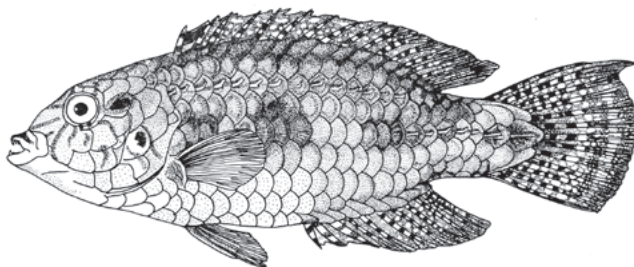
Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 or 13 (usually 12) rays. Mouth moderately large, maxilla usually reaching vertical at nostrils; lower jaw not or only slightly projecting. Body depth 2.6–3.1 in SL; head profile convex; dorsal-fin rays only slightly higher than spines; caudal fin of females rounded, of males rhomboid to lanceolate with elongate dorsal filament, and long central part of fin may be divided into 3 filaments; pelvic fins of males extending beyond anus. LL scales 15 or 16 + 7 or 8; predorsal scales 6, extending

to above middle of eyes; scaly sheath at base of dorsal and anal fins.

Females reddish to orangish brown, finely flecked and blotched with whitish, shading to yellowish on abdomen and ventrally on head; large blackish blotch on side between pectoral-fin tips and lateral line, sometimes followed by less distinct blotches; small blue or green spot behind eye, and blue spot at front of dorsal fin. Males also very variable in colour, but generally finely mottled orangish brown and pale green on body; blackish blotch on side usually evident; head mainly green with pink to orange-red lines radiating from eye; dark blue spot on 1st interspinous membrane of dorsal fin, often with bright red border dorsally. Attains 15 cm TL.



Oxycheilinus bimaculatus, 21 mm SL, juvenile (Madagascar).
Source: Harmelin-Vivien 1974



Oxycheilinus bimaculatus, 59 mm SL, female (Madagascar).
Source: Harmelin-Vivien 1974

DISTRIBUTION Indo-Pacific (widespread). WIO: Oman to South Africa (Park Rynie), Madagascar, Comoros, Seychelles, Réunion and Mauritius; not known from Red Sea; elsewhere to Japan, Australia, New Guinea, Marquesas Is. and Hawaii.

REMARKS Usually not found on coral reefs but in adjacent habitats, especially areas with heavy growth of algae or seagrass; deepest record 110 m.

Oxycheilinus digramma (Lacepède 1801)

Cheeklined wrasse

PLATE 87

Labrus digramma Lacepède 1801: 448, 518, Pl. 1, Fig. 2 (Mauritius, Mascarenes).

Cheilinus coccineus Rüppell 1828: 23 (Jeddah, Saudi Arabia, Red Sea).

Cheilinus commersoni Bennett 1832: 167 (Mauritius, Mascarenes).

Cheilinus digrammus: Valenciennes in Cuv. & Val. 1840; Guichenot 1863; Randall 1983*, 1992; Gomon in Fischer & Bianchi 1984; SSF No. 220.13*; Winterbottom *et al.* 1989*; Field & Field 1998*.

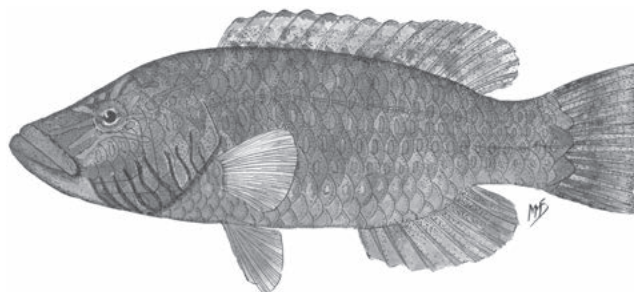
Cheilinus digrammus: Baissac 1953; Smith 1957; SFSA No. 817*; Jones & Kumaran 1980; Allen & Steene 1987*; De Bruin *et al.* 1994.

Oxycheilinus digrammus: Westneat 1993; Winterbottom & Anderson 1997; Lieske & Myers 2004.

Oxycheilinus digramma: Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 or 13 (usually 12) rays. Mouth large and oblique, maxilla usually reaching to below nostrils, and lower jaw protruding. Body depth 2.8–3.3 in SL; snout profile straight to slightly concave to above eyes, slightly convex on nape; caudal fin slightly rounded to truncate, lobe corners slightly prolonged in large adults. GR 15 or 16. LL scales 14–16 + 7–9; predorsal scales 6, extending forward to above middle of eyes; scaly sheath 1 scale in width at base of dorsal and anal fins.

Body colour extremely variable; one common phase greenish grey dorsally, shading to pink ventrally, with dark orangish brown vertical line on each scale, with or without pale-edged dark stripe from front of snout through eye to caudal-fin base; linear pattern on head common to all phases: 3 pink lines in front of eye, 1 or 2 behind eye, and parallel line below; ~8 oblique pink to purple lines across cheek and opercle at right angles to pink lines above; juveniles with pale-edged dark stripe from front of snout to caudal-fin base, oblique lines on cheek fewer in number and only ventral. Attains ~35 cm TL.



Oxycheilinus digramma, 20 cm TL (Mozambique). Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa (KwaZulu-Natal), Comoros, Seychelles, Mascarenes, Chagos and Maldives; elsewhere to Andaman Sea, Micronesia, Great Barrier Reef, New Caledonia and Samoa.

REMARKS Found on coral reefs and adjacent habitats, to at least 50 m deep. Feeds mainly on small fishes. Ormond (1980) described the amazing ability of this species to mimic the colour of non-piscivorous fish, such as goatfishes, swim with a group of these fish, and dart out to capture small fishes.

Oxycheilinus mentalis (Rüppell 1828)

Mental wrasse

PLATES 87 & 88

Cheilinus mentalis Rüppell 1828: 24 (Massawa, Eritrea, Red Sea); Valenciennes in Cuv. & Val. 1840; Günther 1862; Tortonese 1937; Randall 1983*; Dor 1984; Gomon in Fischer & Bianchi 1984. *Cheilinus venosus* Valenciennes in Cuv. & Val. 1840: 100 (Suez, Egypt, Gulf of Suez, Red Sea). *Cheilinus arenatus* (non Valenciennes 1840): Roux-Estève in Roux-Estève & Fourmanoir 1955. *Cheilinus rhodochrous* (non Playfair & Günther 1867): Smith 1957. *Oxycheilinus mentalis*: Field & Field 1998*; Lieske & Myers 2004.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 3.3–3.8 in SL, generally deeper-bodied with growth; snout profile to above eyes slightly concave, profile of nape slightly convex; caudal fin slightly rounded in small individuals, double emarginate in adults. GR usually 13–15. LL scales 14–16 + 6 or 7; scales dorsally on head extending to anterior half of interorbital area.

Colour very variable: subadults often grey to pinkish grey dorsally, scale edges white, becoming white ventrally, with faint grey to pinkish grey stripes; small black spot at midcaudal-fin base; reddish band often present from upper lip to eye; sometimes pale-edged, midlateral stripe on body; fins translucent white, mottled and blotched with red, pelvic fins with large red spot at base. Adults reddish brown dorsally, scales edged and flecked with white, usually with blackish stripe, blotched with white, from eye to whitish blotch or bar at caudal-fin base; irregular black spot often present on 2 to 4 of first 4 LL scales; reddish band from front of snout to eye; rays of median fins often greenish; dorsal fin pinkish to yellowish grey with white dots and short oblique white lines; caudal fin with reddish lobes, linked by broad reddish bar behind basal white blotch. Attains ~22 cm TL.

DISTRIBUTION WIO: Red Sea and Gulf of Aden.

REMARKS Usually found in marginal coral-reef areas with small corals, soft corals, gorgonians, on sand and coral rubble, in 1–25 m. Solitary and easily approached by divers. Like *Oxycheilinus digramma*, this species can mimic non-piscivorous fishes, such as goatfishes, group with them, and get closer to its prey of small fishes.

Oxycheilinus orientalis (Günther 1862)

Oriental wrasse

PLATE 88

Cheilinus orientalis Günther (ex Bleeker) 1862: 132 (Batjan, Indonesia) [new name for *Cheilinus coccineus* Bleeker]; Gomon in Fischer & Bianchi 1984. *Cheilinus rhodochrous* Günther in Playfair & Günther 1867: 90, Pl. 11, Fig. 3 (Zanzibar, Tanzania). *Cheilinus* sp.: Khalaf & Disi 1997. *Oxycheilinus orientalis*: Myers 1999*; Parenti & Randall 2000; Randall & Khalaf 2003.

Dorsal fin 9 spines, 10 rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Mouth large, maxilla reaching vertical at front edge of orbit. Body slender, depth 3.2–3.9 in SL, deeper with growth; head profile straight to slightly convex; snout pointed, 2.5–2.7 in HL; caudal fin rhomboid to slightly double emarginate, upper lobe corner slightly protruding in large adults; pelvic fins short. GR 10–13 (usually 11 or 12). LL scales 12–14 + 6–8; scales dorsally on head extending to anterior half of interorbital area.

Adults mottled reddish brown dorsally, whitish ventrally, scales with reddish to orange edges; broad orange-yellow to red stripe, often with darker red margins anteriorly, from eye to caudal-fin base, sometimes continuing to front of snout; 5 faint whitish bars dorsally on body, crossing midlateral stripe, and faint whitish bar at caudal-fin base; blackish blotch covering 2 or 3 scales usually present in adults between anterior lateral line and dorsal fin; small blackish or dark red spot often present at caudal-fin base, and second spot midlateral below middle of soft-rayed portion of dorsal fin. Attains 16 cm TL.

DISTRIBUTION Indo-Pacific (widespread but few localities). WIO: Red Sea (including Gulf of Aqaba), Tanzania (Zanzibar) and South Africa (KwaZulu-Natal); elsewhere, Indonesia, Ryukyu Is. and Marshall Is.

REMARKS Occurs in seagrass beds and on substrates with dense algal growth (particularly *Dictyota*, *Padina*, *Caulerpa* and *Halimeda*), in 8–42 m. Feeds in part on small fishes. Unusually small-sized at maturity (females as small as 4.2 cm SL, males as small as 7.2 cm, and an intersex specimen of 5.6 cm SL: Randall & Khalaf [2003]).

GENUS *Paracheilinus* Fourmanoir 1955

Dorsal fin 9 (rarely 8 or 10) spines, 11 rays; anal fin 3 spines, 9 (rarely 8 or 10) rays; pectoral fins 14 (rarely 13 or 15) rays. Mouth small, oblique, not reaching vertical at anterior edge of orbit; upper jaw with 3 pairs of laterally projecting canines at front, 3rd pair largest and most strongly recurved, single pair of canines at front of lower jaw, no canine at corners of mouth. Body depth 2.8–4.1 in SL; scleral cornea of pupil divided almost vertically into 2 roundish adjacent parts (believed to provide for close vision of small planktonic animals); snout short, 3.3–4.8 in HL; caudal fin varying from lanceolate to lunate. Preopercle margin finely serrate on upper part (may be reduced to a few serrae in large individuals). Lateral line interrupted, LL scales 14–17 + 4–9 pored scales; median predorsal scales usually 5 (rarely 4 or 6); head scaly except snout, chin and interorbital region. Small-sized, colourful, zooplankton-feeding fishes. Males expand the median fins in courtship, displaying brilliant colour in the dorsal fin (hence the common name flasher wrasses). Twenty species, in Indo-Pacific, 5 in WIO.

KEY TO SPECIES

- 1a Caudal fin rounded 2
- 1b Caudal fin emarginate to rhomboid or lunate 3

- 2a Body depth 3–3.4 in SL; outer margin of dorsal fin not uniformly convex, 1st ray filamentous in males (may be >½ SL); GR 13–15; 3 narrow blue stripes on body, one from nape along dorsal-fin base; one in middle of body disjunct just behind pectoral fin, and one along lower side *P. mccoskeri*
- 2b Body depth 2.7–3 in SL; outer margin of dorsal fin uniformly convex, without filament; GR 16–18; 7 or 8 uninterrupted blue lines on body *P. octotaenia*

- 3a Caudal fin of adults rhomboid to lanceolate; 1st dorsal-fin ray filamentous and very thin; GR 12–14; orange to red dorsally, grading to yellow ventrally, with 4 narrow lavender-blue stripes on head, lower 2 extending to chest and abdomen, and 3 on side of body *P. attenuatus*
- 3b Caudal fin of adults emarginate to lunate; 1st dorsal-fin ray not filamentous; GR 14–16; colour not as above 4

- 4a Caudal fin of females emarginate, of males lunate with filamentous lobes, fin length varying from 2 in SL in males to 3.6 in females; 8 narrow purplish blue stripes on body (including one below dorsal-fin base and one from chest to abdomen), middle 3 not extending half distance to caudal-fin base *P. hemitaeniatus*

Continued ...

KEY TO SPECIES

- 4b Caudal fin of females truncate, of males emarginate, fin length 3.4–4.2 in SL; 3 narrow purplish blue stripes on body, one dorsal, one from lower edge of pectoral-fin base, and one from chest to abdomen *P. piscilineatus*

Paracheilinus attenuatus Randall 1999

Diamondtail flasher wrasse

PLATES 88 & 89

Paracheilinus mccoskeri (non Randall & Harmelin-Vivien 1977):

Randall & Van Egmond 1994.

Paracheilinus attenuatus Randall 1999: 34, Figs. 2–6 (St François Atoll, Amirante Is., Seychelles).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins usually 14 rays. Body depth 3.4–3.6 in SL; dorsal profile convex on snout, almost straight on nape; dorsal-fin spines of adults progressively longer, 9th spine of males ~4–5 times longer than 1st spine; females with long filament developing from 1st dorsal-fin ray, this filament longer in males; caudal fin truncate to rounded in juveniles, lanceolate in adults (though slightly <HL); dorsal- and anal-fin rays of males long, longest anal-fin ray may be >HL; pelvic fins short, not extending to anus. Preopercle margin finely serrate, rounded corner and ventral edge thin and membranous. GR 12–14. LL scales 15–18 + 5–7; median predorsal scales 5; horizontal scale rows on cheek below eye 2; single row of elongate scales, one per membrane, along base of dorsal and anal fins.

Juveniles: upper half of body orange-yellow, lower half lavender-pink; 3 lavender-blue lines with periodic thickening on upper half of head and body from eye to caudal-fin base; large black spot, rimmed in blue, at dorsal-fin base in middle of body, and smaller ocellus on upper peduncle. Females lose ocelli, become more yellow ventrally, with 2 more stripes, one from lower edge of pectoral-fin base to lower edge of peduncle, and one from lower edge of eye to anal-fin origin. Males mainly yellow, suffused with red dorsally, especially on head, with same stripes as females but lavender-pink; dorsal fin yellow with large blue-edged red area covering most of central soft-rayed part of fin, with pointed extension into rear spines; anal fin red, separated from yellow basal part by row of irregular red-edged pink spots; middle row of small pink spots in yellow basal part of fin; caudal fin red with hyaline rear margin and pink submarginal line. Attains 8 cm TL.

DISTRIBUTION WIO: Kenya and Seychelles.

REMARKS Collected from rubble substrate, in 21–50 m, with spear, powerhead blast, and dredge. The caudal fin of an adult male from Kenya has an almost quadrangular shape, whereas that of a male from Seychelles is lanceolate (the rear margins concave), though of comparable body size. More specimens and tissue samples are needed for further study.

Paracheilinus hemitaeniatus

Randall & Harmelin-Vivien 1977

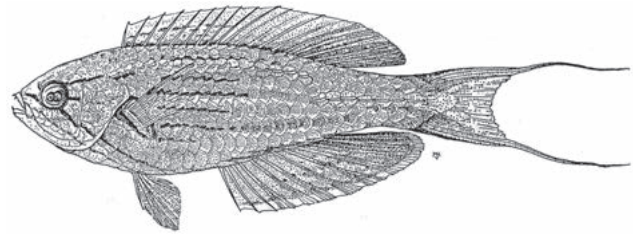
Halfbanded flasher wrasse

PLATE 89

Paracheilinus hemitaeniatus Randall & Harmelin-Vivien 1977: 338, Fig. 4 (Toliara, Madagascar); Randall & Lubbock 1981; Gomon *in* Fischer & Bianchi 1984; Randall 1999.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 14 rays. Body relatively elongate, depth 3.4–4.1 in SL; head profile slightly convex; dorsal-fin spines of adults progressively longer, 1st spine 2.4–2.5 in length of 9th spine; no dorsal-fin rays elongate as filament; caudal fin of females emarginate, of males lunate with long filamentous lobes, fin length from ~3.6 in SL in females to ~2 in males. Preopercle lower margin finely serrate, upper margin covered by a scale, and rounded corner and lower edge thin and membranous. GR 14–16. LL scales 16 + 5 or 6; median predorsal scales 5; horizontal scale rows on cheek below eye 2; single row of elongate scales, one per membrane, along base of dorsal and anal fins.

Females dusky orange-red with 8 faint short yellowish bars dorsally on body and 8 faint narrow purplish blue stripes (including one below dorsal-fin base, and one from chest to abdomen), middle 3 stripes more distinct (in more yellowish area), not extending half distance to caudal-fin base; head more reddish dorsally with irregular white lines on snout, 2 continuing onto nape; 3 narrow purplish blue stripes diverging posteriorly from eye, uppermost leading to dotted stripe following anterior LL; ventral part of head, chest and abdomen whitish; pectoral-fin base in yellow spot encircled by narrow dark purplish band; iris red. Males orangish brown, grading to pale yellow ventrally, with same pattern of narrow purplish blue stripes, but more distinct, the 3 short stripes on side of body with narrow broken purplish line in each interspace; head grading to purplish red between eyes and on snout, and brownish red dorsally on opercle; iris mainly bright orange; caudal fin bright orange-pink centrally with broad green submarginal green bands that lead to long, pale green filaments. Attains 15 cm TL.



Paracheilinus hemitaeniatus, 7 cm SL, male (Madagascar).

Source: Randall & Harmelin-Vivien 1977

DISTRIBUTION WIO: Madagascar (Toliara) and South Africa (KwaZulu-Natal: photographs only [DR King]).

REMARKS The three type specimens were collected from the outer-reef slope of a barrier reef, in 42–45 m.

Paracheilinus mccoskeri

Randall & Harmelin-Vivien 1977

McCosker's flasher wrasse

PLATE 89

Paracheilinus mccoskeri Randall & Harmelin-Vivien 1977: 332, Fig. 2 (Grande Comore, Comoros); Gomon *in* Fischer & Bianchi 1984; Winterbottom *et al.* 1989*; Randall 1992*, 1995*, 1999; Randall & Van Egmond 1994; Carpenter *et al.* 1997*.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins usually 14 rays. Body depth 3–3.6 in SL; dorsal profile convex on snout, almost straight on nape; dorsal-fin spines of adults progressively longer, 9th spine ~5–6 times longer than 1st spine of males; long filament developing from 1st dorsal-fin ray in females, reinforced by membrane basally from 2nd dorsal-fin ray, this filament longer in males; caudal fin rounded; anal-fin rays of males greatly expanded, longest ray up to 1.2–1.3 in HL; pelvic fins short, not extending to anus. Preopercle margin finely serrate, rounded corner and ventral edge thin and membranous. GR 13–15. LL scales 15–17 + 5–9; median predorsal scales 5; horizontal scale rows on cheek below eye 2; single row of elongate scales, one per membrane, along base of dorsal and anal fins.

Females orange-yellow, with narrow blue stripe on side of snout, another from dorsal part of eye to below 3rd and 4th dorsal-fin spines, one from middle of eye to pectoral-fin base, and one from corner of mouth to chest; body with 3 narrow blue stripes: one from nape along dorsal-fin base; a disjunct middle stripe, front part largely under the pectoral fin, rear part above and slightly overlapping, extending to peduncle; 3rd stripe from pectoral-fin axil, curved below fin to middle of caudal-fin base. Males orange, grading to yellow ventrally, with blue stripes as for females; dorsal fin yellow, including filament, with row of small dark-edged blue spots, one per membrane, from middle of spinous part to 1st membrane of soft-rayed

portion; rear three-quarters of soft-rayed part of anal fin banded from base to margin with red, white, yellow, and pale blue; anal fin yellow basally, broadly red distally with row of faint white spots between, and narrow lavender border; caudal fin mainly dusky yellow. Attains 7 cm TL.



Paracheilinus mccoskeri, 5 cm SL, TP (Comoros). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indian Ocean. WIO: Persian/Arabian Gulf and Oman to Kenya (aquarium trade), Tanzania photograph [A Sutton], southern Mozambique photograph [J Strömvoll], Comoros, Seychelles, Chagos and Maldives; elsewhere, Andaman Sea and Indonesia (western Sumatra).

REMARKS Usually found over rubble, in 6–50 m. Males harem; in courtship they display vivid blue colour over the soft-rayed portion of the anal fin.

Paracheilinus octotaenia Fourmanoir 1955

Eightline wrasse

PLATE 89

Paracheilinus octotaenia Fourmanoir in Roux-Estève & Fourmanoir 1955: 199, Fig. 1 (Abu Latt, Saudi Arabia, Red Sea); Randall & Harmelin-Vivien 1977; Randall 1983*; Dor 1984; Gomon in Fischer & Bianchi 1984; Field & Field 1998*; Lieske & Myers 2004.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 14 rays. Body depth 2.7–3 in SL; head profile convex; snout short, length subequal to eye diameter in adults, 4.4–4.7 in HL, profile steep, at ~50° angle; spinous membranes of dorsal and anal fins not incised; first 6 dorsal-fin spines of males progressively longer, and last 3 spines subequal and 4–5 times longer than 1st spine; caudal fin of females truncate to slightly rounded, of males strongly rounded; pelvic fins of males extending well beyond anus. Preopercle margin finely serrate. GR 16–18. LL scales 15 or 16 + 5 or 6.

Females orange-pink, abruptly pale lavender-blue ventral to eye and on chest and abdomen, with 8 continuous, dark-edged,

longitudinal blue lines on body, lowermost on chest and abdomen; 2 dark-edged blue lines radiating back from eye, and upper half of orbit with blue rim; median fins translucent with small blue spots along base; pectoral fins with basal yellow spot partly rimmed in blue. Males orange-yellow with blue lines as for females on body and on head behind eye; 2 blue lines across interorbital (rear line incomplete); dorsal and anal fins coloured as for body with pale blue margin and black submarginal line; caudal fin with broad yellow bar after basal scaly part of fin. Attains 9 cm TL.

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba to at least Farasan Bank) and Gulf of Aden (Djibouti: JM Rose, pers. comm.).

REMARKS Occurs in plankton-feeding aggregations well above the substrate, generally in 5–30 m. Males maintain a harem of as many as 12 females; during courtship, they become olive-yellow with fully expanded bright red median fins, the dorsal fin orange anteriorly and with rows of magenta dots, and vivid blue lines on body and fin margins.

Paracheilinus piscilineatus (Cornic 1987)

Blue-lined flasher wrasse

PLATE 90

?*Cirrhilabrus piscilineatus* Cornic 1987: 141 (Mauritius, Mascarenes).
Paracheilinus piscilineatus: Randall 1995, 1999; Fricke 1999.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 14 rays. Body depth 3.6–3.8 in SL; snout short (3.7–3.9 in HL) and strongly convex, nape slightly convex; membranes between dorsal- and anal-fin spines not incised; first 6 dorsal-fin spines of males progressively longer, last 3 spines subequal, at most 3 times longer than 1st spine; 7th dorsal-fin ray longest in males, last ray about half as long; caudal fin truncate to slightly emarginate; pelvic fins not extending to anus, slightly longer in males than in females. Preopercle margin finely serrate. GR 15 or 16. LL scales 16 or 17 + 5–9; median predorsal scales 5.

Males orange-yellow, suffused with brown posteriorly; short purple stripe below first 3 LL scales, followed just above lateral line by broad purplish brown stripe extending to upper edge of peduncle; yellow pectoral-fin base encircled by purplish blue band curved ventrally, extending to caudal-fin base; purplish blue stripe dorsal to upper lip, below eye to lower corner of opercle; head below band green; chest and lower abdomen green with oblique blue band; margin of orbit purple, with narrow, irregular, oblique purple band ending near origin of lateral line; dotted purple line extending back from middle of orbit; dorsal fin yellow with large bright red area over most of last 5 rays and membranes; double row of small blue spots that

enlarge into irregular purple spots and bands in soft-rayed part of fin, ending in front of red area; anal fin orange; caudal fin olivaceous with large central orangish area posteriorly and blue upper and lower margins. Females mainly orange, with same pattern of bands as males, but not as well-developed; median fins mainly orange. Attains 7 cm TL.

DISTRIBUTION WIO: Mauritius.

REMARKS This species was briefly described in a small popular book on Mauritius fishes, ending in the statement that the blue lines suggest the name *piscilineatus*. No generic name was given, but *Cirrhilabrus* seems intended, as it followed a page devoted to *Cirrhilabrus* sp. Randall (1999) designated a neotype and redescribed the species in the genus *Paracheilinus* from four specimens, collected over sand and rubble bottom in ~35 m.

GENUS *Pseudocheilinus* Bleeker 1861

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 13–17 rays. Upper jaw with 3 or 4 pairs of canines at front, lateral pair enlarged and obliquely recurved, no canine at corners of mouth; lower jaw with single pair of canines at symphysis. Body depth 2.5–3.7 in SL; snout pointed, head profile straight to slightly convex; dorsal fin not notched between spines and rays; 2nd anal-fin spine longer than 3rd; caudal fin rounded; paired fins short. Preopercle margin membranous, with protruding flap at corner, edge smooth, and free as much ventrally as posteriorly (except finely serrate on lower edge of *P. hexataenia*). GR 11–18. Lateral line interrupted, LL scales 14–19 + 4–7; median predorsal scales 6; opercle covered by large scales; scale rows on cheek 2–4; series of elongate scales at bases of dorsal and anal fins. Scleral cornea of eyes divided into 2 adjacent parts (anterior part believed to serve as a close-up lens to aid in feeding on small prey). Small-sized, at most 12 cm TL. Seven species, in Indo-Pacific, 4 in WIO (Randall 1999).

KEY TO SPECIES

- 1a Pectoral fins 15–17 rays; 4 pairs of canines at front of upper jaw; free edge of preopercle usually finely serrate; black spot slightly smaller than pupil at upper caudal-fin base; 6 dark blue stripes on upper two-thirds of body; caudal fin green or greenish yellow *P. hexataenia*
- 1b Pectoral fins 14 rays; 3 pairs of canines at front of upper jaw; free edge of preopercle not serrate; colour not as above 2

Continued ...

KEY TO SPECIES

- 2a Anterior LL scales 14–16; body red with numerous fine, longitudinal white lines on body; bluish white streak extending across cheek from corner of mouth *P. evanidus*
- 2b Anterior LL scales 16–18; body yellowish with 8 pink to purplish brown stripes narrower than interspaces; no bluish white streak across cheek 3
- 3a Second anal-fin spine 7.3–8.1 in SL; 1st and 2nd anal-fin spines with long filaments; GR usually 13; body pale yellow with 8 narrow pink stripes; preserved specimens with 2 dark spots on opercle *P. dispilus*
- 3b Second anal-fin spine 5.6–6.9 in SL; 1st and 2nd anal-fin spines without long filaments; GR usually 14; body orange, pink, lavender, or pale grey with 7 or 8 narrow dark brown, red, dark pink, or violet stripes; preserved specimens without dark spots on opercle *P. octotaenia*

Pseudocheilinus dispilus Randall 1999

Doublespot wrasse

PLATE 90

Pseudocheilinus octotaenia (non Jenkins 1901): Allen & Steene 1987; Fricke 1999.

Pseudocheilinus dispilus Randall 1999: 10, Fig. 1, Pl. 1b–c (Réunion and Mauritius, Mascarenes).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 14 rays. Upper jaw with 3 pairs of large canines at front, lateral pair 1.5–2 times longer and strongly recurved. Body moderately elongate, depth 3.2–3.6 in SL; HL 2.5–2.6 in SL; snout length 2.6–3 in HL; first 2 dorsal-fin spines without very long filaments (<40% spine length); filament on 2nd anal-fin spine moderately long (23–70% spine length, longer in males than in females); caudal fin 3.8–4.1 in SL. Preopercle with membranous flap at angle, margin smooth above this. GR 12–14. LL scales 18 + 4–7; horizontal rows of scales on cheek 3 or 4.

Body yellow, with 8 narrow pink stripes following centre of scale rows, the upper stripes continuing twice as numerous on head behind eye and indistinctly on snout; more narrowly onto dorsal part of head; ventral part of head lavender with yellow lines and small spots; 2 prominent purple spots appear on opercle after death, one oval and dorsoposterior, the other smaller and vertically linear or hook-shaped (the spots are on the bone of the opercle and may not show through the overlying tissue in life); dorsal and anal fins lavender-pink basally, hyaline distally, with yellow stripes, the dorsal with pale blue margin; caudal fin with pale blue rays, translucent membranes, and longitudinal rows of small yellow spots, mostly on membranes. Attains 9.5 cm TL.

DISTRIBUTION WIO: Réunion and Mauritius.

REMARKS Type specimens collected from reefs, in 15–37 m. In addition to colour and length of anal-fin spines, this species is differentiated from *P. octotaenia* by a modal difference in GR counts (13 in *P. dispilus* versus 14.5 in *P. octotaenia*). Dentition also differs: the inner row of small conical teeth behind the canines of the upper jaw is continuous across the symphysis in *P. dispilus*, whereas in *P. octotaenia* the small conical teeth medial to the 2 small conical teeth at the symphysis are usually absent.

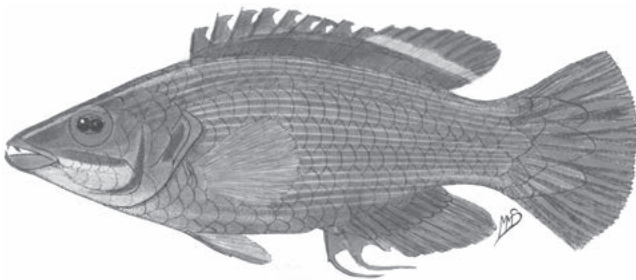
Pseudocheilinus evanidus Jordan & Evermann 1903
Disappearing wrasse

PLATE 90

Pseudocheilinus evanidus Jordan & Evermann 1903: 192 (near Hilo, Hawaii I., Hawaii); Regan 1907; Smith 1957; Smith & Smith 1963*; Harmelin-Vivien 1976; Randall 1981*, 1983*; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.47*; Allen & Steene 1987*; Winterbottom *et al.* 1989*; Field & Field 1998*; Fricke 1999; Heemstra & Heemstra 2004; Lieske & Myers 2004.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 13 or 14 (rarely 13) rays. Upper jaw with 3 pairs of small canines at front, followed on each side by large recurved canine. Body depth 2.7–3.4 in SL; HL 2.5–2.8 in SL; snout length 2.7–3 in HL; anal-fin spines 1–2 with long filaments; caudal fin 3.3–3.8 in SL; pelvic fins not extending to anus. GR 11–15 (usually 13 or 14). LL scales 14–17 + 4–6; horizontal rows of scales on cheek 2 (3 anteriorly).

Body red to orange-red, with ~25 longitudinal whitish lines on body, and bluish white streak extending back from mouth; lower edge of preopercle often magenta, and vertically elongate purple spot or streak usually present on opercle (magenta to purple markings persist as dark blue or green in preservative). Attains ~8 cm TL.



Pseudocheilinus evanidus, 6 cm TL (Aldabra). Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa (KwaZulu-Natal), Madagascar, Comoros, Aldabra, Seychelles,

Mascarenes, Chagos and Maldives; elsewhere to Andaman Sea, Japan, Great Barrier Reef, New Caledonia, Tuamotu Is. and Hawaii.

REMARKS Secretive, as other members of the genus; to 66 m deep. The holotype was collected from a deep tidepool at Hawaii. JE Randall examined the stomach contents of nine adult specimens: one contained a small fish, the others small crustaceans (no crabs), a small worm and a fragment of a brittlestar.

Pseudocheilinus hexataenia (Bleeker 1857)

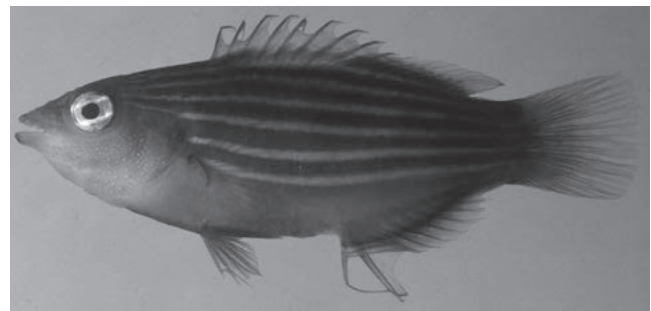
Sixstripe wrasse

PLATE 90

Cheilinus hexataenia Bleeker 1857: 84 (Ambon I., Moluccas, Indonesia).
Pseudocheilinus hexataenia: Bleeker 1862; Sauvage 1891; Smith 1957; Smith & Smith 1963*; SFS No. 819*; Harmelin-Vivien 1976; Jones & Kumaran 1980; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.48*; Allen & Steene 1987*; Winterbottom *et al.* 1989*; Randall 1992*, 1995*; Allen & Smith-Vaniz 1994; Heemstra & Heemstra 2004*.
Cossyphus echis Guichenot 1869: 197, Pl. 12, Fig. 5 (Madagascar).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 15–16 (rarely 17) rays. Upper jaw with 3 pairs of small canines at front, followed on each side by large, recurved, outflaring canine. Body moderately deep, 2.5–2.9 in SL; HL 2.6–2.9 in SL, proportionately shorter with growth; snout length 2.8–3.5 in HL; first 2 dorsal-fin spines without long filaments (filament of 1st spine $\frac{1}{3}$ – $\frac{1}{2}$ length of spine); first 2 anal-fin spines with long filaments; caudal fin 3.7–4 in SL. Preopercle with membranous flap at angle, margin above flap usually finely serrate for about half its length. GR 12–18 (usually 16). LL scales 16–18 + 4–6; horizontal rows of scales on cheek 2.

Body with 6 dark blue stripes alternating with yellow-orange; blue-edged black spot slightly smaller than pupil at upper caudal-fin base; 2 small blackish spots anteriorly on lower lip; caudal fin green. Attains 7.5 cm TL.



Pseudocheilinus hexataenia, 4 cm SL (Comoros). © R Winterbottom, ROM

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Gulf of Aden, Oman to South Africa (Park Rynie), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives and Lakshadweep; elsewhere to Andaman Is., Indonesia, Ryukyu Is., southern Great Barrier Reef, Lord Howe I., Tuamotu Is. and Line Is.

REMARKS Solitary and cryptic; to ~36 m deep. Winterbottom *et al.* (1989) reported an optimal depth of 6–15 m at Chagos. Four food-habit studies reported mainly a wide variety of benthic and demersal planktonic crustaceans, chiefly copepods (including parasitic calagoids), amphipods, isopods, tanaids, shrimps and shrimp larvae, mysids and crab larvae, but also foraminiferans, polychaetes, small gastropods and gastropod eggs.

Pseudocheilinus octotaenia Jenkins 1901

Eightstripe wrasse

PLATE 90

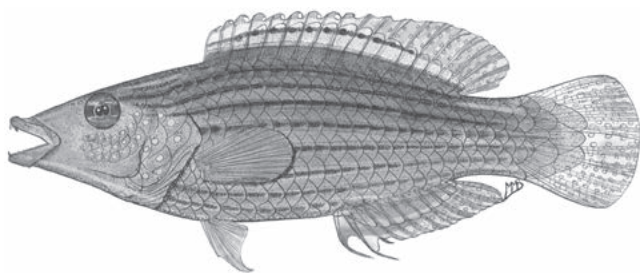
Pseudocheilinus hexataenia (*non* Bleeker 1857): Streets 1877.

Pseudocheilinus octotaenia Jenkins 1901: 64 (Oahu I., Hawaii); Gomon *in* Fischer & Bianchi 1984; SSF No. 220.49*; Winterbottom *et al.* 1989*; Randall & Anderson 1993; Anderson *et al.* 1998; Debelius 1999*; Heemstra & Heemstra 2004.

Pseudocheilinus margaretae Smith 1956: 929, Fig. 1 (Aldabra); Smith 1957*; Smith & Smith 1963*.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 9 rays; pectoral fins 13–15 (usually 14) rays. Upper jaw with 3 pairs of large canines at front, lateral pair about twice as long and strongly recurved. Body moderately elongate, depth 2.9–3.5 in SL; HL 2.5–2.7 in SL; snout length 2.7–2.9 in HL; anal-fin spines 2–3 without long filaments (filaments $< \frac{3}{4}$ length of spine); caudal fin 4–4.2 in SL. Preopercle with membranous flap at angle, upper margin smooth. GR 12–17 (usually 14 or 15). LL scales 16–18 + 5 or 6; horizontal rows of scales on cheek 3 or 4.

Body yellow, with 8 lavender, magenta or purplish brown stripes narrower than yellow interspaces (sometimes orange dashes or elongate spots within yellow interspaces); head with small orange-yellow spots; caudal fin pale yellow, finely spotted with orange-yellow; dorsal and anal fins faintly and narrowly striped with violet and yellow. Attains 12 cm TL.



Pseudocheilinus octotaenia, 10 cm TL (Aldabra). Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: South Africa (Aliwal Shoal), Aldabra and Agalega Is., Comoros, Seychelles, Chagos and Maldives; elsewhere to Indonesia, southern Japan, Great Barrier Reef, New Caledonia, Pitcairn Is. and Hawaii.

REMARKS An insular species, with no records from continental shores or large islands (such as Madagascar, Sumatra, Borneo or New Guinea); in 6–41 m. Solitary and secretive, in low reef and rubble areas, more approachable than other species of the genus. Two food-habit studies (Hobson 1974; Randall 1988) reported mainly small crustaceans, including brachyuran crabs, shrimps and copepods, but also small fishes, demersal fish eggs, small gastropods and an echinoid.

GENUS *Pseudocoris* Bleeker 1862

Dorsal fin 9 spines (first 2 spines of adults closer together than remaining spines), 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12–14 rays; caudal fin 14 rays. Mouth small and oblique, maxilla extending at most to below rear nostrils; front of jaws with pair of forward-projecting, slightly recurved canines that curve laterally; remaining conical teeth on sides of jaws small and almost equal in length; no canine at corners of mouth. Body depth 3.4–5 in SL, deeper-bodied with growth; HL 3.3–3.7 in SL; eyes near centre on sides of head; snout short, 3.4–4.3 in HL; dorsal-fin origin above upper end of gill opening; dorsal- and anal-fin spines flexible. Preopercle margin smooth. Lateral line continuous, abruptly curved downward below rear part of dorsal fin to straight on peduncle, LL pored scales 64–79, +1 scale on caudal-fin base; no scales on head, no median predorsal scales; scales on sides of nape extending forward almost to rear edge of eyes (anterior scales on nape embedded); no scales on base of dorsal and anal fins. Vertebrae 25.

Torpedo wrasse is the preferred common name for these swift-swimming fishes, but false coris is also used. The species form aggregations that feed on zooplankton, generally well above the substratum; they are very difficult to approach. All species are sexually dichromatic. The initial phase is either male or female, both sexes are the same colour; the terminal phase is only male and typically more colourful. Spawning not observed, but initial-phase fish presumed to spawn in aggregations, the terminal male spawns individually with females in a harem. Nine species, in Indo-Pacific, 3 in WIO (Randall *et al.* 2015).

KEY TO SPECIES

- 1a Adults slender, body depth 4.7–5 in SL; 1st spine of dorsal fin of terminal males long, subequal to HL. Initial phase orange dorsally, with narrow dark purple stripe from top of snout following lateral line dorsally on body; broad sides of body mainly blue-green, with large black spot on opercular flap and irregular spot at caudal-fin base; head and body pink ventrally. Terminal male with broad black stripe on upper sides, narrowly green above, bordered below by blue line wavy; 2 yellow bars of near-eye width across black stripe in middle of body, separated by black zone of equal width; head mainly yellowish green, blue around mouth and ventrally *P. petila*
- 1b Adults not slender, body depth 3.3–4.7 in SL; 1st spine of dorsal fin shorter than HL; colour not as above 2
- 2a Snout profile of males convex to above eyes; LL scales 72–79; body depth 3.4–4 in SL. Females green, often with 2 darker green to blackish stripes, one from top of snout to dorsally on caudal-fin base, other from upper pectoral-fin base, to below lateral line on caudal-fin base; caudal fin bluish white with blackish base and narrowing black lobes. Males yellowish green dorsally, pale blue-green or greenish yellow ventrally, with 2 broad black areas anteriorly on side of body, followed by series of black bars that diminish in height posteriorly; head blue to blue-green with blackish zone behind eye that broadens posteriorly; black spot on opercular flap *P. occidentalis*
- 2b Snout profile of males almost straight to above eyes (may be slightly convex or slightly sinuous); LL scales 66–74; body depth 3.6–4.7 in SL. Females lavender-grey, yellowish grey, or pink, often with longitudinal pale lines, 2 of which extend onto head, one above and one below eye; bright red spot at base and axil of pectoral fins. Males yellowish green, with irregular vertical black lines to level of lower edge of pectoral-fin base (so dense on some individuals to almost obscure yellowish green colouration); black stripe from heavier black lines often present at level of pectoral-fin base, narrowing and disappearing posteriorly; body white below stripe, with small yellow spots in zone above anal fin; head bluish to greenish grey, darker on snout and interorbital, white ventrally *P. hemichrysos*

Pseudocoris hemichrysos

Randall, Connell & Victor 2015

Yellowback torpedo wrasse

PLATE 90

Pseudocoris yamashiroi (non Schmidt 1931): Gomon in Fischer & Bianchi 1984; Winterbottom *et al.* 1989*; Randall & Anderson 1993*; Lieske & Myers 1994; Kuitert 1998*; Fricke 1999; Randall & Connell 2013*.

Pseudocoris sp.: Allen & Steene 1987*.

Pseudocoris hemichrysos Randall, Connell & Victor 2015: 26, Figs. 22–25 (Maldives).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body depth 3.6–4.7 in SL, terminal male deeper-bodied; snout profile to above eyes almost straight, may be slightly sinuous or slightly convex; HL 3.4–3.7 in SL; snout length 3.5–4.3 in HL; first 2 dorsal-fin spines of adults closer together than remaining spines, 1st spine of terminal male elongate, varying in small individuals from ~3.5 in HL to ~1.5 in HL in large males; 3rd–9th dorsal-fin spines progressively longer, 3rd spine ~1.2–1.3 in length of 9th spine; caudal fin truncate in initial phase, slightly emarginate in terminal male; pectoral fins long, ~ $\frac{3}{4}$ HL in adults; pelvic fins short, not extending to anus. GR 17–21. LL scales 70–75.

Colour variable. Small initial-phase fish lavender-grey, pale blue-green, yellowish grey, or pink, with pale yellow to whitish longitudinal lines, 2 continuing broader onto head, one above and one below eye; head and anterior body often suffused with blue; large bright red spot at base and axil of pectoral fins; dark red stripe on side of snout in line with red of middle part of iris; larger females lose pale lines on body but retain 2 broader lines on head. Terminal male yellowish green, with irregular vertical black lines to level of lower edge of pectoral-fin base (so dense on some individuals to almost obscure ground colour); black longitudinal stripe resulting from thicker black lines often present at level of pectoral-fin base, narrowing and disappearing posteriorly; body white below stripe, with small yellow spots above anal fin; head bluish to greenish grey, darker on snout and interorbital, white ventrally. Attains 15 cm TL.

DISTRIBUTION WIO: Madagascar, Comoros, Seychelles, Mascarenes, Chagos and Maldives.

REMARKS Generally found in 5–30 m.

Pseudocoris occidentalis

Randall, Connell & Victor 2015

Elusive torpedo wrasse

PLATE 91

Pseudocoris heteroptera (non Bleeker 1857): Gomon in Fischer & Bianchi 1984; Winterbottom *et al.* 1989*; Randall & Van Egmond 1994; Taquet & Diringer 2013.

Pseudocoris sp.: Kuitert 2002*.

Pseudocoris occidentalis Randall, Connell & Victor 2015: 13, Figs. 8–14 (near Mombasa, Kenya).

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body depth 3.5–4.7 in SL, males deeper-bodied; head profile evenly convex; HL 3.3–3.5 in SL; snout length 3.4–3.7 in HL; first 2 dorsal-fin spines of adults closer together

than remaining spines; 1st dorsal-fin spine of males elongate (up to $\sim\frac{1}{2}$ HL), 3rd–9th dorsal-fin spines progressively longer, posterior rays shorter; pectoral fins long, $\sim\frac{3}{4}$ HL; pelvic fins short, not extending to anus. GR 17–21. LL scales 73–77.

Small juveniles red, with blue-bordered, black lateral stripe; caudal fin yellow; larger juveniles with red replaced by yellow. Initial phase blue-green anteriorly, grading to pale green posteriorly, with 2 narrow green to dusky stripes on body, one from above opercle to caudal-fin base, one from above pectoral-fin base; vertically oval black spot on opercular flap; dorsal and anal fins orange-yellow, dorsal with small pale green spots; caudal-fin lobes black. Terminal male yellowish green dorsally, pale blue-green or greenish yellow ventrally, with large irregular blackish to black area above pectoral-fin base, followed by series of 7 or 8 black bars becoming progressively shorter posteriorly, last 1 or 2 as blotches; head blue to blue-green with blackish zone behind eye that broadens posteriorly; jet black spot on opercular flap; lobes of caudal fin blackish or edged in black, central rear part whitish. Attains 20 cm TL.

DISTRIBUTION WIO: Kenya to South Africa (southern KwaZulu-Natal), Madagascar, Seychelles (including Amirantes and Aldabra), Réunion and Mauritius.

REMARKS Usually seen in small aggregations, feeding on zooplankton, to 5 m or more above the substrate; difficult to approach. The related Pacific species *P. heteroptera* ranges from Indonesia to Taiwan, Line Is. and Tuamotu Is.

Pseudocoris petila Allen & Erdmann 2012

Slender torpedo wrasse

PLATE 91

Pseudocoris cf. *bleekeri*: Taquet & Diringier 2012.

Pseudocoris petila Allen & Erdmann 2012: 1146, Figs. 1–5 (South Cinque I., Andaman Is.); Randall *et al.* 2015*.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body slender, depth 4.7–5 in SL; head profile of initial phase evenly convex, of terminal male almost straight from snout to well above eyes and then convex on nape; HL 3.3–3.5 in SL; snout length 4.6–4.7 in HL; 1st dorsal-fin spine of terminal male elongate (at least $\frac{3}{4}$ HL), 9th spine longest (2.8–3.6 in HL); caudal fin truncate, 1.6–1.9 in HL; pectoral fins pointed, ~ 1.4 in HL; pelvic fins short, tips not extending to anus. GR 15 or 16. LL scales 73–75.

Initial phase pink dorsally on head and anterior part of body, grading to orange posteriorly, with narrow black stripe from dorsally on snout, following lateral line, and disappearing near middle of body; side of body with broad blue-green stripe suffused with purple dorsally, ending in large elliptical pale green spot posteriorly on body with irregular black spot;

ventral part of body pink; large black spot on opercular flap, preceded by broad purple stripe to eye; cheek mainly blue-green; iris red; median fins orange-yellow, dorsal and anal fins with small pale blue-green spots. Terminal male with broad black stripe on upper sides, narrowly green above, bordered by blue below line wavy; 2 yellow bars of near-eye width across black stripe, separated by black bar of equal width, above anal-fin origin; head green dorsally, grading to yellow on cheek, blue ventrally and around mouth; chest and abdomen yellow; dorsal fin black with submarginal blue-green line, narrowly blue-green at base; caudal fin black, longitudinally lined with blue. Attains 8 cm TL.

DISTRIBUTION Indian Ocean. WIO: southern Mozambique photograph [J Strömvoll], South Africa photograph [DR King], Seychelles photograph [R Daly], Réunion photograph [Taquet & Diringier 2013] and Sri Lanka (aquarium trade); elsewhere, Andaman Is. and Indonesia (northwestern Sumatra).

REMARKS Found over rubble bottom and off outer-reef drop-offs, in 10–25 m. Described from two initial-phase specimens collected at Andaman Is. and an underwater photograph of a terminal male from Pulau Weh, off northwestern tip of Sumatra, Indonesia.

GENUS *Pseudodax* Bleeker 1861

Genus diagnosis as for the single species. This monotypic Indo-Pacific genus possibly merits placement in its own subfamily based on the unique dentition.

Pseudodax moluccanus (Valenciennes 1840)

Chiseltooth wrasse

PLATE 92

Odax moluccanus Valenciennes in Cuv. & Val. 1840: 305, Pl. 408, Fig. 2 (Moluccas, Indonesia).

Odax borbonicus Valenciennes in Cuv. & Val. 1840: 306 (Réunion, Mascarenes).

Pseudodax moluccanus: Bleeker 1861; Playfair & Günther 1867; Day 1877; Baissac 1953; Smith 1955*, 1957*; Fourmanoir & Guézé 1962; Smith & Smith 1963*; Randall 1983*, 1992; Gomon in Fischer & Bianchi 1984; SSF No. 220.50*; Allen & Steene 1987*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Pseudodax moluccensis: Günther 1862 [unjustified emendation].

Dorsal fin 11 spines, 12 rays; anal fin 3 spines, 14 rays; pectoral fins 15 rays. Pair of large spatulate, incisiform teeth at front of jaws, lower jaw with adjacent smaller rear pair; remaining teeth on sides of jaws coalesce to form cutting ridge; no

canine at corners of mouth; pharyngeal teeth more like those of parrotfishes than wrasses (illustrated in Bleeker's *Atlas Ichthyologique*, Vol. 1, 1862; Pl. 18). Body depth 2.5–3.4 in SL, deeper-bodied with growth; head profile of adults straight to above eyes, then slightly convex on nape; mouth small; spines and rays of dorsal and anal fins increasing gradually to penultimate ray; caudal fin slightly rounded. GR 16–19. Lateral line continuous, without sharp bend below rear of dorsal fin, LL scales 30 or 31; head scaly except on interorbital region, snout and chin; sheath of small scales at base of dorsal and anal fins; large scales on basal half of caudal fin, last row pointed.

Adults greenish or bluish grey, with reddish brown spot on each scale of body (vertically elongate dorsally, round ventrally); wash of orange on nape and dorsoanteriorly on body; upper lip mainly yellow with blue streak above extending across lower cheek; teeth blue; caudal fin deep purple to dark blue with narrow blue margin and broad yellowish white bar across base; dorsal and anal fins dull orange-yellow with faint dark markings, blue margin and black submarginal band; pectoral fins with yellow rays and blackish streak dorsally at base, with blue dorsal margin; juveniles dark brown with 2 bright blue stripes, one dorsal and one ventral, that narrow posteriorly on body and extend anteriorly onto head. Attains 25 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa (Sodwana Bay), Comoros, Aldabra, Seychelles, Réunion, Mauritius, Chagos and Sri Lanka; elsewhere to Andaman Is., Cocos (Keeling) Is., Indonesia, Japan, Great Barrier Reef, New Caledonia, Marquesas Is. and Tuamotu Is.

REMARKS Occurs on coral and rocky reefs, to ~60 m deep. Feeds by scraping small invertebrates from the substrate, but a food-habit study is needed; juveniles have been observed cleaning other fishes.

GENUS *Pseudojuloides* Fowler 1949

Dorsal fin 9 spines, 11 or 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 or 13 rays, uppermost ray rudimentary. Pair of canines at front of jaws; teeth on sides of jaws chisel-like incisors; no canine at corners of mouth; no very large molars on pharyngeal plates. Body slender, depth 3.8–5.6 in SL; head profile slightly to moderately convex; HL 2.9–3.4 in SL; snout pointed, length 2.5–3.6 in HL; pectoral fins small, length 1.3–1.9 in HL; pelvic-fin length 1.5–2.9 in HL; caudal fin slightly rounded to double emarginate. Preopercle margin smooth. GR 14–19. Lateral line continuous, sharply deflected ventrally below rear of dorsal fin to straight on peduncle, LL pored scales 27, +1 scale at caudal-fin base; scales between

lateral line and dorsal-fin origin 3–5; scales on chest much smaller than those on remainder of body. Eighteen species, in Indo-Pacific, 7 in WIO (6 described here; see Remarks under *Pseudojuloides erythroptus*).

KEY TO SPECIES

- 1a Dorsal fin 12 rays; pectoral fins 12 rays; no median predorsal scales; body green, males with horizontally elongate blackish patch on side of body between soft-rayed portions of dorsal and anal fins *P. argyreogaster*
- 1b Dorsal fin 11 rays; pectoral fins 13 rays; median predorsal scales 8–12, small and may be embedded anteriorly; colour not as above 2
- 2a Body depth 5–5.4 in SL; upper sides of males behind pectoral fins with 2 narrow blue stripes that enclose broad zone of green 3
- 2b Body depth 3.8–4.9 in SL; colour of males not as above 4
- 3a GR 16 or 17; head and body of males to base of 6th dorsal-fin spine black with bright blue markings; remainder of body green with 2 irregular blue stripes, white ventrally ... *P. erythroptus*
- 3b GR 13; postorbital part of head and upper half of body to base of 7th or 8th dorsal-fin spines black or green or brown suffused with black; snout and ventral half of head and body below pectoral fins yellow with irregular reticulate pattern of bright pink *P. edwardi*
- 4a Caudal fin truncate; preopercle free margin with 9 pores; median predorsal scales ~12; colour of females probably red; males orangish grey, shading to yellowish ventrally, with yellow band in shoulder region and large black spot anteriorly on dorsal fin *P. xanthomos*
- 4b Caudal fin slightly rounded to double emarginate; pores along preopercle free margin 10–13; median predorsal scales 8–11; male colour not as above 5
- 5a GR 15 or 16 (usually 15½). Females dusky pink on upper half of body, grading to pale lavender-blue ventrally, and to dark blue-green on dorsal half of peduncle; lower half of body, chest and head pale green; upper half of snout green, grading to blue on interorbital; large squarish violet area across head posterior to eye; mid-dorsal whitish line on snout and nape, continuing faintly along dorsal-fin base. Males mostly green, with narrow pink stripe along dorsal-fin base, from nape to caudal peduncle; a variably dark band along upper body and a midlateral pale green, blue or pinkish band; mid-dorsal black stripe from upper lip to nape, with adjacent bright blue stripe from sides of upper lip to nape *P. kaleidos*

Continued ...

KEY TO SPECIES

- 5b GR 15–19 (usually 17). Females pale orange-red dorsally, shading to yellowish ventrally on body and whitish ventrally on head and chest; males olive-green dorsally, pale blue ventrally, with double stripe of blue and yellow midlaterally on body and large black area edged in pale blue submarginally in caudal fin. Terminal male green, with orange stripe as wide as eye containing scattered blue dots near upper margin and bordered above and below by blue line on sides of body from behind opercular flap to caudal-fin base; faint orange stripe on cheeks below eyes *P. polackorum*

Pseudojuloides argyreogaster (Günther 1867)

Green smalltail wrasse

PLATE 92

Pseudojulis argyreogaster Günther in Playfair & Günther 1867: 95, Pl. 12, Fig. 2 (Zanzibar, Tanzania).

Julis argyreogaster: Smith 1957.

Pseudojuloides argyreogaster: Randall & Randall 1981*; Gomon in Fischer & Bianchi 1984; SSF No. 220 [in key]; Randall & Van Egmond 1994.

Dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays; caudal-fin lower procurrent rays 5 (6 in other species). Body elongate, depth 4.7–5.1 in SL; HL 3–3.2 in SL; snout moderately long, 2.5–2.7 in HL; dorsal-fin spines progressively longer, 9th spine 2.9–3.5 in HL; pelvic fins short, 2.5–2.9 in HL. GR 17–19. LL scales 27; suborbital pores 8–12; no median predorsal scales.

Females green, grading to greenish yellow on cheek, opercle and chest; fins with greenish yellow spines and rays and translucent membranes. Males dark green dorsally, many scales with small pale blue spot, those anteriorly vertically elongate, grading to paler green ventrally on abdomen, chest and head; irregular, horizontally elongate black spot on upper midlateral part of body containing bright pale blue spots and dashes; head with irregular long blue lines. Juvenile (32 mm SL) green, abdomen and throat bluish white, with 3 rows or red dots on upper half of body and pale blue stripe under eyes. Attains 10.5 cm TL.

DISTRIBUTION WIO: Tanzania (Zanzibar), Comoros and Seychelles.

REMARKS Occurs in seagrass beds; the juvenile from Platte I., Seychelles, was collected from *Thalassodendron ciliatum*, in 6 m.

Pseudojuloides edwardi Victor & Randall 2014

Edward's wrasse

PLATE 92

Pseudojuloides edwardi Victor & Randall 2014: 3, Figs. 1–4, 6a (off Mombasa, Kenya).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body elongate, depth 4.2–4.9 in SL; HL 2.9–3 in SL; snout length 3.1–3.4 in HL; eyes relatively small, orbit diameter 4.7–5 in HL; dorsal-fin spines progressively longer, 9th spine 3.2–4 in HL; caudal fin slightly rounded in females, truncate to slightly emarginate in males, 1.6–1.9 in HL; 3rd pectoral-fin ray longest, 1.8–2.1 in HL; pelvic fins 2.2–2.4 in HL. GR 14. LL scales 27; suborbital pores 4–7; series of pores along free margin of preopercle 10 or 11; head naked; median predorsal scales 8 or 9; scales between lateral line and dorsal-fin origin 3 or 4.

Females reddish orange to pink, often with yellow tint anteriorly, grading to white ventrally on head and abdomen. Males with rear half of body emerald green with 2 bright blue stripes, lower along lateral midline, upper along mid-upper body, dorsum above upper blue line olive-green; upper head and anterior body olive-green, becoming darker to black at mid-body; lower half of head and anterior body yellow with prominent deep pink reticulum; dorsal and anal fins with bluish base and edge surrounding thick central yellow band; caudal fin blue-edged dorsally (and sometimes ventrally), with blue extension of midlateral stripe onto fin base. Attains 73 mm SL.



Pseudojuloides edwardi, 7 cm SL, female paratype (Kenya). © BC Victor

DISTRIBUTION Known only from aquarium-trade specimens collected in Kenya.

REMARKS The East African representative of the *P. severnsi* species-complex. *Pseudojuloides severnsi* Bellwood & Randall 2000 occurs from Sri Lanka to Japan and New Caledonia.

Pseudojuloides erythroptus Randall & Randall 1981

Redeye smalltail wrasse

PLATE 92

Pseudojuloides erythroptus Randall & Randall 1981: 71, Figs. 13–14

(Mauritius, Mascarenes); Gomon in Fischer & Bianchi 1984;

SSF No. 220 [in key]; Allen & Steene 1987*; Randall & Von Egmond

1994; Fricke 1999.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body elongate, depth 5–5.4 in SL; HL 3–3.1 in SL; snout length 3.1–3.2 in HL; dorsal-fin spines progressively longer, 9th spine 2.9–3.2 in HL; pelvic fins moderately long, but not extending to anus, length 2.1–2.2 in HL; caudal fin slightly rounded in females, truncate to slightly emarginate in males, 1.5–1.8 in HL. GR 16 or 17. LL scales 27; suborbital pores 5–7; series of pores along free margin of preopercle 10–13; head naked; median predorsal scales 8 or 9; scales between lateral line and dorsal-fin origin 3½.

Females orange-red dorsally, grading to yellow ventrally, with wash of lavender over abdomen; head orange dorsally, white on cheek, lower opercle, and chest, snout and interorbital suffused with violet; whitish streak from upper lip to lower edge of orbit; iris bright red; dorsal fin with yellow rays and translucent, pale yellow membranes; caudal and anal fins with pale pink rays and translucent membranes. Males dark purplish grey on head and anterior fifth of body, with 2 narrow bright blue bands extending back from corners of mouth across head, one above and the other below eye; 2 blue dashes ventrally on opercle, and numerous blue spots on dark anterior fifth of body; rear four-fifths of body green dorsally with 2 irregular longitudinal blue lines, white ventrally; dorsal fin grey with irregular blue band at base and white submarginal line; caudal fin pale. Attains 10 cm TL.

DISTRIBUTION WIO: Mauritius.

REMARKS The Mascarene representative of the *P. severnsi* species-complex. A related species, *Pseudojuloides labyrinthus* Victor & Edward 2016, occurs in Kenya and Seychelles, characterised by a prominent maze of blue bands on the head and body (Plate 93).

Pseudojuloides kaleidos Kuitert & Randall 1995

Kaleidoscope wrasse

PLATE 92

Pseudojuloides kaleidos Kuitert & Randall 1995: 107, Figs. 1–4 (North Malé Atoll, Maldives).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body depth 4–4.4 in SL; HL 2.9–3 in SL; snout length 3–3.1 in HL; dorsal-fin spines progressively longer, 9th spine 2.8–3.5 in HL; pelvic fins moderately short, 1.9–2 in HL; caudal fin truncate, 1.6–1.7 in HL. GR 15 or 16. LL scales 27;

suborbital pores 5 or 6; pores along free margin of preopercle 10 or 11; head naked; median predorsal scales 8–10; scales between lateral line and dorsal-fin origin 3.5.

Females overall reddish to orange or pinkish, grading to pale then white ventrally; in transition this species develops a bluish interorbital wash. Male colour as in key, variation occurs in the length of the broad black stripe on the upper sides of males (from none to >½ SL). Attains 9 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives; elsewhere, Andaman Sea, Indonesia and New Guinea.

REMARKS Type specimens collected from open area of bottom rubble, in ~30 m.

Pseudojuloides polackorum

Connell, Victor & Randall 2015

Polack's wrasse

PLATE 93

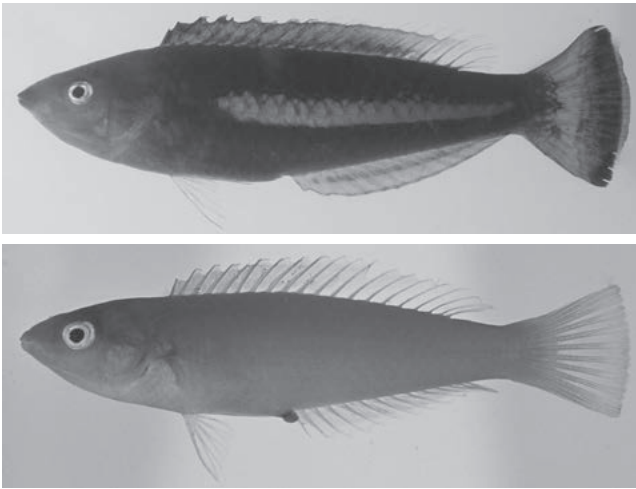
Pseudojuloides cerasinus (non Snyder 1904): Gomon in Fisher & Bianchi 1984; SSF No. 220.51*.

Pseudojuloides cf. *cerasinus*: King & Fraser 2014.

Pseudojuloides polackorum Connell, Victor & Randall 2015: 51, Figs. 1–5 (Mombasa region, Kenya).

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body depth 3.9–4.4 in SL; HL 3–3.2 in SL; snout length 2.8–3.4 in HL; dorsal-fin spines progressively longer, 9th 3–3.6 in HL; 2nd or 3rd pectoral-fin ray longest, 1.8–1.9 in HL; pelvic fins short, 1.8–2.1 in HL; caudal fin truncate, length 1.6–1.8 in HL. GR 15–18. LL scales 27; suborbital pores 5–7; series of pores along free margin of preopercle 10 or 11; head naked; median predorsal scales 7–9; scales between lateral line and dorsal-fin origin 3 or 4.

Females pale orange-red dorsally, shading to pale pink ventrally on body and pinkish white ventrally on head and chest, fins pale yellowish, caudal and anal fins with thin blue margin; iris yellow. Terminal male green with bright orange stripe as wide as eye, bordered above and below by blue dashes and dots, on side of body from behind opercular flap to caudal-fin base; faint orange stripe on cheek below eye; caudal fin with green to blue vertical line where fin broadest, followed by black zone and thin blue posterior margin; dorsal and anal fins pale blue with broad median green stripe. Attains ~8.5 cm SL.



Pseudojuloides polackorum, 8 cm SL, TP (top); 5 cm SL, IP (bottom) (both South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Kenya (Mombasa), South Africa (Sodwana Bay) and northern Madagascar (photograph).

REMARKS Swims close to the bottom in rocky and weedy areas, the females in small groups, the males more active and solitary (King & Fraser 2014). Long overlooked because of its similarity to the wide-ranging *P. cerasinus*, now split into a species-complex; members have very different mtDNA sequences and clearly different colour patterns.

Pseudojuloides xanthomos Randall & Randall 1981

Yellowstreak wrasse

PLATE 93

Pseudojuloides xanthomos Randall & Randall 1981: 67, Fig. 10 (Mauritius, Mascarenes); Gomon in Fischer & Bianchi 1984; Fricke 1999.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 12 rays; pectoral fins 13 rays. Body depth 4.2 in SL; HL 3.2 in SL; snout length 2.9 in HL; mouth slightly inferior, the gape horizontal; 1st dorsal-fin spine 4.5 in HL, 9th spine 3.9 in HL; caudal fin truncate; pelvic fins almost extending to anus, 1.9 in HL. GR 15–17. LL scales 27; suborbital pores 5; pores along free margin of preopercle 9; head naked; median predorsal scales ~12, extending before upper end of margin of preopercle but not to vertical at rear edge of orbit; scales between lateral line and dorsal-fin origin 4; scales on sides of chest about half height of those on body.

Male (fresh specimen) orangish grey dorsally on body, grading ventrally through indistinct zone of bluish grey to pale yellow on ventral half of body; chest pale blue-green; head with broad yellow stripe from front of snout through eye and

across upper part of opercle, then continuing brighter yellow above upper end of gill opening for about 6 scales; dorsal, anal and paired fins translucent whitish, 1st membrane of dorsal fin almost covered by black spot; caudal fin pale yellowish basally, grading to translucent whitish posteriorly. Females uniform pink to reddish, TP individuals develop yellowish band on head behind eye. Attains at least 7 cm TL.

DISTRIBUTION Known only from Mauritius.

REMARKS The Mascarene representative of the wide-ranging *P. cerasinus* species complex, differing in colour pattern and mtDNA sequences.

GENUS *Pteragogus* Peters 1855

Dorsal fin 9–11 spines, 9–11 rays; anal fin 3 spines, 9 rays; pectoral fins 12–17 (rarely 12 or 17) rays. Two pairs of canines at front of jaws, anterior pair projecting, 2nd pair outcurved; well-developed molars on pharyngeal plates. Body depth 2.2–2.9 in SL; snout profile straight to above eyes, then slightly convex on nape; cirrus often extending as filament from membrane near tip of anterior dorsal-fin spines, best developed in males; caudal fin slightly to strongly rounded. Scleral cornea of eyes modified to form double pupil. Preopercle ventral margin thin and membranous, rear margin finely serrate. Lateral line complete, deflected sharply downward below 5th ray of dorsal fin to straight on peduncle; LL pored scales 23 or 24, +1 or 2 very large scales on caudal-fin base; head with scales, except on snout, interorbital region and chin; low scaly sheath at base of dorsal and anal fins. Ten species, in Indo-Pacific, 7 in WIO. *Duymaeria* Bleeker 1856 and *Labrastrum* Guichenot 1860 are generic synonyms.

KEY TO SPECIES

- 1a Dorsal fin 9 spines, 11 rays; long filaments and adjacent membrane extending from tip of anterior 4 dorsal-fin spine membranes in males (short and only from first 2 membranes in females); oblique white band usually present from near eye to chest below pectoral-fin base; no ocellated black spot on opercle *P. flagellifer*
- 1b Dorsal fin 10 or 11 spines, 9 or 10 rays; long filaments from tip of anterior dorsal-fin spines present or absent; no white band from below eye to chest; ocellated black spot present or absent on opercle 2

Continued ...

KEY TO SPECIES

- 2a Dorsal fin 10 spines; dusky to blackish spot present or absent anteriorly on dorsal fin (if present, only on 1st membrane) 3
- 2b Dorsal fin 11 spines; black spot present on first 2 or 3 membranes of dorsal fin 4

- 3a Males with filaments from membrane tips of first 4 spines of dorsal fin; pelvic fins not extending beyond anal-fin origin; dark ocellus on opercle; no prominent dark bar ventrally from eye; no dark bars dorsally on body; no black spot at rear dorsal-fin base; maximum 11 cm TL *P. cryptus*
- 3b Males without filaments from membrane tips of first 4 spines of dorsal fin; pelvic fins of males long, 1st ray extending beyond anal-fin spines; no dark ocellus on opercle; prominent, usually pale-edged, dark bar ventrally from eye; irregular dark bars on body above lateral line; pupil-size black spot at rear dorsal-fin base; maximum 15 cm TL *P. taeniops*

- 4a Head profile of adults concave; body depth of adults 2.4–2.5 in SL; maximum 15 cm TL *P. pelycus*
- 4b Head profile of adults straight; body depth of adults 2.7–2.9 in SL; maximum <11 cm TL 5

- 5a Interorbital convex; pelvic fins long, extending well beyond anal-fin origin in adults, 2–3.3 in SL; eye small, 4.3–5.4 in HL; caudal fin long, 2.7–3.1 in SL; black spot on each of first 3 membranes of dorsal fin (may be faint or absent on 3rd membrane of small females) *P. trispilus*
- 5b Interorbital flat; pelvic fins 3.3–4.1 in SL; eye 3.5–4.5 in HL; caudal fin 3–3.3 in SL; black spot present on first 1 or 2 membranes of dorsal fin 6

- 6a Longest anal-fin ray 1.7–1.8 in HL; body depth 3–3.2 in SL; dark brown spots along lateral line; rear soft-rayed part of dorsal fin probably not transparent in life *P. darkae*
- 6b Longest anal-fin ray 1.9–2.3 in HL; body depth 2.7–3 in SL; no dark brown spots along lateral line; rear three-quarters of soft-rayed part of dorsal fin transparent in life, except basally *P. variabilis*

Pteragogus clarkae Randall 2013

Clark's wrasse

PLATE 93

Duymaeria opercularis (non Peters 1855): Klunzinger 1871.

Pteragogus opercularis (non Peters 1855): Al-Hussaini 1947;

Klausewitz 1964.

Pteragogus pelycus [in part]: Dor 1984; Goren & Dor 1994; Golani &

Bogorodsky 2010.

Pteragogus clarkae Randall 2013: 24, Fig. 17 (Hurghada, Egypt, Red Sea).

Dorsal fin 11 spines, 9 rays; anal fin 3 spines, 9 rays; pectoral fins 13 or 14 (usually 13) rays. Body moderately deep, depth 3–3.2 in SL; HL ~2.6 in SL; head profile straight; dorsal-fin spines progressively longer, last spine 2–2.2 in HL; 1st pelvic-fin ray 3.5–3.8 in SL; caudal-fin length 3–3.3 in SL. Preopercle margin with 14–21 serrae on straight part. GR 12–17. LL scales 23 or 24, +1 greatly enlarged scale at caudal-fin base.

Body yellowish brown, with dark brown blotches on lower sides; small dark brown spots along anterior part of lateral line; scattered small dark brown spots on nape; dark brown dash or pair of small dark spots on side of snout before eye; only traces remain of opercular ocellus; rear margin of preopercle and adjacent band of opercle pale yellowish; dorsal fin pale yellowish with dark brown spot on each of first 2 spinous membranes, 2nd spot usually smaller; irregular black spot at rear dorsal-fin base. Attains ~10.5 cm SL.

DISTRIBUTION WIO: northern Red Sea.

REMARKS Known from seagrass beds, in 2–15 m.

Al-Hussaini (1947) reported on the food habits of specimens identified as *Pteragogus opercularis* from Hurghada, Egypt, collected in 10–15 m, and found the intestine full of the shells of foraminiferans, and small gastropods in a larger specimen.

Pteragogus cryptus Randall 1981

Cryptic wrasse

PLATE 94

Pteragogus cryptus Randall 1981: 83, Pl. 1, Figs. 3–4 (Eilat, Israel,

Gulf of Aqaba, Red Sea); Dor 1984; Field & Field 1998*.

Dorsal fin usually 10 spines (rarely 9), 9 or 10 rays; anal fin 3 spines, 9 rays; pectoral fins 12 or 13 rays. Body depth 2.3–2.6 in SL; head profile straight to nape, then slightly convex; cirrus from near tip of first 4 dorsal-fin spines and adjacent membrane of males elongated as filaments; caudal fin rounded, 3.1–3.2 in SL; pelvic fins not extending beyond anal-fin origin. Preopercle margin serrate. GR 12–17. LL scales 23 or 24.

Colour variable: body usually dark red, reddish brown or olivaceous, scales often with whitish or pale yellow edges; lateral line conspicuous, with small white spots and dashes and dark olive or brown spots; white line or streak often present from front of snout, dorsally through eye, to upper margin of opercle; dorsal and anal fins with irregular, oblique, whitish streaks or lines; caudal fin membranes often dotted with blue, and sometimes rows of blue dashes posteriorly in dorsal and anal fins. Attains 9.5 cm TL.

DISTRIBUTION WIO: Red Sea.

REMARKS Found on coral reefs and adjacent habitats, in 4–67 m. Secretive, usually hiding in soft corals, branching corals or algae. Donaldson (1995) described the courtship and spawning of a closely related, undescribed species from the Pacific, which has usually one fewer gill raker and a smaller maximum size.

Pteragogus flagellifer (Valenciennes 1839)

Cocktail wrasse

PLATE 94

Ctenolabrus flagellifer Valenciennes in Cuv. & Val. 1839: 240 [no locality given].

Duymaeria flagellifera: Smith 1955*, 1957*; Fourmanoir 1957; SFSA No. 796*.

Pteragogus flagellifera: Schultz in Schultz *et al.* 1960; Jones & Kumaran 1980; Lieske & Myers 1994.

Pteragogus flagellifer: Randall 1981, 1995*; Gomon in Fischer & Bianchi 1984; SSF No. 220.52*; Randall *et al.* 1994*; Carpenter *et al.* 1997; Fricke 1999.

Dorsal fin 9 spines, 10–12 rays; anal fin 3 spines, 9 rays; pectoral fins 13 or 14 rays. Body depth 2.5–3.1 in SL, deeper-bodied with growth; head profile straight, at most slightly convex posteriorly on nape; membranes from tips of anterior dorsal-fin spines elongated to filaments, extremely long (to ~½ SL) on first 4 spines in fully mature males; caudal fin strongly rounded, very large in mature males, fin length up to 2.5 in SL; pelvic fins short, at most extending slightly beyond anus. Preopercle margin finely serrate. GR 12–16. LL scales 23 or 24; cheeks scaly to below centre of eyes.

Colour variable: body often olivaceous or yellowish brown, paler ventrally on head, chest and abdomen; lateral line with small dark brown and white spots; body with 3 indistinct pale bars from vertical series of small double or single white spots on scales that extend finely into adjacent dorsal and anal fins; 4th vertical series of single white spots across front of peduncle, ending in small white spot at rear base of dorsal and anal fins; cluster of very small black spots above and behind eye; irregular oblique white band usually present from near eye to chest; large whitish blotch usually behind corner of mouth; midlateral series of 5 large brown blotches often present, 1st on opercle (but not as ocellated black spot as seen on *P. pelycus* and *P. cryptus*); oval bluish black spot on outer part of 1st membrane of dorsal fin. Attains 20 cm TL.



Pteragogus flagellifer, 10 cm SL (Kenya). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific (scattered localities). WIO: Persian/Arabian Gulf, Red Sea, Kenya to South Africa (Aliwal Shoal), Madagascar, Comoros, Aldabra, Seychelles, Mauritius and Lakshadweep; elsewhere to Taiwan, Australia, Great Barrier Reef, New Caledonia and Vanuatu.

REMARKS Usually found in seagrass beds, on mixed rubble, or areas of dense algal growth, in 1.5–20 m. A record from Japan (Masuda *et al.* 1984) is a misidentification of *Pteragogus aurigarius* (Richardson 1845). Parenti & Randall (1998) discovered an earlier name for this species, *Labrus ramentosus* Forskål 1775, and petitioned for its suppression to preserve the established name *P. flagellifer*.

Pteragogus pelycus Randall 1981

Sideburn wrasse

PLATE 95

Cossyphus opercularis Peters 1855: 451 (Mozambique) [objectively invalid; preoccupied by *Cossyphus opercularis* Guichenot 1847].

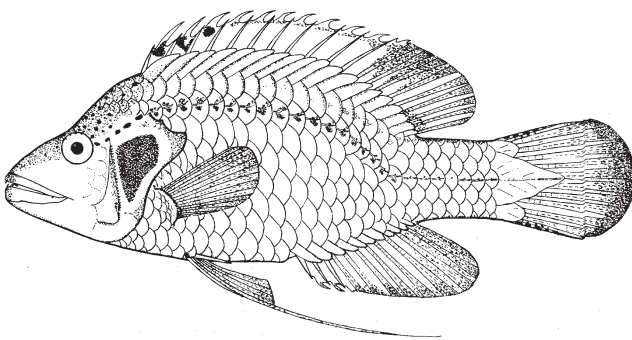
Duymaeria filamentosa (*non* Peters 1855): Günther 1862; Playfair & Günther 1867.

Pteragogus opercularis: Playfair & Günther 1867; Smith 1955*, 1957*; Fourmanoir 1957; Smith & Smith 1963*; SFSA No. 797*.

Pteragogus pelycus Randall 1981: 82, Pl. 1, Figs. 1–2 [replacement name for *Cossyphus opercularis* Peters 1855, a homonym]; SSF No. 220.53*; Randall 2013.

Dorsal fin 11 spines, 9 rays; anal fin 3 spines, 9 rays; pectoral fins usually 13 (rarely 12) rays. Body depth 2.5–3.1 in SL; tips of dorsal-fin spine membranes not filamentous; caudal fin strongly rounded, length 3.4–4 in SL in females, 2.7–2.9 in males; 1st pelvic-fin ray elongated, very long in males (2.3–3 in SL). Preopercle margin with moderate-sized serrae (increasing in number with age, but not as numerous as those of *P. flagellifer* or *P. taeniops* of same body size). GR 12–16. LL scales 24; cheeks scaly to below centre of eyes.

Colour variable: body olivaceous, green, yellowish brown or brownish red; large oval black spot, edged in yellow, on opercle; small black spots on head behind eye, upper interorbital and on nape; small white spots along lateral line (dark brown spots may also be present); black spot, narrowly rimmed in blue, on first 2 or 3 dorsal-fin membranes of adults, broadly edged below in orange in males, which may continue as broken orange band to end of fin; longitudinal whitish band, consisting mainly of adjacent white blotches, from above eye to below lateral line; sometimes lesser whitish stripe on lower side from beneath ventral edge of pectoral fin; eye with 7 short dark lines radiating like spokes in outer part of iris. Attains 15 cm TL.



Pteragogus pelycus, 14 cm TL (South Africa). Source: Smith 1937

DISTRIBUTION WIO: Tanzania (Zanzibar), Mozambique, South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles, Réunion, Mauritius and St Brandon Shoals.

REMARKS Usually found on substrates dominated by seagrass or algae, in 6–28 m. Randall (1981) included specimens from the Red Sea when publishing a replacement name for *Cossyphus opercularis* Peters 1855; however, the Red Sea specimens represent the related species *P. clarkae*.

Pteragogus taeniops Peters 1855

Cheekbar wrasse

PLATE 95

Cossyphus taeniops Peters 1855: 262 (Mozambique).

Pteragogus taeniops: Günther 1862; Playfair & Günther 1867; Peters 1877; Bleeker 1879; Smith 1957; SFA No. 798*; Baissac 1976; SSF No. 220.54*; Fricke 1999.

Dorsal fin 10 spines, 10 rays; anal fin 3 spines, 9 rays; pectoral fins 13 rays. Body depth 2.2–2.5 in SL; spinous dorsal-fin membranes moderately incised, tips not elongated as filaments; 1st pelvic-fin ray elongated as filament, extending well beyond anal-fin origin in males; caudal fin rounded, ~3.3–3.7 in SL in adults. Preopercle margin finely serrate, serrae more numerous

with growth (a 63-mm specimen had 30 serrae, and a 103-mm specimen had 40; serrae in *P. cryptus* and *P. flagellifer* more numerous, and serrae fewer in *P. pelycus*, at a given body size). GR 13 or 14. LL scales 23; cheeks scaly to below centre of eyes.

Body mainly red or brownish red, with series of 8 dark brown blotches or indistinct bars dorsally on head and above lateral line on body, the 1st on interorbital, the 2nd mid-dorsal on nape and 6 below dorsal-fin base (the blotch on nape and the one at rear dorsal-fin base darkest); small blackish spots behind eye; lateral line clearly evident from small pale and blackish spots; pale-edged dusky red bar extending ventrally from eye across head; often narrow dark band across interorbital area and one anteriorly from eye onto snout; oblong black spot on 1st dorsal-fin membrane; no ocellated black spot on opercle. Attains 15 cm TL.



Pteragogus taeniops, 5 cm SL (Comoros). © R Winterbottom, ROM

DISTRIBUTION WIO: Tanzania (Zanzibar), Mozambique, South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles and Mauritius.

REMARKS Usually found on algal-covered substrates.

Pteragogus trispilus Randall 2013

Triplespot wrasse

PLATE 95

Pteragogus pelycus [in part]: Randall 1981; Dor 1984; Goren & Dor 1994; Khalaf & Disi 1997; Kuitert 2002*; Golani & Bogorodsky 2010.
Pteragogus trispilus Randall 2013: 29, Figs. 20–22 (Gulf of Aqaba).

Dorsal fin 11 spines, 9 rays; anal fin 3 spines, 9 rays; pectoral fins 13 (rarely 12) rays. Body depth 2.8–3.0 in SL; HL 2.7 in SL; dorsal profile of head of adult males a slight sinuous curve, concave above eye, nape slightly convex; dorsal profile of adult female straight; eye 4.2–5.4 in HL; 1st dorsal-fin spine 3.3–3.8 in HL; 11th dorsal-fin spine longest, 2–2.2 in HL; membranes of spinous portion of dorsal fin very narrowly incised

posteriorly; filamentous 1st pelvic-fin ray reaching well beyond origin of anal fin, 2.4–3.3 in SL. Straight part of rear margin of preopercle with close-set, spinous serrae that angle slightly dorsally, progressively longer ventrally, except last few a little shorter; number of serrae increasing with growth, from 14 (on 27-mm paratype) to 23 (on 73-mm holotype). GR 13–15. LL scales 24, with 2 on caudal-fin base, last scale greatly enlarged; 2 scales from LL to base of dorsal fin.

Colour in life variable: body brownish to olive, paler ventrally, with many irregular white and brown flecks; opercle with dark green to black ocellus with narrow, greenish border; median and pelvic fins pale greenish with many small white spots on rays; membrane between first 4 dorsal-fin spines of males with black spot at base, mature females with only 2 spots; pectoral fins translucent. Colour in preservative yellowish brown with faint dark spots and dashes along anterior part of lateral line; fins translucent yellowish, with dark brown spots on spinous dorsal fin as above. Attains 7 cm SL.

DISTRIBUTION WIO: Red Sea (Gulf of Suez and Gulf of Aqaba).

REMARKS Lessepsian migrant into Mediterranean; from seagrass beds and other sheltered waters, to 18.5 m.

Pteragogus variabilis Randall 2013

Variable wrasse

PLATE 96

Pteragogus pelycus (non Randall 1981): Fricke 1999; Kuitert 2002*.

Pteragogus variabilis Randall 2013: 34, Figs. 23–27 (Mauritius, Mascarenes).

Dorsal fin 11 spines, 9 rays; anal fin 3 spines, 9 rays; pectoral fins 13 or 14 (usually 13) rays, rays flattened at tips but not branched. Body depth 2.7–3.1 in SL; HL 2.6–2.6 in SL; head profile straight; eyes large, 3.5–4.5 in HL; dorsal-fin spines progressively longer, last spine 2–2.2 in HL; no long filaments at tips of dorsal-fin spines; caudal fin rounded and moderately long, 3.1–3.15 in SL; 1st pelvic-fin ray extending to between 1st and last anal-fin spines, 3.2–4.1 in SL. Preopercle margin serrate on straight part, serrae varying from 13 (on 34-mm specimen) to 25 (on 58-mm specimen). GR 12–15. LL scales 24, last scale on caudal-fin base greatly enlarged; 1 row of scales from behind to below eyes.

Colour in life very variable: body ground colour may be brown, sometimes suffused with orange, red or yellow, or else greenish grey, orange-yellow or red; all colour forms share the following features: opercle of darker colour, often more red, orange or yellow than remainder of head, and with oblique elliptical ocellus; 4 white spots along anterior lateral line,

4th anteriorly on peduncle, with irregular white spots and flecks dorsally from first 3 spots into dorsal fin, and ventrally from all 4 spots; preopercle with broad white rear border, with adjacent white triangular band on opercle; white dots extending down and back from orbit; median and pelvic fins coloured much like adjacent body, but with more small white blotches and dots; dorsal fin with blackish spot on 1st membrane and usually smaller spot on 2nd membrane; about posterior three-quarters of soft-rayed part of fin transparent, except basally (transparent zone may be crossed by brown lines); caudal fin with series of white or transparent spots along dorsal margin and smaller spots along ventral margin. Preserved specimens pale brownish yellow; oblique elliptical ocellus about twice pupil diameter in length on opercle (often damaged, sometimes effaced); short dark brown dash on side of snout anterior to middle of eye; dark dots sometimes faintly visible on nape; fins translucent pale yellowish, dorsal with blackish spot on 1st membrane, and usually 2nd, smaller spot on 2nd membrane; small dark brown spot at rear dorsal-fin base. Attains ~6 cm SL.



Pteragogus variabilis (Mauritius). © JE Randall, Bishop Museum

DISTRIBUTION WIO: Aldabra, Mauritius and St Brandon Shoals.

REMARKS Found to ~71 m deep.

GENUS *Stethojulis* Günther 1862

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12–16 (rarely 12 or 16) rays, including the very short upper ray. Mouth small; no canines except 1 posteriorly on upper jaw; teeth close-set, incisiform, in single series; no molariform pharyngeal teeth. Body depth 2.8–4.5 in SL; dorsal and anal fins low, spines progressively longer, membrane not notched between spines and rays; pectoral-fin bases strongly

oblique; caudal fin slightly rounded. Preopercle margin smooth. GR 19–30, unique in structure (Winterbottom & Burridge-Smith 1987). Lateral line continuous, deflected downward below rear of dorsal fin; LL pored scales 25 or 26, +1 or 2 scales on caudal-fin base; no scaly sheath at base of dorsal and anal fins; head naked; scales on chest at least as large as those on remainder of body.

All species are strong swimmers, propelled by powerful strokes of the pectoral fins; almost constantly in motion and difficult to approach underwater. Their feeding consists of a quick bite of sand or algal-covered rock, with fine sediment emerging from the gill openings and as they swim off the bottom. Stomach content analysis of 3 species revealed a broad spectrum of very small benthic invertebrates (crustaceans, bivalves, gastropods, polychaetes, sipunculids and foraminifera; the shells of the small molluscs were intact). All species sexually dichromatic: initial phase is either male or female, and both sexes are the same colour; terminal phase is only male, and typically more colourful. Initial-phase fish spawn in aggregations; the terminal male spawns individually with females in a harem. Ten species (Randall 2000), in Indo-Pacific (with 1 to tropical eastern Pacific), 4 in WIO.

KEY TO SPECIES

- 1a Pectoral fins 12 or 13 rays 2
 1b Pectoral fins 14 or 15 rays 3
- 2a GR 20–24. Initial phase olivaceous to yellowish brown on dorsal half of head and body, ventral half white with rows of blackish dots, the 2 zones usually separated by blackish stripe. Terminal male green to yellowish green with 2 blue lines on body, one from above eye along dorsal-fin base, ending dorsally on caudal-fin base, other midlateral on posterior half of body; 2 blue lines running back from eye, and one back from dorsal edge of eye; black spot at upper pectoral-fin base with blue line above and below, and orange-red spot above that *S. interrupta*
- 2b GR 25–28. Initial phase grey-brown on dorsal two-thirds of body, yellowish posteriorly, with longitudinal rows of very small whitish spots, continuing more finely onto head; lower third of body white with rows of black dots, smaller ventrally, zones separated by orange stripe. Terminal male green on body and nape, grading to yellow on head below eye and prepectoral region, with 4 longitudinal, black-edged blue lines, 3rd from snout ending below pectoral fins *S. trilineata*

Continued ...

KEY TO SPECIES

- 3a Pectoral fins usually 14 rays. Initial phase greenish to greyish brown on dorsal half of body, finely dotted in pale blue; 2 small, pale-edged, blackish spots usually present midlaterally at end of peduncle; orange-red spot above pectoral-fin base. Terminal male with 3 blue lines on body, one from front of snout through upper part of eye and along dorsal-fin base (may be broken into dots), one from maxilla, below eye, above pectoral-fin base, to near middle of caudal fin, and one from lower pectoral-fin base, parallel to 2nd; curved blue line from chin to lower edge of opercle, continuing on front margin of chest, preceded by black, to pectoral-fin base; pectoral-fin base orange-yellow *S. albovittata*
- 3b Pectoral fins usually 15 rays. Initial phase with small pale-edged blackish spot above midlateral line at caudal-fin base; upper half of body yellowish grey, lower half paler with dark-edged, longitudinal white lines; small dark spot at rear dorsal-fin base. Terminal male yellowish to greyish brown on dorsal half of body, abruptly white ventrally, with dark-edged blue line from front of snout through upper part of eye, encircling small black spot dorsally on opercular flap, and continuing to middle of caudal fin; dark-edged white line from upper lip to above pectoral-fin base; bright red area anterior to oblique pectoral-fin base, continuing faintly below white line on opercle; very small black spot on caudal-fin base above midlateral blue line *S. strigiventer*

Stethojulis albovittata (Bonnaterre 1788)

Bluelined wrasse

PLATE 96

Labrus albovittatus Bonnaterre (ex Koelreuter) 1788: 108, Pl. 98, Fig. 399 [no locality given].

Labrus koelreuteri Walbaum 1792: 262 [no locality given].

Stethojulis albovittata: Günther 1861 [in part], 1862; Playfair & Günther 1867; Bleeker 1874; Smith 1955*, 1957; Smith & Smith 1963*; SFSA No. 802*; Harmelin-Vivien 1976; Jones & Kumaran 1980; Randall 1983*, 1992, 1995*, 2000; Gomon in Fischer & Bianchi 1984; SSF No. 220.55*; Winterbottom *et al.* 1989*; Field & Field 1998*; Fricke 1999; Lieske & Myers 2004.

Julis balteatus (non Quoy & Gaimard 1824): Guichenot 1863.

Julis axillaris (non Quoy & Gaimard 1824): Guichenot 1863.

Stethojulis axillaris (non Quoy & Gaimard 1824): Playfair & Günther 1867; Klunzinger 1871; Bleeker 1874; Smith 1957; Smith & Smith 1963*; SFSA No. 800*; Jones & Kumaran 1980.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 14 or 15 (usually 14) rays. Body depth 3–3.5 in SL; pelvic fins short; caudal fin slightly rounded. GR 25–30 (usually 28). LL scales 25; suborbital pores 10–15.

Initial phase (male or female) greenish to grey-brown, finely flecked with pale dots on upper half of body, whitish below, the 2 areas sometimes separated by narrow reddish zone; 2 small blue-edged black spots midlaterally on caudal-fin base; elongate bright orange-red spot above pectoral-fin base. Terminal male dark green to olivaceous dorsally, shading to pale greyish blue or pale green ventrally, with 4 narrow blue stripes, 1st extending from top of snout through upper edge of eye and continuing along back to end dorsally on peduncle; 2nd stripe from behind eye to above pectoral fin; 3rd from corner of mouth through lower edge of eye, above pectoral-fin base, ending in middle of caudal fin; 4th from chin across cheek and along lower edge of gill opening, curved over pectoral-fin base and continuing to ventral caudal-fin base; pectoral-fin base, axil and adjacent area bright yellow. Attains 13 cm TL.

DISTRIBUTION Indian Ocean. WIO: Red Sea to South Africa (Transkei region), Seychelles, Réunion, Mauritius, Chagos and Lakshadweep; elsewhere to Andaman Sea and Indonesia (western Sumatra, southern Java and Bali).

REMARKS Found on shallow reefs, reef flats and large tidepools, to at least 21 m deep (most collections from <2 m). Harmelin-Vivien (1979) examined the stomach contents of 45 specimens from Madagascar and found the dominant prey to be benthic copepods, tanaids and amphipods, followed by polychaetes. A member of a complex of 3 allopatric species: the others, *S. balteata* (Quoy & Gaimard 1824) from Hawaii and *S. bandanensis* (Bleeker 1851), are wide-ranging in the eastern Indian Ocean and throughout the tropical and subtropical Pacific, including islands of the eastern Pacific.

Stethojulis interrupta (Bleeker 1851)

Cutribbon wrasse

PLATE 96

Labrus chlorocephalus Bloch & Schneider 1801: 254 (Indian Ocean)
[*nomen oblitum*: Randall & Parenti 1999].

Julis (Halichoeres) interruptus Bleeker 1851: 252 (Banda Is., Moluccas, Indonesia).

Stethojulis interrupta: Günther 1861; Playfair & Günther 1867; Barnard 1927; Smith 1955*, 1957; SFSA No. 803*; Randall 1983*, 1995*, 2000; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.56*; De Bruin *et al.* 1994; Field & Field 1998*; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Stethojulis kallosoma Bleeker 1862: 290 [unjustified emendation of *Julis (Halichoeres) kallosoma*]; Playfair & Günther 1867.

Stethojulis phekadopleura (*non* Bleeker 1849): SFSA No 804*.

Stethojulis axillaris (*non* Quoy & Gaimard 1824): Smith & Smith 1963*.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 or 13 (rarely 12) rays. Body depth 3.6–4.1 in SL. GR 20–24. LL scales 25; suborbital pores 6–9.

Initial phase grey-brown to olivaceous, sometimes tinged with yellow or pinkish yellow, often with pattern of fine pale blue dots, grading to white ventrally; scales above anal fin and dorsally on abdomen with small grey to black spot; pale-edged longitudinal black line above pectoral-fin base, continuing beneath pectoral fins and to lower edge of eyes (line on head may be yellow or blue); small red area often present dorsoanterior to pectoral-fin base. Terminal male with upper half of head and body yellowish grey, green, or olivaceous, lower half abruptly white to pale green, zones separated by dark-edged blue line, usually interrupted on anterior half of body; bright orange-red to yellow spot above and in front of pectoral-fin base; dark-edged blue line from above eye, along dorsal-fin base, ending dorsally on peduncle or caudal-fin base; second dark-edged blue line from dorsally on snout, through upper part of eye, curved above black spot on opercular flap, and ending dorsal to bright pectoral spot; dorsal fin dull orange to reddish; remaining fins with grey rays and translucent membranes; juveniles with 2 dark stripes, one mid-dorsal, the other midlateral. Attains 13 cm TL.



Stethojulis interrupta, 5 cm TL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea to South Africa (Algoa Bay), and sight records (by JE Randall) at Seychelles, Mauritius and St Brandon Shoals; elsewhere to Indonesia, Solomon Is., Australia and Lord Howe I.

REMARKS Most specimens collected in <18 m, except one taken in a trawl from 31 m off Somalia. *Julis kallosoma* Bleeker 1852 is a synonym based on the initial phase (Randall & Kay 1974). *Labrus chlorocephalus* Bloch & Schneider was discovered as an earlier name for this species; Parenti & Randall (2000) advised that it be suppressed in order to conserve the established name *S. interrupta*.

Stethojulis strigiventer (Bennett 1833)

Stripebelly wrasse

PLATES 96 & 97

Julis strigiventer Bennett 1833: 184 (Mauritius, Mascarenes).

Stethojulis strigiventer: Playfair & Günther 1867; Bleeker 1874; Day 1877; Barnard 1927; Smith 1955*; Smith & Smith 1963*; SFSA No. 801*; Harmelin-Vivien 1976; Jones & Kumaran 1980; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.57*; Winterbottom *et al.* 1989*; Randall 1992, 2000; Fricke 1999; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

Stethojulis renardi: Playfair & Günther 1867; SFSA No. 799*.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins usually 15 (rarely 14 or 16) rays. Body depth 3.3–3.9 in SL. GR 24–30. LL scales 25; suborbital pores 8–15.

Initial phase with upper half of body greenish to brownish grey, lower half with dark-edged, longitudinal white lines, uppermost at ventral edge of pectoral-fin base largest and brightest; dark-edged, bluish white line from upper lip across head just below eye to pectoral-fin base; much narrower parallel line through upper part of eye; small blue-edged dark spot at rear dorsal-fin base; smaller spot on caudal-fin base. Terminal male yellowish to greyish brown on dorsal half of body, abruptly white ventrally, with dark-edged bluish white line from front of snout through upper part of eye, encircling small black spot dorsally on opercular flap, and continuing to middle of caudal fin; dark-edged white line from upper lip to above pectoral-fin base; narrow bright red area anterior to pectoral-fin base, continuing faintly below white line on opercle; small, pale-edged, blackish spot above midlateral line on caudal-fin base. Juveniles similar in colour to initial phase, some with narrow white stripe from front of snout to upper caudal-fin base, and may have 2nd narrower and more irregular stripe from corner of mouth to lower caudal-fin base; small dark spot at upper caudal-fin base, one at rear dorsal-fin base, and one at rear base of anal fin, this lost at 38–59 mm SL. Attains 12 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Transkei region), Madagascar, Aldabra, Seychelles, Mascarenes, Maldives, Chagos and Lakshadweep; not known from Red Sea, Oman, Persian/Arabian Gulf and northern Arabian Sea; elsewhere to Andaman Sea, Indonesia, Japan (Honshu I.), Marshall Is., Australia and Tuamotu Is.

REMARKS The most wide-ranging species of the genus; inhabits shallow waters, often on seagrass beds, algal flats or sand bottom, and usually within or near well-developed coral reefs. Harmelin-Vivien (1979) collected specimens from Madagascar for stomach-content analysis, and found benthic copepods (primarily harpacticoids) as the principal prey, but also foraminiferans, ostracods, tanaids and amphipods.

Stethojulis trilineata (Bloch & Schneider 1801)

Three-ribbon wrasse

PLATE 97

Labrus trilineatus Bloch & Schneider 1801: 253 (Coringa, Coromandel coast, India).

Julis sebanus Valenciennes *in* Cuv. & Val. 1839: 474 [no locality given].

Halichoeres sebae Kner 1860: 12, Pl. 1, Fig. 9 [no locality given].

Stethojulis trilineata: Günther 1861; Jones & Kumaran 1980; Randall 1992*, 2000.

Stethojulis phekadopleura: Jones & Kumaran 1980.

Dorsal fin 9 spines, 11 rays; anal fin 3 spines, 11 rays; pectoral fins 12 or 13 (rarely 12) rays. Body moderately deep, 2.7–3.2 in SL. Total GR 25–28 (usually 27). LL scales 25; suborbital pores 8–12.

Initial phase grey-brown on upper two-thirds of body, yellowish posteriorly, with longitudinal rows of very small whitish to pale yellowish spots, continuing progressively smaller onto head; lower third of body white with rows of black dots, smaller ventrally, zones separated by orange stripe (may be pinkish orange or yellow) continuing anteriorly to chin; mainly grey on head; lips white, followed by white stripe below eye, through pectoral-fin base, narrowing posteriorly; small blackish spot usually visible at midcaudal-fin base. Terminal male green on nape and upper two-thirds of body; head and chest to level of chin orange-yellow, suffused with green dorsally; ventral part of head and body pale blue; 4 longitudinal, black-edged, blue lines, one from dorsally on head, above eye, along dorsal-fin base; 2nd from snout through upper edge of eye, ending in dorsal third of caudal fin; 3rd from upper lip, passing below eye, and ending beneath pectoral fin; 4th from chin to lower third of caudal fin; lips pink; dorsal fin orange-red; caudal fin orange; pelvic and anal fins pale blue. Attains 15 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives, Lakshadweep and India; elsewhere to Andaman Sea, Indonesia, southern Japan, Australia, Caroline Is. and Samoa.

REMARKS Usually found in outer-reef areas or clear lagoons.

GENUS *Suezichthys* Smith 1958

Dorsal fin 9 spines, 11 or 12 rays (rarely 13); anal fin 3 spines, 10 rays; pectoral fins rounded to pointed, with 12 or 13 rays; pelvic fins 1 spine, 5 rays; caudal fin rounded to truncate. Dorsal- and anal-fin spines and rays progressively longer, spines pungent. Body elongate, depth at dorsal-fin origin 3.2–5.3 in SL. Mouth terminal and small, maxilla extending to or slightly beyond vertical through anterior nostril; lips

moderately fleshy, upper lip with longitudinal plicae. Upper jaw with pair of large recurved canines at front, followed by 10–14 progressively smaller teeth, an inner row of 4–7 small canines behind anteriormost teeth, and 1 enlarged canine (rarely 2) posteriorly; lower jaw with 1 or 2 canines at front, followed by inner row of 3 or 4 smaller canines; pharyngeal dentition well-developed. Lateral line complete, abruptly deflected downward below rear end of dorsal fin to midlateral on peduncle; LL pored scales 25 or 26 (rarely 27); scale rows between lateral line and dorsal-fin (plus small basal sheath scale) $1\frac{1}{2}$ – $2\frac{1}{2}$ (species with $2\frac{1}{2}$ are often considered genus *Nelabrichthys* Russell 1983; a split supported by genetic divergence); low scaly sheath at base of dorsal and anal fins present or absent; predorsal scales 3–6; cheek scale rows behind eye 1–3, with several rows below eye extending forward to beneath middle of orbit; opercle with large scales posteriorly; body scales large. GR 15–20. Vertebrae 25. Apparently 14 species in tropical to temperate Indo-Pacific, probably 5 in WIO.

KEY TO SPECIES

- 1a Scale rows between lateral line and dorsal-fin base $1\frac{1}{2}$; no scaly sheath at base of dorsal and anal fins; initial phase whitish with midlateral dark band from front of snout through eye on sides of body below lateral line, ending in black spot at caudal-fin base, no rear dorsal-fin spot; terminal male with dark upper body band (often segmented); no prominent cheek lines; dorsal half of caudal fin with oblique dark band *S. caudavittatus*
- 1b Scale rows above lateral line $2\frac{1}{2}$; low scaly sheath at base of dorsal and anal fins; initial phase with 3 dark spots (1st dorsal-fin membrane, posterior dorsal fin and upper caudal peduncle) and yellowish or reddish body, uniform or barred, with rows of pearly spots on lateral scales; terminal phase with prominent blue striping and reticulations, especially curved blue lines under eye 2
- 2a Terminal male with blue stripes and reticulations mainly on head and upper body *S. russelli*
- 2b Terminal male with blue striping prominent, but reduced or absent along midlateral body; caudal fin with 4 vertical blue lines *S. ornatus*

Suezichthys caudavittatus (Steindachner 1898)

Tailband wrasse

PLATE 97

Labrichthys caudavittatus Steindachner 1898: 199 (Suez fish market, Gulf of Suez, Red Sea).

Suezia caudovittatus: Smith 1957.

Suezichthys caudovittatus: Smith 1958; Dor 1984; Russell 1985, 1995*; Carpenter *et al.* 1997.

Suezichthys gracilis (*non* Steindachner & Döderlein 1887): Randall *et al.* 1994*; Carpenter *et al.* 1997.

Suezichthys caudavittatus: Parenti & Randall 2000; Manilo & Bogorodsky 2003; Russell & Westneat 2013.

Dorsal fin 9 spines, 11 rays; no scaly sheath at base of dorsal and anal fins; scale rows above lateral line $1\frac{1}{2}$.

Initial phase dark above, pale below, a dark brownish stripe from front of snout through eye and along sides slightly below lateral line (stripe often partially broken into segments), usually ending in elliptical dark to black spot at caudal-fin base; additional parallel dark band from above eye along dorsal-fin base; fins unmarked and no rear dorsal-fin spot, but larger IP developing black spot on 1st dorsal-fin membrane. Terminal male with lower two-thirds of head and body mostly pale; brownish upper body band from snout to caudal-fin base and sometimes with dark spot at caudal end, band on head with dark margins; dorsal fin with black spot on first 2 dorsal-fin membranes, and a dark submarginal band below long marginal yellow band along the fin; dorsal half of caudal fin with oblique dark band. Attains ~12 cm TL.



Suezichthys caudavittatus, 7 cm SL (Gulf of Suez). © SV Bogorodsky

DISTRIBUTION WIO: northern Red Sea, Somalia and Persian/Arabian Gulf to Mozambique and South Africa (KwaZulu-Natal).

REMARKS Described from five terminal-male specimens obtained from the Suez fish market. Juveniles found at 25 m on open sand near reefs, adults deeper. Trawled off Mozambique in 64–69 m and DNA-identified larvae in KwaZulu-Natal, South Africa. DNA lineage from South Africa and Saudi Arabia very close to Western Australian *S. soelae*.

Suezichthys ornatus (Carmichael 1819)

Southern ornate wrasse

PLATE 98

Labrus ornatus Carmichael 1819: 502, Pl. 27 (Tristan da Cunha).

Labrichthys lantzii Sauvage 1875: 988 (Saint-Paul I.).

Labrichthys isleanus Sauvage 1875: 988 (Saint-Paul I.).

Pseudolabrus isleanus: Gill 1892.

Pseudolabrus lantzii: Gill 1892.

Labrichthys ornatus: Regan 1913.

Labrichthys tetrica (non Richardson 1840): Angot 1951.

Nelabrichthys ornatus: Russell 1983; Collette & Parin 1991; Parenti & Randall 2000.

Suezichthys ornatus: Russell & Westneat 2013*.

Dorsal fin 9 spines, 12 (rarely 13) rays; scaly sheath at base of dorsal and anal fins; scale rows above lateral line $2\frac{1}{2}$.

Initial phase head and body yellowish to reddish, with rows of pinkish spots on lateral scales; prominent black spot on 1st dorsal-fin membrane, also near rear of fin, and on upper caudal-fin base. Terminal male with head yellowish, body greenish, and lavender to blue stripes along head and body, fading rearward, prominent blue curved lines below eye; caudal fin barred with irregular vertical thin blue lines. Attains 15 cm TL.

DISTRIBUTION WIO: Walters Shoals; elsewhere, Tristan da Cunha, in southern Atlantic, Saint Paul I. and seamounts of southern Indian Ocean.

REMARKS Described from Tristan da Cunha where found on shallow reefs as well as on deep slopes. Collette & Parin (1991) found them in trawls on Walters Shoals at 35–48 m. The mtDNA lineage is several percent different from the South African *S. aff. ornatus*, which has a more colourful IP (Plate 97). Interestingly, *S. aff. ornatus* is genetically closer to the New Zealand *S. ornatus*. An additional, more distant, mtDNA lineage is present in South Africa based on a larval specimen – it may represent the presently unrecognised species *PlatyGLOSSUS robinsoni* Gilchrist & Thompson 1914, described from a unique holotype from KwaZulu-Natal.

Suezichthys russelli Randall 1981

Russell's wrasse

PLATE 98

?*PlatyGLOSSUS robinsoni* Gilchrist & Thompson 1914: 86 (KwaZulu-Natal, South Africa).

?*Halichoeres robinsoni*: SFSA No. 734*.

Suezichthys tripunctatus: (non Randall & Kotthaus 1977) [in part].

Suezichthys russelli Randall 1981: 90, Pl. 2, Fig. 5 (Ras Abu Galum, Sinai Peninsula, Red Sea); Dor 1984; Russell 1985; Russell & Westneat 2013.

Dorsal fin 9 spines, 11 rays; scaly sheath at base of dorsal and anal fins; scales above lateral line $2\frac{1}{2}$.

Initial phase head and body yellowish to reddish with rows of pinkish spots on lateral scales; irregular black spot on upper caudal-fin base, prominent black spot on 1st dorsal-fin membrane and ocellated black spot at rear of dorsal fin. Terminal male with head yellowish, body greenish with lavender stripes on head behind eye, in curved lines on snout from eye to jaw, and body with pinkish bars (South African populations with red-barred IP and pinkish-barred TP with blue and lavender stripes behind eye). Attains ~9 cm TL.

DISTRIBUTION WIO: northern Red Sea, Somalia and Kenya, and a similar population in KwaZulu-Natal, South Africa.

REMARKS The holotype and paratype were speared at over 50 m depth at the base of a steep drop-off, in the Gulf of Aqaba, off Sinai; paratypes from Somalia and Kenya were taken by trawl from 70–130 m. The latter two collections were included (in error) as paratypes of the Hawaiian *Suezichthys tripunctatus*. *Suezichthys russelli* is the NWIO representative of the *S. ornatus/arquatus/notatus* species-complex.

GENUS *Thalassoma* Swainson 1839

Dorsal fin continuous, with 9 spines, 12–14 (usually 13) rays; anal fin 3 spines, 10–13 (usually 11) rays; caudal fin 14 principal rays (12 branched); pectoral fins 14–17 rays. Mouth terminal, relatively small, maxilla not extending to vertical at front edge of orbit. Pair of strong canines at front of jaws, followed by row of 9–14 progressively smaller conical teeth; no canine at corners of mouth in upper jaw; pharyngeal dentition well-developed. Body depth 2.9–4.2 in SL; head relatively small, HL 3–4 in SL; caudal fin slightly rounded to double emarginate or lunate; pelvic fins short, not extending to anus. Lateral line complete, abruptly bent downward below rear part of dorsal fin to straight on peduncle; LL pored scales 25–29; 3 or 4 scales between lateral line and dorsal-fin origin; scales on chest distinctly smaller than those on body; head naked except for patch of small scales dorsally on opercle in most species; no scaly sheath at base of dorsal and anal fins. The species are very similar in morphology and some are distinguished principally by colour. Twenty-eight species, 6 in Atlantic, 5 in eastern Pacific, and the remainder in Indo-Pacific; 12 species in WIO.

KEY TO SPECIES

- 1a No scales dorsally on opercle; body slender, depth 3.8–4.2 in SL; snout short and bluntly rounded, 4–4.6 in HL of adults. Initial phase pale green dorsally, white ventrally, with broad black stripe from snout through eye to caudal-fin base, and 2nd narrower black stripe from interorbital along dorsal-fin base. Terminal male reddish with vertical green lines and broad yellow bar dorsoanteriorly, enclosing pectoral-fin base; head green, grading to blue ventrally and on chest, with 2 parallel oblique golden lines, one behind eye and one from corner of mouth; attains <16 cm TL *T. amblycephalum*
- 1b Small patch of scales dorsally on opercle; body not slender as adult, depth 2.9–4 in SL; snout 2.5–3.5 in HL of adults; colour not as above; maximum size >16 cm TL 2
- 2a Body depth of adults 2.9–3.2 in SL; both colour phases green, with 6 oblique wedge-shaped black bars, progressively shorter posteriorly, 1st beneath pectoral fins to abdomen, last saddle-like spot on peduncle, and broad pink bands on head, most radiating from eye; terminal male also with midlateral pink stripe *T. hardwicke*
- 2b Body depth of adults >3 in SL (except *T. purpureum*); colour not as above 3
- 3a Initial phase yellowish green, with numerous vertical black lines; pale yellow bar below pectoral fins from front of dorsal fin, often followed by series of 6 short pale yellowish bars dorsally on body, with shorter faint bar between each pair; head blue-green with narrow curved green bands behind eyes, on cheeks and chest; black spot anteriorly on dorsal fin; caudal fin yellow with orangish lobes *T. hebraicum*
- 3b Colour not as above 4
- 4a Pectoral fins usually 15 rays 5
- 4b Pectoral fins usually 16 rays 6
- 5a Terminal male dusky salmon-pink, with 2 longitudinal series of blue-green bars aligned to vertical scale rows, one on upper side at level of dorsal end of gill opening, other in line with pectoral-fin base; 4 blue-green bars of upper series with extension to dorsal-fin base; chest mainly blue, continuing as stripe across ventral part of abdomen; head blue-green to blue ventrally with 4 short salmon-pink bands above eye, long irregular band from snout through lower part of eye, across opercle, and one on lower cheek behind salmon-pink spot at corner of mouth; large dark purplish blue area covering most of dorsal part of opercle, and another over most of caudal fin, fin margins green. Juvenile (4.5 cm TL) pale blue, with 2 irregular black stripes, one dorsal, other midlateral; orange line along lower side at level of pectoral-fin base containing 6 long blackish dashes; bluish black spot covering most of 2nd dorsal-fin membrane, rimmed in front of orange-red; GR 15–20 *T. loxum*
- 5b Colour not as above; GR 17–25 6
- 6a Initial phase white, with blackish bar on nape and head behind eyes, followed by 6 irregular, broad, blackish bars on body (in which scales are evident from a vertical black streak), that reach progressively farther ventrally; bars separated mainly dorsally by irregular white ground colour, those below dorsal fin extending basally into fin. Terminal male with extension of black bar on nape to below basal part of pectoral fin, interrupted by yellow streak above opercular flap; 2nd broad oblique black bar from 4th–7th dorsal-fin spines extending below outer 3rd of pectoral fin, 3rd broad oblique black bar from soft-rayed dorsal fin to posterior half of soft-rayed part of anal fin, expanding distally in fin; black bar across caudal-fin base, continuing narrowly along upper and lower margins *T. janseni*
- 6b Colour not as above 7
- 7a Initial phase green, with vertical pink lines, grading to blue ventrally; head green with irregular pink bands radiating from eye; large black spot at midcaudal-fin base (ocellus at mid-dorsal-fin base of juveniles may also be present on small initial-phase fish). Terminal male with suffusion of blue over head and anterior body, masking pink bands; pectoral fins blue with large magenta central area; caudal fin with bright yellow posterior crescent *T. lunare*
- 7b Colour not as above 8
- 8a Initial phase green, with vertical broken magenta lines on body; head dusky green dorsally, pale green ventrally, with magenta band on snout and large magenta area over postorbital part of head, except for green margin on opercular flap; large circular pink mark below eye. Terminal male blue on lower 60% of body, black on upper 40%, extending into large yellow area on peduncle; head black dorsally, enclosing blue lips, eye, and extending into large yellow area on nape; cheek and lower opercle pink and yellow with blue band forming irregular C-shape; dorsal and anal fins of both phases blue with pink longitudinal band; black spot centred on 2nd dorsal-fin spine *T. genivittatum*
- 8b Colour not as above 9
- 9a Initial phase yellow to yellowish green, with vertical magenta lines; head and anterior body above pectoral-fin base yellow with 5 curved deep pink bands (1 dorsal, 1 on side of snout, 2 curved from behind eye to above pectoral-fin base, and 2 on cheek); median fins yellowish green, dorsal and anal with pink band near base, caudal with pink band in each lobe. Terminal male green, with vertical magenta lines, becoming blue with purple vertical lines in front of zone beneath pectoral fin; head pink, with suffusion of purple dorsally, and narrow blue-edged green bands (3 behind eye, 2 in front of eye, joining broad median green zone on chin, snout, and continuing to nape, and 2 on cheek that join anteriorly); pectoral fins bright yellow with broad outer deep blue border *T. lutescens*
- 9b Colour not as above 10

Continued...

KEY TO SPECIES

- 10a Initial phase pale green dorsally, pale green to white ventrally, with irregular, orange-pink, midlateral stripe almost dividing the 2 colours; pale violet stripe from nape along back and adjacent dorsal-fin base, ending dorsally on peduncle; 19 narrow magenta bars linking dorsal and midlateral stripes; pink stripe extending back from lower pectoral-fin base across abdomen and fading on lower side above anal fin; head yellowish green with pink bands (2 above eye, 1 before and behind eye, and 2 progressively more curved below eye). Terminal male with dorsal stripe and bars purplish blue, midlateral stripe deep orange, lower stripe indistinct pale blue; pink bands on head dark magenta *T. rueppellii*
- 10b Colour not as above 11
- 11a Caudal fin of adults slightly emarginate. Initial phase green or greenish yellow, with 2 irregular deep pink stripes on upper side, linked by narrow bars of same colour; head deep pink with 4 narrow green bands extending outward from eye, and narrow, semicircular green band on cheek, convex upper end almost touching ventral edge of eye; oblique deep pink band on chest, followed by shorter parallel one anteriorly on abdomen; caudal fin green with semicircular translucent orange area posteriorly in fin, each lobe with deep pink band. Terminal male with similar pattern, pink markings suffused with purple *T. quinquevittatum*
- 11b Caudal fin of adults truncate; colour not as above 12

- 12a GR 20–25 (usually 23). Initial phase green, with 3 pink stripes on body overlaid by 6 squarish dark blotches and vertical series of pink lines containing spindle-shaped dark brown spots; head with irregular bands (dark red dorsally, pink ventrally), one on snout forming diagnostic V- or Y-shape. Terminal male blue-green, with 2 irregular pink stripes on sides narrowing posteriorly; irregular magenta to violet band dorsally on body continuous with irregular pink band dorsally on head ending in eye; large irregular pink band claw-shaped, extending ventroposteriorly from eye, and large diagnostic V-shaped pink spot on snout *T. purpureum*
- 12b GR 17–24 (usually 20). Initial phase very similar to that of *T. purpureum*, with irregular C- or G-shaped pink mark on snout. Terminal male red (may be suffused with purple dorsally), grading to orange on abdomen and chest, with 2 longitudinal series of vertically elongate green rectangles on side of body, 4 of which continue narrowly to dorsal-fin base; head orange, sometimes heavily overlaid dorsally with green or purple *T. trilobatum*

Thalassoma amblycephalum (Bleeker 1856)

Twotone wrasse

PLATE 98

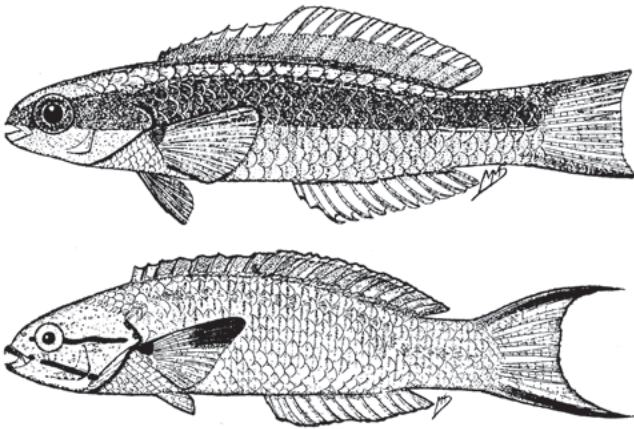
Julis (Julis) amblycephalus Bleeker 1856: 83 (Java, Indonesia); Bleeker 1862; Günther 1862; Day 1877.

Thalassoma melanochir: Fowler 1904; Smith 1957; Smith & Smith 1963*; SFSA No. 780a*.

Thalassoma amblycephalus: Fowler & Bean 1928; Smith 1957; Smith & Smith 1963*; SFSA No. 569*, No. 782a*; Harmelin-Vivien 1976; Jones & Kumaran 1980; Gomon *in* Fischer & Bianchi 1984; SSF No. 220.58*; Winterbottom *et al.* 1989*; Randall 1992*; Fricke 1999; Heemstra *et al.* 2004; Heemstra & Heemstra 2004.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 15 rays. Body slender, depth 3.8–4.2 in SL; snout short, 4–4.6 in HL in adults; caudal fin truncate to slightly emarginate, becoming lunate in large males. GR 16–19. LL scales 26 or 27.

Initial phase pale yellowish green dorsally, white ventrally, with broad black stripe from snout through eye and across body to caudal-fin base, part on body consisting of numerous, close-set, vertical black lines; 2nd narrower black stripe from interorbital along dorsal-fin base; upper and lower margins of caudal fin with broad orange band that narrows posteriorly. Terminal male reddish, with vertical green lines and broad yellow bar dorsoanteriorly, enclosing pectoral-fin base; head green, grading to blue ventrally and on chest, with 2 parallel oblique golden lines, one extending back from eye across opercle, 2nd from corner of mouth across cheek to margin of opercle; dorsal fin with broad middle orange band; base and lobes of caudal fin orange to magenta enclosing a hemispherical whitish posterior zone; pectoral fins yellow, broadly tipped with deep blue, with triangular black spot at upper base. Attains 16 cm TL.



Thalassoma amblycephalum, 8 cm TL, IP (top); 10 cm TL, TP (bottom) (both Mozambique). Source: Smith 1956

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Transkei region), Madagascar, Comoros, Seychelles, Mascarenes, Chagos, Maldives, Lakshadweep, India and Sri Lanka; elsewhere to Andaman Is., Indonesia, southern Japan, Australia, Lord Howe I., northern New Zealand, Line Is. and Tuamotu Is.

REMARKS Usually found in aggregations feeding on zooplankton over shallow reefs. Initial-phase fish often seen group spawning.

Thalassoma genivittatum (Valenciennes 1839)

Cheekmark wrasse PLATES 98 & 99

Julis genivittatus Valenciennes in Cuv. & Val. 1839: 416 (Mauritius, Mascarenes).

Julis commersoni Valenciennes in Cuv. & Val. 1839: 418 (Madagascar; Mauritius, Mascarenes).

Julis matthaei Valenciennes in Cuv. & Val. 1839: 419 (Mauritius, Mascarenes).

Julis bicolor Günther 1862: 184, 508 [no locality given].

Thalassoma commersoni: Barnard 1927; Smith 1957; SFSA No. 781*; Allen & Steene 1994*.

Thalassoma lunare (*non* Linnaeus 1758): Baissac 1953; Fourmanoir & Guézé 1961; Harmelin-Vivien 1976.

Thalassoma genivittatum: SSF No. 220.59*; Randall & Van Egmond 1994; Heemstra *et al.* 2004.

Thalassoma sp.: Allen & Steene 1987*.

Thalassoma mascarenium Fricke 1999: 437, Figs. 6a, 7a (Réunion, Mascarenes).

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 16 rays. Body depth 3.2–3.8 in SL; snout length 2.9–3.5 in HL in adults; caudal fin truncate or with lobes slightly produced in initial phase, lunate in terminal male. GR 19–22. LL scales 25.

Initial phase dusky green dorsally, shading to pale green on lower side and lavender-pink ventrally on abdomen, with irregular vertical magenta lines following scale rows; chest and peduncle often yellow; head dark green dorsally, pale green to yellowish green ventrally, with magenta band on side of snout and broad magenta area covering most of postorbital part of head except for oblique green band on margin of opercular flap; large, irregular, circular pink mark on cheek below eye; lips pale blue; dorsal fin green with broad middle magenta band; anal fin green with basal magenta band; caudal fin green, blackish basally, with magenta band in each lobe. Terminal male blue on lower three-fifths of body, black on upper two-fifths, extending into large yellow area on peduncle; head black dorsally, including blue lips, eye, and extending into large yellow area on nape; cheek and lower opercle pink and yellow with blue band forming irregular C-shape; dorsal and anal fins of both phases blue with pink longitudinal band; black spot centred on 2nd dorsal-fin spine with broad, blackish band covering entire back, shading to yellow anterior to base of 4th spine and onto nape; caudal fin mainly yellow except where dorsal black band extends into middle portion; ventral half of body blue-green; upper part faintly showing pale red vertical lines on scales; head with same basic pattern as initial phase but more blackish dorsally and with blue-green on edges of cheek. Attains 20 cm TL.



Thalassoma genivittatum, 8 cm SL, IP (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: South Africa (Sodwana Bay; Park Rynie), Madagascar, Seychelles and Mascarenes.

REMARKS Common in Mauritius; found on coral reefs and adjacent habitats, including large tidepools, to ~10 m deep. One of a species-complex that includes *T. lutescens*, *T. duperrey* (Quoy & Gaimard 1824) from Hawaii, and *T. grammaticum* Gilbert 1890 from the eastern Pacific.

Thalassoma hardwicke (Bennett 1830)

Sixbar wrasse PLATE 99

Labrus quindecimaculeatus Lacepède 1801: 432, 480, Pl. 25, Fig. 1 (Gulf of India) [*nomen dubium*].

Sparus hardwicke Bennett 1830: no page number, Pl. 12 (Sri Lanka).

Julis dorsalis Quoy & Gaimard 1834: 713, Pl. 15, Fig. 5 (Mauritius, Mascarenes); Playfair & Günther 1867; Day 1877.

Julis semifasciatus Valenciennes in Cuv. & Val. 1839: 448 (Mauritius, Mascarenes).

Thalassoma dorsale: Barnard 1927.

Thalassoma hardwicke: Fowler & Bean 1928; Baissac 1953; Munro 1955* [as *hardwicki*]; Smith 1957; Smith & Smith 1963*; SFSA No. 780*; Jones & Kumaran 1980; Gomon in Fischer & Bianchi 1984; SSF No. 220.60*; Allen & Steene 1988*; Winterbottom *et al.* 1989* [as *hardwicki*]; Randall 1992*; Heemstra *et al.* 2004.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 16 rays. Body depth 2.9–3.2 in SL (initial phase more slender than terminal male); snout length 2.8–3.4 in HL; caudal fin truncate in juveniles, emarginate in adults. GR 22–25. LL scales 25.

Initial and terminal-male phases have essentially the same colour pattern, differing mainly in being more vivid in the terminal male. Body green, with 6 black bars on body, progressively shorter posteriorly (1st bar from below front of dorsal fin, beneath pectoral fins to abdomen, slightly below level of pectoral-fin base; 3rd–5th bars extending onto dorsal fin and joined distally by black band; last bar saddle-like on peduncle); midlateral pink stripe on posterior half of body; head with 5 broad orange to pink bands radiating from eyes; nape with 2 oblique black bands; oblique black band anterior to pectoral-fin base. Attains 18 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Transkei region), Comoros, Seychelles, Mascarenes, Chagos, Maldives, Sri Lanka and Lakshadweep; elsewhere to Andaman Sea, Ryukyu Is., Australia, Lord Howe I., Line Is. and Marquesas Is.

REMARKS Inhabits reef areas, from near shore to ~15 m deep; initial-phase fish often seen in groups.

Thalassoma hebraicum (Lacepède 1801)

Goldbar wrasse

PLATE 99

Labrus hebraicus Lacepède (ex Commerson) 1801: 454, 526, Pl. 29, Fig. 3 (Mauritius, Mascarenes).

Julis cingulata Quoy & Gaimard 1834: 711, Pl. 15, Fig. 3 (Mauritius, Mascarenes).

Julis hebraicus: Valenciennes in Cuv. & Val. 1839.

Julis hebraica: Playfair & Günther 1867; Day 1877.

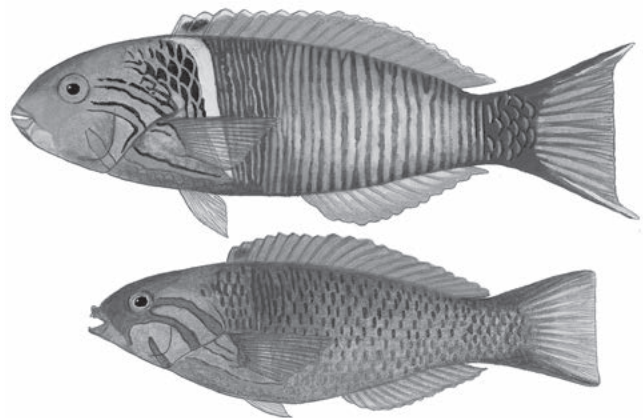
Julis blochii Valenciennes in Cuv. & Val. 1839: 422 [no locality given].

Thalassoma hebraicum: Barnard 1927; Baissac 1953; Smith 1957* [with *genivittatum* wrongly included as a synonym]; Smith & Smith 1963*; SFSA No. 778*; Harmelin-Vivien 1976; Van der Elst 1981*; Gomon in Fischer & Bianchi 1984; SSF No. 220. 61*; Allen & Steene 1987*; Winterbottom *et al.* 1989*; Heemstra & Heemstra 2004*.

Thalassoma schwanefeldi (*non* Bleeker 1853): Smith 1957, 1961; SFSA No. 778a [juvenile].

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 15–16 rays. Body depth 3.2–3.8 in SL; dorsal and ventral profiles of head of terminal male strongly convex; snout length of adults 2.9–3.3 in HL; caudal fin varying with age, from truncate to lunate with long slender lobes in adult males, caudal concavity to ~1.2 in HL. LL scales 25. GR 20–23.

Initial phase yellowish green, with numerous vertical blackish lines; 6 pale yellowish bars dorsally from nape to peduncle, with much shorter and paler bar between each pair of pale bars on body; oblique bright yellow band from below base of 2nd dorsal-fin spine, beneath pectoral fins to front of abdomen (variously developed); head dusky blue-green dorsally, pale bluish grey ventrally, with narrow dark-edged green band curved from behind eye to edge of opercle at level of upper pectoral-fin base; semicircular dark-edged green line from throat curved upward just below eye, and parallel to 1st band; short green line from middle of cheek to ventral edge of chest; 2 broader oblique green bands across chest; dorsal and anal fins greenish grey, dorsal fin with bluish black spot centred on 2nd spine and narrow yellow margin on spinous part of fin; caudal fin yellowish with orangish lobes. Attains 23 cm TL.



Thalassoma hebraicum, 13 cm TL, TP (top); 9 cm TL, IP (bottom) (both South Africa). Source: CFSA

DISTRIBUTION Indian Ocean. WIO: Kenya to South Africa (Algoa Bay), Comoros, Seychelles, Réunion and Mauritius; elsewhere to Andaman Is.

REMARKS Found on rocky or coral reefs, to ~15 m deep; young sometimes in tidepools. Van der Elst (1981) reported it feeding mainly on sea urchins and gastropod molluscs, which are crushed by the pharyngeal teeth, and most of the indigestible shell matter is ejected through the gill openings.

Thalassoma janseni (Bleeker 1856)

Jansen's wrasse

PLATE 99

Julis (Julis) janseni Bleeker 1856: 56 (Manado, Sulawesi, Indonesia); Bleeker 1862; Günther 1862; Day 1877.

Thalassoma janseni: Munro 1955; Jones & Kumaran 1980; Gomon *in* Fischer & Bianchi 1984; Randall 1992*; Allen & Smith-Vaniz 1994.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 15 or 16 rays. Body depth of adults 3.6–3.9 in SL; snout length of adults 3–3.3 in HL; peduncle depth 6.6–7 in HL; caudal fin varying from truncate to slightly emarginate in initial phase, to lunate in terminal male, caudal concavity in terminal phase to half HL. GR 20–23. LL scales 26.

Initial phase white, with blackish bar on nape and postorbital part of head, followed by 6 irregular, broad, blackish bars on body, those after extending progressively farther ventrally; bars separated dorsally by irregular white ground colour; bars below dorsal fin extending basally into fin. Terminal male with extension of black bar on nape to below basal part of pectoral fin, interrupted by yellow streak above opercular flap; 2nd broad oblique black bar from dorsal-fin spines 4–7 extending below outer 3rd of pectoral fin, and 3rd broad oblique black bar from soft-rayed part of dorsal fin to posterior half of soft-rayed part of anal fin, expanding distally into anal fin; black bar across caudal-fin base, continuing narrowly along upper and lower margins of caudal fin. Attains 23 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives, Lakshadweep and Sri Lanka; elsewhere to Andaman Sea, Indo-Malayan Archipelago, New Guinea and Australia.

REMARKS Inhabits shallow coral reefs, usually in <10 m, often in small aggregations. Walsh & Randall (2004) described the hybrid *Thalassoma janseni* × *T. quinquevittatum* from the Banda Sea, Indonesia. Originally regarded as one wide-ranging Indo-Pacific species, but now restricted to WIO, the Indo-Malayan region (except for the eastern end of New Guinea, where it is replaced by *T. nigrofasciatum* Randall 2003) and northwestern Australia.

Thalassoma loxum Randall & Mee 1994

Slantband wrasse

PLATE 100

Thalassoma loxum Randall & Mee 1994: 303, Pls. 1–5 (Hoone's Bay, Oman, Arabian Sea); Randall 1995*; Lieske & Myers 2004.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 14 or (usually) 15 rays. Body depth of adults 3.2–3.9 in SL; HL 2.9–3.3 in SL; snout length of adults 3.2–3.4 in HL.

GR 15–20. LL scales 26; head naked except for isolated patch of 1–4 small scales dorsally on opercle.

Initial-phase colouration unknown. Terminal male with dusky salmon-pink body with 2 longitudinal series of blue-green bars aligned to vertical scale rows, one on upper side at level of dorsal end of gill opening, the other in line with pectoral-fin base; 4 blue-green bars of upper series with dorsal extension to dorsal-fin base; chest mainly blue, continuing as stripe across lower part of abdomen; head blue-green to blue ventrally with 4 short salmon-pink bands above eye, long irregular band from snout through lower part of eye and across opercle, and one on lower cheek behind salmon-pink spot at corner of mouth; large dark purplish blue area covering most of dorsal part of opercle, and another over most of caudal fin, fin margins green. Juvenile (4.5 cm TL) pale blue with 2 irregular black stripes (one dorsal, one midlateral); orange line along lower side at level of pectoral-fin base with 6 long blackish dashes; bluish black spot covering most of 2nd dorsal-fin membrane, with orange-red rim. Attains 18 cm TL.

DISTRIBUTION WIO: Oman.

REMARKS The most abundant inshore wrasse on the southern coast of Oman; rare in the Gulf of Oman, where it has been observed only as juveniles. Closely related to *Thalassoma cupido* (Temminck & Schlegel 1845) of Japan and Taiwan.

Thalassoma lunare (Linnaeus 1758)

Moon wrasse

PLATE 100

Labrus lunaris Linnaeus (ex Gronovius) 1758: 283 ('in Indiis').

Scarus gallus Forsskål 1775: 26, x (Al-Luhayya, Yemen, Red Sea)

Labrus zeylanicus Forster 1781: 24, Pl. 13, Fig. 3 (Sri Lanka).

Trichopus arabicus Shaw 1803: 390 (Al-Luhayya, Yemen, Red Sea).

Julis porphyrocephala Bennett 1833: 183 (Sri Lanka).

Julim lutescentem Bennett 1833: 184 (Sri Lanka).

Julis lunaris: Rüppell 1835; Valenciennes *in* Cuv. & Val. 1839; Playfair & Günther 1867; Gilchrist & Thompson 1908.

Julis trimaculatus Rüppell 1835: 13 (Massawa, Eritrea, Red Sea)

[preoccupied by *Julis trimaculatus* Quoy & Gaimard 1834 = *Halichoeres trimaculatus*].

Julis meniscus Valenciennes *in* Cuv. & Val. 1839: 415 (Seychelles; 'seas of India'; Macao).

Thalassoma lunare: Barnard 1927; Baissac 1953; Smith 1957; Smith & Smith 1963*; SFSA No. 777*; Harmelin-Vivien 1976; Jones & Kumaran 1980; Randall 1983*, 1992*, 1995*; Gomon *in* Fischer & Bianchi 1984; SSF No. 222.62*; Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994*;

Carpenter *et al.* 1997; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Julis cupido var. *bipunctatum* Vasilii 1931: 349, Pl. 10, Fig. 11 (Sri Lanka).

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 15 rays. Body depth 3.1–3.7 in SL; caudal fin truncate in

juveniles to strongly lunate in terminal male, caudal concavity subequal to HL. GR 18–20. LL scales 25.

Initial phase green, with vertical pink to magenta lines on scales; head with pink bands radiating from eye; scythe-shaped pink band ventrally on head from corner of mouth across cheek, enclosing oblique band of the same colour below; chest crossed by pink bands that link to bands on opercle, lowermost continuing on abdomen to anal-fin origin; dorsal and anal fins green with pink stripe; lobes of caudal fin with blue-edged pink bands enclosing large semicircular bright yellow region; pectoral fins blue-green with broad pink band. Terminal male with same basic colour pattern, but green largely replaced by bright blue, and pink by magenta or purple; suffusion of blue over the head and nape of large males almost obliterates pattern of bands. Juveniles green with vertical orange-pink lines, pale blue ventrally, often with 6 short pale blue-green bars dorsally on body; black spot as large or larger than eye at midcaudal-fin base, and large black ocellus in front of soft-rayed portion of dorsal fin; deep pink bands on head fully formed on large juveniles. Attains 25 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea, Tanzania to South Africa (Transkei region), Comoros, Maldives, Seychelles, Réunion, Mauritius, Chagos, Lakshadweep and Sri Lanka; elsewhere to Andaman Sea, Cocos (Keeling) Is., Macao, Ryukyu Is., Australia, Tonga and Line Is.

REMARKS Occurs on rocky and coral reefs, including silty areas of dead reefs, to at least 20 m deep. A bold, opportunistic fish that preys mainly on benthic invertebrates and occasionally on small fishes; often follows divers, taking advantage of prey exposed by their habitat disturbance.

Thalassoma lutescens (Lay & Bennett 1839)

Sunset wrasse

PLATE 100

Julis lutescens Lay & Bennett (ex Solander) 1839: 65, Pl. 19, Fig. 2 (Tahiti, Society Is.).

Thalassoma lutescens: Jordan & Snyder 1907; Allen & Steene 1988*; Allen & Smith-Vaniz 1994; Randall 1995*; Lieske & Myers 2004.

Dorsal fin 8 spines, 13 or 14 rays; anal fin 3 spines, 11 rays; pectoral fins 15–17 rays. Body depth 3–3.5 in SL; caudal fin slightly rounded in juveniles to lunate with elongate lobes in large terminal male. GR 20–23. LL scales 25.

Initial phase yellow to yellowish green, with vertical pink to magenta lines on body; head greenish yellow, with 5 longitudinal curved pink bands; median fins greenish yellow, dorsal fin with pink stripe near base, anal fin with pink stripe

at base, and caudal fin with pink upper and lower margins. Terminal male green, with vertical magenta lines, becoming blue with purple vertical lines in front of zone under pectoral fin; head pink with suffusion of purple dorsally, and narrow blue-edged green bands (3 behind eye, 2 in front of eye, joining broad median green zone on chin, snout, and continuing to nape, and 2 bands on cheek that join anteriorly); median fins green with magenta bands; pectoral fins bright yellow with broad outer deep blue border. Juveniles with dorsal half of head and body greenish yellow, lower half white; black stripe from series of black spots, one per scale, in middle of body marginal to white zone, disappearing on peduncle but followed by black spot on caudal-fin base; narrow dull yellow stripe on body at level of lower pectoral-fin base, extending onto head; 3 irregular orange-pink bands extending back from eye; small black spot mid-dorsally near tip of snout; fins greenish yellow. Attains 25 cm TL.

DISTRIBUTION Indo-Pacific. WIO: southern Oman, Gulf of Aden, Kenya and Tanzania; elsewhere widespread to Christmas I., Cocos (Keeling) Is., southern Japan, Australia, Great Barrier Reef, Pitcairn Is., French Polynesia and Hawaii, but not known from Indonesia or Philippines (Allen & Erdmann 2012).

REMARKS Found on coral reefs and adjacent habitats, in 1–30 m. Feeds mainly on molluscs, polychaete worms, brittlestars and sea urchins (Randall 2007).

Thalassoma purpureum (Forsskål 1775)

Surge wrasse

PLATE 101

Scarus purpureus Forsskål in Niebuhr 1775: 27, x (Jeddah, Saudi Arabia, Red Sea).

Julis semicoeruleus Rüppell 1835: 10, Pl. 3, Fig. 1 (Jeddah, Saudi Arabia, Red Sea).

Julis umbrostygma Rüppell 1835: 11, Pl. 3, Fig. 2 (Jeddah, Saudi Arabia, Red Sea).

Julis aeruginosus Valenciennes in Cuv. & Val. 1839: 441 (Mauritius, Mascarenes).

Scarus georgii quarti Bennett 1851: no page number, Pl. 34 (Sri Lanka).

Julis purpurea: Day 1877.

Thalassoma purpureum: Jenkins 1903; Gilchrist & Thompson 1917; Barnard 1927; Baissac 1953; Smith 1957*; SFSA No. 779*; Harmelin-Vivien 1976; Van der Elst 1981*; Randall 1983*, 1992*; Gomon in Fischer & Bianchi 1984; SSF No. 222.63*; Winterbottom *et al.* 1989*; Allen & Smith-Vaniz 1994; Field & Field 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Julis umbrostygma: Gilchrist & Thompson 1908.

Thalassoma semicoeruleus: Smith & Smith 1963*; SFSA No. 779a.

Thalassoma umbrostygma: Smith & Smith 1963*; Jones & Kumaran 1980.

Thalassoma purpurea: Jones & Kumaran 1980.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 15 or 17 rays. Body depth 2.8–3.6 in SL, deeper-bodied with growth; caudal fin of initial phase slightly rounded to truncate, of terminal males truncate to slightly double emarginate with slightly produced lobes, particularly the upper. GR 20–25. LL scales 26.

Initial phase green, with 3 pink stripes on body overlaid by 6 squarish dark blotches and vertical series of pink lines with spindle-shaped dark brown spots; head with irregular bands, dark red dorsally, pink ventrally, one on snout forming diagnostic V- or Y-shape. Terminal male blue-green, with 2 irregular pink stripes on side of body that narrow posteriorly; irregular magenta to violet band dorsally on body continuous with irregular pink band dorsally on head ending in eye; large, irregular pink band, shaped like claw extending back from eye, and large diagnostic V-shaped pink spot on snout; median fins blue, dorsal and anal fins with pink stripe near base. Attains 43 cm TL.



Thalassoma purpureum, 7 cm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific to tropical eastern Pacific. WIO: Red Sea, Kenya to South Africa (Algoa Bay), Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Christmas I., Indonesia, Japan, Australia, Lord Howe I., Hawaii and Easter I.

REMARKS Occurs inshore on reefs and along rocky shores exposed to wave action; may be seen in surprisingly shallow water for so large a fish. Randall (1985) examined the stomach contents of adult specimens and found sea urchins and heart urchins, crabs and other crustaceans, fishes, gastropods and gastropod eggs, brittlestars, bivalves, damselfish eggs and starfish.

Thalassoma quinquevittatum

(Lay & Bennett 1839)

Fivestripe wrasse

PLATE 101

Julis coris Lesson 1828: 404 (Caroline Is.) [*nomen oblitum*: Randall & Parenti 1999].

Scarus quinquevittatus Lay & Bennett 1839: 66, Pl. 19, Fig. 3 (Ryukyu Is., Japan).

Thalassoma quinquevittatus: Smith 1957*; SFSA No. 782b.

Thalassoma quinquevittatum: SSF No. 220.64*; Winterbottom *et al.* 1989*; Randall 1992*; Randall & Van Egmond 1994; Fricke 1999; Kemp 2000; Lieske & Myers 2004.

Thalassoma quinquevittata: Jones & Kumaran 1980; Gomon *in* Fischer & Bianchi 1984.

Thalassoma purpureum (*non* Forsskål *in* Niebuhr 1775): Allen & Steene 1987*.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 16 (rarely 15 or 17) rays. Body depth 3.2–3.6 in SL; caudal fin slightly rounded in juveniles to emarginate in adults. GR 20–25. LL scales 25.

Initial phase green, sometimes white ventrally, with 2 deep pink stripes on upper side (the 2nd stripe midlateral), linked by narrow bands of same colour; lower edge of 2nd stripe with numerous thin ventral extensions; head deep pink, sometimes with wash of violet dorsally, with 4 narrow green bands radiating from eye, and near-semicircular arc on cheek, convex upper end almost to ventral edge of orbit; oblique orange to deep pink band on chest, with similar, shorter band on abdomen; dorsal fin green with blue-edged black spot on 2nd spinous membrane, followed by rose-pink stripe; anal and paired fins pale blue-green; caudal fin with large semicircular pale orange area centroposteriorly, lobes with narrowing deep pink band, narrowly bordered with green. Terminal male with same basic pattern, dorsal stripe on body purple, midlateral stripe magenta; some individuals with yellow mixed with the green on side of body; cheek below curved green band lavender-pink. Juveniles with upper pink stripe as series of close-sets vertical bands, 2nd in zigzag pattern; head with broad purple band on side of snout, and 2 parallel deep pink bands extending back from eye; dorsal fin with anterior, posterior, and larger middle black spot. Attains 17 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Gulf of Aden, Mozambique, South Africa (Transkei region), Comoros, Mascarenes and Chagos; elsewhere to Christmas I., Indonesia, Ryukyu Is., Caroline Is., Australia, Tuamotu Is., Line Is., Marshall Is. and Hawaii.

REMARKS Found to ~40 m deep, usually in <10 m. Kemp (2000) observed spawning at Sikha I., Gulf of Aden, in 0.5–3 m.

Thalassoma rueppellii (Klunzinger 1871)

Rüppell's wrasse

PLATE 101

Julis purpureus (*non* Forsskål *in* Niebuhr 1775): Rüppell 1828.

Julis rueppellii Klunzinger 1871: 536 (Al-Qusayr, Egypt, Red Sea).

Thalassoma klunzingeri Fowler & Steinitz 1956: 278, Fig. 24 (Eilat, Israel, Gulf of Aqaba, Red Sea); Randall 1983*; Field & Field 1998*.

Thalassoma rueppellii: Dor 1984; Allen & Steene 1987* [*as ruppellii*]; Lieske & Myers 2004.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins 15 or 16 (rarely 15) rays. Body depth 3.3–3.7 in SL; caudal fin slightly rounded in juveniles, to truncate or slightly emarginate in initial phase, and lunate in terminal males, caudal concavity at least ½ HL. GR 19–23. LL scales 24–26.

Initial phase pale green on upper half of body, white below, grading to pale blue-green ventrally, with violet stripe from nape, below dorsal fin, to dorsally on peduncle, orange-pink midlateral stripe with irregular borders, breaking into spots anteriorly, lavender-pink stripe at level of lower pectoral-fin base, crossing abdomen and disappearing above middle of anal fin; body between upper and midlateral stripes crossed by ~20 narrow magenta bars, except posteriorly; body between midlateral and lower stripes white; oblique deep pink band from middle of chest onto abdomen; head yellowish green, with deep pink bands broader than green interspace: short oblique band above eye; band on side of snout, expanding anteriorly; 2 bands curved posteriorly from eye, uppermost ending dorsally at pectoral-fin base, and 2 bands on cheek strongly curved ventrally; median fins pale blue-green, dorsal fin with median orange-pink stripe, anal fin with lavender-pink basal stripe, and caudal fin with lavender-pink band in each lobe. Terminal male pale blue-green overall, upper and lower stripes reduced or missing, deep pink bands on head more irregular, and median fins dominantly greenish yellow. Attains 17 cm TL.

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Occurs on coral reefs and adjacent habitats, to ~20 m deep. Feeds mainly on benthic invertebrates, occasionally on small fishes. Relatively unafraid of divers and attracted to the disturbances they often make to the substrate. Rüppell (1828) misidentified this species as *Julis purpureus* (Forsskål 1775). Klunzinger (1871) recognised the mistake and proposed a new name, *Julis rüppellii*. However, Bennett (1831) had used the name *Julis rueppellii* for another wrasse. In a review of Indo-Pacific species of *Thalassoma*, Randall & Edwards (1984) considered Klunzinger's name a homonym and used *Thalassoma klunzingeri* for the species. However, rüppellii is not a homonym of rueppellii (spelling must be identical), so the latter is the valid name. Randall & Miroz (2001) described a hybrid of *T. lunare* and *T. rueppellii*.

Thalassoma trilobatum (Lacepède 1801)

Ladder wrasse

PLATES 101 & 102

Labrus fuscus Lacepède (ex Commerson) 1801: 437, 493 (Indo-Pacific, probably Mauritius) [objectively invalid; preoccupied by *Labrus fuscus* Gmelin 1789 and *Labrus fuscus* Walbaum 1792 = *Symphodus mediterraneus* (Linnaeus 1758)].

Labrus trilobatus Lacepède (ex Commerson) 1801: 454, 526, Pl. 4, Fig. 3 (Mauritius, Mascarenes).

Sparus hemisphaericus Shaw 1803: 454, Pl. 66 (Indian seas).

Sparus brachiatus Shaw 1803: 456 (Indian seas).

Julis bicatenatus Bennett 1832: 167 (Mauritius, Mascarenes).

Julis trilobatus: Valenciennes in Cuv. & Val. 1839; Gilchrist & Thompson 1909.

Julis formosus Valenciennes in Cuv. & Val. 1839: 439 (Mauritius, Mascarenes); Guichenot 1863.

Julis souleyetii Valenciennes in Cuv. & Val. 1839: 457 (Mauritius, Mascarenes; Hawaii).

Julis abhortani Valenciennes in Cuv. & Val. 1839: 459 (Mauritius, Mascarenes).

Julis trilobata: Günther 1862; Playfair & Günther 1867; Sauvage 1891.

Thalassoma fuscus: Baissac 1953; Smith 1957*; Smith & Smith 1963*; SFSA No. 782*.

Thalassoma fuscum: Van der Elst 1981*; Gomon in Fischer & Bianchi 1984.

Thalassoma trilobatum: Randall & Edwards 1984*; SSF No. 220.65*;

Allen & Smith-Vaniz 1994; De Bruin *et al.* 1994; Heemstra & Heemstra 2004; Allen *et al.* 2006.

Dorsal fin 8 spines, 13 rays; anal fin 3 spines, 11 rays; pectoral fins usually 16 (rarely 15 or 17) rays. Body depth 3.1–3.4 in SL; caudal fin of initial phase slightly rounded to truncate, of terminal males truncate to slightly double emarginate. Total GR 18–24. LL scales 25.

Initial phase green, reduced on sides to 2 longitudinal series of close-set, vertically elliptical, green spots corresponding to scale rows, separated by dusky pink with numerous spindle-shaped dark brown spots; 6 narrow green bars connect upper series of green spots to dorsal-fin base; head green with numerous small spots and irregular bands (dark red dorsally, pink ventrally), one on snout in irregular C-shape, usually continuing as irregular narrow band across cheek. Terminal male salmon-pink to orange or red with 2 longitudinal rows of close-set, vertically elongate, subrectangular green to blue-green spots on side; 4 green spots of upper row with dorsal extensions linking to irregular green band at dorsal-fin base; head and chest orange to orange-brown without markings; head sometimes overlaid dorsally with green; caudal fin olivaceous to brownish orange, with narrow blue upper and lower margins, outer third of rays blue. Attains 28 cm TL.



Thalassoma trilobatum, 18 cm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Transkei region), Madagascar, Mascarenes and Chagos; elsewhere to Christmas I., Indonesia, Ryukyu Is., Marshall Is., Australia, Polynesia and Hawaii.

REMARKS An active shallow-water fish of exposed rocky shores, but generally occurs in slightly deeper and less turbulent waters than the similar *T. purpureum*. Feeds mainly on crustaceans (especially crabs), molluscs and ophiuroids (Randall & Edwards 1984).

GENUS *Wetmorella* Fowler & Bean 1928

Dorsal fin 9 spines, usually 10 (rarely 11) rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Teeth conical, slightly compressed, close-set, in single row in jaws, those at front slightly recurved; no canine at corners of mouth. Body depth 2.5–3.3 in SL, deeper-bodied with growth; head pointed, profile straight to slightly concave; dorsal-fin membranes deeply incised; caudal fin rounded and short, 1.4–1.9 in HL; pelvic fins short, not extending to anus. GR 11–17, short. Scales large and deciduous; lateral line interrupted, with 13–15 + 5–7 scales; head covered with large scales, except extreme front and sides of snout; preopercle margin scaly; row of large scales basally on dorsal and anal fins; basal two-thirds of caudal fin covered by scales.

Randall (1983) revised the genus, recognising only 2 species: *W. albofasciata* Schultz & Marshall 1954 and *W. nigropinnata* (Seale 1901). However, he documented differences between the Pacific and WIO populations of *W. nigropinnata*, including a modal difference of 1 GR. Additional material and colour photographs, plus noting the consistent concave dorsal profile of the head of WIO specimens, led to the conclusion that the populations should be treated as separate species. Satapoomin *in* Kimura *et al.* (2009) illustrated only *W. nigropinnata* from the Andaman Sea, and Hutchins (2001) listed only *W. nigropinnata* in a checklist of fishes of Western Australia. The Pacific and eastern Indian Ocean population retains the oldest name, *W. nigropinnata* (type locality Guam), and the WIO population is *W. bifasciata* Schultz & Marshall 1954 (type locality Sudan). Randall & Kuitert (2007) added a fourth species, *W. tanakai* Randall & Kuitert 2007, from Indonesia and the Philippines, thus 4 Indo-Pacific species; 2 in WIO. Several authors have noted the resemblance of *Wetmorella* adults to juveniles of *Cheilinus fasciatus* and *Epibulus insidiator*.

KEY TO SPECIES

- 1a Body of adults dark brown, with 4 narrow white bands (from 2nd dorsal-fin spine to mid-abdomen; short band from base of 7th dorsal-fin spine; oblique band from midbase of soft-rayed portion of anal fin to anterior of fin; last band across peduncle); body depth 2.8–3.3 in SL; longest dorsal-fin spine 1.9–2.3 in HL; 3rd anal-fin spine 2–2.3 in HL *W. albofasciata*
- 1b Body of adults red to reddish brown, with narrow pale yellowish bar anteriorly on peduncle, and curved yellow line from nape to lower corner of opercle, touching eye with its convex anterior edge; body depth 2.6–3.2 in SL; longest dorsal-fin spine 1.7–2.1 in HL; 3rd anal-fin spine 1.8–2.1 in HL *W. bifasciata*

Wetmorella albofasciata Schultz & Marshall 1954

Whitebanded sharpnose wrasse

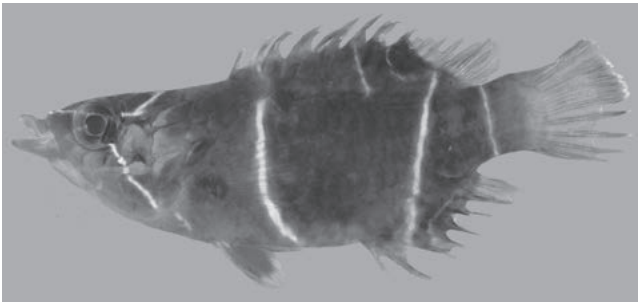
PLATE 102

Wetmorella philippina Fowler & Bean 1928: 211, Pl. 17 (Zamboanga, Philippines) [in part].

Wetmorella albofasciata Schultz & Marshall 1954: 446, Pl. 12e (Mabul I., Malaysia); Smith 1955*; Randall 1983*; Randall & Anderson 1993; Allen *et al.* 2006.

Dorsal fin 9 spines, 10 (rarely 11) rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 2.8–3.3 in SL; HL 2.4–2.6 in SL; head profile straight from upper lip to above eyes, then slightly convex on nape; snout length 3.2–3.4 in HL; eyes subequal to snout length; longest dorsal-fin spine 1.9–2.3 in HL; 3rd anal-fin spine 2–2.3 in HL. GR 11–16, short. LL scales 13–15 + 5–7.

Body dark reddish to yellowish brown, with narrow white bar from 2nd dorsal-fin spine to mid-abdomen; large ocellated black spot in front of soft-rayed portions of dorsal and anal fins; narrow oblique white band rimming rear edge of dorsal-fin black spot and crossing body obliquely to outer half of 2nd anal-fin spine; white line across peduncle; head with 2 curved white lines passing through each eye, one from upper lip to nape, other from behind corner of mouth to pelvic-fin origin; caudal fin mostly translucent, with brown rays, brown at base, and broad blackish bar on most of outer half of fin, followed by narrow translucent zone and narrow white margin; pelvic fins largely covered by reddish black spot, with small white spot at fin origin and on outer white margin. Attains 4.5 cm TL.



Wetmorella albofasciata, 4 cm SL (Comoros). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Tanzania (Mafia I.), Comoros, Aldabra, Agalega Is. and Maldives; elsewhere to Malaysia, Philippines, Christmas I., Society Is. and Hawaii.

REMARKS Known from relatively few records; collected mainly from caves or beneath ledges in coral reefs, in 10–42 m (mostly >30 m). Rarely seen by divers.

Wetmorella bifasciata Schultz & Marshall 1954

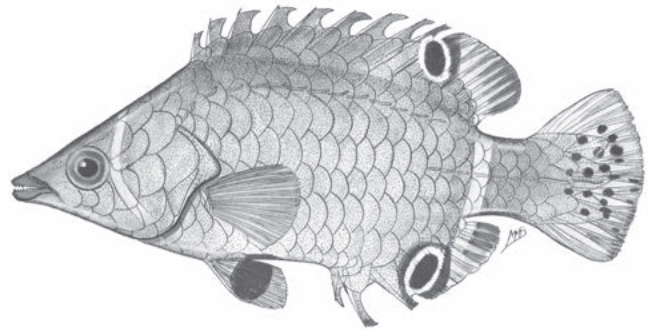
Western sharpnose wrasse

PLATE 102

- Wetmorella philippina* Fowler & Bean 1928: 211, Pl. 17 (Zamboanga, Philippines) [in part]; Smith 1952, 1955*, 1957*; Smith & Smith 1963*.
Wetmorella philippina bifasciata Schultz & Marshall 1954: 441, Pl. 12a–b (Suakin, Sudan, Red Sea); Dor 1984.
Wetmorella ocellata (non Schultz & Marshall 1954): Harmelin-Vivien 1976.
Wetmorella nigropinnata (non Seale 1901): Randall 1983*;
 Winterbottom *et al.* 1989*; Randall & Anderson 1993*; Field & Field 1998*; Fricke 1999; Heemstra *et al.* 2004; Lieske & Myers 2004.

Dorsal fin 9 spines, 10 (rarely 11) rays; anal fin 3 spines, 8 rays; pectoral fins 12 rays. Body depth 2.6–3.2 in SL; HL 2.4–2.6 in SL; head profile and nape slightly concave on anterior two-thirds, straight on posterior third; snout length 3–3.4 in HL; eye diameter in adults slightly less than snout length; longest dorsal-fin spine 1.7–2.1 in HL; longest anal-fin spine 1.8–2.1 in HL. GR 12–16, short. LL scales 13–15 + 5–7.

Body red to reddish brown, with narrow pale greenish yellow bar at anterior end of peduncle; convexly curved yellow line across head, anterior central part contacting rear edge of eyes; juveniles and subadults with 2 white bars across body, one from base of 2nd dorsal-fin spine, one from base of 8th dorsal-fin spine, sometimes persisting in small adults; blue-edged black spot broadly rimmed in pale orange-red distally in anterior parts of soft-rayed dorsal and anal fins; cluster of small black spots centrally in rear part of caudal fin; snout orange-red, white ventrally; pelvic fins bluish white, almost covered by large reddish black spot. Attains 8 cm TL.



Wetmorella bifasciata, 8 cm TL (WIO). Source: Smith & Smith 1963

DISTRIBUTION WIO: Red Sea, Gulf of Aden to Mozambique and islands of WIO; elsewhere, Philippines.

REMARKS Cryptic on sheltered rocky or coral reefs; often found as shallow as 1 m, but reported to 30 m deep. Rarely seen by divers, and only fleetingly.

GENUS *Xyrichtys* Cuvier 1815

Questionably present in WIO. Steindachner (1861) described *Xyrichtys argentimaculata* as a new species of razorfish from the Cape of Good Hope, South Africa, but this was probably a locality error for Mediterranean *Xyrichtys novacula* (Linnaeus 1758). Dor (1970) mistakenly reported “*Hemipteronotus javanicus* (Bleeker 1862)” from the Gulf of Aqaba based on a single specimen (~11 cm SL) with the following data: dorsal fin 9 spines, 12 rays; anal fin 3 spines, 12 rays; pectoral fins 12 rays; LL scales 18 + 5, each with single pore; head naked, except for 2 scales dorsally on opercle; preopercle rounded; length of dorsal-fin spines equal to eye diameter (spines increasing slightly in size posteriorly), soft rays longer, equal to postorbital HL; pectoral fins subequal to pelvic fins, ending before anus; caudal fin slightly rounded; 2 prominent canines at front in both jaws; maxillary teeth conical, in several rows; lower GR 14. Preserved specimens reddish brown; anal fin with 17 oblique dark bands; caudal fin with 7 transverse bands.

Unfortunately, Dor’s specimen has been lost; nevertheless, his drawing conforms to a *Xyrichtys*, perhaps a vagrant *X. novacula* (see Plate 102) from the Mediterranean Sea via the Suez Canal. Without additional specimens, the presence of *Xyrichtys* in the Red Sea cannot be confirmed.

Randall & Bauchot (1993) recommended that the labrid genus *Hemipteronotus* Lacepède be suppressed to preserve the names *Naucrates* and *Xyrichtys*; this was approved by Opinion 1799 of the International Commission on Zoological Nomenclature.

GLOSSARY

brachyuran crabs – typical crabs with the abdomen folded in under the thorax/carapace.

exserted (rays) – elongate; protruding.

foraminifera – single-celled organisms with shells of various minerals, the shells with many tiny holes; may be planktonic or benthic.

homonym – two organisms with the same name, of which the younger name is invalid.

pharyngeal plates – the bones in the pharynx that carry teeth.

plicate (lips) – with pleat-like folds.

scleral cornea of pupil – the transparent outer layer of the eye overlying the pupil.

sipunculids – a group of unsegmented marine worms that live in burrows or discarded shells; some bore into rock or coral. Also called peanut worms.

tanais – a small order of shrimp-like Crustacea, the Tanaidacea.

The taxonomic status of parrotfishes

David R Bellwood

The taxonomic status of the parrotfishes and wrasses is one of the most contentious issues in the field of systematic ichthyology. It underscores the practical limitations of phylogenetic systematics and its potential inability to provide classifications that are of use to ecologists and people who work with living fishes. It seems evident that parrotfishes and wrasses are distinctly different: the former are herbivores with beak-like jaws, the latter are carnivores with individual teeth. However, a cladistic or phylogenetic approach becomes problematic. The early morphological analyses of BC Russell (presented at the 3rd International Conference on the Systematics and Evolution of Indo-Pacific Fishes, Wellington, New Zealand, in 1989) suggest that parrotfishes may be highly modified wrasses. Morphological evidence for the monophyly of parrotfishes by Bellwood (1994) shows the parrotfishes to be distinct, but that work did not resolve the broader question of the status of the Labridae *sensu lato*.

The placement of parrotfishes within the Labridae was first proposed by Westneat & Alfaro (2005) based on molecular evidence. This placement has been supported by subsequent studies (e.g., Cowman *et al.* 2009; Near *et al.* 2013). In these schemes, the parrotfishes are designated as tribe Scarini within the family Labridae, together with the Cheilini, Labrini, Hypsigenyini, etc. (The alternative scenario, with the Labridae split into 8 or more families has, thankfully, never been suggested.) There are currently two schools of thought: those who base classifications on the results of the molecular phylogenies

following Westneat & Alfaro (2005) (e.g., Cowman & Bellwood 2011; Choat *et al.* 2012), and those who prefer the traditional taxonomic divisions with the Scaridae and Labridae as separate families (e.g., Allen & Erdman 2012; Randall & Parenti 2014). Both approaches have advantages. Placement of the scarines within the Labridae more accurately reflects evolutionary relationships, whereas the division of the Scaridae and Labridae seems to more accurately reflect the fishes as they are physically encountered in nature.

This taxonomic instability has led to a plethora of terms: in the new school ‘parrotfishes’ (Labridae) or ‘scarine labrids’ vs. the old school ‘scarids’ (Scaridae, and potentially the Scarinae and Sparisomatinae: subfamilies within the Scaridae). There is collective agreement that parrotfishes are distinct from wrasses, and that within the parrotfishes there are two groups or clades (cf. Streebman *et al.* 2002) — namely the seagrass-associated parrotfishes and the reef-associated parrotfishes. The former group matches the old Sparisomatinae (comprised of *Nicholsina*, *Cryptotomus*, *Sparisoma*, *Leptoscarus* and *Calotomus*), and the latter group the Scarinae (*Cetoscarus*, *Bolbometopon*, *Scarus*, *Chlorurus* and *Hipposcarus*). Indeed, this scheme may offer the most parsimonious solution: parrotfishes and wrasses recognised as two separate groups (not families, nor clades) within the Labridae. Lastly, it is a testament to the importance of the parrotfishes that their names and taxonomic status elicit so much concern.

FAMILY SCARIDAE

Parrotfishes

John E Randall

Appropriately named parrotfishes as they possess beak-like jaws and many species are gaudily coloured. Body oblong to moderately elongate, robust, not much compressed; snout generally bluntly rounded; mouth small, terminal, not protractile. Teeth fused to form beak-like dental plates separated by a median suture (except *Calotomus* with bony ridge in jaws covered by imbricate, flattened, conical teeth); small, often recurved, conical teeth (generally called canines) may be present at corner of mouth on outside of dental plates; pharyngeal dentition unique, the interlocking upper pharyngeal bones with 1–3 rows of molars on a convex surface, which occlude to molars on the concave surface of the single lower pharyngeal bone. Dorsal fin continuous, with 9 slender, often flexible spines, 10 rays; anal fin 3 spines, 9 rays; pectoral fins 13–16 rays; pelvic fins 1 spine, 5 rays; caudal fin rounded, truncate, lunate or emarginate, with the shape often changing with growth. Lateral line following dorsal contour of the body to below rear of dorsal fin, then one scale row lower and midlaterally along peduncle; LL pored scales usually 18 + 6. Body scales large, cycloid, and those of lateral line with branching tubes; head naked except for scales in rows on cheeks, operculum and top of head; fins not scaly, although median fins may have scale rows at base. Vertebrae 24 or 25.

Juveniles usually differ in colour from adults, and adults of most species exhibit striking sexual dichromatism. The reproductive biology usually involves sex reversal, as in the Labridae: adults in the initial phase (IP in picture captions) are usually females (but may be females or males in some species) and are generally drab-coloured, often brown, reddish or grey. Terminal males (mostly a result of sex reversal) are usually brightly and complexly coloured, with green frequently dominant. Initial-phase fish tend to spawn in aggregations, typically with several males making upward spawning rushes with a single female. Terminal-phase males (TP in picture captions) are frequently territorial and maintain a harem of females, although they spawn with individual females within those territories.

Abundant on coral reefs, along rocky shores, and in seagrass beds, which is the preferred habitat for some small species and the nursery area for the young of many species. Primarily herbivorous, though a few of the larger species feed in part on live corals. Scarids scrape algae from dead corals or limestone (leaving characteristic grooved scrape marks on the surface) with their strong dental plates and ingest the small animals that live in association with the algae. Some species feed on algal

films on compacted sand or on seaweeds. The rock fragments and sand are ground into fine sediment along with the plant material in their pharyngeal mill, thus rendering the plant material more digestible. The digestive tract lacks a stomach, but the intestine is very long, as found in herbivores in general. The pulverising of coral rock fragments and coarse sand by parrotfishes is a major source of sand on coral reefs.

The genera of the family Scaridae were revised by Bellwood (1994). Notwithstanding the state of flux of the systematics of the wrasses (family Labridae) and parrotfishes (Bellwood *et al.* 2019), 2 subfamilies are recognised here, with 10 genera; 7 genera and at least 37 species in WIO. The Scarinae of WIO were reviewed by Randall & Bruce (1983), and the Indo-Pacific genera *Calotomus* and *Leptoscarus* (of Sparisomatinae) were revised by Bruce & Randall (1985).

KEY TO SUBFAMILIES

- 1a Cheek scales in 1 row; pectoral fins usually 13 (rarely 12) rays **Sparisomatinae**
- 1b Cheek scales in 2–4 rows; pectoral fins 13–17 rays **Scarinae**

SUBFAMILY SCARINAE

Cheek scales in 2–4 rows; pectoral fins 13–17 rays; vertebrae 10–12 + 13–15. Five genera, all in WIO.

KEY TO GENERA

- 1a Outer surface of dental plates granular; upper pharyngeal bone with 3 rows of molars, teeth of lateral row rudimentary; GR 16–24; posterior nostrils markedly larger (up to 4 times) than anterior nostrils **2**
- 1b Outer surface of dental plates smooth; upper pharyngeal bone with 1 row of large molars, and with or without lateral row of rudimentary teeth; GR 38–81; posterior and anterior nostrils subequal (except posterior nostrils larger in *Scarus ghobban*) **3**
- 2a Head with hump above eyes (may be evident by ~20 cm SL), becoming very large in adults; body deep, 2.1–2.5 in SL; snout length ~1.7 in HL; median predorsal scales 2–5 (usually 4); 1 scale row on interopercle; GR 16–18 ***Bolbometopon***
- 2b Dorsal profile slightly and evenly convex; body depth 2.5–2.8 in SL; snout length 1.8–2.2 in HL; median predorsal scales 5–7; 2 scale rows on interopercle; GR 20–24 ***Cetoscarus***

Continued ...

KEY TO GENERA

- 3a Dental plates narrow, their height ~1.5–2 in eye diameter; head moderately pointed; eyes near dorsal profile, and interorbital space not strongly convex; cheek scales small, in an almost triangular isolated patch *Hipposcarus*
- 3b Dental plates not narrow, their height usually greater than eye diameter; head not pointed; eyes not near dorsal profile, and interorbital space strongly convex; cheek scales not small, not in isolated patch 4
- 4a Dental plates broadly exposed, their cutting edge irregular; anterior profile of head symmetrically broadly rounded (bullet-shaped), or steep with an angle or pronounced convexity anterodorsal to eyes; predorsal scales usually 4 (rarely 3) *Chlorurus*
- 4b Dental plates mostly covered by lips, and their cutting edge usually even; anterior profile of head not symmetrically rounded or not with an angle or convexity anterodorsal to eyes; predorsal scales 3–8 (usually 4–6) *Scarus*

GENUS *Bolbometopon* Smith 1956

Body deep, 2.1–2.5 in SL; head profile of adults steep, with large mass of reticulate bone anterodorsally supporting prominent fleshy gibbosity on forehead; posterior nostrils more than twice size of anterior nostrils; upper dental plate overlapping lower plate when mouth closed; cheek scales in 3 rows; pectoral fins usually 16 rays. One species.

Bolbometopon muricatum (Valenciennes 1840)

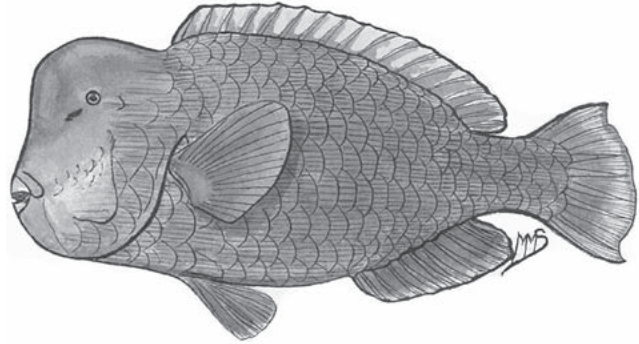
Humphead parrotfish

PLATE 103

Scarus muricatus Valenciennes in Cuv. & Val. 1840: 208 (Java, Indonesia).*Callyodon muricatus*: Smith 1953.*Bolbometopon muricatus*: Smith 1956*, 1959; Smith & Smith 1963*.*Chlorurus gibbus* (non Rüppell 1829): Schultz 1958.*Bolbometopon muricatum*: Randall 1983*; Randall & Bruce 1983*; SSF No. 221.4*; Manilo & Bogorodsky 2003; Lieske & Myers 2004.

Diagnosis as for genus. Pectoral fins 15 or 16 rays. Median predorsal scales 2–5; cheek scales in 3 rows, lowest row with only 1 or 2 scales; 1 scale row on interopercle; predorsal and cheek scales partly embedded with age. Outer surface of dental plates granular (with small knobs), no conical teeth at sides, and plates only partly covered by lips. Hump on head may be evident by ~20 cm SL; caudal fin rounded, the corners slightly elongated in adults. GR 16–18.

Colour of males and females the same (unlike nearly all other parrotfishes): adults dull green (appearing grey underwater), front of head whitish, pale yellowish or pink; juveniles olive to brown, with 5 vertical rows of small, widely spaced whitish spots, and often a narrow white interorbital stripe. Attains 120 cm SL (~46 kg).



Bolbometopon muricatum, 100 cm TL (WIO). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to Mozambique (Bazaruto I.) and Mauritius; elsewhere to Indonesia, Philippines, Tuamotu Is. and Line Is.

REMARKS Largest of the parrotfishes. Feeds on live corals and encrusted algae; the sound of the jaws crushing coral or limestone is clearly audible to divers. IUCN Red List conservation status Vulnerable.

GENUS *Cetoscarus* Smith 1956

Teeth in jaws fully fused to form dental plates, outer surface of plates granular; individual teeth smoothly rounded; upper dental plate overlapping lower plate when mouth closed. Median predorsal scales 5–7; scales in 3 rows on cheeks, in 2 rows on interopercle. Posterior nostrils more than twice size of anterior nostrils. Gill membranes narrowly joined to isthmus. Pectoral fins 14 or 15 (usually 14) rays. Juveniles with distinct ocellated black spot on dorsal fin. Two species, both in WIO, but long considered as one wide-ranging species in Indo-Pacific. Randall (2005) used the name *C. bicolor* for the species in the Red Sea, and *C. ocellatus* (Valenciennes 1840) for the population elsewhere in the Indo-Pacific, based on observed colour differences and an unpublished genetic study by JH Choat and colleagues.

KEY TO SPECIES

[Adults]

- 1a Scales on sides greenish grey in initial phase, strongly rimmed but faintly dotted with black (except strongly spotted ventrally); dorsal and anal fins and caudal-fin lobes dark grey to black; ventral part of head of terminal males white below narrow pink and green band behind corner of mouth; naked part of caudal fin mainly pink with blue-green lines and small spots *C. bicolor*
- 1b Scales on sides green in initial phase, strongly rimmed and spotted with black; dorsal and anal fins and caudal-fin lobes dull red; ventral part of head of terminal males green below broken pink line from behind corner of mouth; naked part of caudal fin mainly blue-green, with pink bar at base and pink band in lobes *C. ocellatus*

Cetoscarus bicolor (Rüppell 1829)

Bicolour parrotfish

PLATE 103

Scarus bicolor Rüppell 1829: 82, Pl. 21, Fig. 3 (Jeddah, Saudi Arabia, Red Sea).

Scarus pulchellus Rüppell 1835: 25, Pl. 8, Fig. 3 (Jeddah, Saudi Arabia, Red Sea).

Pseudoscarus bicolor: Günther 1862.

Callyodon bicolor: Fowler & Bean 1928.

Cetoscarus bicolor: Smith 1956 [in part], 1959 [in part]; Randall 1983*; Randall & Bruce 1983* [in part]; Manilo & Bogorodsky 2003; Lieske & Myers 2004 [in part].

Chlorurus bicolor: Schultz 1958 [in part].

Chlorurus pulchellus: Schultz 1958 [in part].

Pectoral fins 14 or 15 rays. Median predorsal scales 5–7, anterior scales often partly embedded; cheek scales in 3 rows, upper row with 7 or 8 scales not extending beneath eye, lowest row with 3–7 scales; 2 scale rows on interopercle. Dental plates largely covered by lips, no conical teeth at sides. Snout long, 1.8–2.2 in HL; posterior nostrils more than twice size of anterior nostrils; caudal fin rounded in juveniles, emarginate in adults, lobes longer in terminal males. GR 20–24.

Subadults with white body and orange-yellow head; dorsal fin white, with large black spot narrowly rimmed in yellow between spines 3 and 6; caudal fin mostly whitish, upper and lower margins broadly orangish. Initial phase with diffuse yellow band on upper body from behind head to below dorsal fin, ~2½ scales in height, and narrowing somewhat on peduncle; lower body greenish grey, scales rimmed and faintly dotted with black; head purplish to greenish grey, dusky to black-spotted ventrally; median fins dull red; caudal-fin margin with diffuse whitish crescent. Terminal males green, scales edged with pink, becoming spotted with pink on body from behind pectoral fins and dorsally on head; upper lip

narrowly rimmed pink, lower lip mainly rimmed green, with both colours continuing as bands to pectoral-fin bases; head below bands pinkish white, becoming green on chest; caudal fin deep pink, with blue-green lines parallel to rays, narrow blue margin, and pale yellow central crescent, and margin spotted with blue; dorsal and anal fins pink with broad blue margin and blue bands parallel to rays; pectoral fins mainly dark purple. Both phases with white dental plates. Attains ~80 cm TL.

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Occurs over reef flats and along upper reef slopes in lagoons and on seaward reefs, at 1–20 m. Shy; usually solitary or in small groups, with a terminal male and a few initial-phase females. Randall (1963) showed that *Cetoscarus pulchellus* (Rüppell 1835) is the terminal male of *C. bicolor* (Rüppell 1829) and selected the latter as the senior synonym.

Cetoscarus ocellatus (Valenciennes 1840)

Indo-Pacific bicolour parrotfish

PLATES 103 & 104

Scarus ocellatus Valenciennes in Cuv. & Val. 1840: 278 (Caroline Is.).

Callyodon scriptus Gronow in Gray 1854: 85 (Indian Ocean).

Pseudoscarus nigripinnis Günther in Playfair & Günther 1867: 105, Pl. 15, Fig. 2 (Zanzibar, Tanzania).

Cetoscarus bicolor: Smith 1956 [in part], 1959*; Kimura *et al.* 2009.

Cetoscarus pulchellus: Smith 1956 [in part], 1959.

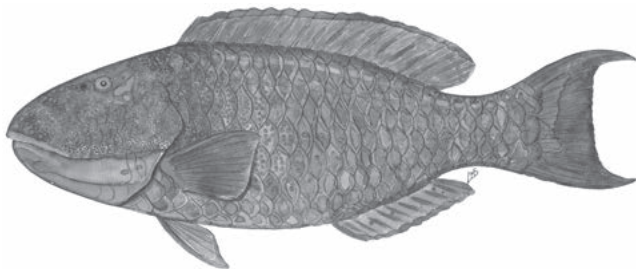
Cetoscarus ocellatus: Randall 2005*; Fricke *et al.* 2009.

Counts and morphology as for *Cetoscarus bicolor*.

Juveniles with white body; head covered with broad black-edged orangish bar (enclosing eyes in its anterior part); dorsal fin white in front of 6th spine, and with large black orange-edged spot between spines 3 and 6, and remainder of fin behind spot translucent. Initial-phase fish with diffuse yellowish band on upper body below dorsal fin (~2½ scales in height, narrowing posteriorly on peduncle), body greenish below band with scales strongly rimmed and spotted with black, and body black-spotted ventrally; head may be reddish grey anteriorly, greenish grey posteriorly, dusky ventrally; pectoral fins yellowish; median fins brownish yellow or brownish red; caudal-fin margin pale, forming crescent. Terminal males similar in colour to *C. bicolor*, but have distinctive broken pinkish line from corner of mouth to pectoral-fin base; ventral part of head, chest and abdomen abruptly solid pale green, but abruptly pinkish white anteriorly; naked part of caudal fin blue-green, with irregular blue-edged pink bar at base, and broad lavender-pink band in lower lobe. Both phases with white dental plates. Attains ~70 cm SL.



Cetoscarus ocellatus, 45 cm TL, IP (WIO). Source: SSF



Cetoscarus ocellatus, 90 cm TL, TP (WIO). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: Somalia to South Africa, Madagascar, Mascarenes and Maldives; elsewhere to southern Japan, Marshall Is., Caroline Is., New Guinea, Australia, New Caledonia, Line Is. and Tuamotu Is.

REMARKS Usually relatively rare; found on reef fronts, slopes and passes, to ~35 m deep.

GENUS *Chlorurus* Swainson 1839

Body moderately deep; head bluntly rounded, with prominent protuberance on forehead in two of the Indian Ocean species. Teeth in jaws fully fused to form dental plates, plates broadly exposed, their outer surface smooth, and their cutting edge irregular: vertical tooth rows alternate on crenate cutting edge; edge of upper plate overlapping lower plate when mouth closed; upper dental plate with canines at sides. Median predorsal scales usually 4 (rarely 3); 2 or 3 scales rows on cheeks, 1 row on interopercle. Pectoral fins usually 15 or 16 (occasionally 14) rays. Nostrils subequal; gill membranes narrowly joined to isthmus. Eighteen species, 8 in WIO. *Pseudoscarus* Bleeker 1861, *Xanothon* Smith 1956 and *Ypsiscarus* Schultz 1958 are synonyms. However, *Ypsiscarus* is a valid subgenus for 3 species, including *Chlorurus cyanescens*.

KEY TO SPECIES

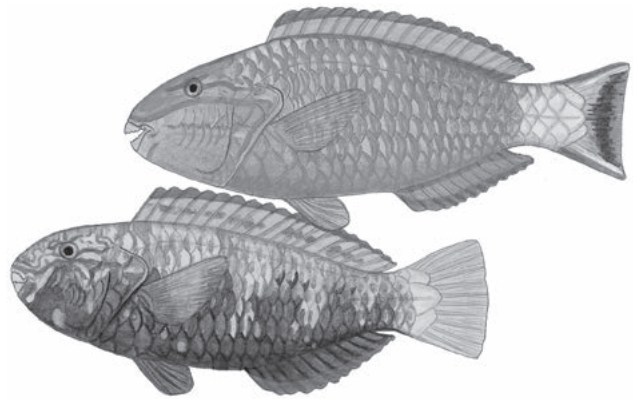
[Adults]

- 1a Median predorsal scales 3; prominent protuberance on forehead above eyes; caudal fin slightly rounded; head and anterior portion of body deep blue, posterior two-thirds of body green, scales edged deep blue; fins deep blue, outer edge of pelvic fins and median-fin margins bright blue (submarginal on spinous part of dorsal fin) *C. cyanescens*
- 1b Median predorsal scales 4–7; head profile not as above; caudal fin varying from slightly rounded to lunate; colour not as above 2
- 2a Pectoral fins usually 16 (rarely 15 or 17) rays; cheek scales in 3 rows, usually 5–7 scales in lowest row; head profile of initial-phase fish strongly convex, of terminal males very steep from mouth to above eyes then curving sharply and thereafter slightly convex 3
- 2b Pectoral fins usually 13–15 (rarely 16) rays; cheek scales in 2 or 3 rows, lowest row usually with ≤4 scales; head profile not as above 4
- 3a Initial-phase fish with yellow body, grading to pale green ventrally, and each scale with narrow pale orange-red bar; head yellow, then abruptly blue-green beneath corner of mouth. Terminal males narrowly green dorsally, broadly purple on sides, and green ventrally; head purple to level of corner of mouth, then abruptly pale blue-green below *C. gibbus*
- 3b Initial-phase fish green to yellowish green dorsally, grading to pink on sides and lavender-pink ventrally; head green, grading to lavender-pink on cheeks and opercles. Terminal males green, with vertical pink bar between each pair of scales; head blue-green and suffused with lavender above narrow green band from corner of mouth and below eye to opercle flap, head mostly yellow below this and grading to greenish lavender posteriorly *C. strongylocephalus*
- 4a Paired fins relatively long; pectoral-fin length ~1.4 in HL, pelvic-fin length ~1.7 in HL; head profile of large adults moderately steep above mouth, with break in contour anterodorsal to eyes; caudal fin of adults emarginate, caudal concavity ~5–8 in HL; not sexually dichromatic: head and body mostly green, with streak of orange at corner of mouth, and narrow ring of lavender-pink around eyes *C. enneacanthus*
- 4b Pectoral-fin length 1.4–1.6 in HL, pelvic-fin length 1.8–2.1 in HL; head profile evenly convex; caudal fin of adults slightly rounded to slightly emarginate; colour not as above 5
- 5a First 2 median predorsal scales not notably larger than last 2; GR 49–61 6
- 5b First 2 median predorsal scales notably larger than last 2; GR 39–51 7

Continued ...

KEY TO SPECIES

- 6a Peduncle depth 13–13.9% SL; longest dorsal-fin spine 11.2–12.1% SL; terminal males with deep blue crescent (black in preservative) in caudal fin, and green band across cheeks at level of mouth *C. atrilunula*
- 6b Peduncle depth 14–15.5% SL; longest dorsal-fin spine 12.2–13.9% SL; terminal males without dark crescent in caudal fin and without green band across cheeks *C. capistratoides*
- 7a Initial-phase fish dark brown, sometimes with 2 rows of whitish spots on sides, and reddish around mouth; dental plates pale salmon-pink. Terminal males: cheeks orange-yellow (Red Sea) or green (Indian Ocean), without broad stripe; peduncle solid green, and caudal fin green with longitudinal streaks of salmon-pink; dental plates green *C. sordidus*
- 7b Initial-phase fish brown, paler on peduncle, with orange-red bar on each scale; dental plates white. Terminal males: cheeks with broad blue-green stripe across upper part, and broad dark purplish stripe on lower part (dark brown in preservative); peduncle same colour as body (blue-green with orange bar on each scale); caudal fin mostly blue, with salmon-pink stripe in each lobe, and dark purplish crescent in centre of fin (dark brown in preservative); dental plates white *C. genazonatus*



Chlorurus atrilunula, 34 cm TL, TP (top); 26 cm TL, IP (bottom) (both South Africa). Source: CFSA

DISTRIBUTION WIO: Kenya to South Africa (Sodwana Bay).

REMARKS Closely related to *Chlorurus japonensis* (Bloch 1789) of the western Pacific, and resembles *C. capistratoides* (Bleeker 1847) of the Indo-Pacific. Records of this species from WIO islands may be misidentifications of *C. capistratoides*.

Chlorurus atrilunula (Randall & Bruce 1983)

Bluemoon parrotfish

PLATE 104

Xanothon capistratoides (non Bleeker 1847): Smith 1956, 1959; Smith & Smith 1963*.

Scarus atrilunula Randall & Bruce 1983: 9, Pl. 4, Figs. A–B (Shimoni, Kenya); SSF No. 221.6*.

Chlorurus atrilunula: Manilo & Bogorodsky 2003; ?Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

Pectoral fins 15 rays. Median predorsal scales 4; cheek scales in 2 rows. Body moderately deep, 2.6–2.9 in SL; head bluntly rounded, dorsal and ventral profiles convex; caudal fin slightly rounded to truncate in initial phase, slightly emarginate in terminal males. Nostrils very small. GR 50–59.

Initial phase dark brown, with 4 or 5 irregular narrow whitish vertical bars, most scales with vertically elongate spot; most of peduncle and caudal fin pale pink; pectoral fins yellowish. Terminal males green, anterior part of each body scale salmon-pink, shading to whitish on peduncle and caudal-fin base; dark blue crescent on caudal fin, and jade-green crescent at margin; broad green-edged whitish zone from mouth and across cheek to below eyes and opercle margin. Attains 34 cm TL.

Chlorurus capistratoides (Bleeker 1847)

Sergeant major parrotfish

PLATE 104

Scarus capistratoides Bleeker 1847: 162 (Jakarta, Java, Indonesia).

Pseudoscarus capistratoides: Bleeker 1862.

Xanothon capistratoides: Smith 1956, 1959; Smith & Smith 1963*.

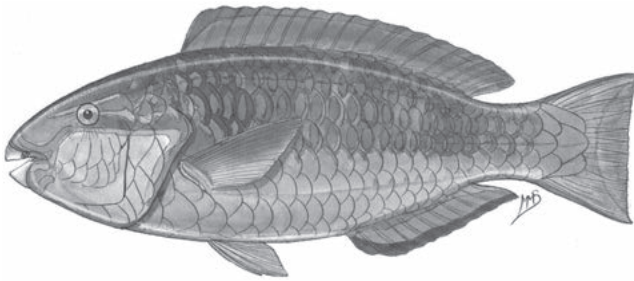
Scarus capistratoides: Randall & Bruce 1983*.

Chlorurus capistratoides: Anderson *et al.* 1998; Kimura *et al.* 2009.

Pectoral fins usually 15 (rarely 14) rays. Median predorsal scales usually 4 (rarely 3); cheek scales in 2 rows. Upper dental plate with prominent canines at sides. Body depth 2.5–2.7 in SL; caudal fin of initial phase slightly rounded, fin of terminal males truncate. Nostrils very small. GR 49–61.

Initial phase dark greenish grey, with dark orangish brown bar on each scale, gradually becoming spots posteriorly; 4 pale pinkish vertical bars on sides of body; rear of peduncle and caudal fin pale salmon-pink; head dark brown, with irregular salmon-pink bands radiating from eyes; pectoral fins mainly yellow, with orange bar at base broadly bordered with black. Terminal males blue-green, with upper edge of scales salmon-pink, and midsides appearing progressively more salmon-pink; lower third of body blue-green; head pale green, grading to salmon-pink on cheeks; blue-green band from below eye, forming acute angle at opercular flap and descending submarginally on opercle, and band continuing forward to corner of mouth where it divides into bands submarginally on

salmon-pink lips; parallel blue-green band above eye and one behind middle of eye; dorsal and anal fins blue, with broad salmon-pink stripe through middle; caudal fin mostly pale salmon-pink, upper and lower edges blue, and centre with crescentic blue margin. Attains 40 cm TL.



Chlorurus capistratoides, 30 cm TL (WIO). Source: SSF

DISTRIBUTION Indo-Pacific (widespread in Indian Ocean). WIO: Seychelles, Mauritius (photographs) and Maldives; elsewhere to Andaman Sea, Thailand, Indonesia and Samoa.

REMARKS Closely related to *Chlorurus japonensis* (Bloch 1789) of western Pacific; often confused with *C. atrilunula*, but differs in lacking a green streak across the cheeks at level of mouth and the deep blue crescent on caudal fin.

Chlorurus cyanescens (Valenciennes 1840)

Blue humphead parrotfish

PLATE 104

Scarus cyanescens Valenciennes in Cuv. & Val. 1840: 254 (Mauritius, Mascarenes); Randall & Bruce 1983*.

Pseudoscarus chloromelas Günther in Playfair & Günther 1867: 109, Pl. 15, Fig. 1 (Zanzibar, Tanzania).

Pseudoscarus cyanescens: Sauvage 1891.

Xanothon chloromelas: Smith 1956.

Chlorurus cyanescens: Heemstra *et al.* 2004; Heemstra & Heemstra 2004*.

Pectoral fins 15 rays. Median predorsal scales 3; cheek scales in 2 rows. Lips covering $< \frac{1}{2}$ of dental plates; upper dental plate of adults with 1 or 2 canines at sides. Adults with convex, fleshy protuberance above eyes. Body depth 2.8–3.1 in SL; caudal fin slightly rounded. GR 44–47.

Head and body deep blue in front of line from base of 5th dorsal-fin spine and curving back to anal-fin origin, and body yellowish green behind this line; dorsal fin with narrow blue band (submarginal on spinous part, marginal on soft-rayed part); dental plates dull white. Attains 50 cm TL.

DISTRIBUTION WIO: Tanzania (Zanzibar), South Africa, Madagascar, Mauritius and Rodrigues.

REMARKS Rare; usually in >15 m. Closely related to *Chlorurus oedema* (Snyder 1909) from the western Pacific, *Scarus ovifrons* (Temminck & Schlegel 1846) and *Scarus obishime* Randall & Earle 1993, both described from Japan, and *C. rhakoura* Randall & Anderson 1997 from Sri Lanka, all with a hump on the forehead.

Chlorurus enneacanthus (Lacepède 1802)

Captain parrotfish

PLATE 104

Scarus enneacanthus Lacepède 1802: 2, 6 (Mauritius, Mascarenes); Randall & Bruce 1983; SSF No. 221.9; Winterbottom *et al.* 1989*.

Scarus capitaneus Cuvier 1829: 265 (Mauritius, Mascarenes).

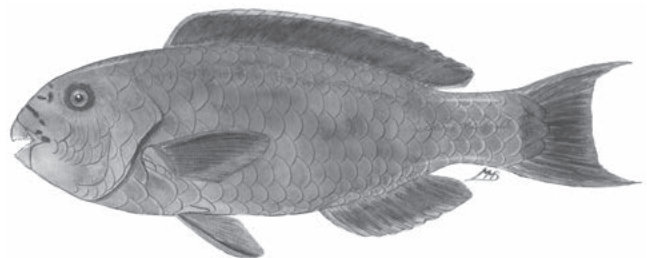
Xanothon capitaneus: Smith 1956, 1959.

Callyodon enneacanthus: SFSA No. 823*.

Chlorurus enneacanthus: Anderson *et al.* 1998; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Pectoral fins 14 or 15 rays. Median predorsal scales 4; cheek scales in 2 rows, upper row with 6 or 7 scales. Upper dental plate with 2 or 3 small canines at rear on each side, no canines on lower plate. Body depth 2.6–2.9 in SL; in adults, dorsal profile of head steeper and straighter than ventral profile; caudal fin slightly rounded to truncate in subadults, lobes slightly produced in adults. GR 54–61.

Males and females apparently same colour: head and body dull green-grey, edges of scales in middle and rear part of body narrowly rimmed in lavender-pink; peduncle and scaly basal part of caudal fin may be paler green, naked part of caudal fin green, lobes streaked with lavender-pink, broad central part of fin streaked blue; eyes with pale green rim; dental plates greenish. Attains 45 cm TL.



Chlorurus enneacanthus, 36 cm TL (Mozambique). Source: Smith & Smith 1963

DISTRIBUTION Indian Ocean. WIO: Mozambique, Seychelles, Mascarenes, Chagos and Maldives; elsewhere to Cocos (Keeling) Is. and Andaman Is.

REMARKS The author photographed six adults, all the same colour, in the lagoon of North Malé Atoll, Maldives. Appears closely related to *Chlorurus frontalis* (Valenciennes 1840) from the central and western Pacific, also monochromatic.

Chlorurus genazonatus (Randall & Bruce 1983)

Purplestreak parrotfish

PLATES 104 & 105

Scarus genazonatus Randall & Bruce 1983: 19, Pl. 6e–f (Marsa el Muqabila, Sinai, Egypt, Gulf of Aqaba, Red Sea); Bruce & Randall *in* Fischer & Bianchi 1984.

Chlorurus genazonatus: Manilo & Bogorodsky 2003; Lieske & Myers 2004.

Pectoral fins 15 or 16 rays. Median predorsal scales 4 (first 2 much larger than last 2); cheek scales in 2 rows, each row with 6–8 scales. Upper dental plate of large adults with 1 or 2 conical teeth at sides, no canines on lower plate. Body moderately deep, 2.5–2.8 in SL; front of head bluntly rounded, dorsal and ventral profiles about equally convex; caudal fin slightly rounded to truncate in initial phase, becoming double emarginate in large males. GR 39–47.

Initial phase brown, paler on peduncle and ventrally; scales with vertically elongate orange bar, progressively broader posteriorly (becoming a spot on scales of peduncle); fins yellowish to orangish brown; dental plates white. Terminal males blue-green, with lavender-pink bar on each scale except those of chest and abdomen; narrow blue-green band on upper lip, curving to below eye, joined by another band from below corner of mouth and broadening as irregular band across opercle; head above band lavender, suffused with green, and with green line extending forward from eye, and 2 lines backward; cheeks below green band with large purple zone; paired fins mainly pale yellow; pectoral-fin axils bright yellow, with broad outer zone of bright orange; dorsal and anal fins blue, with broad salmon-pink band; caudal-fin mostly same colour as lower body, and with broad blue crescent rimmed by purple, and upper and lower edges blue with submarginal salmon-pink band. Attains 30 cm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) and Gulf of Aden (including Seven Brothers Is., Djibouti).

REMARKS Relatively rare; found on coral reefs, usually in >20 m, but known from 6 m.

Chlorurus gibbus (Rüppell 1829)

Steephead parrotfish

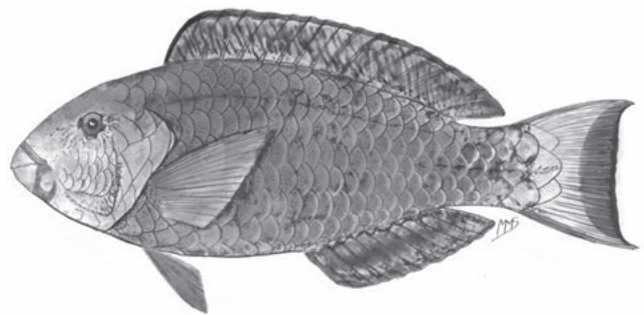
PLATE 105

Scarus gibbus Rüppell 1829: 81, Pl. 20, Fig. 2 (Al Muwaylih, Saudi Arabia, Red Sea); Klunzinger 1871; Randall 1983*; Randall & Bruce 1983*; Dor 1984.

Chlorurus gibbus: Smith 1959*; Lieske & Myers 2004.

Pectoral fins 16 or 17 rays. Median predorsal scales 3 or 4 (anteriormost scale largest); cheek scales in 3 rows, lowest row usually with 5–7 scales. Head profile strongly convex in initial phase, that of terminal males very steep from mouth to above eyes, curving sharply, and then slightly convex to dorsal-fin origin; caudal fin truncate, but with produced lobes, in both phases. Upper dental plate of large adults with 1 or 2 conical teeth at sides, none on lower plate; lips covering <¼ of dental plates.

Juveniles dark brown, with 4 yellow longitudinal stripes, progressively narrower posteriorly. Initial phase yellow, shading to pale green ventrally, with narrow pale orange-red bar on each scale; head yellow, abruptly blue-green behind corner of mouth; upper lip with broad blue-green band; eyes encircled by blue-green, sometimes with short bands radiating back; dorsal and anal fins yellow, with green band or row of spots at base, and blue margin; caudal fin yellow, with blue upper and lower edges, and blue crescent posteriorly; dental plates dark green with white edges. Terminal males: head purplish blue, with wavy demarcation from corner of mouth to opercular flap, and blue-green below; body mostly purplish blue, greener dorsally and ventrally, but many scales with green centres and purplish blue edges; dorsal and anal fins variably banded; caudal fin dark purplish blue, with narrow green upper and lower edges, and broadly green posteriorly. Attains 60 cm TL.



Chlorurus gibbus, 28 cm TL, IP (WIO). Source: SSF

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS In a review of the Scaridae, Schultz (1958) mistakenly used the name *Chlorurus gibbus* for *Bolbometopon muricatum* (Valenciennes 1840); he was later corrected by Smith (1959). Randall (1983) continued to classify this species in *Scarus* and gave the distribution as Indo-Pacific, yet recognised three populations based on colour: Red Sea, Indian Ocean, and western and central Pacific (note that his photograph of the initial phase in the Red Sea was falsely printed with more red than yellow). Winterbottom *et al.* (1989) reported the species from Chagos as *Scarus gibbus*. Based on distinct differences in colour, Randall (1992, 1995) finally followed Smith (1959) in using *Chlorurus gibbus* for the Red Sea, *C. stronglylocephalus* (Bleeker 1855) for the Indian Ocean, and *C. microrhinos* (Bleeker 1854) for the Pacific Ocean populations.

Chlorurus sordidus (Forsskål 1775)

Bullethead parrotfish

PLATE 105

Scarus sordidus Forsskål in Niebuhr 1775: 30, x (Hurghada, Egypt, Red Sea);

Randall 1983*, 1992; Randall & Bruce 1983*; Winterbottom *et al.* 1989*.

Scarus erythrodon Valenciennes in Cuv. & Val. 1840: 255 (Mauritius, Mascarenes).

Scarus variegatus Valenciennes in Cuv. & Val. 1840: 256 (Mauritius, Mascarenes).

Callyodon bipallidus Smith 1956: 936 ([several localities] Malindi, Kenya, to KwaZulu-Natal, South Africa, to Aldabra, Seychelles).

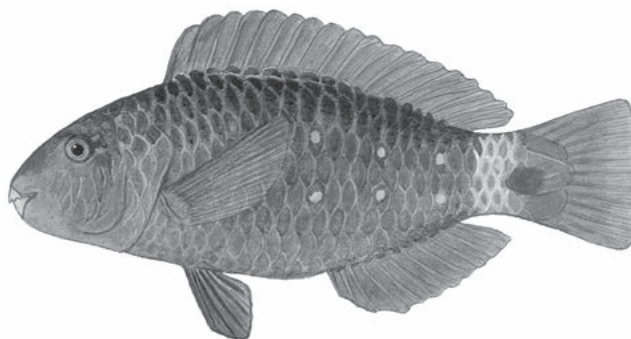
Xanothon margaritus: Smith 1956; Smith & Smith 1963*.

Chlorurus sordidus: Randall 1992, 1995*; Carpenter *et al.* 1997; Manilo & Bogorodsky 2003; Lieske & Myers 2004; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Kimura *et al.* 2009.

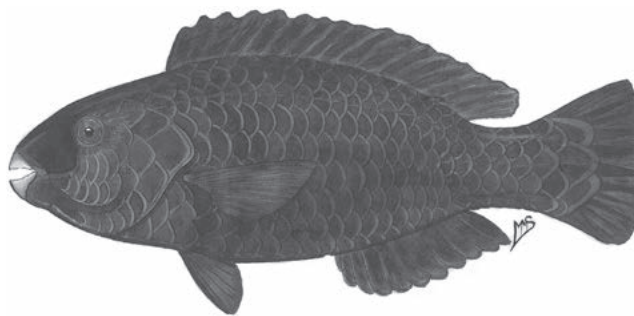
Pectoral fins 14 or 15 rays. Median predorsal scales 3 or 4 (progressively smaller posteriorly); cheek scales in 2 rows, both with 5–8 scales. Upper dental plate of large adults with 1 or 2 conical teeth at sides, none on lower plate; lips covering $< \frac{1}{2}$ of dental plates. Head strongly rounded, dorsal and ventral profiles about equally convex; caudal fin slightly rounded in juveniles, truncate in adults, and may be slightly emarginate in large males. GR 42–51.

Juveniles uniformly dark brown or dark brown with 4 narrow yellowish white stripes. Initial phase dark reddish brown; snout and chin pinkish to reddish brown; scales on interorbital region and nape irregularly marked in yellow, but especially at the edges; two rows of 5 or 6 vertically aligned pairs of whitish spots often on sides of body; broad whitish

bar with large circular blackish spot sometimes present on peduncle and caudal-fin base (this colour pattern and pairs of whitish spots are quickly assumed or removed at will); median fins and pelvic fins reddish brown; dental plates salmon-pink with white edges. Terminal males variably coloured: usually green, scales edges pink to purple, except nearly solid green on peduncle; anterodorsal part of body often suffused with yellow; head green above irregular horizontal demarcation through lower part of eyes; snout lavender to purplish blue; upper lip with narrow pink margin, bordered above by green band joined by band from below corner of mouth, passing beneath lavender band at lower edge of eye; chin pink, crossed by 3 broad green bands, ending in broad yellow zone across cheeks; dorsal and anal fins with purple line from fin origins to rear end of fins, and fins mainly lavender-pink below line and blue-green above; caudal fin green, streaked distally with lavender. Attains 40 cm TL.



Chlorurus sordidus, 20 cm TL, IP (South Africa). Source: CFSA



Chlorurus sordidus, 20 cm TL, IP (WIO). Source: Smith & Smith 1963

DISTRIBUTION Indian Ocean. WIO: Red Sea, Kenya to South Africa (Eastern Cape), Madagascar, Mascarenes, Aldabra, Maldives and Chagos; elsewhere to Andaman Sea and western Indonesia.

REMARKS Often occurs as the most common scarid in a variety of coral and rocky reef habitats, in 1–25 m. Group and pair spawning was described by Yogo *et al.* (1980), and pair spawning by Randall & Bruce (1983). A phylogenetic study by Choat *et al.* (2012) concludes that the Pacific population is a different species, referable to *Chlorurus spilurus* (Valenciennes 1840). Colour variation among terminal males from the Red Sea and from the Indian Ocean may indicate that the name *C. erythrodon* (Valenciennes 1840) should be applied to the WIO population.

Chlorurus strongylocephalus (Bleeker 1855)

Roundhead parrotfish

PLATE 106

Scarus strongylocephalus Bleeker 1855: 439 (Jakarta, Java, Indonesia).

Pseudoscarus microcheilos Bleeker 1861: 231 (Jakarta, Java, Indonesia).

Chlorurus strongylocephalus: Smith 1956, 1959; Smith & Smith 1963*;

Randall 1992, 1995*; Anderson *et al.* 1998; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Fricke *et al.* 2009; Kimura *et al.* 2009.

Scarus microrhinos (non Bleeker 1854): Schultz 1958 [in part].

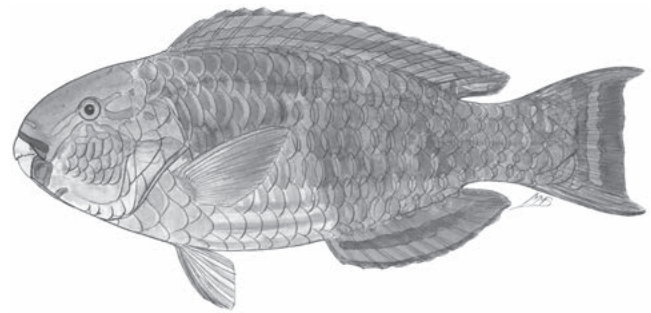
Scarus gibbus (non Rüppell 1829): Randall & Bruce 1983*;

Winterbottom *et al.* 1989*.

Pectoral fins 15–17 rays. Median predorsal scales usually 4; cheek scales in 3 rows. Lips covering $\leq \frac{1}{4}$ of dental plates. Body depth 2.4–2.7 in SL (adults); head profile steep and smoothly convex, but becoming steeper at snout and forming rounded angle in front of eyes in terminal males; caudal fin of adults truncate to slightly double emarginate with elongate lobes, maximum caudal concavity ~ 1.4 in HL.

Small initial phase (~ 15 cm TL) with green body and lavender-pink bar on each scale; head lavender-pink dorsally, pale green ventrally; lips with blue-green margin; eyes with irregular green rim. Large initial phase (~ 40 cm TL) with head and body greenish yellow dorsally, grading to pale red or pink on sides and ventrally, scale edges slightly darker; eyes rimmed with dark green; lip margins with green or blue-green band, 2 bands not meeting at corner of mouth. Terminal males blue, outer part of scales behind pectoral fins broadly pale yellowish green, and scales on sides of body with pale lavender-pink bars at base (broadest in pectoral region, progressively narrower posteriorly); head mainly blue dorsally, sometimes suffused with lavender posteriorly; 2 green or yellow-green bands from behind eye; pale blue or green band on lips, separated at corner of mouth by pink spot, upper band continuing to below eyes and to opercular flap (band faint on some individuals); cheek and opercle below band variously yellow, grading to pale blue

or lavender-blue ventrally; narrow band of yellowish green along dorsal-fin base, breaking into spots posteriorly; dorsal and anal fins with blue margins and broad blue band through middle, becoming labyrinth of irregular bands in large adults; pectoral fins dark greenish yellow, with pale blue upper edge becoming deep blue at fin base; caudal fin with irregular double lavender-pink bar in centre, continuing as narrowing band in middle of each lobe. Both phases with blue-green dental plates (often discoloured by algae in adults, especially basally and posteriorly). Attains ~ 70 cm TL.



Chlorurus strongylocephalus, 28 cm TL (WIO). Source: SSF

DISTRIBUTION Indian Ocean. WIO: southern Oman (not known from Gulf of Oman) to Mozambique, Madagascar, Seychelles, Mascarenes, Chagos and Maldives; elsewhere to Andaman Sea, Cocos (Keeling) Is. and Indonesia (western Sumatra and Java).

REMARKS Generally the most common of the larger scarids, usually seen in outer-reef areas. One of a complex of three large-sized and closely related species: *Chlorurus gibbus* from the Red Sea and Gulf of Aden, *C. strongylocephalus* from the Indian Ocean, and *C. microrhinos* from the western Pacific to Line Is. and Pitcairn Is.

GENUS *Hipposcarus* Smith 1956

Snout long; eyes near dorsal profile. Dental plates narrow and nearly covered by lips; teeth of plates fully coalesced, with individual teeth visible only on cutting edge; upper dental plate overlapping lower plate when mouth closed; canines may be present at sides of upper dental plate. Median predorsal scales usually 4; cheek scales small, in nearly triangular isolated patch of 3 or 4 irregular rows. Pectoral fins 15 rays. Two species, 1 in WIO.

Hipposcarus harid (Fabricius 1775)

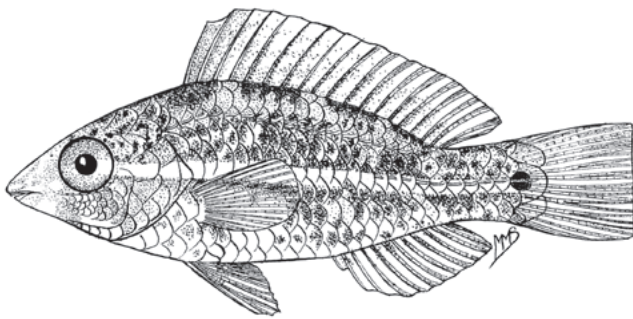
Longnose parrotfish

PLATE 106

Scarus harid Fabricius in Niebuhr (ex Forsskål) 1775: 30, x [Red Sea].*Hipposcarus harid*: Smith 1956*; Randall 1983*, 1992; Randall & Bruce 1983*; Winterbottom *et al.* 1989*; Parenti & Randall 2000; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Lieske & Myers 2004; Fricke *et al.* 2009.*Hipposcarus harid vexillus* Smith 1959: 277, Fig. 9 (Shimoni, Kenya).

Snout long and pointed, its profile straight or a very slight sinuous curve; mouth slightly inferior; anterior and posterior nostrils subequal; caudal-fin margin more concave with age, lobes becoming strongly produced in terminal males. Dental plates narrow, their height 1.5–2 in eye diameter; upper dental plate of terminal males with 1 or 2 conical teeth at sides. Median predorsal scales 3 or 4 (2nd scale largest); cheek scales in 3 rows, present as an almost triangular isolated patch. GR 56–65, number increasing with growth.

Juvenile specimen (4.5 cm TL, Red Sea) pale pinkish grey, with broad white scale edges; small black spot at middle of caudal-fin base, followed by narrow black bar. Initial phase pale tan, shading to whitish ventrally, scales edges paler grey; dorsal and anal fins pale pinkish grey, with pale blue margin; caudal fin pale grey to bluish grey, lobes darker. Terminal males pale green, shading to pale blue-green ventrally, scales on upper three-quarters of body with narrow, curving, orange-pink bar at bases; small pale green blotches on sides of abdomen; margin of upper lip salmon-pink, with narrow submarginal blue-green band above, pink continuing diffusely onto cheeks, and pale pink bands extending around eyes; dorsal and anal fins salmon-pink, with narrow blue margin; pectoral fins with pale blue upper edge, broad orange submarginal band, and lower half of fin with orange rays and transparent membranes; caudal fin mostly same colour as body, pale blue distally, with broad pink band in each lobe, and ~7 longitudinal pink streaks in centre of fin. Attains 75 cm TL (commonly 55 cm TL).



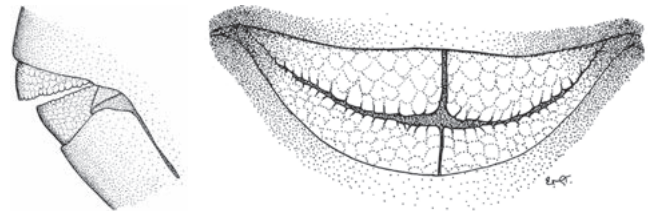
Hipposcarus harid, 5 cm TL, juvenile, holotype of *H. harid vexillus* (Seychelles). Source: Smith 1959

DISTRIBUTION WIO: Red Sea, Kenya to Mozambique (Bazaruto I.), Seychelles, Madagascar, Mascarenes, Chagos and Maldives.

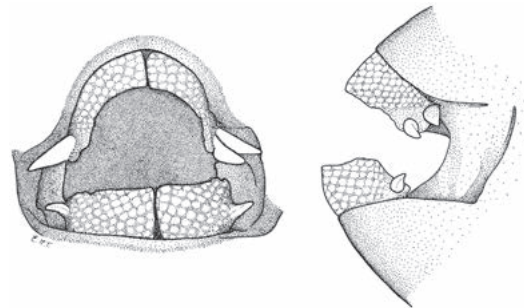
REMARKS Found more often in protected waters of lagoons and bays than in outer-reef areas; generally associated with sand and rubble areas marginal to reefs (for which the pale colouration is adapted). Usually seen in small mobile aggregations of initial-phase fish with one terminal male.

GENUS *Scarus* Forsskål 1775

Pectoral fins usually 15 or 16 (occasionally 14) rays. Teeth in jaws fully fused to form dental plates, each vertical tooth row with a tooth on cutting edge; edge of upper dental plate overlapping lower plate when mouth closed, and plates mostly covered by lips; upper dental plate with canines at sides in most species, and some species also with canines at sides of lower plate. Median predorsal scales 3–8; cheek scales in 2–4 rows. Body moderately deep, head rounded; nostrils subequal (except posterior nostrils notably large and oval in *S. ghobban*); gill membranes narrowly joined to isthmus; GR 39–61. At least 52 valid species, 21 in WIO.



Teeth of *Scarus russelii* fused to form dental plates.



Teeth of *Scarus viridifucatus* with canines on lower and upper dental plates.

KEY TO SPECIES

[Adults]

- 1a Head profile rising steeply from mouth to level of eyes, then curving sharply and nearly straight for rest of head; no rudimentary lateral row of teeth on upper pharyngeal bones; initial phase mostly reddish, yellowish grey dorsally and on sides, scales with narrow blackish edges and short markings, and fins mainly red; terminal males green dorsally, suffused with purplish, yellowish on sides, and pale blue-green ventrally; upper lip narrowly salmon-pink, with broad blue-green band above; lower lip broadly blue-green at margin; chin salmon-pink, crossed by blue-green band joining that of lip to pass below eyes *S. rubroviolaceus*
- 1b Head profile not as above; row of rudimentary teeth laterally on each upper pharyngeal bone; colour not as above 2

- 2a Dorsal profile of snout straight to slightly concave, and then steep above eyes (~70°), then mostly straight to dorsal-fin origin; terminal males with 2 green or blue-green bands from eyes across interorbital space, posterior band twice as broad *S. festivus*
- 2b Dorsal profile of snout and colour not as above 3

- 3a Head profile strongly and evenly convex, mouth distinctly inferior and posterior to front of snout; usually pair of adjoining or slightly overlapping scales in front of 1st median predorsal scale 4
- 3b Head profile not strongly and evenly convex, mouth not inferior and posterior to front of snout; no pair of small scales in front of 1st median predorsal scale 5

- 4a Median predorsal scales 4–6 (3rd and 4th scales largest); GR 46–49; terminal males green, with salmon-pink scale edges (except ventrally where green forms stripes, and anteriorly where green breaks into small spots); head green, with irregular pink stripe from snout through lower part of eyes, and irregular pink markings behind eyes; small black spot at base of 4th dorsal-fin spine; caudal fin green *S. globiceps*
- 4b Median predorsal scales 3–5, size subequal; GR 39–46; terminal males green, with salmon-pink scale edges, head dull green, grading to orangish ventrally, with large patch of bright blue-green on sides of snout that may extend onto chin; naked part of caudal fin green, upper and lower edges blue, with submarginal salmon-pink band *S. viridifucatus*

- 5a Cheek scales in 2 rows; median predorsal scales 4 6
- 5b Cheek scales in 3 rows; median predorsal scales 5–7 11

- 6a GR 74–81; initial phase yellowish grey-brown, with 3 narrow white stripes on abdomen following centres of scale rows; terminal males edge of upper lip rose-pink, joined by band of same colour from chin, continuing through lower part of eye, bordered below by blue-green; green stripes on peduncle and caudal-fin base following scale rows; naked part of caudal fin salmon-pink, with vertical blue bar, and blue margin on middle rays *S. collana*
- 6b GR 37–58; colour not as above 7

- 7a Pectoral fins usually 15 rays 8
- 7b Pectoral fins usually 14 rays 9

- 8a Median predorsal scales subequal; upper lip covering less than half of dental plate; rear margin of upper dental plate with 4 or 5 ventrally projecting blunt teeth; caudal fin of initial phase slightly rounded to truncate, fin of terminal males slightly emarginate, maximum caudal concavity ~12 in HL; initial phase grey-brown, with narrow brownish orange bar at base of each scale; irregular pale blue-green interorbital band, also extending behind orbits; head pale blue-green ventrally; median fins orangish brown with blue margin (caudal-fin margin sometimes white); dental plates blue-green; terminal males green, suffused with yellow on sides of head and body, scale edges orangish yellow; broad irregular zone of deep green around eyes and across interorbital area; ventral part of head broadly blue-green *S. arabicus*
- 8b Median predorsal scales progressively smaller posteriorly; upper lip covering three-quarters of dental plate; no small teeth posteriorly on upper dental plate; caudal fin truncate with elongate lobes, maximum caudal concavity ~5.4 in HL; initial phase green, grading to orangish on abdomen, scale edges orangish brown; head greenish yellow, grading to blue on opercle and onto chest; irregular short green bands radiating from eyes, with a long band to upper lip and another to chin; terminal males with scales half pink and half green, progressively more green posteriorly, pink replaced by yellow in circular area on sides of body centred below rear of dorsal fin; broad yellow band below dorsal-fin origin and enclosing pectoral-fin bases; snout and chin green, grading to blue on nape, yellowish on cheeks, and blue ventrally on head and chest *S. zuffar*

- 9a Caudal fin of initial phase slightly rounded, becoming double emarginate to truncate with moderately elongated lobes in terminal males, maximum caudal concavity ~5.5 in HL; initial phase reddish grey, with brownish red bar at base of each scale, often with 5 dark bars on body; terminal males abruptly darker in front of line from base of 9th dorsal-fin spine to anal-fin origin; both phases with blue margins on lips, broad on upper lip and with transverse band of salmon-pink, and no small black spot on upper part of pectoral-fin base ... *S. russelii*

Continued...

KEY TO SPECIES

- 9b Caudal fin of initial phase truncate to slightly emarginate, fin of terminal males deeply emarginate to lunate, caudal concavity 1.6–3 in HL; initial phase without dark bars, and terminal males not bicoloured; small black spot present on upper part of pectoral-fin bases 10
- 10a Median predorsal scales 4 (1st and 2nd scales larger than 3rd and 4th); caudal fin of terminal males deeply emarginate to lunate, maximum caudal concavity ~1.6 in HL; GR 47–58; no dark spot on 1st membrane of dorsal fin; initial phase greenish grey, scale edges dark purplish brown; lips edged with dull blue-green, sometimes enclosing an orange spot in upper lip; chin dull orange, with transverse dull blue-green band; terminal males green, scale edges purple, with pale bar (width ~2 scales) across body, centred below base of 2nd dorsal-fin ray *S. fuscopurpureus*
- 10b Median predorsal scales 3–5, nearly equal in size; caudal fin of terminal males emarginate, maximum caudal concavity ~3 in HL; GR 40–50; initial phase usually reddish brown, shading to dull orange-red on chest and abdomen; snout and chin usually paler than rest of head; dark brown spot at base of 1st dorsal-fin membrane (most evident on preserved specimens); terminal males with scales about half green and half salmon-pink, green tending to merge to form 3 stripes on abdomen and 4 or 5 stripes on peduncle; lips bright blue-green, the colour joining band from corner of mouth to below eyes, and snout above band often suffused with lavender *S. psittacus*
- 11a Median predorsal scales usually 7 12
- 11b Median predorsal scales usually 5 or 6 13
- 12a Dental plates blue-green; initial phase reddish brown, scales on sides grey with brown spots and short lines; dull green bands on lips, chin and in front of and behind eyes; terminal males dark green, scale edges dark reddish; head green bands as in initial phase except for broad irregular band from upper edge of eyes to greenish yellow spot at upper end of gill openings; penultimate anal-fin ray elongate, 1.5–1.6 in HL *S. niger*
- 12b Dental plates white; initial phase yellow to pale reddish brown, with 5 dark brown stripes on sides; no green markings on head; terminal males green on lower half of head and body behind vertical at base of 5th dorsal-fin ray; rest of head and body green, with numerous small orange spots and short irregular lines; penultimate anal-fin ray not elongate, its length ~2 in HL *S. frenatus*
- 13a Pectoral fins almost always 14 rays 14
- 13b Pectoral fins 15 (rarely 16) rays 16
- 14a Upper dental plate with 1 or 2 strong canine teeth at rear; initial phase pale grey, with narrow orange-yellow bar separating scales, except grey with white stripe following centres of scales on abdomen; caudal fin pale blue-grey; terminal males green, with narrow lavender-pink bar separating scales; large bright green area on cheeks, grading to pink and yellow on opercles, narrowing to corners of mouth and expanding onto upper lip; head above green area grey, suffused with lavender; caudal fin with broad blue lobes, margin between lobes lime-green *S. quoyi*
- 14b No canine teeth at rear of upper dental plate; colour not as above 15
- 15a Scales in 3rd row on cheek 1–4; no canine teeth on dental plates; upper part of body of initial phase yellowish with 4 dark grey bars or blotches; lower part of body pale yellowish to pinkish white; terminal males green, edges of scales salmon-pink, except body anterior to demarcation from base of 8th dorsal-fin spine and dorsal part of head, which are dark grey; edge of upper lip narrowly salmon-pink; broad band of blue-green above this, joined at corner of mouth with similar band on lower lip and extending across upper cheek to edge of opercle *S. scaber*
- 15b Scales in 3rd row on cheek 3–6; terminal males and occasional large initial-phase fish with 1 or 2 canine teeth at rear of upper dental plate; initial phase dark purplish to blackish, shading on side to blue with black edges on scales and ventrally to orange-yellow, truncate to emarginate caudal fin pale red; terminal males green, edges of scales salmon-pink; head lavender dorsally with 2 narrow blue-green stripes, 1 through dorsal part of eye and 1 passing from base of upper lip ventral to eye; caudal fin broadly lunate, blue with salmon-pink crescent continuing to lobe tips *S. tricolor*
- 16a Posterior nostril oval, 2–5 times larger than anterior; 3rd scale row of usually 1 scale sometimes present on cheeks; initial phase yellow, centres of scales blue, often with 5 blue bars on body; terminal males pale green, scales edged with salmon-pink (green dominating dorsally and pale salmon ventrally); broad irregular green band across lower cheek (below scales); dental plates pale salmon-pink *S. ghobban*
- 16b Posterior nostril at most slightly larger than anterior; 1–4 scales in 3rd (lowest) row on cheeks; colour not as above; dental plates green or blue-green 17

Continued ...

KEY TO SPECIES

- 17a Caudal fin of initial phase slightly rounded to truncate or slightly emarginate; caudal-fin lobes of terminal males not very long, maximum caudal concavity ~3.9 in HL; GR 39–53 **18**
- 17b Caudal fin of initial phase truncate to deeply emarginate; caudal-fin lobes of terminal males very long, maximum caudal concavity ~1.7 in HL; GR 51–65 **19**
- 18a Caudal fin of initial phase truncate to slightly rounded, of terminal males double emarginate; initial phase dark greyish brown with 3 whitish bars on body below dorsal fin, narrower than dark interspaces, and one anteriorly on peduncle, grading to yellow posteriorly; dorsal and caudal fins yellow; body of terminal males violet-blue, grading to bright green below posterior third of dorsal fin and dorsal three-quarters of peduncle, and to orangish yellow anteriorly on body and head behind eyes; scales of body rimmed with salmon-pink except on chest and abdomen; large blue-green covering most of chin and anterior snout except salmon-pink margin of upper lip, narrowing to lower half of eye, with narrow irregular blue-green bands extending from rest of eye; pale blue bar dorsally on body off tip of pectoral fin, scales within bar still rimmed with salmon-pink *S. ferrugineus*
- 18b Caudal fin of initial phase emarginate to truncate, of terminal males emarginate; initial phase pale brownish grey, scales narrowly rimmed with dark yellowish brown, grading to pale reddish grey ventrally; 3 vertical pairs of whitish spots larger than pupil on midside of body, 1st just behind pectoral fin, last before caudal peduncle; median fins reddish grey with blue margins; terminal males green, scale edges orange-yellow, with broad dusky bar in middle of body off tip of pectoral fin; head orange-yellow, grading to pale blue-green ventrally, with irregular blue-green bands on snout and an irregular band on chin to below eye *S. persicus*

- 19a Pectoral fins 1.4–1.6 in HL; GR 51–55; initial phase dark reddish brown on head and body anterior to line at 8th dorsal-fin spine; remainder of body reddish white with 3 dark reddish brown bars, last bar mainly as vertically elongate spot on side of peduncle; caudal fin reddish white with dark reddish brown lobes; dental plates white; terminal males green, scales narrowly edged in lavender-pink; midside of body and cheek suffused with salmon; snout pale lavender-blue with few blue-green spots to blue-green band across front of interorbital; edge of upper lip narrowly salmon-pink with broad submarginal blue-green band; chin salmon-pink with transverse blue-green bands, 1st marginal on lower lip, joining 2nd behind mouth to below eye; dental plates blue-green *S. caudofasciatus*
- 19b Pectoral fins 1.2–1.5 in HL; GR 55–65; colour not as above ... **20**
- 20a Pectoral fins 15 or 16 rays; body depth 2.1–2.5 in SL; initial phase dark olive-grey, shading to red on abdomen, chest, and ventrally on head, with scattered small whitish spots on body (more numerous posteriorly); dental plates white; terminal males dull blue-green, scales narrowly edged in reddish, with very broad blue-green band beginning anteriorly on head (except area of orange around mouth), covering all of cheek and most of ventral head, continuing on upper chest, and narrowing on side of abdomen and along base of anal fin to lower edge of peduncle; ventral part of head and body orange-pink below blue-green band *S. falcipinnis*
- 20b Pectoral fins 15 rays; body depth 2.3–2.7 in SL; colour of initial phase very similar to *S. falcipinnis*, but with narrow blue-green band from chin nearly to eye and blue-green dental plates; terminal males green dorsally, grading to blue on side and ventrally, scales narrowly rimmed with magenta, becoming dull orange-yellow anterodorsally on body and onto head to an irregular blue line from chin to below eye and across opercle at level of dorsal edge of pectoral fin; head below bright green, scales narrowly rimmed with magenta *S. prasiognathos*

Scarus arabicus (Steindachner 1902)

Arabian parrotfish

PLATE 106

Pseudoscarus arabicus Steindachner 1902: 318 (Al Mukallā, Yemen, Gulf of Aden); Steindachner 1903*.

Scarus arabicus: Randall & Bruce 1983*; Bruce & Randall in Fischer & Bianchi 1984; Randall 1995*; Manilo & Bogorodsky 2003; Psomadakis *et al.* 2015.

Pectoral fins 15 rays. Median predorsal scales 4 (subequal in size); cheek scales in 2 rows. Upper dental plate with 4 or 5 ventrally projecting blunt teeth at rear on each side; lips covering <1/2 of dental plates. Head profile of terminal males steep and convex; caudal fin slightly rounded to truncate in initial phase, becoming slightly emarginate in terminal males, maximum caudal concavity ~12 in HL.

Initial phase grey-brown, with narrow brownish orange bar at base of each scale; irregular pale blue-green band across interorbital and extending behind orbit; head pale blue-green ventrally; median fins orangish brown with blue outer margin (may be white on caudal fin); dental plates blue-green in both phases. Terminal males green, suffused with yellow on side of head and body, scales rimmed with orangish yellow; broad irregular zone of deep green around eye and across interorbital; ventral part of head broadly blue-green; snout green, edge of upper lip narrowly lavender-pink; median fins with broad blue margins, except caudal-fin margin narrowly white. Attains ~45 cm TL.

DISTRIBUTION WIO: Gulf of Aden (Yemen) to Gulf of Oman (less common) and Pakistan.

Scarus caudofasciatus (Günther 1862)

Redbarred parrotfish

PLATE 106

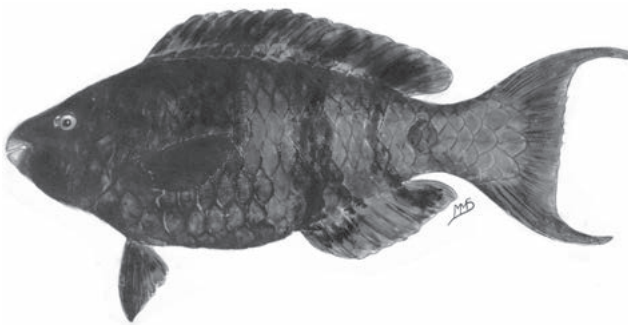
Pseudoscarus caudofasciatus Günther 1862: 238 (Mauritius, Mascarenes).*Callyodon rubrofasciatus* Smith 1956: 10, Pl. 43, Fig. I (Shimoni, Kenya);

Smith 1959; Smith & Smith 1963*.

Scarus caudofasciatus: Randall & Bruce 1983*; Bruce & Randall in Fischer & Bianchi 1984; Randall 1992; Fricke *et al.* 2009.

Pectoral fins 15 or 16 rays. Median predorsal scales 5–7 (4th scale slightly larger than others); cheek scales in 3 rows, lowest row with 2–4 scales. Lips covering $\frac{1}{2}$ – $\frac{2}{3}$ of dental plates; large initial-phase fish and terminal males with 1 or 2 canines at sides of both dental plates. Body depth 2.4–2.6 in SL; caudal fin deeply emarginate in initial phase, becoming lunate with produced lobes in terminal males, maximum caudal concavity ~1.7 in HL. GR 51–55.

Initial phase with head and anterior body dark reddish brown to vertical at base of 8th dorsal-fin spine; rest of body pale red with 3 dark reddish brown bars, last short, anteriorly on midside of peduncle; fins pale red; dental plates pale brownish red, edges white. Terminal males green, scales narrowly edged in lavender-pink; midside of body and cheek suffused with salmon; snout pale lavender-blue with few blue-green spots to blue-green band across anterior interorbital; edge of upper lip narrowly salmon-pink with broad submarginal blue-green band; chin salmon-pink with transverse blue-green bands, 1st marginal on lower lip, joining 2nd behind mouth, extending to below eye; dental plates blue-green; caudal fin blue-green with large central lavender-pink area containing blue-green crescent. Attains 50 cm TL.

*Scarus caudofasciatus*, 45 cm TL (WIO). Source: SSF

DISTRIBUTION WIO: Red Sea, Kenya to South Africa (Sodwana Bay), Madagascar, Seychelles, Mascarenes and Maldives; elsewhere from Andaman Is.

REMARKS Rare; observed only in outer-reef areas, at 10–40 m.

Scarus collana Rüppell 1835

Greenband parrotfish

PLATES 106 & 107

Scarus collana Rüppell 1835: 25, Pl. 8, Fig. 2 (Massawa, Eritrea, Red Sea);

Randall & Bruce 1983*; Lieske & Myers 2004.

Pseudoscarus ismailius Kossmann & Räuber 1877: 410 (Red Sea).*Scarus ghardaqensis* Bebars 1978: 78, Fig. 2 (Hurghada, Egypt, Red Sea).

Pectoral fins 14 or 15 rays. Median predorsal scales 4; cheek scales in 2 rows, each with 5 or 6 scales. Upper dental plate with 2–8 small canine-like teeth on margin, but no large canines at rear; lips covering at least four-fifths of dental plates. Body depth 2.4–2.7 in SL; mouth slightly inferior; caudal fin emarginate in initial phase, becoming deeply emarginate in terminal males. GR 74–81.

Initial phase pale greenish grey, the scales rimmed with yellow, paler ventrally, with 3 indistinct white stripes on abdomen; dorsal fin very pale pink with pale blue-green margin; anal fin pale orangish with pale blue-green margin; caudal fin pale pinkish grey with pale greenish margin all around; pectoral fins with pale dusky rays, transparent membranes, and very small blackish spot dorsally on base. Terminal males green on upper two-thirds of body, with narrow pink bar at base of each scale, grading to pinkish blue ventrally with 3 blue stripes centred on scale rows; green of scales merging on peduncle to form 5 irregular bands, narrowly separated by pink; head purplish blue-green dorsally, yellow on cheek, and blue ventrally; pink band on upper and lower lips, joining at corner of mouth, and through lower edge of eye; pink bands of lips bordered with blue, lower lip changing to green posteriorly; short pink band behind eye, sometimes one extending anteriorly; chest uniform blue; caudal fin purplish blue with purple bar in middle of fin; dental plates greenish. Attains 33 cm TL.

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Usually found in sheltered habitats, typically areas of silty sand with small coral heads and rubble, at 1–15 m. Resembles *Scarus psittacus*, which differs in having a small dark brown spot basally on the 1st membrane of the dorsal fin, a small triangular black spot dorsally on the pectoral-fin base, white dental plates, and GR 40–50.

Scarus falcipinnis (Playfair 1868)

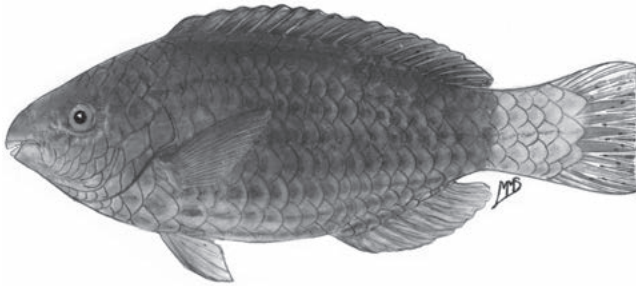
Sicklefin parrotfish

PLATE 107

Pseudoscarus falcipinnis Playfair 1868: 865, Fig. 3 (Seychelles).*Callyodon falcipinnis*: Smith 1955*, 1956, 1959*.*Callyodon pindae* Smith 1956: 11, Pl. 45, Fig. I (Pinda, Mozambique).*Callyodon improvisus* Smith 1956: 12, Pl. 41, Fig. E (Mahé, Seychelles); Smith 1959*.*Scarus falcipinnis*: Randall & Bruce 1983; Winterbottom *et al.* 1989*; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Pectoral fins 15 or 16 rays. Median predorsal scales 6 (4th scale largest); cheek scales in 3 rows, lowest row with 1–3 scales. Upper dental plate of terminal males with 1 or 2 canines at rear on each side; lips covering $\frac{1}{2}$ – $\frac{3}{4}$ of dental plates. Body depth 2.1–2.5 in SL; pectoral fins 1.2–1.4 in HL; caudal fin truncate to moderately emarginate in initial phase, becoming deeply emarginate with elongate lobes in terminal males, maximum caudal concavity ~1.6 in HL. GR 55–65.

Initial phase dark olive-grey, scale edges dark brown, grading to reddish ventrally; scattered whitish spots smaller than pupil on body, more numerous posteriorly; head yellowish green, grading to pink ventrally and on snout; dental plates white. Terminal males dull blue-green, scale edges narrowly salmon-pink, with broad area of blue on cheek that divides forward to band on snout and one on chin, and continues back as narrowing band across chest below pectoral fins, across abdomen and above anal-fin base, to lower edge of peduncle; anal fin blue with narrow salmon-pink stripe, continuous with ventral part of abdomen and chest; naked part of caudal fin blue with submarginal salmon-pink band in each lobe; dental plates blue-green. Attains 60 cm TL (~30 kg).



Scarus falcipinnis, 19 cm TL, IP, holotype of *Callyodon pindae* (Mozambique). Source: SSF



Scarus falcipinnis, 53 cm TL, TP (WIO). Source: SSF

DISTRIBUTION WIO: Kenya to Mozambique (Pinda), Madagascar, Aldabra, Seychelles, Mascarenes and Chagos.

REMARKS All specimens examined were collected in <6 m. Similar to *Scarus prasiognathos* Valenciennes 1840, with the initial phase of the two species almost identical

but for a narrow bridle-like green band anteriorly on head of *S. prasiognathos*; terminal phases readily distinguishable. Not known to be sympatric: *S. prasiognathos* ranges from the Maldives to the western Pacific.

Scarus ferrugineus Forsskål 1775

Rusty parrotfish

PLATE 107

Scarus ferrugineus Forsskål in Niebuhr 1775: 29, x (Dahab, Egypt, Gulf of Aqaba, Red Sea); Randall 1983*, 1995*; Randall & Bruce 1983*; Dor 1984; Manilo & Bogorodsky 2003; Lieske & Myers 2004.
Scarus caeruleus Valenciennes (ex Ehrenberg) in Cuv. & Val. 1840: 230 (Red Sea).
Scarus aeruginosus Valenciennes in Cuv. & Val. 1840: 257 (Red Sea).
Pseudoscarus augustinus Kossmann & Räuber 1877: 409 (Red Sea).
Scarus marshalli Schultz 1958: 88, Fig. 24 (Mersa Sheikh Sa'ad, Red Sea).

Pectoral fins 15 rays. Median predorsal scales 6 or 7 (5th scale largest); cheek scales in 3 rows, lowest row with 2–4 scales. Upper dental plate of terminal males with 0–2 conical teeth at rear on each side (no conical teeth in initial phase); lips covering $\geq \frac{2}{3}$ of dental plates. Body depth 2.5–2.8 in SL; caudal fin slightly rounded to truncate in initial phase, becoming double emarginate in large males.

Females dark olive-grey, scale edges narrowly dark brown, usually with 3 dark brown bars on body extending from base of dorsal fin, progressively narrower posteriorly; peduncle yellowish anteriorly, grading to bright yellow posteriorly and on caudal fin; white spot at corner of mouth; dental plates of both phases deep blue-green; males violet-blue, grading to green dorsoposteriorly (peduncle mainly green) and to greenish yellow dorsoanteriorly on body and head behind eyes, scales rimmed with lavender-pink; pale blue bar ~3 scales wide often present in middle of length of body; broad deep blue-green area anteriorly on head covering most of snout and chin, narrowing to eye, with short irregular bands extending to behind eye; upper lip bordered with lavender-pink; dark bars of initial phase first forming at ~6 cm TL. Attains 41 cm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba), Gulf of Aden, Oman and Persian/Arabian Gulf.

REMARKS Found in 1–60 m; easily approached by divers. Randall & Ormond (1978) resurrected this species from among those that Schultz (1958) regarded as unidentifiable, described a neotype, and concluded that the species is monandric: males maintain harems in territories up to 50 m in diameter.

Scarus festivus Valenciennes 1840

Lunate parrotfish

PLATES 107 & 108

Scarus festivus Valenciennes in Cuv. & Val. 1840: 282 [no locality given: probably Caroline Is.]; Randall & Bruce 1983*; SSF No. 221.10*; Manilo & Bogorodsky 2003.

Callyodon lunula Snyder 1908: 99 (Naha market, Okinawa I., Japan); Schultz 1958.

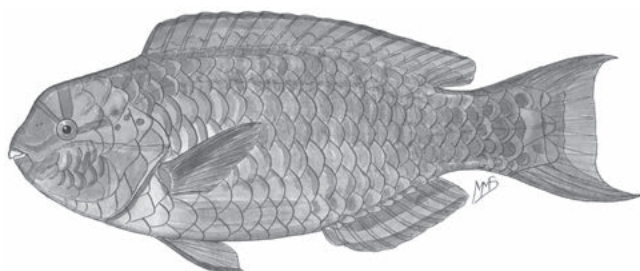
Callyodon verweyi De Beaufort in Weber & De Beaufort 1940: 298 (Jakarta, Java, Indonesia).

Margaritodon verwayi: Smith 1956.

Callyodon (Margaritodon) lunula: Smith 1959; Smith & Smith 1963*.

Pectoral fins 13 or 14 rays. Median predorsal scales 4 or 5 (2nd scale largest), often with a pair of slightly overlapping scales in front of 1st median scale; cheek scales in 3 rows, lowest row with 1–3 scales. Upper dental plate strongly overlapping lower plate when mouth closed; lips covering $< \frac{1}{2}$ of dental plates. Dorsal profile of snout straight to slightly concave, steep, forming angle of $\sim 70^\circ$ to above eyes, then continuing at an angle of $\sim 15^\circ$ to dorsal-fin origin; terminal males develop strong convexity anterodorsally to eyes; caudal fin emarginate to lunate, maximum caudal concavity ~ 1.4 in HL. GR 38–46.

Body green, scale edges orange; snout and dorsal part of head green suffused with lavender; 2 vertical blue-green bands crossing interorbital space, 2nd broadest; upper lip broadly blue-green, containing transverse band of orange anteriorly; edge of lower lip with blue-green joining band from upper lip and continuing, sometimes broken, as band to below eye; dental plates white; caudal fin orangish with upper and lower margins and central blue crescent; pectoral fins broadly blue-green dorsally with large dark purple submarginal band from lower base to fin tip; large individuals with large, nearly circular, orange-yellow patch on side of peduncle, more above than below lateral line. Apparently not sexually dichromatic. Attains 45 cm TL.



Scarus festivus, 30 cm TL (WIO). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (KwaZulu-Natal), Seychelles, Mauritius and Maldives; elsewhere to Indonesia, southern Japan, Caroline Is., Marshall Is., Australia and Gambier Is.; not known from Red Sea and Hawaii.

REMARKS Not common at any locality; Randall & Bruce (1983) noted it as rare at Indian Ocean islands.

Scarus frenatus Lacepède 1802

Bridled parrotfish

PLATE 108

Scarus frenatus Lacepède (ex Commerson) 1802: 13, Pl. 1, Fig. 2 [Indo-Pacific]; Schultz 1958; Smith 1959; Randall 1983*, 1992, 1995*; Winterbottom *et al.* 1989*; Randall & Bruce 1993*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Lieske & Myers 2004; Fricke *et al.* 2009.

Scarus sexvittatus Rüppell 1835: 26 (Jeddah, Saudi Arabia, Red Sea); Smith 1959.

Callyodon vermiculatus Fowler & Bean 1928: 472, Pl. 49 (Moluccas, Indonesia); Smith 1956.

Scarus vermiculatus: Schultz 1958.

Callyodon frenatus: Smith 1959*.

Xanothon frenatus: Smith 1959*.

Pectoral fins usually 14 (rarely 15) rays. Median predorsal scales 6 or (usually) 7 (4th or 5th scale largest); cheek scales in 3 rows, lowest row with 2–4 scales. Lips covering $> \frac{3}{4}$ of dental plates. Body depth 2.3–2.9 in SL; caudal fin truncate to slightly emarginate in initial phase, becoming double emarginate with moderately elongate lobes in terminal males, maximum caudal concavity ~ 2.3 in HL. GR 44–55.

Initial phase yellowish grey to pale reddish brown with 6 dark brown stripes on body following centres of scale rows (stripes sometimes obscure); head reddish brown; dark stripe from eye to opercular flap formed from irregular dark markings on scales; fins dull red; dental plates white. Body of terminal males anterior to vertical at base of 5th dorsal-fin ray green, scales with small lavender-pink spots and irregular lines; body behind this line and caudal-fin base pale green; blue-green bands above and below the mouth join behind the mouth and continue across the head; head above level of ventral edge of eye lavender-pink with many small green spots and narrow irregular bands (2 extending in front of and 2 behind eye); margin of upper lip pinkish orange with broad green band above, joined at corner of mouth by 2 broad green bands from chin that continue across head below eye; cheek and opercle ventral to green band lavender-pink with

green vermiculation; dorsal fin green on basal row of scales, broadening distally on last 2 or 3 rays and membranes, with blue line above; rest of fin orange-pink with middle row of irregular blue-green spots and blue margin that narrows posteriorly; anal fin similar but without blue line above basal scales; caudal fin green with middle crescentic orange-pink band, bordered in blue-green and containing irregular green spots, across middle of fin, ends extending into lobes of fin; pectoral fins green with broad purple band from midbase to tip; small juveniles green to brownish with 3 narrow pale yellowish stripes and 4 vertical rows of whitish spots; larger juveniles reddish brown, grading to white posteriorly. Attains 47 cm TL.



Scarus frenatus, 25 cm TL, IP (WIO). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea (including Gulf of Aqaba), Kenya, Mozambique, Madagascar, Seychelles, Mascarenes and Chagos; elsewhere to Indonesia, southern Japan, Australia, New Caledonia, Pitcairn Is. and Line Is.; not known from Hawaii and Easter I.

REMARKS Usually found on seaward reefs, including outer-reef flats at high tide, to ~25 m deep. Randall (1963) correctly linked the female initial-phase synonyms *Scarus sexvittatus* Rüppell 1835 and *S. randalli* Schultz 1958 to the terminal male described as both *S. vermiculatus* (Fowler & Bean 1928) and *S. frenatus* Lacepède 1802, but erred in treating *S. sexvittatus* as the senior synonym.

Scarus fuscopurpureus (Klunzinger 1871)

Purple-brown parrotfish

PLATE 108

Pseudoscarus forskalii var. *fuscopurpureus* Klunzinger 1871: 567 (Al-Qusayr, Egypt, Red Sea).

Pseudoscarus collana var. *equus* Steindachner 1903: 151 [29] (Al Mukallā, Yemen, Gulf of Aden).

Scarus fuscopurpureus: Randall 1980*; Randall & Bruce 1983*; Randall *et al.* 1994; Carpenter *et al.* 1997; Manilo & Bogorodsky 2003.

Pectoral fins 14 or 15 rays. Median predorsal scales 4; cheek scales in 2 rows. Lips covering ~ $\frac{3}{4}$ of dental plates. Body depth 2.4–2.8 in SL; caudal fin truncate in initial phase, becoming lunate in large terminal males, maximum caudal concavity ~1.6 in HL. GR 47–58.

Initial phase body olive, scales on body with narrow, dark purplish red bar; 5 irregular pale bars on body from pale centres of 1 scale or 2 adjacent scales; dental plates white; margin of lips with blue-green and submarginal orange-pink bands, blue-green joining behind mouth and continuing as single band to eye; chin with faint blue-green band adjacent and behind orange-pink marginal band; median fins dull orange-pink, dorsal and anal fins with middle green band or row of green spots, margin blue with submarginal blackish line; caudal fin with 2 vertical rows of large green spots, upper and lower margins blue with submarginal dark line; pectoral fins with dark brown rays, dorsal margin bluish, with translucent membranes, small triangular black spot at upper base, axil dull rose-pink. Terminal males body green, scale margin pink to magenta, or with curving pink bar only basally on scales; often with pale pink to bluish white bar, usually 1 or 2 scales in width, across body from below front soft part of dorsal fin; head lavender-pink, suffused with green dorsally, with banding on lips as in initial phase, but often bright blue-green or blue on edge of lower lip; ventral part of head dominated by irregular green bands. Juveniles not identified. Attains 38 cm TL.

DISTRIBUTION WIO: Red Sea and Gulf of Aden to Persian/Arabian Gulf.

REMARKS Inhabits relatively shallow water, sometimes in <3 m. Unlike most scarids, it often grazes on algae on compacted sand or in weedy areas. Seems most closely related to *Scarus russelii*, a WIO species not known from the seas of the Arabian Peninsula. Colour especially variable: the initial phase may be almost uniformly dark, or distinctly barred and mottled, or not mottled; terminal males may be dark green, almost obliterating the pink bar on the scales.

Scarus ghobban Forsskål 1775

Bluebarred parrotfish

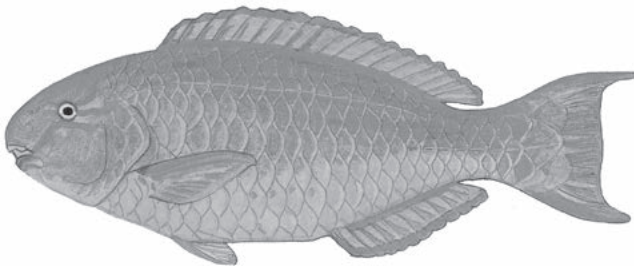
PLATES 108 & 109

Scarus ghobban Forsskål in Niebuhr 1775: 28, x (Jeddah, Saudi Arabia, Red Sea); Randall 1983*, 1992*, 1995*; Randall & Bruce 1983*; SSF No. 221.11*; Winterbottom *et al.* 1989*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004; Fricke *et al.* 2009; Psomadakis *et al.* 2015.
Scarus guttatus Bloch & Schneider (ex Sonnerat) 1801: 294 ('Indian seas').
Scarus maculosus Lacepède 1802: 5, 21, Pl. 1, Fig. 3 (Mauritius, Mascarenes).

Scarus dussumieri Valenciennes in Cuv. & Val. 1840: 252 (Seychelles).
Pseudoscarus natalensis Gilchrist & Thompson 1909: 259 (KwaZulu-Natal, South Africa).
Callyodon apridentatus Smith 1956: 14, Pl. 44, Fig. F (Malindi, Kenya); Smith 1959*.
Callyodon ghobban: Smith 1956, 1959; Smith & Smith 1963*.
Callyodon guttatus: SFSA No. 824*.
Scarus fehlmanni Schultz 1969: 24, Fig. 2 (Strait of Jubal, Egypt, Red Sea).

Pectoral fins 15 or 16 rays. Median predorsal scales 6 (rarely 5; 4th scale usually largest); cheek scales in 3 rows, lowest row with only 1 or 2 scales. Lips covering half to most of dental plates. Posterior nostrils large and oval, 2–5 times larger than anterior nostrils. Body depth 2.4–2.9 in SL; dorsal body profile of terminal males strongly convex; caudal fin slightly emarginate in initial phase, becoming lunate in terminal males, maximum caudal concavity ~2.3 in HL. GR 45–53.

Initial phase body orange-yellow, grading to whitish ventrally, with vertically elongate blue spot in centre of each scale, spots gradually changing to round on peduncle; 4 blue bars often present on body below dorsal fin (from deeper blue scale centres in bars of 2 scales in width); small initial-phase fish often with 1 or 2 white spots near middle of body; head dusky yellow dorsally, yellow on side, and whitish ventrally; dental plates white; upper lip with orange margin and short submarginal blue band; lower lip with orange margin, continuing as irregular band below eye; irregular blue band through upper part of eye, and short band behind middle of eye; caudal fin orange-pink with blue-green longitudinal bands and broad blue upper and lower margins. Terminal males green dorsally, edges of scales salmon-pink; side of body progressively less green and more salmon-pink ventrally, lower side with only one small spot of pale green on each scale; faint irregular blackish bar often present across middle of body, sometimes lesser one below front of dorsal fin; head irregularly banded with pale pink and pastel green; dental plates pale salmon; upper lip with pink margin and green submarginal band; lower lip with narrow white margin and very broad, short, purple submarginal band, broadly bordered by pink; caudal with broad blue-green upper and lower margins, naked centroposterior part alternately striped with lavender-pink and pale blue-green. Attains 90 cm TL.



Scarus ghobban, 81 cm TL, TP (Mauritius). Source: CFSA

DISTRIBUTION Indo-Pacific to eastern Pacific (widespread). WIO: Pakistan, Oman, Red Sea and Lessepsian migrant to eastern Mediterranean Sea, Kenya to South Africa (juveniles to Algoa Bay), Seychelles, Mascarenes and Chagos; elsewhere to southern Japan, Australia, Great Barrier Reef, Lord Howe I., Tonga, Rapa Iti, Gulf of California and Panama.

REMARKS Prefers shallow reefs and adjacent sandy areas of lagoons and bays; more inclined to enter silty, murky environments than other scarids. More than 20 scientific names for this species have been published; only those described from WIO are listed in the synonymy. Genetic studies will probably resolve at least 3 species.

Scarus globiceps Valenciennes 1840

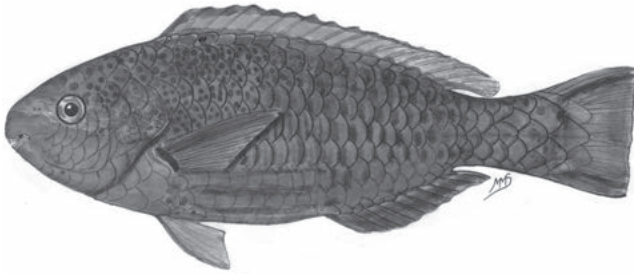
Roundhead parrotfish

PLATE 109

Scarus globiceps Valenciennes in Cuv. & Val. 1840: 242 (Tahiti, Society Is.); Randall & Bruce 1983*; SSF No. 221.12*; Heemstra *et al.* 2004; Fricke *et al.* 2009.
Callyodon globiceps: Smith 1956*.

Pectoral fins 14 rays. Median predorsal scales 4–6 (3rd or 4th scale largest); cheek scales in 3 rows, lowest row with 1–4 scales. Head profile strongly and evenly convex, but terminal males with slight convexity on forehead; mouth distinctly inferior; lips covering or nearly covering dental plates; caudal fin slightly rounded to truncate in initial phase, becoming emarginate in terminal males. GR 46–49.

Initial phase dark brown to grey-brown dorsally, grading to yellowish brown or pale reddish brown ventrally, often with 3 whitish stripes on abdomen from lines in centres of scales; median fins dark yellowish brown; pectoral-fin rays dark brown, membranes pale, with blackish spot dorsally at base. Terminal males green with salmon-pink bar on each scale, this pattern breaking into irregular lines and small spots dorsally on front of body and on head behind eyes, and ventrally into irregular green and pink stripes; head with horizontal lavender-pink band from front of snout through ventral part of eye; head behind eye with narrow irregular pink and green bands; snout above lavender-pink band lavender with irregular green spots; head below stripe green, grading ventrally on head to blue; usually small black spot basally between 4th and 5th dorsal spines; dark bar across base of pectoral fins; caudal fin green, usually with submarginal orange-pink band in each lobe; pectoral fins green dorsally with orange-pink stripe and dark bar across base, broadest and darkest dorsally. Attains 27 cm TL.



Scarus globiceps, 17 cm TL (WIO). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Sodwana Bay), Madagascar, Seychelles and Mascarenes; not known from Chagos and Maldives; elsewhere to Philippines, southern Japan, Wake Atoll, Solomon Is., Australia, New Caledonia, Society Is., Rapa Iti, Gambier Is. and Line Is.

REMARKS Inhabits relatively shallow water, to ~30 m. A record of ‘*Callyodon dubius*’ from 405 m off Durban, South Africa (Smith 1964: 297), may have been based on a specimen of *S. globiceps*, but the stated depth is surely erroneous. Initial-phase fish may form small feeding aggregations. Randall & Choat (1980) reported both group and pair spawning.

Scarus niger Forsskål 1775

Dusky parrotfish

PLATE 109

Scarus niger Forsskål in Niebuhr 1775: 28, x [Red Sea]; Randall 1980*, 1992*; Randall & Bruce 1983*; SSF No. 221.13*; Winterbottom *et al.* 1989*; Manilo & Bogorodsky 2003; Lieske & Myers 2004.

Scarus nuchipunctatus Valenciennes in Cuv. & Val. 1840: 224 ('Indian seas').

Pseudoscarus flavomarginatus Kner 1865: 262, Pl. 10, Fig. 2 (Java, Indonesia).

Pseudoscarus madagascariensis Steindachner 1887: 230 (Madagascar).

Callyodon madagascariensis: Smith 1956*.

Callyodon niger: Smith 1956*, 1959, 1962; Smith & Smith 1963*.

Pectoral fins 13–15 rays. Median predorsal scales 6–8; cheek scales in 3 rows, lowest row with 2–5 scales. Lips covering $\geq \frac{3}{4}$ of dental plates. Body depth 2.2–2.5 in SL; caudal fin slightly rounded to truncate in initial phase, becoming double emarginate with projecting lobes in terminal males, maximum caudal concavity ~2.7 in HL. GR 44–50.

Initial phase brownish red to greenish grey, scales crossed with dark brown to black lines, most horizontal, many joined to form narrow dark stripes; head dusky salmon to brownish red, brighter anteriorly, with transverse dark green band on base of upper lip and 2 bands on chin, uppermost continuing irregularly below lower margin of eye; 2 or 3 short green

bands extending back from eye; small yellowish green spot usually present at origin of lateral line, sometimes linked by irregular green band to upper edge of eye; dental plates pale blue to blue-green in both phases. Terminal males dark green to blue-green, edges of scales deep magenta, disappearing on body above pectoral fins and on head; bands on head identical to those of initial phase, but more brightly hued; pectoral fins with magenta rays and broad red upper margin; lobes of caudal fin broadly deep pink with blue outer margin, the central part of fin with broad middle purple zone, followed by broad yellowish green bar and narrow blue rear margin; juveniles deep purplish blue with bright blue dot on each scale, grading to pale yellowish grey anterodorsally on body and dorsally on head; black spot dorsally and ventrally at base of caudal fin, followed by broad white bar, the remainder of fin with pink rays and transparent membranes. Attains 39 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Oman to South Africa (Sodwana Bay), Madagascar, Comoros, Seychelles, Mauritius and Chagos; elsewhere to Indonesia, southern Japan, Marshall Is., Australia, New Caledonia, Tonga and Tuamotu Is.

REMARKS Associated with coral reefs, especially outer slopes with good coral growth; observed as shallow as 2 m. Appears to be monandrous, with males maintaining small harems; when courting the tail is held upward and the anal fin is strongly depressed.

Scarus persicus Randall & Bruce 1983

Gulf parrotfish

PLATES 109 & 110

Scarus persicus Randall & Bruce 1983: 25, Pl. 6g–h (Bahrain fish market, Persian/Arabian Gulf); Bruce & Randall in Fischer & Bianchi 1984; Randall 1995*; Carpenter *et al.* 1997; Manilo & Bogorodsky 2003.

Pectoral fins 15 rays. Median predorsal scales 5 or 6 (subequal in size); cheek scales in 3 rows: upper row with 6 scales, middle row with 5 or 6 scales, and lower row with 2 scales. Upper dental plate of terminal males with 2 canine teeth at rear on each side; lips covering $\frac{1}{2}$ – $\frac{3}{4}$ of dental plates. Body depth 2.8–2.9 in SL; dorsal profile of snout initially steeper than ventral profile; mouth slightly inferior; caudal fin slightly rounded to slightly emarginate in initial phase, becoming moderately emarginate in terminal phase. GR 40–44.

Body of initial phase grey, scale edges yellowish brown, shading ventrally to pale red; head yellowish grey, shading to salmon-pink on lips; dental plates blue-green; margins of dorsal and anal fins and upper and lower edges of caudal fin blue; terminal males lavender-pink to salmon-pink with a green bar or irregular green vertical markings on scales; broad

blackish bar in middle of body continuing at least basally into dorsal fin; chin salmon-pink with a transverse green band; square bluish white spot at corner of mouth; dental plates deep blue-green; juveniles pale yellowish green with 3 broad dark brown stripes. Attains ~50 cm TL.

DISTRIBUTION WIO: Persian/Arabian Gulf and Gulf of Oman to Oman (less common on south coast).

Scarus prasiognathos Valenciennes 1840

Greencheek parrotfish PLATE 110

Scarus prasiognathos Valenciennes in Cuv. & Val. 1840: 272 (New Ireland, Bismarck Archipelago).

Scarus chlorodon Jenyns 1842: 105, Pl. 21 (Cocos [Keeling] Is.).

Scarus singaporensis Bleeker 1852: 69 (Singapore).

Pseudoscarus janthochir Bleeker 1853: 139 (Ternate, Moluccas, and Jakarta, Java, Indonesia); Schultz 1969 [in part].

Pseudoscarus singaporensis: Bleeker 1862.

Pectoral fins 15 rays; fin length 1.2–1.5 in HL. Median predorsal scales 6 (4th or 5th scale usually largest); cheek scales in 3 rows, lowest row with 1–3 scales. Mouth slightly inferior; lips covering half to entire dental plates. Snout of large adults rounded anteriorly, dorsal profile slightly concave or nearly straight to above eyes, and then slightly angular or nearly straight to nape. Body depth 2.3–2.7 in SL (deeper-bodied with growth); caudal fin slightly emarginate in initial phase, margin deeply concave in terminal males, maximum caudal concavity ~2.4 in HL. GR 56–61.

Body of initial phase dark greenish grey, scales rimmed with dark orangish brown, grading to greyish orange on abdomen and chest; most scales with greenish white spot (or 2 spots, one above the other); spots in 3 longitudinal rows on midside of body larger and more white, some in vertical alignment; head greenish orange dorsally, dull orangish red ventrally, with scattered small blue spots, some in rows radiating from eye; lips reddish orange; narrow blue band on chin, angling at corner of mouth and extending about half-way or more to eye; dental plates pale blue; median fins dark orangish brown with dark bluish margins, caudal fin with scattered small pale greenish spots in central part. Body of terminal males blue, suffused with greenish yellow dorsally, continuing more greenish yellow dorsally on head to very irregular dark green line from behind corner of mouth to below eye across opercle to below opercular flap; head below line blue-green; irregular blue spot on snout edged in dark green; dental plates deep blue-green, sometimes discoloured with algae; dorsal fin orange-yellow with blue rays and bright blue margin; anal fin blue-green crossed by irregular longitudinal orange-yellow

streak; naked part of caudal fin blue with broad orange-yellow band in each lobe that narrows posteriorly; pectoral fins mainly deep blue. Attains at least 40.5 cm TL (possibly to 70 cm TL).

DISTRIBUTION Indo-Pacific. WIO: Maldives (photographs only); elsewhere to Cocos (Keeling) Is., Christmas I., Singapore, Indonesia, Philippines, Ryukyu Is., Bismarck Archipelago, Palau and Australia.

REMARKS Found more often on exposed (not protected) coral reefs, commonly in 1–15 m, and often in schools of 100+ individuals. Replaced elsewhere in WIO by *Scarus falcipinnis*. Known in older literature mainly by the names *S. singaporensis* for the initial phase, and *S. janthochir* for the terminal male.

Scarus psittacus Forsskål 1775

Palenose or common parrotfish PLATE 110

Scarus psittacus Forsskål in Niebuhr 1775: 29, x (Jeddah, Saudi Arabia, Red Sea); Randall 1983*, 1992*; Randall & Bruce 1983*; SSF No. 221.14*; Winterbottom *et al.* 1989*; Carpenter *et al.* 1997; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Lieske & Myers 2004; Fricke *et al.* 2009.

Scarus venosus Valenciennes in Cuv. & Val. 1840: 212 (Réunion, Mascarenes).

Scarus hertit Valenciennes (ex Ehrenberg) in Cuv. & Val. 1840: 215 (Al-Luhayya, Yemen, Red Sea).

Scarus taeniurus Valenciennes in Cuv. & Val. 1840: 257 (Mauritius, Mascarenes).

Pseudoscarus forskalli Klunzinger 1871: 566 [unnecessary replacement name for *Scarus psittacus*].

Xanophon bataviensis (non Bleeker 1857): Smith 1956*, 1959*; Smith & Smith 1963*.

Xanophon carifanus Smith 1956: 6, Pl. 42d (Shimoni, Kenya).

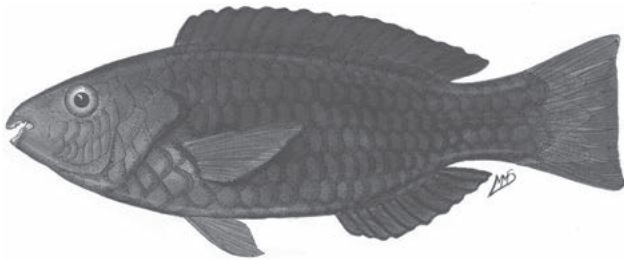
Xanophon parvidens Smith 1956: 7, Pl. 45e (Bazaruto I., Mozambique).

Scarus quoyi (non Valenciennes 1840): Kuitert 1998*.

Pectoral fins 13 or (usually) 14 rays. Median predorsal scales 3–5; cheek scales in 2 rows. Lips covering $>\frac{3}{4}$ of dental plates. Body depth 2.6–3.1 in SL; caudal fin slightly emarginate in initial phase, becoming deeply emarginate in terminal males, maximum caudal concavity ~3 in HL. GR 40–50.

Initial phase greyish brown, grading to pale orangish or reddish brown ventrally on head, chest and abdomen; snout and chin paler than remainder of head; dorsal fin with diffuse dark brown spot anteriorly at base of 1st interspinous membrane; caudal fin brown with crescentic pale rear margin; pectoral-fin rays dark brown, membranes transparent, base orange-red with small triangular black spot at upper edge; pelvic fins orange-red. Terminal males yellowish green with pink to magenta bar on each scale, progressively less elongate posteriorly; centres of scales ventrally on body green, forming

3 stripes on abdomen; head yellowish green dorsally, grading to greyish lavender, sometimes purple on snout and ventrally; dental plates white; lips narrowly lavender with blue-green submarginal band (very broad on upper lip), bands joining behind corner of mouth and continuing to lower edge of eye; 3 irregular green bands extending back from eye; short transverse blue-green band on chin, and broad green zone medially on head; dorsal and anal fins lavender-pink with blue-green margin (very broad on anal fin); caudal fin with broad blue-green upper and lower margins, central part lavender with green stripes continuing from peduncle, and crescentic rear margin of variable colour. Juveniles similar in colour to initial phase. Attains 30 cm TL.



Scarus psittacus, 20 cm TL, IP (WIO). Source: Smith 1956

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Oman to Mozambique (at least to Pemba), Madagascar, Comoros, Seychelles, Mascarenes and Chagos; elsewhere to southern Japan, Australia, Rapa Iti, Marquesas Is. and Hawaii.

REMARKS Found in relatively shallow water on both sheltered and exposed areas of reefs. Initial-phase fish form small feeding aggregations. Randall & Ormond (1978) described a neotype from a terminal male collected just north of the type locality, noting that Schultz (1969) had selected the wrong species for a type; the authors also reported group spawning and pair spawning (as shallow as 2 m), and documented the spawning colouration. Bruce (1980) discussed the unusually small size (67 mm SL) of mature females and terminal males collected in seagrass beds at Aldabra.

Scarus quoyi Valenciennes 1840

Quoy's parrotfish

PLATES 110 & 111

Scarus quoyi Valenciennes in Cuv. & Val. 1840: 273 (New Ireland, Bismarck Archipelago); Randall & Nelson 1979; Randall & Anderson 1993*; De Bruin *et al.* 1994; Kuitert 1998 [illustration is of *S. psittacus*].
Scarus chrysopomus Bleeker 1847: 163 (Jakarta, Java, Indonesia).
Callyodon mutabilis Gronow in Gray 1854: 86 (Ambon I., Moluccas, Indonesia).
Pseudoscarus quoyi: Bleeker 1861, 1862.

Pectoral fins 14–16 rays. Median predorsal scales 6; cheek scales in 3 rows, lowest row usually with only 2 scales. Head profile steeply convex on snout, less convex towards nape; mouth slightly inferior; lips covering $> \frac{1}{2}$ of dental plates. Body moderately deep, 2.4–2.7 in SL; caudal fin truncate to slightly emarginate.

Initial phase pale greenish to brownish grey, scales rimmed in reddish grey, rims broadest as vertical band at base of each scale; 5 faint irregular pale bars across body, 1 or 2 scales in width, from whitish scale centres; whitish stripes on abdomen following scale centres; fins reddish to greenish grey; colour of terminal males variable, often yellowish green, scales rimmed with bright blue, most evident as vertical blue band at base of each scale, grading to solid bright blue ventrally on chest, abdomen and above anal-fin base; large yellowish green saddle-like area dorsally on rear part of peduncle and scaly basal part of caudal fin; head green dorsally, grading to blue dorsally on snout as broad irregular blue band to and extending a short distance behind eye; front of snout and upper lip with broad green band narrowing at corner of mouth and broadening onto cheek, the band separated from blue above by dark green line; lower part of head blue from merging of dense irregular blue bands; orbit rimmed by dark green, with short dark green line in front of and behind eye, with one to few dark green spots above and behind eye; rose-pink blotch ventrally on opercular flap, varying from small to large; dorsal and anal fins orange-pink with very broad blue borders, sometimes with longitudinal green band or row of spots; central part of caudal fin blue with short greenish and purple streaks, upper and lower margins broadly blue and central rear margin broadly green; pectoral fins deep blue with pink or greenish streak parallelling upper margin. A terminal phase male illustrated in Randall *et al.* (1997: 520) from the northern Great Barrier Reef is more purple than blue with large orange blotch on opercle, continuing on side below pectoral fin, and extending behind fin as large red area. Attains 28 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to Thailand, Indonesia, Philippines, Ryukyu Is., Bismarck Archipelago, Palau, Great Barrier Reef and Vanuatu.

REMARKS Bellwood *in* Carpenter & Niem (2001: 3489) noted the species as “abundant in some areas [Philippines], rare in eastern parts of its range; usually in mixed species groups, in shallow reef regions.”

Scarus rubroviolaceus Bleeker 1847

Ember or redlip parrotfish

PLATE 111

Scarus rubroviolaceus Bleeker 1847: 162 (Jakarta, Java, Indonesia); Randall & Bruce 1983*; SSF No. 221.15*; Winterbottom *et al.* 1989*; Randall 1992*, 1994*, 1995*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004*.

Scarus calus Fowler 1904: 542, Pl. 21 (Padang, Sumatra, Indonesia).

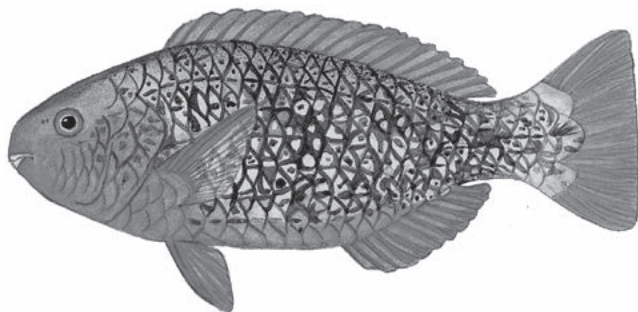
Callyodon africanus Smith 1955: 19, Pl. 3, Fig. 26 (Shimoni, Kenya);
Smith 1956, 1959, 1965; Smith & Smith 1963*.

Callyodon rubroviolaceus: Smith 1956, 1959, 1962, 1965;
Smith & Smith 1963*.

Margaritodon africanus: Smith 1956, 1961; SFSA No. 822a.

Pectoral fins 14–16 rays. Median predorsal scales 5–7; cheek scales in 3 rows, lowest row with 1–3 scales. Head profile nearly vertical to level of eyes, then curving sharply and nearly straight to dorsal-fin origin; lips covering $> \frac{1}{2}$ of dental plates. Body moderately elongate, depth 2.8–3.1 in SL; caudal fin slightly emarginate in initial phase, becoming lunate in terminal males, maximum caudal concavity ~ 1.5 in HL. GR 52–58.

Initial phase pale reddish brown to yellowish grey, shading to pale red ventrally, with numerous small stellate black spots and short dashes set at different angles, often interconnecting; head greenish grey dorsally, shading anteriorly and ventrally to pale red; dental plates pale red to white, sometimes with dark algae growing on base; lips pink with broad submarginal red band; fins mainly pale red, naked part of caudal fin often broadly yellowish except on lobes. Terminal males green dorsally, base of scales narrowly salmon-pink, broader on sides of body; head yellowish green anteriorly grading to salmon-pink posteriorly; dental plates deep blue-green with whitish edge; upper lip broadly blue, with narrow pink edge; lower lip with blue margin, followed by broad pink and blue bands on chin; dorsal fin orange with blue band following rays except posteriorly, and blue margin that narrows posteriorly; anal fin blue with broad salmon-pink band near base that broadens posteriorly; caudal fin salmon-pink with irregular blue markings and broad blue upper and lower margins; both phases sometimes darker on anterior half body as far as vertical line half-way along the lateral line. Juveniles white, with 3 brown stripes partially broken by vertical rows of white blotches. Attains 71 cm TL.



Scarus rubroviolaceus, 32 cm TL, IP (Maldives). Source: CFSA

DISTRIBUTION Indo-Pacific to eastern Pacific (widespread). WIO: southern Red Sea, Oman to South Africa (KwaZulu-Natal), Madagascar, Maldives, Seychelles, Mascarenes and Chagos; elsewhere to Indonesia, southern Japan, Australia, New Caledonia, Hawaii, Gulf of California, Panama and Galápagos Is.

REMARKS Found on seaward reefs and exposed rocky shores, in 1–30 m. The most wide-ranging parrotfish, and the most common on reefs off Sodwana Bay, South Africa.

Scarus russelii Valenciennes 1840

Eclipse parrotfish

PLATE 111

Scarus russelii Valenciennes in Cuv. & Val. 1840: 234 (Visakhapatnam, India).

Xanodon fowleri Smith 1956: 5, Pl. 42g (East Africa); Smith 1959;
Smith & Smith 1963*.

Scarus russelii: Randall & Bruce 1983*; Bruce & Randall in Fischer & Bianchi 1984; SSF No. 221.16*; De Bruin *et al.* 1994;
Manilo & Bogorodsky 2003; Heemstra *et al.* 2004.

Pectoral fins 13–15 rays. Median predorsal scales 4; cheek scales in 2 rows. Lips covering most of dental plates. Body depth 2.5–2.9 in SL; caudal fin usually slightly rounded in initial phase, becoming double emarginate with slightly to moderately elongate lobes in terminal males, maximum caudal concavity ~ 5.5 in HL. GR 48–52.

Initial phase reddish to purplish brown with dull orange-red bar on each scale; 5 slightly curved, pale bars often present on body, 1st beneath outer part of pectoral fin, last posteriorly on peduncle and base of caudal fin; lips dull reddish orange, lower lip and front of upper lip edged with dull blue-green; dull blue-green band from dorsal part of upper lip, joining band from lower lip at corner of mouth and continuing faintly to eye; dental plates white; naked part of caudal fin dark reddish, upper and lower edges bluish grey, with dull blue-green double bar in middle of fin. Terminal males blue-green, with salmon-pink bar on each scale; head behind eyes and body in front of line from base of 9th dorsal-fin spine to anal fin suffused with purplish (nearly eliminating the green and salmon-pink colour on some individuals); interorbital space and dorsal part of snout blue-green; upper lip bright blue-green, enclosing an area of salmon; lower lip edged in blue-green, joining blue-green of upper lip behind mouth and continuing as band to below and behind eye; quadrangular blue-green enclosure on opercle; region of deep yellow on lower cheek; caudal fin salmon-pink with blue upper and lower borders and blue-green quadrangular enclosure in centre of fin, upper and lower edges of which extend as bands to rear margin of fin; dental plates white. Attains at least 50 cm TL.

DISTRIBUTION Indian Ocean. WIO: Kenya to South Africa (Sodwana Bay), Madagascar, Comoros, Aldabra, Seychelles, Mascarenes, Chagos, Maldives, India and Sri Lanka; elsewhere to Andaman Sea and Indonesia (Sumatra).

REMARKS Replaced in Red Sea, Persian/Arabian Gulf, and coast of Oman by *S. fuscopurpureus* (Klunzinger 1871). Inhabits relatively shallow water, usually on mixed sand and patch-reef areas; observed grazing on algal film of compacted sand. The parrotfishes identified by Smith (1956) as *Xanothon frenatus* (Lacepède 1802), *X. pentazona* (Bleeker 1861) and *X. oktodon* (Bleeker 1861) are misidentifications of *S. russelii*.

Scarus scaber Valenciennes 1840

Five-saddle parrotfish

PLATE 111

Scarus scaber Valenciennes in Cuv. & Val. 1840: 239 (Mauritius, Mascarenes); Randall & Bruce 1983; SSF No. 221.17*; Winterbottom *et al.* 1989*; Randall 1992*, 1995*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004; Fricke *et al.* 2009.

Scarus pectoralis Valenciennes in Cuv. & Val. 1840: 269 (Jeddah, Saudi Arabia, Red Sea).

Callyodon lazulinus: Smith 1956*.

Callyodon scaber: Smith 1956*, 1959, 1961; Smith & Smith 1963*.

Callyodon cyanognathus (*non* Bleeker 1847): Smith 1959*.

Callyodon oviceps (*non* Valenciennes 1840): SFSA No. 821*.

Pectoral fins usually 14 (rarely 13) rays. Median predorsal scales 4–7 (usually 6; 4th or 5th scale largest); cheek scales in 3 rows, lowest row with 1–4 scales. Dental plates without conical teeth at sides; lips covering $>\frac{3}{4}$ of dental plates. Body depth 2.4–2.9 in SL; caudal fin truncate in subadults, slightly emarginate in initial phase, and deeply emarginate in terminal males, maximum caudal concavity ~ 2 in HL. GR 45–55.

Initial phase upper body with 4 alternating, slightly oblique bars of dark grey and yellow; lower portion and ventral part of head whitish, suffused with pink or pale yellow; median fins variably pale blue-green to pink, caudal fin sometimes with large semicircular whitish area posteriorly. Terminal males with dorsal part of head and upper half of body dark grey anteriorly to an oblique line from base of 8th dorsal-fin spine; remainder of body green, edges of scales lavender-pink; dental plates blue-green; edge of upper lip lavender-pink; broad irregular blue-green band from front of snout, joined behind mouth by 1 or 2 broad bands from chin, below eye and across opercle; head lavender-pink ventrally, with progressively smaller, median ventral, blue-green bands and spots; caudal fin blue-green with longitudinal lavender-pink bands, largest submarginal in each lobe; pectoral fins broadly blue-green

dorsally, with middle purple band, ventral part of fin with purplish rays and transparent membranes. Attains 37 cm TL.



Scarus scaber, 24 cm TL, TP (Djibouti); 19 cm TL, IP (South Africa).

Source: CFSA

DISTRIBUTION Indian Ocean. WIO: Red Sea, Gulf of Aden, southern Oman to South Africa (Sodwana Bay), Comoros, Seychelles, Mascarenes, Chagos and Maldives; elsewhere to Andaman Sea and Indonesia.

REMARKS Usually found on sheltered coral reefs, in 1–20 m. Known from the Red Sea only as the junior synonym of *Scarus pectoralis* Valenciennes 1840 (no type material extant) and an underwater photograph of a terminal male, taken at Zubair Is. (off Yemen) (see Randall 1994). Pair spawning observed in the Seychelles, in only 1.5 m, the upward spawning rush reaching the surface.

Scarus tricolor Bleeker 1847

Tricolour parrotfish

PLATE 112

Scarus tricolor Bleeker 1847: 164 (Jakarta, Java, Indonesia); Randall & Bruce 1983*; SSF No. 221.19*; Winterbottom *et al.* 1989*; Randall 1992*.

Callyodon viridibusius Fowler & Bean 1928: 459, Pl. 48 (Bouro I., Moluccas, Indonesia).

Callyodon mus Smith 1956: 13, Pl. 41b (Shimoni, Kenya); Smith 1959*.

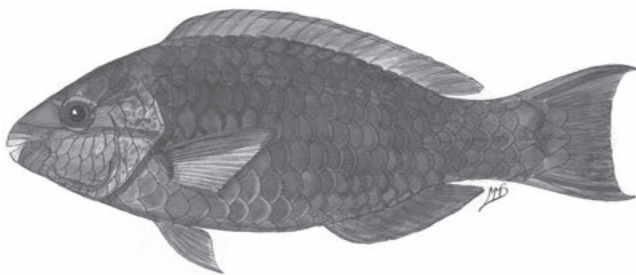
Callyodon pectoralis (*non* Valenciennes 1840): Smith 1956.

Callyodon urbanus Smith 1959: 279, Pl. 42j, Fig. 3 (Shimoni, Kenya).

Pectoral fins usually 14 (rarely 15) rays. Median predorsal scales 5–7 (size subequal); cheek scales in 3 rows, lowest row

with 3–6 scales. Lips covering $>\frac{2}{3}$ of dental plates. Body depth 2.7–3.5 in SL; caudal fin truncate to moderately emarginate in initial phase, becoming deeply emarginate to lunate in terminal males, maximum caudal concavity ~ 1.5 in HL. GR 47–56.

Initial phase upper body blackish, sides dull blue-green with black-edged scales, some individuals with dusky orange-yellow scale centres ventrally; head blackish with large greenish grey patch dorsally on head centred above eye, becoming diffuse posteriorly on nape; margin of lips narrowly white; dental plates white; dorsal fin blackish; anal fin orange-yellow; caudal fin orange-red. Terminal males green, with salmon-pink bar on each scale; dorsal part of head pale lavender-grey, with green band from dorsally on snout through lower edge of eye to below dorsal-fin origin (approximately the margin of the pale oval patch dorsally on head in initial phase); 2nd green band from front of snout, through lower edge of eye, across head parallel to 1st band, area between pale lavender-grey; lower lip and chin blue-green, bisected by salmon-pink bar; dental plates blue to blue-green; iris of both phases bright orange-yellow; dorsal and anal fins pink with blue margin; caudal fin blue-green with large middle lavender crescent, containing green markings, extending narrowing pink bands into caudal-fin lobes. Attains 40 cm TL.



Scarus tricolor, 23 cm TL (WIO). Source: Smith & Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (KwaZulu-Natal), Seychelles, Mauritius, Chagos and Maldives; not known from Red Sea, Gulf of Aden and Oman; elsewhere to Indonesia, Philippines, Palau, New Caledonia, Tonga, Gambier Is., Line Is. and Marquesas Is.

REMARKS Usually found on outer slopes of outer coral reefs.

Scarus viridifucatus (Smith 1956)

Malindi parrotfish

PLATE 112

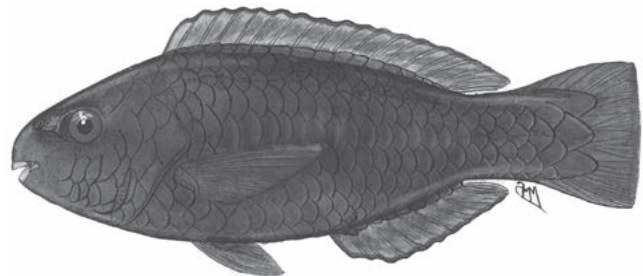
Callyodon viridifucatus Smith 1956: 12, Pl. 42, Figs. B, I (Shimoni, Kenya);

Smith & Smith 1963*; Randall & Bruce 1983*; Randall 1992*.

Callyodon malindiensis Smith 1956: 13, Pl. 45, Fig. H (Malindi, Kenya).

Pectoral fins 13–15 rays. Median predorsal scales 3–5 (size subequal), and usually a pair of smaller laterally overlapping scales in front of the 1st median scale; cheek scales in 3 rows, lowest row almost always with only 2 scales. Head profile strongly and evenly convex; mouth distinctly inferior; lips covering three-fourths to whole of dental plates. Body depth 2.4–2.6 in SL; caudal fin truncate to moderately emarginate in initial phase, becoming emarginate in terminal males, maximum caudal concavity ~ 4 in HL. GR 39–46.

Initial phase body dark brown, sometimes with 5 faint irregular bars of 1 or 2 scale rows in width; head dark reddish to orangish brown, red more evident anteriorly on snout and chin; fins dark reddish to orangish brown, pectoral membranes pale. Terminal males body green, scales rimmed with salmon-pink; head dull green, grading to orangish ventrally, with large patch of bright blue-green on side of snout that may extend below level of mouth, with 2 transverse pink bands on chin; dental plates white in both phases; dorsal and anal fins with wavy green band at base, middle lavender-pink zone, and broad blue outer border, with dark blue submarginal line; naked part of caudal fin green, upper and lower margins blue with submarginal salmon-pink band. Attains 32 cm TL.



Scarus viridifucatus, 17 cm TL, holotype of *Callyodon malindiensis* (Kenya). Source: Smith 1956

DISTRIBUTION Indian Ocean. WIO: southern Red Sea, Kenya, Mozambique (Pinda), Mauritius, Seychelles and Maldives; not known from Chagos; elsewhere to Andaman Sea, Cocos (Keeling) Is. and Indonesia (Bali).

REMARKS Inhabits relatively shallow water, such as reef flats, the reef fronts of atolls, and rocky inshore areas. Diandric; spawning has not been observed, but an individual with colouration intermediate to the initial and terminal phases was observed at Aldabra. Closely related to *Scarus spinus* (Kner 1868) of the western and central Pacific.

Scarus zufar Randall & Hoover 1995

Dhofar parrotfish

PLATE 112

Scarus zufar Randall & Hoover 1995: 684, Pl. 1 (Raysut, Dhofar, Oman);
Manilo & Bogorodsky 2003; Psomadakis *et al.* 2015.

Pectoral fins 14 or 15 rays. Median predorsal scales 4 (progressively larger anteriorly); cheek scales in 2 rows. Head obtusely rounded anteriorly; mouth slightly inferior; lips covering ~¾ of upper dental plate and ~¼ of lower dental plate; no teeth on sides of dental plates. Body depth 2.6–2.7 in SL; caudal fin truncate with projecting lobes, caudal concavity 5.4–9.7 in HL. GR 37–48.

Initial phase body green, scales rimmed in brownish orange, grading to pinkish orange on abdomen, and to blue on chest; orange on scales restricted to basal bar on about rear fifth of body and base of caudal fin; head green dorsally, suffused with lavender, broadly greenish yellow on cheek, grading to blue lower opercle; short, irregular, green to blue-green lines radiating from eye, except for 2 extending to lips, separated by narrow orange band that continues as narrower margin on upper lip; 2nd short, narrower green band on chin; dental plates white in both phases; dorsal and anal fins green with irregular blue longitudinal bands and bright blue margins; caudal fin similar, blue bands vertical, only upper and lower margins bright blue; pectoral fins mainly orange-yellow. Terminal males differ in having wide pink instead of narrow orange margins on scales in broad middle zone of body behind pectoral fin, and area above fin with wash of yellow nearly obliterating green and pink colouration; round yellow area, 3 scales in diameter, posteriorly on side of body with green central area of scales partly obscured; snout green, grading to blue on nape, and merging with yellow zone above pectoral fin. Intermediate-phase fish with the 2 green bands on chin now solid green; caudal fin nearly solid bright blue. Attains 39 cm SL.

DISTRIBUTION WIO: Oman to Pakistan.

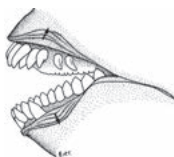
REMARKS One of the most common parrotfishes at southern Oman. Typically found on rocky or rock/sand substrate along coasts exposed to wave action; not seen in bays or on lee shores of islands where live corals are prevalent. Most similar to *Scarus fuscopurpureus* and the allopatric *S. russelii*, in colouration and scale pattern.

SUBFAMILY SPARISOMATINAE

Cheek scales in 1 row; pectoral fins usually 13 rays; vertebrae 9 + 15. Five genera, 2 in WIO.

KEY TO GENERA

1a Teeth not fully fused to form dental plates, and individual flattened teeth readily apparent on outer surface of jaws; tips of outer row of teeth on both jaws forming cutting edge; teeth at edge of upper jaw overlapping lower jaw teeth when mouth closed; gill membranes forming free fold across isthmus; body depth 2.2–3 in SL *Calotomus*



1b Teeth fused to form dental plates; edge of lower jaw plate overlapping upper plate when mouth closed; gill membranes broadly joined to isthmus, not forming free fold; body depth 2.9–3.8 in SL *Leptoscarus*

GENUS Calotomus Gilbert 1890

Body depth 2.2–3 in SL; individual teeth in jaws not fully fused to form dental plates; cutting edge of teeth irregular, formed of outer row of teeth in both jaws; teeth at edge of upper jaw overlapping edge of lower jaw teeth when mouth closed; median predorsal scales usually 4; cheek scales in 1 row of 4 or 5 scales below eye; gill membranes forming free fold across isthmus; pectoral fins usually 13 (rarely 12) rays. Five species, 3 in WIO.

KEY TO SPECIES

1a Incisors at front of upper jaw of adults in 3–6 overlapping rows; caudal fin slightly rounded in juveniles, usually truncate in females, and truncate to slightly double emarginate in large males; caudal-fin margin narrowly white; anus blackish 2

1b Incisors at front of upper jaw of adults in single irregular row; caudal fin rounded in both juveniles and adults; caudal-fin margin not whitish; anus not blackish *C. spinidens*



Continued ...

KEY TO SPECIES

- 2a Broad zone of small reddish brown to black spots from behind eyes to above and behind pectoral fins; when present, dark spot on dorsal fin on 2nd membrane *C. viridescens*
- 2b No small black spots posteriorly on head and above pectoral fins; dark spot on dorsal fin on 1st membrane *C. carolinus*

Calotomus carolinus (Valenciennes 1840)

Star-eye parrotfish

PLATE 103

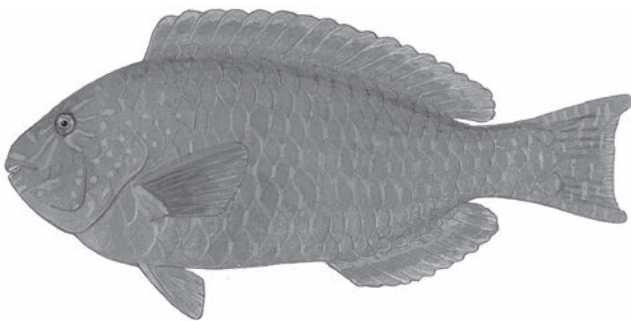
Callyodon carolinus Valenciennes in Cuv. & Val. 1840: 291 (Caroline Is.).*Callyodon genistriatus* Valenciennes in Cuv. & Val. 1840: 293

[no locality given].

Callyodon brachysoma Bleeker 1861: 244 (Ambon I. and Ternate, Moluccas, Indonesia).*Cryptotomus albimarginatus* Fourmanoir & Guézé 1961: 19 (fish market at Réunion, Mascarenes).*Cryptotomus spinidens* (non Quoy & Gaimard 1824): Smith & Smith 1963*.*Calotomus carolinus*: Bruce & Randall 1985*; Winterbottom *et al.* 1989*; Manilo & Bogorodsky 2003; Fricke *et al.* 2009; Kimura *et al.* 2009.

Pectoral fins 13 rays; dorsal-fin spines flexible. Median predorsal scales usually 4 (rarely 3). Teeth flattened and incisiform, readily apparent on outer surface of jaws in 3–6 rows; upper jaw of adults with 1 or 2 curved canines on each side.

Initial phase mottled greyish to reddish or orangish brown, paler ventrally; whitish flecks on scales; juveniles and subadults with 3 to 4 rows of white spots (lost in adults); dark bar at pectoral-fin base. Terminal males dull blue-green, scales narrowly rimmed with salmon-pink; up to 8 broad salmon-pink bands radiating from eyes, and similar transverse bands on snout and chin. Both initial and terminal phases with small dark blotch on 1st membrane of dorsal fin, caudal-fin margin narrowly whitish, and anus blackish. Attains 54 cm TL.

*Calotomus carolinus*, 40 cm TL, IP (South Africa). Source: CFSA

DISTRIBUTION Indo-Pacific. WIO: Gulf of Aden to South Africa (Kosi Bay), Madagascar, Mascarenes, Chagos and Sri Lanka; elsewhere to Indonesia, southern Japan, Marshall Is., Caroline Is., Australia, New Caledonia, Tonga, Pitcairn Is. and Hawaii.

REMARKS Generally found inshore near coral or rocky reefs, and in areas with heavy algal growth or seagrasses, to ~65 m deep. Robertson *et al.* (1982) reported this species as a protogynous hermaphrodite and described the spawning at Aldabra, off the reef front on a falling tide.

Calotomus spinidens (Quoy & Gaimard 1824)

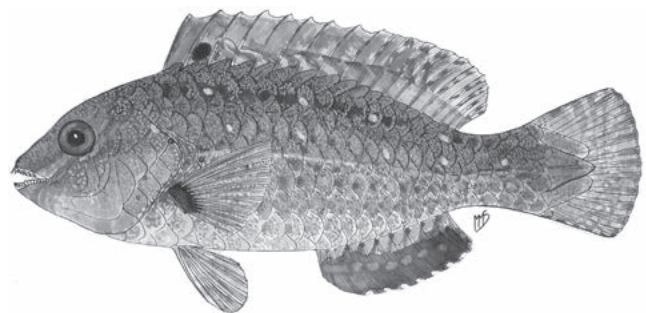
Raggedtooth parrotfish

PLATE 103

Scarus spinidens Quoy & Gaimard 1824: 289 (Waigeo I., Indonesia).*Callyodon waigiensis* Valenciennes in Cuv. & Val. 1840: 296 (Waigeo I., Indonesia).*Callyodon hypselosoma* Bleeker 1855: 425 (Ambon I., Moluccas, Indonesia).*Callyodon moluccensis* Bleeker 1861: 243 (several localities at Indonesia).*Callyodon viridescens* (non Rüppell 1835): Playfair & Günther 1867: 103 (Zanzibar, Tanzania).*Calotomus japonicus* (non Valenciennes 1840): Schultz 1958, 1969 [in part].*Cryptotomus spinidens*: SFSA No. 827*; Smith & Smith 1963*.*Calotomus spinidens*: Bruce & Randall 1985*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004.

Pectoral fins 13 rays; dorsal-fin spines flexible. Body elongate, depth 2.7–3.1 in SL; caudal fin rounded in all stages. Incisors at front of upper jaw in single row; lips nearly covering teeth.

Initial phase olive, scales finely flecked with white, grading to whitish ventrally; 3 longitudinal rows of pupil-size white spots on body; caudal fin margin not whitish, upper and lower edges with alternating dusky and whitish spots. Terminal males greenish grey, with small pink spots on scales; pink spots and short bars on head, most around eyes, most conspicuous bar from eyes to upper lip; blackish bar usually at pectoral-fin base; black spot often present on 2nd membrane of dorsal fin. Attains 30 cm TL.

*Calotomus spinidens*, 18 cm TL (S Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to Mozambique (Maputo Bay), Comoros, Seychelles, Rodrigues, Mauritius, Maldives and Sri Lanka; elsewhere to Indonesia, Philippines, southern Japan, Micronesia, Australia, Fiji and Tonga.

REMARKS Typically found in seagrass beds or on substrate with heavy algal growth; able to quickly alter its colour to match the surroundings.

Calotomus viridescens (Rüppell 1835)

Dotted parrotfish

PLATE 103

Scarus (Calliodon) viridescens Rüppell 1835: 23, Pl. 7, Fig. 2 (Jeddah, Saudi Arabia, Red Sea).

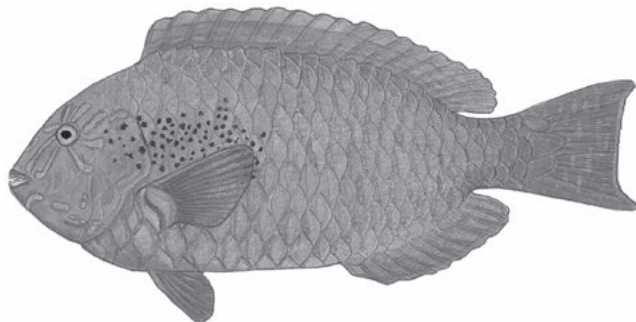
Callyodon viridescens: Klunzinger 1871.

Cryptotomus spinidens (non Quoy & Gaimard 1824): Ben-Tuvia & Steinitz 1952; Dor 1984.

Calotomus viridescens: Randall 1983*; Bruce & Randall 1985*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Lieske & Myers 2004.

Pectoral fins usually 13 (rarely 12) rays; dorsal-fin spines flexible; caudal fin rounded in juveniles, slightly rounded to truncate in females, and slightly double emarginate in males. Median predorsal scales usually 4 (occasionally 3, with overlapping pair). Teeth flattened and incisiform, readily apparent on outer surface of jaws in 3–6 rows; upper jaw of adults with 1 or 2 curved canines on each side.

Resembles *Calotomus carolinus*, differing in having broad zone of small reddish brown to black spots from behind eyes to above and behind pectoral fins, more prominent blackish mark on 2nd membrane of dorsal fin, and narrower radiating and transverse bars on head. Attains 40 cm TL.



Calotomus viridescens, 40 cm TL, TP (South Africa). Source: CFSA

DISTRIBUTION WIO: Red Sea, and photographs from South Africa (KwaZulu-Natal), Seychelles and Maldives.

REMARKS A photograph suggests that this species may hybridise with *C. carolinus*.

GENUS *Leptoscarus* Swainson 1839

Body somewhat elongate, depth 2.9–3.8 in SL; caudal fin moderately rounded. Teeth fused to form narrow dental plates, edge of lower plate overlapping upper plate when mouth closed; lips entirely covering dental plates of both jaws; median predorsal scales 4; cheek scales in 1 row below eye; gill membranes broadly joined to isthmus, not forming free fold; pectoral fins 13 rays. One species.

Leptoscarus vaigiensis (Quoy & Gaimard 1824)

Seagrass parrotfish

PLATE 106

Scarus vaigiensis Quoy & Gaimard 1824: 288 (Waigeo I., Indonesia).

Scarus coeruleopunctatus Rüppell 1835: 24, Pl. 7, Fig. 3 (Jeddah, Saudi Arabia, Red Sea).

Scarus rubronotatus Valenciennes (ex Ehrenberg) in Cuv. & Val. 1840: 212 (Gulf of Aqaba, Red Sea).

Scarus naevius Valenciennes in Cuv. & Val. 1840: 253 (Mahé, Seychelles).

Scarus bottae Valenciennes in Cuv. & Val. 1840: 262 (Red Sea).

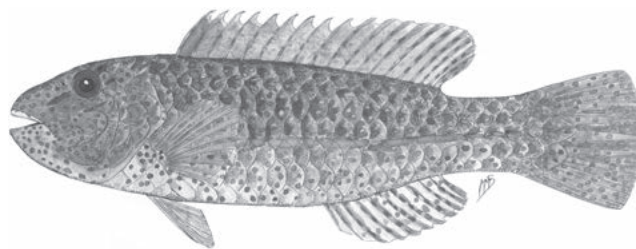
Leptoscarus coeruleopunctatus: SFSA No. 825*.

Scarichthys caeruleopunctatus: Playfair & Günther 1867; Day 1877.

Leptoscarus vaigiensis: Smith & Smith 1963*; SFSA No. 826*; Bruce & Randall 1985*; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004*; Lieske & Myers 2004*; Ohta & Tachihara 2004; Fricke *et al.* 2009.

Diagnosis as for genus. Dorsal-fin spines flexible; anterior interspinous membranes deeply incised $\sim\frac{1}{3}$ length of spines, posterior membranes less incised. Upper dental plate of males with 1–5 canines on each side.

Initial phase mottled olive or greenish, whitish ventrally; most scales with dark brown or greenish brown marking, varying from small stellate spot to covering most of scale; snout and cheeks with 2 or 3 irregular oblique dark olive bars, 1 continuing onto chin; median fins with translucent membranes and yellowish rays heavily mottled with dark olive-green; pectoral fins with pale yellowish rays, membranes mostly translucent, and broad oblique brown bar at base; males with same basic colour pattern as females, but with numerous tiny blue spots on head, body and caudal fin, and often with a few blue lines radiating from eyes; iris yellow-orange. Attains 35 cm TL.



Leptoscarus vaigiensis, 25 cm TL, TP (S Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Oman to South Africa (Transkei region), Madagascar, Seychelles, Mascarenes, Maldives and Sri Lanka; elsewhere to Indonesia, Philippines, southern Japan, Mariana Is., Australia, New Caledonia, northern New Zealand, Pitcairn Is. and Easter I.

REMARKS Inhabits drifting *Sargassum* seaweed, shallow seagrass beds and algae-encrusted substrates, to ~15 m deep. Gonochoristic and does not undergo sex change: females remain females throughout life, and males and females look very similar

GLOSSARY

crenate cutting edge – a scalloped edge.

monandric – initial-phase fish all female, terminal phase all secondary males.

protogynous hermaphrodite – an individual that functions first as a female and then changes to a male.

FAMILY PINGUIPEDIDAE

Sandperches

Terry J Donaldson

Moderate-sized (45–120+ cm SL), body moderately elongate, slightly compressed posteriorly; head usually pointed but some deeper-water species with steep and blunt head profile; eyes extend slightly above dorsal profile. Mouth relatively large, protractile, and terminal or with lower jaw protruding slightly; lips well-developed; front of jaws with outer row of recurved or hooked teeth; palatine teeth present or absent. One dorsal fin with 4–7 short spines, 19–27 rays, and fin more or less notched between spinous and soft-rayed portions; anal fin with 17–25 rays, first 1 or 2 rays spine-like, and fin origin behind dorsal-fin origin. Opercle with sharp spine posteriorly. Gill membranes united, either free from or attached to isthmus. Lateral line continuous. Scales ctenoid, except occasionally some cycloid scales on cheeks, chest and abdomen. Vertebrae 30–37.

Benthic, on coral and rocky reefs, patches of rubble and sandflats, from shallow areas to 400 m or deeper; some species, particularly those reported from deeper water, hover in the water column just above the bottom. Feed on crustaceans and fishes (Myers 1999). Many species are sexually dimorphic for body size and/or colour pattern (Randall 1984). *Parapercis* species are likely all protogynous hermaphrodites (Stroud 1984; Nakazono *et al.* 1985); members of that genus are

reported to be territorial and have a male-dominated harem mating system (Nakazono *et al.* 1985; Clark *et al.* 1991). Spawning aggregation is suspected for species of *Pseudopercis*. Males of harem species patrol territories that contain smaller territories of females (Nakazono *et al.* 1985; Clark *et al.* 1991; Ohnishi *et al.* 1997). Rival territorial males have been observed to sneak spawning attempts with females, either after spawning has been completed with their own harem members (Ohnishi *et al.* 1997) or else when the male swims near a neighbouring male's territory while moving between or courting his own harem, though sneaking by males not holding territories also occurs (Ohnishi *et al.* 1997; TJ Donaldson, pers. obs.). Spawning is pelagic and happens just before and after sunset; eggs and larvae are also pelagic (Leis & Rennis 2000).

Occur in temperate to tropical waters of Indo-Pacific and Atlantic Ocean. Seven genera and ~87 species; 1 genus and at least 14 species in WIO.

GENUS *Parapercis* Bleeker 1863

Body elongate, nearly cylindrical anteriorly, more compressed posteriorly. Dorsal fin long, with 4 or 5 spines (rarely 6), 20–24 rays; anal fin with 1 slender spine, 17–22 rays; pelvic fins 1 spine, 5 rays (4th ray longest), fins inserted before or below pectoral-fin bases; caudal fin 15 branched rays. Eyes oriented nearly dorsally, close-set. Mouth relatively large, slightly oblique, and either terminal or with lower jaw slightly projecting; maxilla mostly hidden beneath preorbital bone when mouth closed. Teeth conical, curved and stout, arranged in outer row on jaws; 3–5 pairs of canines at front of lower jaw; bands of villiform teeth on jaws anteriorly, band on upper jaw narrowing posteriorly; teeth present on vomer, but present or absent on palatines. Opercle with stout spine; edge of preopercle smooth. Branchiostegal rays 6, gill membranes attached to isthmus. Scales small, ctenoid on body, often cycloid on cheeks (Randall 1984, 1995). Unless noted otherwise, the mating system for most species is presumed to be harem with protogynous hermaphroditism and pelagic spawning.

Genus revised by Cantwell (1964) and subsequently reviewed with new species descriptions Schultz (1968) and Randall (1984). About 80 species, at least 14 in WIO, plus possibly undescribed species. Visual surveys of deep reef slopes in tropical habitats appear to have recorded some undescribed *Parapercis* species (Heemstra *et al.* 2006; TJ Donaldson, pers. obs.); for example, one possibly undescribed species was filmed on a deep sandflat, in ~200 m, at Grande Comore I. (Heemstra *et al.* 2006).

KEY TO SPECIES

- | | |
|---|--|
| <p>1a Dorsal fin 4 spines; caudal fin with white blotch distally, 2 large dark spots on cheek, and 1 large brown or black spot behind opercle <i>P. millepunctata</i></p> <p>1b Dorsal fin 5 spines; colour not as above 2</p> <p>2a Palatine teeth present, in single row; body rosy, with 8 or 9 gold blotches, and spinous portion of dorsal fin reddish in life <i>P. maritzi</i></p> <p>2b No palatine teeth; colour not as above 3</p> <p>3a Black blotch covering most of caudal fin; front of lower jaw with 4 pairs of canines <i>P. hexophtalma</i></p> <p>3b No black blotch on caudal fin; front of lower jaw with 3 pairs of canines in outer row 4</p> <p>4a Dorsal-fin membrane notched to base between last spine and first ray; body often with reddish hourglass-shaped bars, and 2 or 3 white lines on opercle <i>P. maculata</i></p> <p>4b Dorsal-fin membrane continuous; colour not as above 5</p> <p>5a LL scales 77–84, scales small; scale rows 8–10 from 1st dorsal-fin ray to lateral line; dorsal fin with line of black spots in middle (one spot on each membrane between rays), and another line at fin base <i>P. robinsoni</i></p> <p>5b LL scales 51–63; colour not as above 6</p> <p>6a LL scales 51–55 7</p> <p>6b LL scales 55–63 8</p> <p>7a Caudal fin rounded, with short prolongation on upper lobe; LL scales 52 or 53; row of 8 black blotches laterally along upper body <i>P. punctata</i></p> <p>7b Caudal fin truncate, with short prolongation on upper lobe; LL scales 51–55; body with 8–10 saddle-like clusters of black spots; dark curved mark below eyes; no pigment on dorsal or anal fins <i>P. somaliensis</i></p> | <p>8a Caudal fin emarginate to lunate 9</p> <p>8b Caudal fin truncate to slightly rounded 12</p> <p>9a Dorsal fin usually 21 (rarely 22) rays 10</p> <p>9b Dorsal fin 22 rays 13</p> <p>10a Spinous dorsal fin black, without coloured margin; soft-rayed portion of dorsal fin with line of smaller, round black spots along middle of fin (one on each membrane between rays, from 1st–5th membrane), and 5 dark/black blotches at base; anal fin with 6 or 7 dark blotches <i>P. signata</i></p> <p>10b Spinous dorsal fin black, with red or golden yellow margin (fish >6 cm SL) 11</p> <p>11a Caudal-fin with short prolongation on upper and lower lobes; soft-rayed dorsal fin with thin whitish margin, and line of large black spots on distal half of each membrane between rays and another line along base <i>P. punctulata</i></p> <p>11b Caudal-fin lobes without short prolongations; soft-rayed dorsal fin with yellowish margin and line of small blackish spots below the yellow, and body with reddish bars <i>P. schauinslandii</i></p> <p>12a Belly white (no colour markings on lower fourth of body); red spots on dorsum and top of head (in life), and caudal fin with sideways, dark W-shaped mark; pectoral fins 16 or (usually) 17 rays, and anal fin 17 rays <i>P. albiventer</i></p> <p>12b Body axis with row of pale patches with black central spot; pectoral fins 16 rays, and anal fin 18 rays <i>P. maramara</i></p> <p>13a Pectoral fins 18 or 19 rays; caudal-fin lobes without short prolongations; in life, 2 dark red spots at caudal-fin base <i>P. albuguttata</i></p> <p>13b Pectoral fins 17 rays; upper rays of caudal fin elongate <i>P. simulata</i></p> |
|---|--|

Parapercis albiventer Ho, Heemstra & Imamura 2014

Whitebelly sandperch PLATES 113 & 115

Parapercis xanthozona (non Bleeker 1849): Playfair & Günther 1867*; SSF No. 234.8*.

Parapercis albiventer Ho, Heemstra & Imamura 2014: 336, Figs. 1–2, 4a–b (off Kosi Bay, KwaZulu-Natal, South Africa).

Dorsal fin 5 spines, 21 rays; anal fin 1 spine, 17 rays; pectoral fins 16 or (usually) 17 rays; caudal fin truncate to slightly rounded. Body depth at head 12.7–15.7 in SL. Front of lower jaw with 3 pairs of canines. LL scales 55–59 (usually 58).

Body red dorsally, bright white ventrally; 3 pairs of dark broad bands on upper lip; pupil-sized orange-red blotches on top of head, eyes, cheek and gill cover, plus dense covering of smaller irregular spots on nape and dorsal surface of body; row of faint red blotches on pale background along sides; row of ~10 reddish blotches on lower half of pectoral-fin base, and solid black bar arising from lower part of each blotch; caudal-fin base with 2 black elongate bars, black spots on upper and lower thirds of fin, central portion solid black, and bright white patch on distal half of middle rays, superimposed with irregular black marks. Attains 17 cm SL.



Parapercis albiventer, 14 cm SL (South Africa). © RE Stobbs

DISTRIBUTION WIO: Mozambique, South Africa (KwaZulu-Natal), Madagascar and Tanzania (Zanzibar).

REMARKS Found at 18–31 m, likely over rubble and sand of protected reefs. Males attain larger sizes than females.

Parapercis alboguttata (Günther 1872)

Whitespot sandperch

PLATES 113 & 115

Percis alboguttata Günther 1872: 424 (Misool I., West Papua, Indonesia).

Parapercis alboguttata: Randall 2001 [in key].

Dorsal fin 5 spines (3rd and 4th spines longest), 22 rays; anal fin 1 spine, 18 rays; pectoral fins 17–19 rays; caudal fin truncate, without short prolongations. Lower jaw with 3 pairs of canines in outer row; no palatine teeth. Body depth 6–6.8 in SL; peduncle slender. LL scales 58–60.

Body reddish dorsally, white ventrally; edges of scales on upper body yellowish brown; snout with pale blue tinge and oblique yellow lines; 2 rows of indistinct red blotches along sides, ending in 2 distinct dark red spots at caudal-fin base; other fins predominately white. Attains 27 cm SL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Arabian Sea, Pakistan and India; elsewhere to Indonesia, Philippines, Taiwan and northwestern Australia.

REMARKS Reportedly taken on trawling grounds (Allen 1997) at >100 m deep; presumably occurs over rubble and sand.

Parapercis hexophthalma (Cuvier 1829)

Speckled sandperch

PLATES 113 & 115

Percis hexophthalma Cuvier in Cuv. & Val. 1829: 271 (Massawa, Eritrea, Red Sea).

Percis polyophthalma Cuvier (ex Ehrenberg) in Cuv. & Val. 1829: 272 (Massawa, Eritrea, Red Sea).

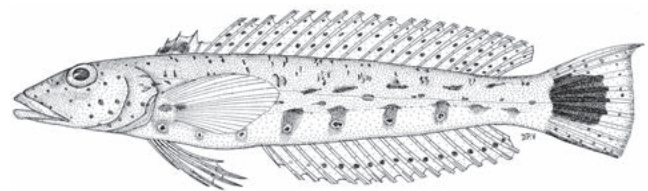
Parapercis cylindrica (non Bloch 1792): Smith & Smith 1963*.

Parapercis polyophthalma: Cantwell 1964.

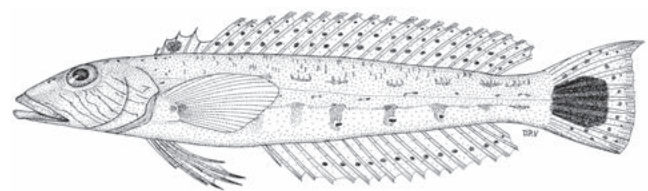
Parapercis hexophthalma: Cantwell 1964; SFSA No. 380; SSF No. 234.1* [as *hexophthalma*]; Winterbottom *et al.* 1989; Fricke *et al.* 1999; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Imamura & Yoshino 2007; Fricke *et al.* 2009; Fricke *et al.* 2013; Bogorodsky *et al.* 2014.

Dorsal fin 5 spines (3rd and 4th spines longest), 21 rays, and membrane extending from tip of last spine to 1st ray; anal fin 1 spine, 17 rays; pectoral fins 16–18 (usually 17) rays; caudal fin more or less rounded, but upper lobe may have slight prolongation. Body depth 4.8–5.8 in SL. Front of lower jaw with 4 pairs of canines; no palatine teeth. LL scales 58–60.

Body pale greenish dorsally, white ventrally; head and body with variously shaped well-defined dark brown speckles, including: rows of small black spots on sides, most rimmed with yellow, and larger white elliptical spots arranged longitudinally and contiguously along lower flanks, with 1 or more small black spots at centre of each white spot; spinous dorsal fin with large black spot, and soft-rayed portion with 3 or 4 rows of black spots along entire fin; 1 row of similar black spots on anal fin; large black blotch covering centre of caudal fin. Males with series of oblique brownish yellow or yellow lines on cheek; females with small brown spots on head. Attains 28 cm SL.



Parapercis hexophthalma, 16 cm TL, female (South Africa). Source: SSF



Parapercis hexophthalma, 20 cm TL, male (South Africa). Source: SSF

DISTRIBUTION Indian Ocean. WIO: Red Sea, Somalia to South Africa (KwaZulu-Natal), Comoros, Amirante Is., Réunion, Rodrigues, Chagos, Maldives, Lakshadweep and Sri Lanka; elsewhere to Thailand.

REMARKS Found in protected shallow reef habitats, mainly on rubble and sand. Mating system harem with protogynous hermaphroditism and pelagic spawning. Imamura & Yoshino (2007) divided the species into four sibling species; however, JE Randall (pers. comm.) considers that these names might be attributed to subspecies.

Parapercis maculata (Bloch & Schneider 1801)

Harlequin sandperch

PLATES 113 & 115

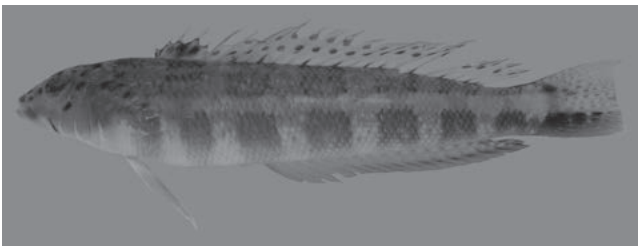
Percis maculata Bloch & Schneider 1801: 179, Pl. 38 (Thoothukudi, India).

Parapercis pulchella: Cantwell 1964 [in part]; SSF No. 234.3*.

Parapercis maculata: Fricke 1999; Randall 2008*; Fricke *et al.* 2009; Bogorodsky *et al.* 2014.

Dorsal fin 5 spines (4th spine longest), 21 rays, and membrane extending from tip of last spine to base of 1st ray; anal fin 1 spine, 17 rays; pectoral fins 16 or 17 rays; caudal-fin margin slightly rounded in adults with 2nd–4th branched rays slightly elongate. Body depth 5.1–5.8 in SL. Lower jaw with 3 pairs of canines; no palatine teeth. LL scales 57 or 58.

Body pale brownish dorsally and laterally, whitish ventrally; 6 or 7 large semicircular pale brown blotches along dorsum, narrowly connected to series of larger brown spots, becoming slightly darker posteriorly; head orangish brown, with small dark brown spots on nape and snout, plus 4 narrow bluish white bars extending upwards from white underside of head, and 3 or 4 similar irregular lines on opercle and preopercle; dorsal fin and anal fin whitish; spinous dorsal fin with dusky blotch at base, and soft-rayed portion with rows of small orange spots distally; lower third of caudal fin darker brown, with small whitish spots on rays, upper portion of fin pale grey, dotted with small white and orange spots. Attains 12 cm SL.



Parapercis maculata, 8 cm SL (South Africa). AD Connell © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Oman, Tanzania (Zanzibar), Madagascar, Comoros, Réunion, India and Sri Lanka; elsewhere to Indonesia.

REMARKS Coastal, often solitary, in shallow estuaries and protected bays, on sandy bottom, at 8–25 m (Allen & Erdman 2012).

Parapercis maramara Sparks & Baldwin 2012

PLATE 113

Parapercis maramara Sparks & Baldwin 2012: 32, Figs. 1–2

(Masoala Peninsula, northeastern Madagascar); Ho *et al.* 2014.

Dorsal fin 5 spines, 21 rays; anal fin 1 spine, 18 rays; pectoral fins 16 rays. Lower jaw with 3 pairs of large recurved canines in outermost row; no palatine teeth. LL scales 58–60.

Body pale tan with highlights of grey or gold, becoming whitish ventrally; 2 dark brown stripes along length of flanks, connected by 7 or 8 medially constricted brown vertical bands, 6–9 black blotches between the vertical bands, and another series of 8 or 9 larger black blotches directly below lower brown stripe where lower connecting bands terminate; scales on flanks (especially posteriorly and above upper brown stripe) with iridescent silver and blue; variously sized dark brown blotches densely arrayed on snout, lachrymal, cheek and opercle; occiput, nape and upper flanks (above upper brown stripe) with smaller dark brown spots; pectoral fins pale brown, with dark brown markings at base; caudal fin pale grey, with 2 prominent oblong black blotches near base (ventral blotch larger and extending posteriorly), and membrane with 2 or 3 black bands distally. Attains at least 11 cm SL.



Parapercis maramara, 10 cm SL, paratype (NE Madagascar).

JS Sparks © AMNH

DISTRIBUTION WIO: Madagascar.

REMARKS Known from shallow inshore reefs. The presence of 18 anal-fin rays is an uncommon condition among *Parapercis* species with 21 dorsal-fin rays (H-C Ho, pers. comm.).

Parapercis maritzi Anderson 1992

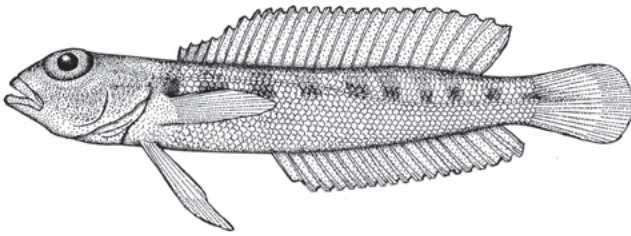
Goldblotch sandperch

PLATE 113

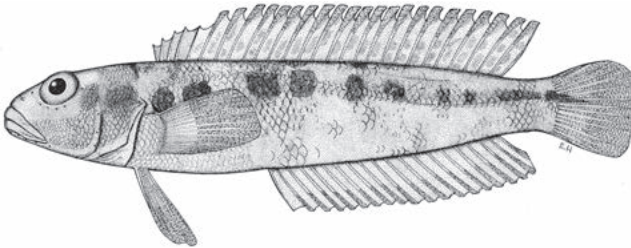
Parapercis maritzi Anderson 1992: 152, Figs. 1–4 (Transkei coast, Eastern Cape, South Africa); Heemstra & Heemstra 2004.

Dorsal fin 5 spines (posteriormost longest), 23 rays, with membrane between 5th spine and 1st soft ray barely incised; anal fin 1 spine, 19 rays; pectoral fins 20–22 rays. Snout steep and blunt. Lower jaw with 6 canines; teeth present on vomer and palatines. LL scales 61–63, lateral line oblique.

Body pale yellowish brown, with series of 8 or 9 golden brown blotches; series of poorly defined dark brown saddle-like blotches extending dorsolaterally to midbody, less distinct posteriorly; blotch on peduncle continues as narrow brown streak on caudal fin. Attains 18.5 cm SL.



Parapercis maritzi, 8 cm SL, juvenile (South Africa). Source: Anderson 1992



Parapercis maritzi, 16 cm SL, adult (South Africa). Source: SSF 1995

DISTRIBUTION WIO: Mozambique (Inhambane) to South Africa (Transkei region).

REMARKS Found on sand and sand-rubble bottom of outer continental shelf; known from 80–300 m. *Parapercis banoni*, from the southeastern Atlantic, has similar colouration and seemingly identical meristics and body proportions.

Parapercis millepunctata (Günther 1860)

Black-dotted sandperch

PLATE 115

Percis millepunctata Günther 1860: 241 (Sri Lanka).

Parapercis cephalopunctata: Winterbottom *et al.* 1989.

Parapercis millepunctata: Randall *et al.* 1990; Ho *et al.* 2014.

Dorsal fin 4 spines, 20 or 21 rays, and membrane extending from last spine to 1st ray; anal fin 1 spine, 17 rays; pectoral fins 17 rays; caudal fin truncate. Front of lower jaw with 6 canines; no palatine teeth. LL scales 55–58.

Body background colour whitish to pale green dorsally, whitish ventrally; longitudinal series of brown blotches interspersed with white, in pattern of 3 rows of brown to dark brown spots joined by narrow darker stripes, and lowest row of spots largest but narrowing ventrally; 2 large dark spots on cheeks, and 1 large brown or black spot behind opercle; dark brown spots on dorsal portion of snout; caudal fin greenish with small dark spots, and large black blotch extending from base to distal narrow white patch. Attains 18 cm SL.

DISTRIBUTION Indo-Pacific. WIO: Mauritius, Chagos, Maldives and Sri Lanka; elsewhere, southern Japan to Great Barrier Reef, New Caledonia and Pitcairn Is.

REMARKS Found on patches of rubble or the pavement of shallow coral reefs. Presumably a protogynous hermaphrodite; mating system harem with pelagic spawning.

Parapercis punctata (Cuvier 1829)

PLATE 113

Percis punctata Cuvier in Cuv. & Val. 1829: 264 [Western Indian Ocean]; Cantwell 1964.

Parapercis guezei Fourmanoir 1966: 218, Fig. 2 (Réunion, Mascarenes).

Parapercis punctata: Fricke 1999; Fricke *et al.* 2009; Fricke *et al.* 2013; Ho 2013*.

Dorsal fin 5 spines (4th spine longest), 21 rays; anal fin 1 spine, 17 rays; pectoral fins 16 or 17 rays; caudal fin rounded, with short prolongation on upper lobe. Front of lower jaw with 3 pairs of large canines; no palatine teeth. LL scales 52 or 53.

Preserved specimens with numerous black spots on dorsal surface of head and anterior portion of body; upper body with row of 8 black blotches; caudal fin with irregular bands. Attains 13 cm SL.

DISTRIBUTION WIO: Mozambique Channel, Aldabra and Réunion.

REMARKS Rare; found on coral-reef rubble, to ~75 m deep.

Parapercis punctulata (Cuvier 1829)

Spotted sandperch

PLATES 114 & 115

Percis punctulata Cuvier in Cuv. & Val. 1829: 265 (Mauritius, Mascarenes).

Percis pleurostigma Liénard in Sauvage 1891: 317 (Mauritius, Mascarenes; Zanzibar, Tanzania; Jakarta, Java, Indonesia).

Percis rosea Liénard in Sauvage 1891: 317 (Mauritius, Mascarenes).

Parapercis bivittata Schultz 1968: 11, Pl. 3 (near Praslin I., Seychelles); Heemstra 1984.

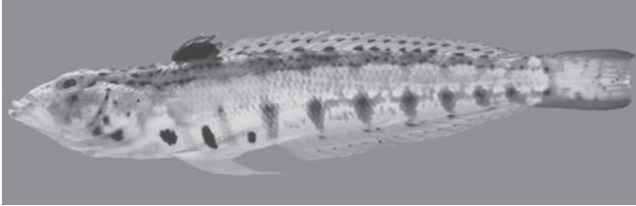
Parapercis trispilota Schultz 1968: 13, Pl. 4 (Curieuse I., Seychelles).

Parapercis punctulata: Randall 1984; SSF No. 234.4*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Fricke *et al.* 2009.

Dorsal fin 5 spines, 21 rays, and membrane extending from last spine to 1st ray; anal fin 1 spine, 17 rays; pectoral fins 17 or 18 rays; caudal fin truncate, may have short prolongation on upper and lower lobes. Front of lower jaw with row of 6 canines; no palatine teeth. LL scales 55–57.

Body mostly whitish, brownish dorsally, with variously sized dark brown speckles and markings overall; centre of spinous dorsal-fin black, soft-rayed portion with 2 rows of black spots (through middle and at base); sexually dimorphic markings on lower part of body: males with 2 blackish brown

lines across belly (1st from lower end of pectoral-fin base, with a break at the midventral line, and 2nd fainter but without break); females with 3 distinct black spots on each side of belly just above pelvic-fin bases. Attains 13 cm SL.



Parapercis punctulata, 9 cm SL, female (South Africa).
PC Heemstra © NRF-SAIAB



Parapercis punctulata, 12 cm SL, male (South Africa).
PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Socotra, Tanzania (Zanzibar), Mozambique, South Africa (Aliwal Shoal), Madagascar, Seychelles, Amirante Is. and Mascarenes; elsewhere to Indonesia.

REMARKS Found in relatively shallow water, commonly on coral reefs. Appears closely related to *Parapercis signata* from Maldives.

Parapercis robinsoni Fowler 1929

Smallscale sandperch

PLATES 114 & 115

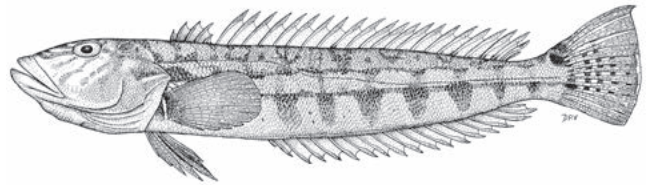
Parapercis robinsoni Fowler 1929: 261, Fig. 5 (KwaZulu-Natal, South Africa); SFSA No. 383; Randall & Stroud 1985; SSF No. 234.5*; Randall 1995; Heemstra & Heemstra 2004*; Fricke *et al.* 2009; Ho *et al.* 2014.

Parapercis nebulosa: Smith & Smith 1963*; SFSA No. 381.

Dorsal fin 5 spines (3rd and 4th spines longest), 21–23 rays, and membrane extending from last spine to 1st ray; anal fin 1 spine, 18 or 19 rays; pectoral fins 16 or 17 rays; caudal fin truncate to slightly emarginate. Vomer with 3–5 short stout teeth; no teeth on palatines. LL scales 77–84.

Body greyish brown dorsally, white ventrally; snout brownish yellow with blue lines; upper body with ~8 large blackish blotches interspersed with smaller irregular brownish blotches,

and lower body with ~7 narrow blackish bars, which continue faintly onto the broad white, dark-edged, midlateral stripe; caudal fin with large black blotch at base, interrupted by white stripe through centre; other fins whitish. Attains 30 cm SL.



Parapercis robinsoni, 20 cm SL (South Africa). Source: SSF 1995

DISTRIBUTION WIO: Pakistan, Persian/Arabian Gulf, Gulf of Oman, Somalia to South Africa (Algoa Bay) and Aldabra.

REMARKS Found on rubble and sand bottom, at 6–55 m.

Parapercis schauinslandii (Steindachner 1900)

Rosy sandperch

PLATES 114 & 115

Percis schauinslandii Steindachner 1900: 175 (Oahu I., Hawaii).

Parapercis pulchella (*non* Temminck & Schlegel 1843): SFSA No. 382.

Parapercis schauinslandii: Cantwell 1964; Yoshino *in* Masuda *et al.* 1984; SSF No. 234.6*; Heemstra & Heemstra 2004 [as *schauinslandii*].

Dorsal fin 5 spines (middle spine longest), 21 rays, and membrane extending from last spine to 1st ray; anal fin 1 spine, 16 or 17 rays; pectoral fins 16 rays; caudal fin emarginate to lunate, lobes without short prolongations. Front of lower jaw with 6 canines; no palatine teeth. LL scales 56–59.

Body white to pale red or green, with ≥8 semicircular to squarish pink or yellowish grey bars on back, each bar with small darker red or dusky spot, pair of spots or a dash in lower portion; flanks and lower part of body with ~8 short orange or red bars or squarish blotches, interspaces pale, and bars/blotches may be linked by orangish horizontal stripe, and last 2 red spots at caudal-fin base; narrow orange or red band extending from front of upper lip to eyes, and cheeks with red markings; spinous dorsal fin black, with broad red margin; 2 red bars on pectoral-fin base. Attains 14 cm SL.

DISTRIBUTION Indo-Pacific. WIO: East Africa to South Africa (Aliwal Shoal), Comoros, Seychelles and Maldives; elsewhere, southern Japan to Great Barrier Reef, New Caledonia, Pitcairn Is., Marquesas Is. and Hawaii; not known from Arabian Peninsula or Southeast Asia.

REMARKS Found on rubble or rubble-sand bottom, at 15–170 m; often seen hovering just above the bottom.

Parapercis signata Randall 1984

Blackflag sandperch

PLATE 115

Parapercis signata Randall 1984: 52 [46], Figs. 6–8 (lagoon at North Malé Atoll, Maldives).*Parapercis ventromaculata* Manilo 1990: 1016 [151], Figs. 1–2 (Malé I., Maldives).

Dorsal fin 5 spines, 21 rays; anal fin 1 spine, 17 rays; pectoral fins 16 or 17 rays; caudal fin truncate to slightly rounded. Front of lower jaw with 3 pairs of canines; no palatine teeth. LL scales 56 or 57.

Head and body background colour white; lower half of body with series of golden bars interspersed with white, and each white semi-bar with small dark spot; upper half of body with series of small dark brown spots; head with reticulated pattern of brown lines; spinous portion of dorsal fin dark brown or black with narrow white margin; soft-rayed dorsal fin with thin white margin, strong blackish submarginal line anteriorly, then broad yellowish brown band marked with black dot on each membrane segment, and beneath this a row of small yellow spots, and lastly a row of ~6 large dark brown blotches at fin base, interspersed with a few small yellow spots; proximal half of anal fin with 5 or 6 black spots with yellow surround on white background, and distal half of fin pale yellowish with narrow wavy pale blue lines; pectoral fins transparent, rays tinged reddish brown; pelvic fins white, rays tinged yellow; caudal fin transparent with irregular vertical rows of small yellow spots, interspersed with a few small black spots distally. Attains 13 cm SL.

DISTRIBUTION WIO: endemic to Maldives.**REMARKS** Found on rubble near reefs, at 12–35 m.*Parapercis simulata* Schultz 1968

PLATE 114

Parapercis simulata Schultz 1968: 5, Pl. 1 (off Somalia); Dor 1984; Bogorodsky *et al.* 2014.

Dorsal fin 5 spines, 22 rays; anal fin 1 spine, 18 rays; pectoral fins 16 or 17 rays; caudal fin emarginate, upper rays longest. Lower jaw with 3 pairs of hooked canines; no palatine teeth. LL scales 58–62.

Preserved specimens with straw-coloured head and body, belly paler; scale edges dusky; lower flanks with 5 evenly spaced dusky bars or blotches; dusky bar from eyes to snout tip, 2 bars from each eye across preorbital area and maxilla, and dark bar with pale centre from lower rear of eye to corner of mouth; dusky pale-centred bar on preopercle; upper ~¾ of pectoral-fin

axil dusky, but fins without markings; pale dusky bars on posterior dorsal-fin rays and on caudal fin; dark spot near bases of middle upper caudal-fin rays, and paler spot near bases of lower rays; no markings on anal-fin rays. Attains 15 cm SL.

DISTRIBUTION WIO: Red Sea (including Gulf of Suez) and Arabian Sea (Somalia).**REMARKS** Inhabits relatively deep water; collected from rubble and sand bottom, at 76–80 m. Resembles *P. alboguttata*.*Parapercis somaliensis* Schultz 1968

Weeping sandsmelt

PLATES 114 & 115

Parapercis somaliensis Schultz 1968: 10, Pl. 2 (off Somalia, Gulf of Aden); Masuda *et al.* 1975; Okamura *in* Masuda *et al.* 1984; SSF No. 234.7*; Baranes & Golani 1993; Manilo & Bogorodsky 2003; Bogorodsky *et al.* 2014.

Dorsal fin 5 spines, 21 rays, and membrane extending from last spine to 1st ray; anal fin 1 spine, 17 rays; pectoral fins 17 rays; caudal fin emarginate, with short prolongation on upper lobe. Lower jaw with 6 canines in outer row; no palatine teeth. LL scales 51–55.

Body brownish dorsally, pale ventrally; ~8 brown bars comprised of dense speckles on upper half of body, extending as faint bars on lower half of body; lips reddish; black blotch above opercle; small black spots at bases of and along dorsal-fin spines and rays; all fins yellowish. Attains 20 cm SL.

DISTRIBUTION WIO: Red Sea and Somalia to Tanzania.**REMARKS** Found on deep slopes and rubble–sand flats, at 40–72 m. Randall (2008) identified records from Taiwan and Japan as *Parapercis shaoi*.

FAMILY TRICHONOTIDAE

Sand-divers

Eri Katayama, Mrinal K Das and Joseph S Nelson

Small-sized (to ~16 cm SL), body greatly elongated, cylindrical, compressed posteriorly. Snout pointed; lower jaw projecting beyond upper jaw and with fleshy extension (usually surrounds tip of upper jaw when mouth closed) and jaw symphysis with ventral projection and smaller dorsal projection; row of cirri bordering lower jaw. Eyes with iris flap or lappet of numerous elongate strands extending ventrally over lens. Dorsal fin

continuous, origin over pectoral-fin bases, with 3–8 spines (some or all spines elongated and filamentous in males of some species), 39–47 rays; anal fin 1 spine, 34–42 rays; pectoral fins 11–15 rays; pelvic fins 1 spine, 5 rays; caudal fin rounded with 13 rays. Lateral line continuous along midbody. Scales large, cycloid; LL scales 52–59. Vertebrae 49–56.

Body with colourful markings in life, often with series of saddles or blotches above lateral line. Occur in Indo-Pacific, including the Red Sea; mostly inhabit shallow water, usually hovering over sand into which they will dive when alarmed.

Smith & Johnson (2007) also include the Creediinae of family Creediidae (sandburrowers) and the Hemeroceetinae of family Percophidae (duckbills) in this family. The distribution and validity of the nominal species is uncertain. A revision of the family with the description of several new species, including one with 2 dorsal-fin spines from Mauritius, is warranted. One genus and ~11 species; at least 6 or 7 species (2 or 3 undescribed) in WIO.

GENUS *Trichonotus* Bloch & Schneider 1801

Diagnosis as for family.

KEY TO SPECIES

[Many counts overlap but a more reliable key is not yet possible.]

- 1a LL scales usually 55–57; dorsal fin 3 spines *T. marleyi*
- 1b LL scales usually 58–60; dorsal fin 2–4 spines 2

- 2a Dorsal fin 2 spines; scaleless areas present above and below anterior portion of lateral line *Trichonotus* sp.
- 2b Dorsal fin 3 or 4 spines; body entirely scaly 3

- 3a Dorsal fin 3 spines; anal fin 39–41 rays; males with elongated dorsal-fin spines *T. nikii*
- 3b Dorsal fin 3 or 4 spines; anal fin 36–39 rays; dorsal-fin spines of males not elongated 4

- 4a Anal fin 37–39 rays; LL scales 55–57; snout length twice eye diameter; males with up to 14 indistinct dark markings on body, females with 2 indistinct dark longitudinal stripes on body *T. arabicus*
- 4b Anal fin 35–38 rays; LL scales 54–56; snout length subequal to eye diameter; both sexes with longitudinal row of 12–14 blotches on body *T. somaliensis*

Trichonotus arabicus Randall & Tarr 1994

Arabian sand-diver

PLATE 116

Trichonotus arabicus Randall & Tarr 1994: 311, Pls. 1–3 (Tarut Bay, Tarut I., Saudia Arabia, Persian/Arabian Gulf); Randall 1995*; Manilo & Bogorodsky 2003; Katayama & Endo 2010; Katayama *et al.* 2012.

Dorsal fin 3 or 4 spines (none elongated), 44–47 rays; anal fin 1 spine, 36–39 rays; pectoral fins 13–15 rays; caudal fin 13 rays. Branchiostegal rays 7; GR 6–9/20–24. LL scales 57 or 58. Vertebrae 52–54.

Head and body yellowish brown dorsally, whitish ventrally; snout to occiput pale brown with numerous dark dots; iris flap golden. Males with upper half of body with up to 14 indistinct dark markings and 3 longitudinal rows of small brilliant bluish white spots; lachrymal whitish with 2 rows of brilliant blue spots; fins transparent, with small yellow dots along dorsal- and anal-fin rays. Females with indistinct narrow dark stripe above lateral line; fins transparent, numerous small yellow to dark brown spots along dorsal- and caudal-fin rays, and small yellow spots posteriorly on anal fin. Attains 14.5 cm SL.

DISTRIBUTION WIO: Persian/Arabian Gulf to southern Oman.

REMARKS Types collected at ~1.5 m.

Trichonotus marleyi (Smith 1936)

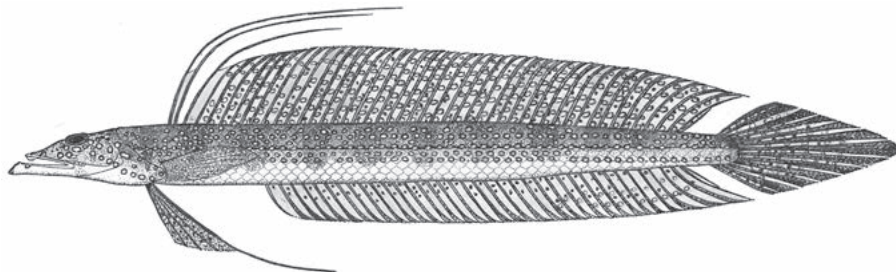
PLATE 116

Taeniolabrus marleyi Smith 1936: 4, Pls. 1–2 (Durban, KwaZulu-Natal, South Africa).

Trichonotus marleyi: SFSA No. 374*; Shimada & Yoshino 1984; SSF No. 231.1*; Randall & Tarr 1994; Heemstra *et al.* 2004.

Dorsal fin 3 spines, 44 rays; anal fin 1 spine, 36–39 rays; pectoral fins 12 rays. GR 6/21. LL scales 55–57.

Body yellowish dorsally, with translucent bluish green and red spots, body pale reddish ventrally; snout to occiput pale brown with numerous dark dots; iris flap golden. Males with up to 14 indistinct dark markings and 3 longitudinal rows of small brilliant bluish white spots on upper half of body; lachrymal whitish with 2 rows of brilliant blue spots; fins transparent, dorsal- and anal-fin rays with small yellowish dots, and numerous dark red dots on pectoral fins. Females with indistinct narrow dark stripe above lateral line; fins transparent, dorsal fin and caudal fin with numerous small yellow to dark brown spots, and anal fin with numerous small yellow spots posteriorly. Attains 19 cm SL.



Trichonotus marleyi, 19 cm TL, holotype (South Africa). Source: SSF

DISTRIBUTION WIO: Mozambique (Maputo Bay) to South Africa (KwaZulu-Natal), Seychelles and Rodrigues.

Trichonotus nikii Clark & Von Schmidt 1966

Red Sea sand-diver

PLATE 116

Trichonotus nikii Clark & Von Schmidt 1966: 29, Figs. 1–3 (Eilat, Israel, Gulf of Aqaba, Red Sea); Shimada & Yoshino 1984; Goren & Dor 1994; Randall & Tarr 1994; Manilo & Bogorodsky 2003.

Trichonotops multistriatus Kotthaus 1977: 48, Fig. 402 (southern Red Sea).

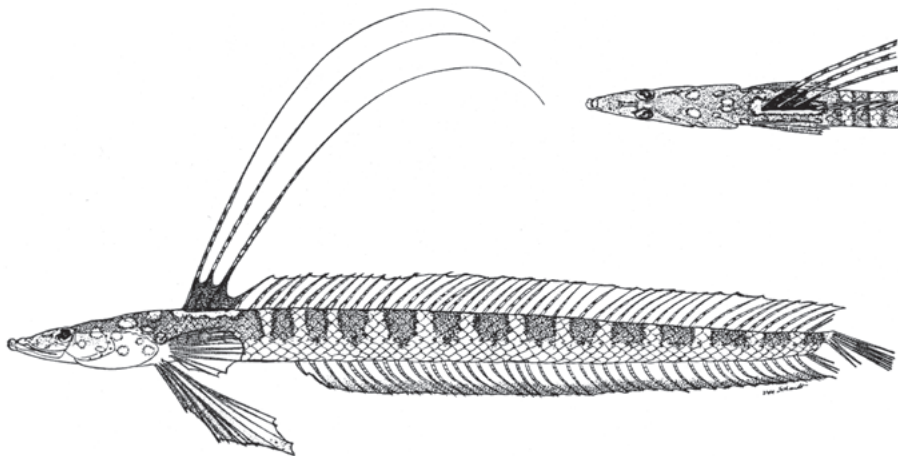
Dorsal fin 3 spines (greatly elongated in males), 46 rays, 2–4 free pterygiophores between last spine and first ray; anal fin 1 spine, 39–41 rays; pectoral fins 12 or 13 rays. GR 7/23. LL scales 58–60.

Males pale yellowish brown dorsally, with up to 14 distinct orange brownish saddles, body pale ventrally; lower part of

head (below eyes) and body to below anterior part of dorsal fin with grey-edged white spots; dorsal-fin spines with alternating white and orange bands, and base of interspinous membrane to first rays black; pelvic fins blackish distally, with black margin; caudal-fin upper lobe with many small orange and white spots, lower lobe whitish. Females pale brown dorsally, fading to white ventrally, without bands and markings on body; head slightly yellowish, and snout to occiput with fine brown specks; interspinous dorsal-fin membrane to first rays with black markings; pectoral fins transparent; pelvic fins and anal fin whitish; dorsal-fin rays and caudal-fin upper lobe with fine pale orange and white stripes, caudal-fin lower lobe whitish. Attains at least 12 cm SL.

DISTRIBUTION WIO: Red Sea and Gulf of Aden.

REMARKS Found to ~52 m deep; seen hovering over the bottom.



Trichonotus nikii, mature male holotype and dorsal view of head (Red Sea). Source: Clark & Von Schmidt 1966 (note: caudal fin damaged)

Trichonotus somaliensis

Katayama, Motomura & Endo 2012

Somali sand-diver

PLATE 116

Trichonotus somaliensis Katayama, Motomura & Endo 2012: 31,

Figs. 4–5 (Somalia).

Trichonotops sp. 1: Kotthaus 1977.

Trichonotops sp. 2: Kotthaus 1977.

Dorsal fin 3 or 4 spines, 44–47 rays, no free pterygiophore between last spine and first ray; anal fin 1 spine, 35–38 rays; pectoral fins 13 or 14 rays. GR 5 or 6/18–24. LL scales 54–56.

Preserved specimens yellowish brown, with 12–14 brownish markings on and above lateral line (subequal to eye diameter in both sexes); upper half of eyes black, lower half white; all fins transparent whitish; no black markings on anterior part of dorsal fin. Attains at least ~8.5 cm SL.

DISTRIBUTION Known only from the types collected from Somalia.

REMARKS Taken at 37–38 m.

Trichonotus sp. 1

PLATE 116

Dorsal fin 2 spines (elongated in males), 45 or 46 rays; anal fin 1 spine, 42–44 rays; pectoral fins 13 or 14 rays. GR 6 or 7/21–23. LL scales 59 or 60; scaleless areas above and below anterior portion of lateral line.

Males pale yellowish brown, more brownish dorsally and whitish ventrally; up to 17 brown-edged white markings on body beneath dorsal-fin base, some dumbbell-shaped; small irregular black and white markings on body above pectoral fins; 13–15 orange dots along dorsal-fin spines, 4 or 5 orange dots along rays, distalmost dot on ray tip; interspinous dorsal-fin membrane to 1st ray black at base; other fin membranes transparent. Mature males with whitish pelvic-fin bases, fins mostly blackish and darkest distally. Females pale white, with 4 blackish longitudinal stripes, upper 2 stripes forming partly dotted and wavy lines, 3rd stripe just above lateral line bold, lowermost stripe below lateral line partly dotted; snout to occiput with fine brown specks; caudal-fin upper lobe with darkish dots, forming 6 vertical stripes when fin folded. Maximum size unknown.

REMARKS Known only from Mauritius (2 male and 6 female specimens, ~7–11 cm SL). Similar to *Trichonotus elegans* from western Pacific in some counts and proportions, but clearly differing in number of dorsal-fin spines and some aspects of colouration.

FAMILY CREEDIIDAE

Sandburrowers

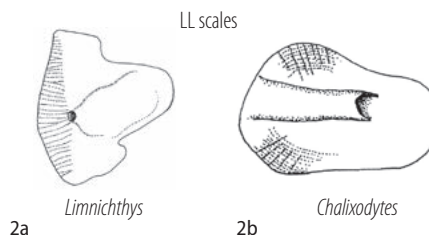
Mrinal K Das, Eri Katayama and Joseph S Nelson

Body elongate, cylindrical; eyes slightly protruding; upper jaw with fleshy snout projecting slightly past lower jaw; lower jaw fringed with row of cirri and projecting knob at symphysis. One continuous dorsal fin, with 12–43 unbranched rays; anal fin 22–40 unbranched rays (except branched rays in *Schizochirus*); pectoral fins 11–16 rays; pelvic fins 1 spine, 3–5 rays (pelvic fins absent in *Apodocreeidia*), interpelvic space very narrow; caudal fin truncate, with 8 or 9 branched rays. Opercular bones highly splintered or fimbriated. GR 6–13 on lower limb, none on upper limb of branchial arch. Lateral line complete, descending gradually or abruptly in area of pectoral fins. Scales cycloid; LL scales frequently with posterior extensions.

Tiny (to ~8 cm TL), found in intertidal areas and shallow marine waters of Indo-Pacific. Eight genera and ~18 species; 3 genera and 4 species in WIO.

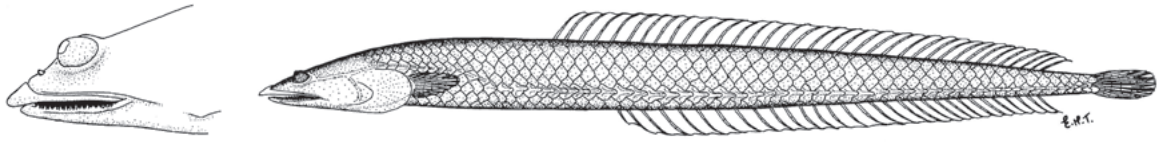
KEY TO GENERA

- 1a No pelvic fins *Apodocreeidia*
1b Pelvic fins with 4 or 5 rays 2
- 2a Anal fin 22–34 rays; LL scales from behind pectoral fins to caudal-fin base with trilobed rear margin; body scaly *Limnichthys*
2b Anal fin 36–40 rays; LL scales from behind pectoral fins with expanded rear margin; much of body without scales *Chalixodytes*



GENUS *Apodocreeidia* De Beaufort 1948

Dorsal fin 35–40 rays; anal fin 32–37 rays; pectoral fins 12–14 rays; caudal fin 8 rays. No pelvic fins. Ascending processes of premaxillae fused together; teeth present on vomer and palatines. No cirri on lower hyoid arch. Lateral line descending abruptly in area of pectoral fins. Scales with elongated posterior extension; LL scales 56–59. One species.



Apodocreeidia vanderhorsti, 7 cm SL (South Africa). Source: SSF

Apodocreeidia vanderhorsti De Beaufort 1948

Longfin burrower

PLATE 117

Apodocreeidia vanderhorsti De Beaufort 1948: 476, Fig. 1 (Inhaca I., Maputo Bay, Mozambique); SSF No. 232.1*; Lucena Rosa 1993.

Diagnosis as for genus. Body silvery white. Attains 8 cm TL.

DISTRIBUTION WIO (few localities): Mozambique (Maputo Bay) to South Africa (KwaZulu-Natal).

Dorsal fin 37–40 rays; anal fin 37–40 rays. LL scales 55–60.

Body pale, with 13–19 short dark bars across dorsum. Attains at least 4.5 cm TL.

DISTRIBUTION WIO (scattered localities): South Africa (Sodwana Bay), Comoros, Seychelles, Mauritius and Chagos.

REMARKS Lucena Rosa (1993) and others have concluded that *Chalixodytes chameleontoculis* from the Indian Ocean is conspecific with *Chalixodytes tauensis* Schultz 1943 from the Pacific. If the two species are the same, then the name *tauensis* would apply.

GENUS *Chalixodytes* Schultz 1943

Dorsal fin 35–41 rays; anal fin 36–40 rays; pectoral fins 11 or 12 rays; pelvic fins 1 spine, 4 rays. No cirri on lower hyoid arch. Scales in most specimens confined to lateral line, predorsal area and peduncle. Two species provisionally recognised, 1 in WIO.

Chalixodytes chameleontoculis Smith 1957

Sand dart

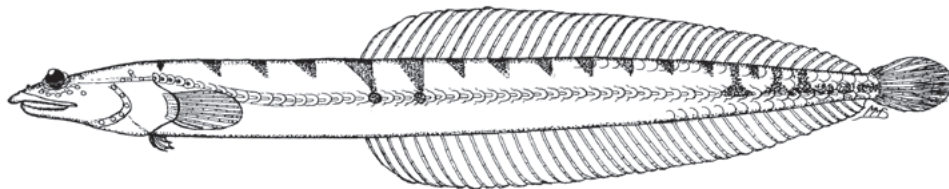
Chalixodytes chameleontoculis Smith 1957: 890, Fig. 1 (Denis I., Seychelles); Springer 1982; SSF No. 232.2*; Winterbottom *et al.* 1989.

GENUS *Limnichthys* Waite 1904

Dorsal fin 21–33 rays; anal fin 22–34 rays; pectoral fins 11–15 rays; pelvic fins 1 spine, 3–5 rays; caudal fin 8 or 9 rays. LL scales 34–47, those posterior to pectoral fins usually with trilobed posterior margin (central lobe larger and longer than lateral lobes; lower lobe often absent on last few LL scales). Cirri present on lower hyoid arch. Six species, 2 in WIO.

KEY TO SPECIES

- | | | |
|----|---|----------------------|
| 1a | Posterior 2–4 dark bars across dorsum reaching to midlateral stripe | <i>L. marisrubri</i> |
| 1b | Posterior dark bars across dorsum not reaching midlateral stripe | <i>L. nitidus</i> |



Chalixodytes chameleontoculis, 4 cm TL, holotype (Seychelles). Source: SSF

Limnichthys marisrubri Fricke & Golani 2012

Red Sea sandlance

PLATE 117

Limnichthys nitidus (non Smith 1958): Nelson 1978 [tentatively identified as new possible species]; Cozzi & Clark 1995 [behaviour].

Limnichthys nitidus nitidus (non Smith 1958): Lucena Rosa 1993.

Limnichthys marisrubri Fricke & Golani 2012: 288, Figs. 1–3 (Eilat, Israel, Gulf of Aqaba, Red Sea).

Dorsal fin 22–24 rays; anal fin 24–26 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 5 rays. LL scales 37–41.

Head pale brown dorsally, with 2 triangular dark grey spots on cheek below eye, and remainder creamy white; body pale brown, pinkish ventrally; 11–14 dark brown bars across dorsum, posterior 2–4 bars reaching to midlateral stripe; sides with orange midlateral stripe and dark brownish grey pigment; eyes dark brownish grey. Head and body of preserved specimens whitish, with 11–14 dark grey bars across dorsum; midlateral stripe dark grey. Attains at least 2.5 cm TL.

DISTRIBUTION WIO: northern Red Sea.

REMARKS Type specimens collected along a beach, to ~1.2 m deep.

Limnichthys nitidus Smith 1958

Sand submarine

PLATE 117

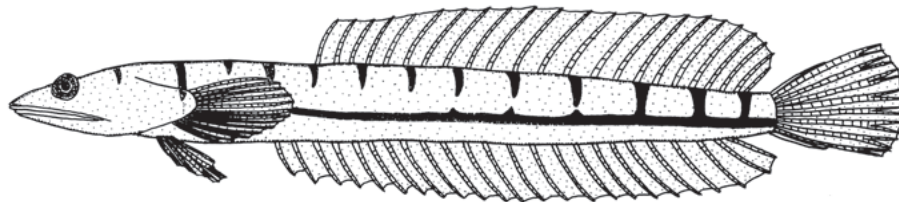
Limnichthys nitidus Smith 1958: 247, Fig. 1 (Pinda, Mozambique); Nelson 1978, 1979, 1985*; SSF No. 232.3*; Winterbottom *et al.* 1989; Lucena Rosa 1993; Cozzi & Clark 1995*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 20–25 rays; anal fin 25–28 rays; pectoral fins 11–14 rays; pelvic fins 1 spine, 5 rays. One epural bone. Body fully scaly except in area of pectoral-fin bases, isthmus and preopercle; LL scales 39–41.

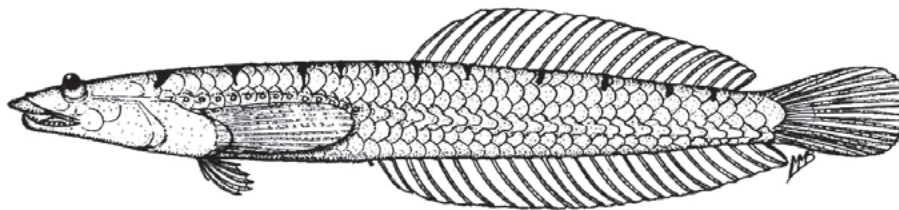
Body tan, with 9–13 brown bars across dorsum and brown line along sides; head to opercle and ventral surface of body whitish. Preserved specimens pale brown; narrow bars apparent on dorsum, but midlateral stripe fainter and not connected to dorsal markings. Attains 3.5 cm TL.

DISTRIBUTION Indian Ocean. WIO: Mozambique, South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles, Mascarenes and Chagos; elsewhere to Cocos (Keeling) Is.

REMARKS Yoshino *et al.* (1999) regarded *Limnichthys donaldsoni* Schultz 1960 as junior synonym of *L. nitidus*; however, data on some meristic characters are lacking for specimens from the northwestern Pacific. The synonymy of these species needs to be reviewed.



Limnichthys marisrubri, 22 mm SL, holotype (Red Sea). Source: Fricke & Golani 2012



Limnichthys nitidus, 25 mm TL (N Mozambique). Source: SSF

FAMILY PERCOPHIDAE

Duckbills

Mrinal K Das, Eri Katayama and Joseph S Nelson

Body elongate, subcylindrical; head depressed; eyes usually large, close-set. Usually 2 separate dorsal fins: 1st dorsal fin 2–9 spines (fin absent in *Hemerocoetes* of western Pacific), 2nd dorsal fin 13–43 rays (13–18 rays in WIO species); pectoral fins 15–26 rays; pelvic fins 1 spine, 5 rays, fin bases well separated; anal fin with or without a single spine, 15–42 rays; caudal fin truncate or rounded, with 7–13 branched rays. Gill rakers well-developed. Lateral line complete. Scales cycloid, ctenoid or reduced ctenoid.

Small-sized, benthic, to ~700 m in tropical to warm-temperate marine waters of Atlantic, Indo-Pacific and southeastern Pacific. Not of commercial importance but reportedly used as fishmeal in West Africa (Knapp 1981).

Eleven genera and ~50 species; 4 genera and possibly 7 species in WIO. Differences of opinion exist on the species composition of *Osopsaron* and *Pteropsaron*. For instance, Suzuki & Nakabo (1996) follow the traditional separation based on presence or absence of scales on the cheek, whereas Smith & Johnson (2007) present a different view, and comparative information is lacking for some nominal species. The subfamily Hemerocoetinae (Nelson 2006), here including the genera *Osopsaron* and *Pteropsaron*, is considered by Smith & Johnson (2007) to be a subfamily of the Trichonotidae.

KEY TO GENERA

- 1a Lower jaw projecting beyond upper jaw; anterior face of maxilla without protruding spine; opercle with 2 spines; caudal fin 10 or 11 branched rays 2
- 1b Lower jaw shorter than upper jaw; anterior face of maxilla with protruding spine; opercle with 1 spine; caudal fin 7 or 8 branched rays 3
- 2a Tentacle at rear tip of maxilla *Bembrops*
- 2b No tentacle at rear tip of maxilla *Chironema*
- 3a Anal-fin rays branched; snout length much shorter than eye diameter; 2nd dorsal fin 17–20 rays; pelvic fins extend past anal-fin origin *Osopsaron*
- 3b Anal-fin rays unbranched; snout length subequal to eye diameter; 2nd dorsal fin either 14 or 15, 21 or 22 rays; pelvic fins not reaching anal-fin origin *Pteropsaron*

GENUS *Bembrops* Steindachner 1876

First dorsal fin 6 spines; 2nd dorsal fin 13–17 rays; anal fin 14–18 rays; pectoral fins 17–29 rays; caudal fin 13 rays. Triangular 'tentacle' at rear tip of maxilla; deep notch at posterior tip of maxilla; teeth present on vomer and palatines. LL scales 40–69. About 19 species, probably 4 in WIO. Discrimination of species has been confused, and taxonomic changes from an improved understanding of the species are expected with further work.

KEY TO SPECIES

- 1a Dorsal-fin membranes with dark grey to black pigmentation on distal edge between all spines; LL scales 47–57 *B. platyrhynchus*
- 1b Dorsal-fin membranes with grey to black pigmentation restricted to between first 2 or 3 spines; LL scales 42–54 2
- 2a Dorsal-fin membranes with blackish pigmentation between first 2 spines only; scale rows 2 between lateral line and 1st dorsal-fin origin; LL scales 43–48 *B. nematopterus*
- 2b Dorsal-fin membranes with dark grey pigmentation between first 3 spines; scale rows 3 or 4 between lateral line and 1st dorsal-fin origin; LL scales 42–54 3
- 3a Complete suborbital canal of 11–13 pores under eye to front margin of orbit *B. adenensis*
- 3b Very short suborbital canal of ≤5 pores along rear margin of orbit *B. caudimacula*

Bembrops adenensis Norman 1939

Bembrops adenensis Norman 1939: 69, Fig. 24b (Gulf of Aden); Nelson 1978; Klauswitz 1980*; Goren & Dor 1994; Manilo & Bogorodsky 2003.

Second dorsal fin 13 or 14 rays; anal fin 15 or 16 rays; pectoral fins 24–27 rays. Suborbital canal of 11–13 pores. Lateral line descending gradually adjacent to pectoral fins; LL scales 45–51.

Body yellowish brown dorsally, paler ventrally; dorsal-fin interspinous membranes with dark grey pigment between first 3 spines. Attains 17 cm SL.

DISTRIBUTION WIO: endemic to Red Sea and Gulf of Aden.

REMARKS Considered a synonym of *B. caudimacula* by Das & Nelson (1996) and Thompson & Suttkus (2002). Here, distinguished from *B. caudimacula* in having a complete suborbital canal of 11–13 pores (versus ≤5 pores), slimmer body and peduncle, longer maxillary tentacle, and smaller eye.

Bembrops caudimacula Steindachner 1876

Tailspot duckbill

PLATE 118

Bembrops caudimacula Steindachner 1876: 212 [164] (Nagasaki, Japan); Alcock 1899, 1902*; Jordan & Snyder 1902; Kuroda 1950*; Smith 1965*; Lindberg & Krasnyukova 1969*; Nelson 1978; Das & Nelson 1996; Thompson & Suttkus 2002*.

Second dorsal fin 13–15 rays; anal fin 14–17 rays; pectoral fins 19–25 rays. Suborbital canal short, ≤ 5 pores. GR 3–5/11–16. Lateral line descending gradually adjacent to pectoral fins; LL scales 42–54.

Body pale yellowish brown dorsally, white ventrally; 4–12 circular or oval dusky spots along lateral line; dark grey to black pigmentation on membranes between first 3 spines of dorsal fin; caudal fin with dark pigmentation along upper edge and large, round, black spot; peritoneum greyish to pale yellowish brown, with scattered dark spots in some individuals. Attains 20.5 cm SL.



Bembrops caudimacula (Myanmar). PN Psomadakis © FAO

DISTRIBUTION Indo-Pacific and eastern Atlantic (Gulf of Guinea). WIO: Somalia, near Gulf of Aden, and India; elsewhere, Andaman Sea, Indonesia, Philippines, Korea, Japan, New Guinea and northeastern Australia.

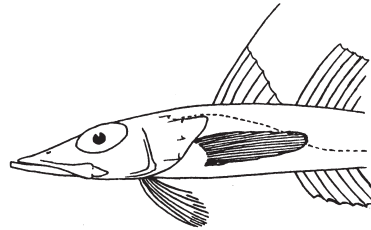
REMARKS Found at ~250–500 m. Distinguished from *B. adenensis* by a very short suborbital canal with ≤ 5 pores; from *B. nematopterus* by a longer head and more scale rows between lateral line and 1st dorsal-fin origin; and from *B. platyrhynchus* in more scale rows between lateral line and 1st dorsal-fin origin (5–7 versus 4–6 in *B. platyrhynchus*).

Bembrops nematopterus Norman 1939

Bembrops nematopterus Norman 1939: 70, Fig. 24c (Zanzibar, Tanzania); Das & Nelson 1996; Thompson & Suttkus 2002*.

First spine of 1st dorsal fin elongate; 2nd dorsal fin 13 or 14 rays; anal fin 16 rays; pectoral fins 21 or 22 rays. GR 5/15 or 16. Lateral line descending gradually; scale rows 2 between lateral line and 1st dorsal-fin origin; LL scales 43–48.

Preserved specimens yellowish brown dorsally, paler ventrally; almost black pigmentation on distal portion of membrane between first 2 dorsal-fin spines; thick dark brown line along lower edge of caudal fin; peritoneum pale brown, with scattered dark spots. Attains 19.5 cm SL.



Bembrops nematopterus, 16 cm TL (Zanzibar). Source: Norman 1939

DISTRIBUTION WIO: Kenya to South Africa.

REMARKS Found at 183–293 m. The most widely known *Bembrops* species off the coast of East Africa.

Bembrops platyrhynchus (Alcock 1894)

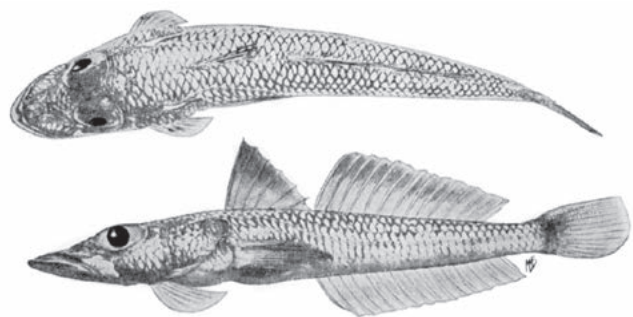
PLATE 118

Bathypercis platyrhynchus Alcock 1894: 178 [10], Pl. 9, Fig. 1 (Bay of Bengal, India).

Bembrops platyrhynchus: Norman 1939; Nelson 1978; SSF No. 233.1*; Das & Nelson 1996; Thompson & Suttkus 2002*; Jawad *et al.* 2013.

First spine of 1st dorsal fin elongate in some adults; 2nd dorsal fin 13–16 rays; anal fin 15–17 rays; pectoral fins 25–27 rays. GR 3–5/11–17. Lateral line descends gradually; LL scales 47–57.

Body yellowish brown dorsally, paler ventrally; dark grey to black pigmentation on distal edge of membranes between all spines of 1st dorsal fin; 8–13 large dark brown spots along lateral line (spots may be small or vague in smaller fish); dark blotch on upper and lower edges of caudal fin; peritoneum dark greyish or blackish. Attains 25 cm TL.



Bembrops platyrhynchus, 20 cm TL (South Africa). Source: SFSA

DISTRIBUTION Indo-Pacific. WIO: Oman, Somalia, South Africa, Mozambique and Mascarene Ridge; elsewhere, Bay of Bengal, South China Sea, Philippine Sea and Tasman Sea.

REMARKS Found off Africa at ~100–350 m. As here, Thompson & Suttkus (2002) regard the distribution to be uncertain because of nomenclatorial confusion, except they do not consider the species to be present off Africa or even west of the Bay of Bengal. Das & Nelson (1996) regarded *Bembrops philippinus* Fowler 1939 (replacement name for *B. filifer* Fowler 1938 from the Philippines, preoccupied by *B. filifera* Gilbert 1905 from Hawaii, and emended to *B. filiferus* by Thompson & Suttkus 2002, considered a valid species known from the eastern Indian Ocean and western Pacific) as a synonym of *B. platyrhynchus*, but Thompson & Suttkus (2002) regarded *Bembrops philippinus* Fowler 1939 as a valid species. *Bembrops filamentosa* Norman 1939 had also been proposed as a replacement name for *B. filifer* Fowler 1938. In addition, Das & Nelson (1996) regarded *Bembrops aethalea* McKay 1971 (from northwestern Australia) a synonym of *B. platyrhynchus*, but Thompson & Suttkus (2002) tentatively regarded it as a synonym of *B. caudimacula*.

GENUS *Chrionema* Gilbert 1905

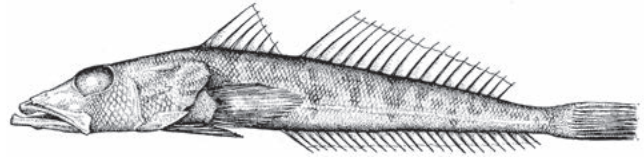
First dorsal fin 6 spines; 2nd dorsal fin 15–17 rays; anal fin 18–20 rays; pectoral fins 20–25 rays; caudal fin 13 rays. Teeth present on vomer and palatines. LL scales 50–87. Resembles *Bembrops* except without tentacle at rear tip of maxilla and with shorter snout. Six species, 1 in WIO.

Chrionema chlorotaenia McKay 1971

Chrionema chlorotaenia McKay 1971: 44, Fig. 4 (off northwestern Australia); Talwar 1974*; Iwamoto & Staiger 1976*; Heemstra & Nelson 1984; Parin 1990.

Second dorsal fin 16 or 17 rays, first ray unsegmented; anal fin 23–25 rays; pectoral fins 23–25 rays. Rear margin of maxilla truncated. GR 4/15–17. Lateral line descending abruptly behind opercle and running along lower sides; LL scales 80–85.

Body yellowish brown dorsally, paler ventrally; 8–10 yellowish blotches along sides; darker pigmentation on membranes between first 2 spines of 1st dorsal fin. Attains 22 cm SL.



Chrionema chlorotaenia (W Australia). Source: McKay 1971

DISTRIBUTION Indo-Pacific. WIO: southwestern India (Kerala); elsewhere, East China Sea to Japan (Tosa Bay), and northwestern Australia.

GENUS *Osopsaron* Jordan & Starks 1904

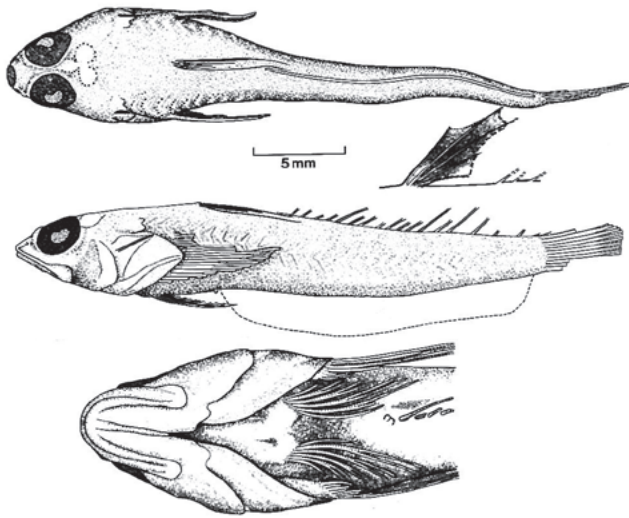
First dorsal fin 4–6 spines; 2nd dorsal fin 17–20 rays; anal fin 22–25 rays; pectoral fins 16–20 rays; caudal fin ~8 rays. LL scales 30–33. The generic placement of the nominal species of *Osopsaron* and *Pteropsaron* is uncertain. We provisionally prefer to regard those species with branched anal-fin rays and a snout length much shorter than eye diameter as belonging to *Osopsaron*, whereas those with unbranched anal-fin rays and with a snout length subequal to eye diameter as belonging to *Pteropsaron*. Four species, 1 in WIO. Smith & Johnson (2007) however place this species in *Pteropsaron* on the basis of it having long dorsal-fin spines in males.

Osopsaron natalensis Nelson 1982

Osopsaron natalensis Nelson 1982: 4, Figs. 3–4 (off Kosi Bay, KwaZulu-Natal, South Africa); SSF No. 233.2*.

First dorsal fin 4 or 5 spines; 2nd dorsal fin 18–20 rays; anal fin 22–25 rays; pectoral fins 18 or 19 rays; caudal fin 10 rays. Pelvic fins extend beyond anal-fin origin; lower jaw slightly shorter than upper jaw; forward-directed spine on anterior tip of maxilla; few teeth on vomer. GR 9 on lower limb of 1st arch. Lateral line straight along midsides; LL scales 31–33.

Preserved specimens pale; 1st dorsal fin with black pigment on all membranes. Attains 35 mm SL.



Osopsaron natalensis, 30 mm SL, holotype, with ventral view of head and belly, and lateral view of erect spinous dorsal fin (South Africa).

Source: Nelson 1982

DISTRIBUTION Known only from the type specimens from South Africa.

REMARKS Dredged from ~100 m.

GENUS *Pteropsaron* Jordan & Snyder 1902

First dorsal fin 4–6 spines, 14 or 15 or 20–22 rays; anal fin 23–27 rays; pectoral fins 18 or 19 rays; caudal fin 10 rays. Pelvic fins not reaching anal-fin origin. LL scales 31–33. As mentioned above, the generic placement of nominal species of *Osopsaron* and *Pteropsaron* is uncertain. We provisionally prefer to regard those species with unbranched anal-fin rays and a snout length subequal to eye diameter as belonging to *Pteropsaron*. Five species, 1 in WIO.

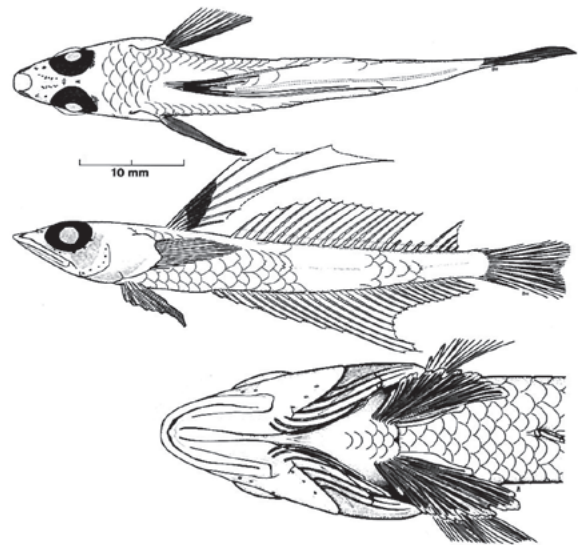
Pteropsaron heemstrai Nelson 1982

PLATE 118

Pteropsaron heemstrai Nelson 1982: 2, Figs. 1–2 (off Park Rynie, KwaZulu-Natal, South Africa); SSF No. 233.3*; Smith & Johnson 2007.

First dorsal fin 5 or 6 spines, elongated in males; 2nd dorsal fin 20–22 rays; anal fin 24 or 25 rays; pectoral fins 19 rays. Lower jaw distinctly shorter than upper jaw; forward-directed spine on anterior tip of maxilla; teeth present on vomer. GR 10 or 11 on lower limb of 1st arch. Lateral line straight along midsides; LL scales 32 or 33.

Dorsal fin with black pigment on all interspinous membranes. Attains 55 mm SL.



Pteropsaron heemstrai, 45 mm SL, holotype, with ventral view of head and belly (South Africa). Source: Nelson 1982

DISTRIBUTION Known only from two type specimens from South Africa.

REMARKS Dredged from ~143 m.

FAMILY OPISTOGNATHIDAE

Jawfishes

William F Smith-Vaniz

Small-sized, body moderately elongate, narrow and tapering; head and mouth large; caudal fin rounded. Eyes relatively large and high on head. Dorsal fin continuous, with 10 or 11 weak spines, 11–20 rays; anal fin 2 or 3 spines, 10–19 rays; pelvic fins 1 spine, 5 rays, with outer 2 rays unbranched and inner 3 rays branched (an arrangement unique to jawfishes). Teeth moderate, canine-like, usually in 1 row on sides of jaws; maxilla usually extends well behind eye. Lateral line high on body, close to dorsal-fin base, incomplete and ending below middle of fin; lateral-line tubes or canals mostly embedded in skin. Scales cycloid; head naked in most species.

Occur in all oceans except the eastern Atlantic. Found on continental margins, from shore to ~300 m deep (usually in <30 m). All species occupy burrows which they construct by scooping up sand or small stones with their mouth or by picking up larger rocks in their jaws, and the burrow may be elaborately lined and reinforced with pebbles and shell fragments. As far as known, males of all species brood the eggs orally. Mouthbrooding behaviour and a short pelagic larval stage have resulted in reduced faunal connectivity and a relatively high level of endemism in many species.

Three genera and ~80 described species, plus many more undescribed; 2 genera and 13 species in WIO.

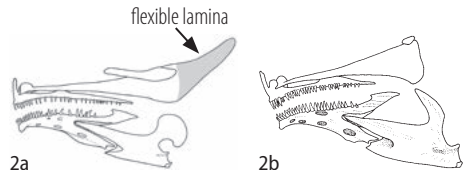
KEY TO GENERA

- 1a Anterior dorsal-fin spines not transversely forked distally, and skin covering them not forming a dorsal hood; first 2 dorsal-fin spines moderately long and essentially vertical ... *Opistognathus*
- 1b Anterior dorsal-fin spines transversely forked distally and skin covering them forming a broad dorsal hood to accommodate the uniquely shaped spines; first 2 dorsal-fin spines very short and strongly canted backwards *Stalix*

GENUS *Opistognathus* Cuvier 1816

Differs from genus *Stalix* in having relatively long and not transversely forked anterior dorsal-fin spines. The smaller species of this genus are ideally suited as aquarium fishes because of their interesting behaviour; however, most are strongly territorial, require sand or pebbles for burrow construction, and are prone to jumping from the water. About 75 species, many of these undescribed; at least 11 species in WIO, and additional undescribed species likely to occur.

KEY TO SPECIES

- 1a Dorsal fin with ocellated spot between spines 3–8, followed by 2 irregular dark blotches that extend onto body; outermost pectoral-fin ray tightly bound to adjacent ray, and interradial membrane not incised distally or only slightly incised at tip; cheek with dark stripe bordering upper jaw *O. muscatensis*
- 1b Colour pattern not as above; outermost pectoral-fin ray not bound to adjacent ray, and interradial membrane distinctly incised distally (except in *O. pardus*); no dark stripe on cheek bordering upper jaw 2
- 2a Rear end of upper jaw with flexible lamina 3
- 2b Rear end of upper jaw rigid, without flexible lamina 5
- 
- 3a GR 15 or 16 on lower limb of adults, total GR 24 or 25; LSS ~40–44; supramaxilla relatively wide and ovate ... *O. adelus*
- 3b GR 20–29 on lower limb of adults, total GR 31–45; LSS ~68–95; supramaxilla relatively slender and elongate 4
- 4a Dorsal fin with prominent ocellus between spines 3–8; caudal fin usually with pair of pale spots at base; GR usually 23–29 on lower limb *O. nigromarginatus*
- 4b No ocellus on dorsal fin; no basicaudal spots; GR 31–37 on lower limb *O. variabilis*
- 5a Oral membrane between dentaries and 'tongue' dark brown; height of tentacle on anterior nostril at least 4 times diameter of posterior nostril; dorsal fin 20 rays; anal fin 19 rays; caudal vertebrae 24 *O. longinaris*
- 5b Oral membrane between dentaries and 'tongue' pale; tentacle, if present, on anterior nostril ~0.5–2 times diameter of posterior nostril; dorsal fin 11–15 rays; anal fin 10–16 rays; caudal vertebrae 16–18 6
- 6a Dorsal fin 11 rays; anal fin 10 or 11 rays 7
- 6b Dorsal fin 13–15 rays; anal fin 12–16 rays 8
- 7a GR 15 or 16 on lower limb, total GR 40 or 41; body depth at anal-fin origin 21% SL; head covered with numerous small dark spots; proximal half of spinous dorsal fin with 2 pale ocelli with dark centres *O. pardus*
- 7b GR 11 on lower limb, total GR 34; body depth at anal-fin origin 26% SL; head with irregular white spots and dark blotches; proximal half of spinous dorsal fin with 3 dark blotches, the sharply defined pale interspaces nearly as wide as the blotches *O. crassus*

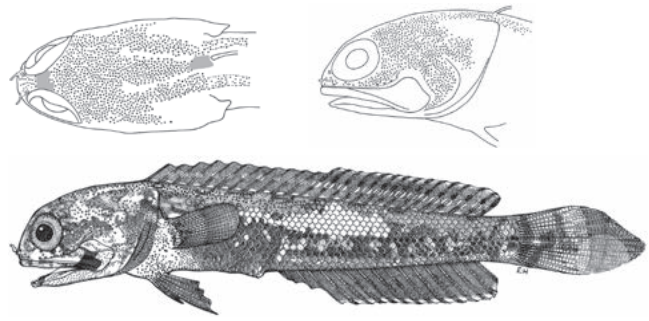
Continued...

KEY TO SPECIES

- 8a Dorsal fin with ocellated spot between spines 3–5; body usually naked anterior of last dorsal-fin spine *O. margaretae*
- 8b No ocellated spot on dorsal fin; body naked anterior of dorsal-fin spines 5 or 6 9

- 9a Anterior nostril without tentacle; dorsal-fin spines moderately stout and straight distally, with slightly swollen fleshy tab on tips; dorsal fin 13 or 14 rays; anal fin 12–14 rays; vomerine teeth 2 or 3; lateral line ends below dorsal-fin rays 2–4 *O. afer*
- 9b Anterior nostril with slender tentacle; dorsal-fin spines relatively slender and curved distally, tips flexible and lacking swollen fleshy tabs; dorsal fin 15 rays; anal fin 15 or 16 rays; no teeth on vomer; lateral line ends below dorsal-fin ray 6 or 7 10

- 10a Caudal fin with pair of conspicuous pale spots at base; spinous portion of dorsal fin with row of pale midlateral spots; no supraneural bones *O. dipharus*
- 10b No paired basicaudal spots; no pale midlateral spots on dorsal fin; 1 supraneural bone *O. simus*



Opistognathus adelus, 47 mm SL, male holotype and cephalic sensory pores on reversed right side view of head, with damaged regions indicated by shading (Madagascar). Source: Smith-Vaniz 2010

DISTRIBUTION WIO: northwest Madagascar and South Africa (Kosi River mouth: 1 specimen).

REMARKS The South African specimen, dredged from ~65 m, differs in some meristic characters, but not in colour pattern, from the five type specimens from Madagascar, collected at 5–10 m. More specimens are required to determine if two species are actually represented.

Opistognathus adelus Smith-Vaniz 2010

Obscure jawfish

PLATE 119

Opistognathus adelus Smith-Vaniz 2010: 42, Figs. 2a, 3a, 4–6 (off Nosy Tanga, Nosy Be, Madagascar).

Dorsal fin 11 spines, 13 or 14 rays; anal fin 3 spines, 13 or 14 rays. Upper jaw extends length of 1–1.2 eye diameter behind eye, its end flexible and broadly rounded; lateral line ends below dorsal-fin rays 2–4; anterior nostril with small tentacle, its height about twice diameter of posterior nostril. No teeth on vomer. GR 9–15/15 or 16. LSS ~40–44.

Live colour unknown. Preserved specimens tan, with naked areas of body (including pectoral-fin bases) heavily freckled; upper lip with dark bands, and underside of maxilla with black blotch visible externally; branchiostegal membranes dark brown; orbital rim with small dark spots; dorsal fin tan, soft-rayed portion with row of faint brown spots, and row of larger pale spots below; caudal fin with narrow dark blotch and pair of indistinct pale spots at base (fin lacking bands). Attains 6 cm TL.

Opistognathus afer Smith-Vaniz 2010

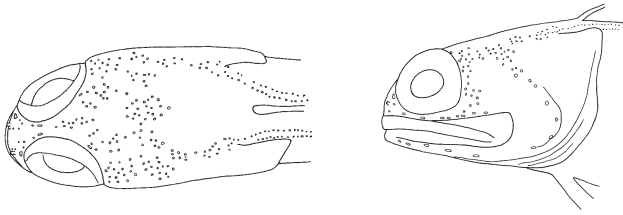
African jawfish

PLATE 119

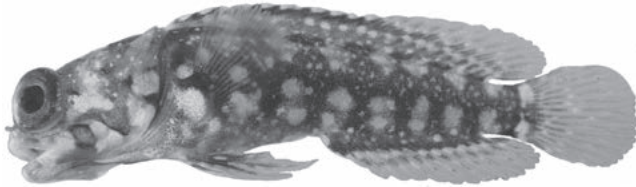
Opistognathus afer Smith-Vaniz 2010: 45, Figs. 8–10 (Maputoland Reef, south of Kosi River mouth, South Africa).

Dorsal fin 11 spines, 13 or 14 rays; anal fin 3 spines, 12–14 rays. Dorsal-fin spines moderately stout and straight with pungent tips, each with fleshy white tab; upper jaw extends length of 0.5–0.8 eye diameter behind eye, its end rigid and truncate; lateral line ends below dorsal-fin rays 2–4. Vomer with 2 or 3 teeth. GR 8/14 or 15. LSS ~58–62.

Body with prominent rows or series of pale spots or blotches, including on pectoral-fin base and opercle, and small double spot on end of maxilla; dorsal fin and anal fin with similar multiple horizontal series of smaller spots; dorsal-fin spines with white tab at tips; caudal fin with irregular bands of small white spots and pair of large spots at base. Attains 5 cm TL.



Opistognathus afer, 41 mm SL, male holotype, cephalic sensory pores on reversed right side view of head (South Africa). Source: Smith-Vaniz 2010



Opistognathus afer, 29 mm SL (South Africa). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Kenya to South Africa.

REMARKS Known from coastal areas, in 22–32 m.

Opistognathus crassus Smith-Vaniz 2010

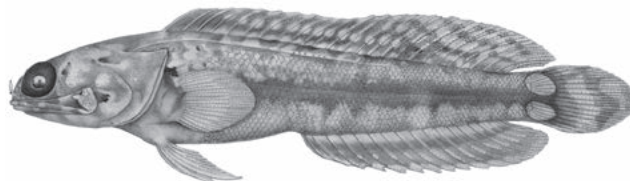
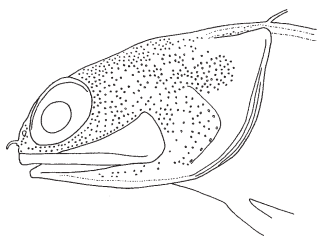
Stout jawfish

PLATE 119

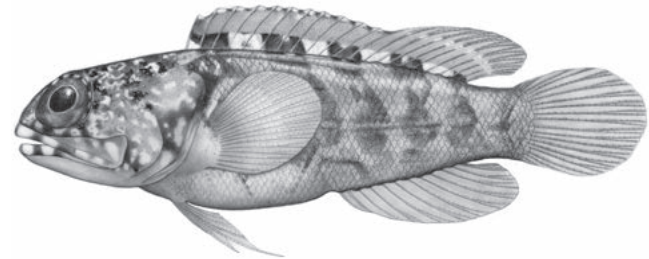
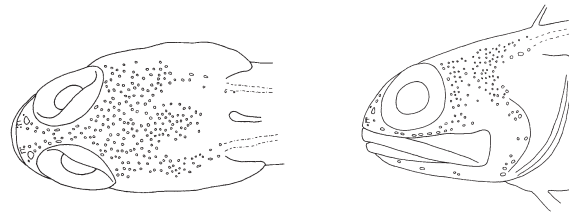
Opistognathus crassus Smith-Vaniz 2010: 47, Figs. 2c, 11–13 (Ari Atoll, reef north of Bathala Is., Maldives).

Dorsal fin 11 spines, 11 rays; anal fin 2 spines, 10 rays. Dorsal-fin spines moderately stout and straight with pungent tips, each with fleshy white tab; upper jaw extends length of 0.5 eye diameter behind eye, its end rigid and truncate; anterior nostril a short tube without tentacle; lateral line ends below dorsal-fin ray 2. No teeth on vomer. GR 11/23. LSS ~44.

Body and head mostly tan, with irregular white spots and dark blotches; areas between some scale rows appear as series of faint narrow brown stripes; proximal half of dorsal fin with 5 evenly spaced dark blotches, alternating with sharply defined pale areas as wide as blotches, and blotches 2–4 with small pale spot centred on distal margin of blotch; other fins uniformly pale. Attains at least 46 mm TL.



Opistognathus crassus, 36 mm SL, male holotype and cephalic sensory pores (Maldives). Source: Smith-Vaniz 2010 (by TD Pedersen)



Opistognathus crassus, 36 mm SL, male holotype and cephalic sensory pores (Maldives). Source: Smith-Vaniz 2010 (by TD Pedersen)

DISTRIBUTION Known only from the holotype collected from the Maldives.

REMARKS Taken at ~35 m.

Opistognathus dipharus Smith-Vaniz 2010

Tail-beacon jawfish

Opistognathus dipharus Smith-Vaniz 2010: 49, Figs. 1d, 14–15 (Dahlak Archipelago, Red Sea).

Dorsal fin 11 spines, 15 rays; anal fin 3 spines, 16 rays.

Upper jaw extends length of 0.9 eye diameter behind eye, its end rigid and truncate; anterior nostril with small tentacle, its height ~3 times diameter of posterior nostril; lateral line ends below dorsal-fin rays 6–7. No teeth on vomer. GR 10/18. LSS ~63 or 64.

Head tan with dark brown marks; dorsal fin dusky, with series of pale spots anteriorly, and several narrow dark diagonal bands posteriorly; underside of maxilla with dark blotch externally visible posteriorly; prominent pair of pale, oval, basicaudal spots on dark background, remainder of fin pale brown with indistinct pale bands. Attains ~6 cm TL.

DISTRIBUTION WIO: Red Sea and Karam Masamirit I., Sudan (photograph).

REMARKS Known from 3–23 m.

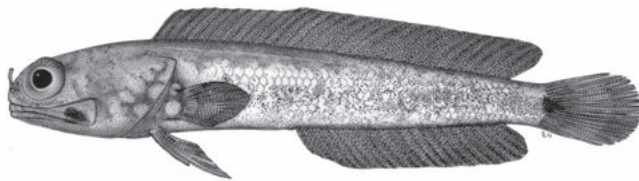
Opistognathus longinaris Smith-Vaniz 2010

Long-nostril jawfish

Opistognathus longinaris Smith-Vaniz 2010: 51, Figs. 2e, 16 (off Kosi River mouth, KwaZulu-Natal, South Africa).

Dorsal fin 10 spines, 20 rays; anal fin 3 spines, 19 rays. Upper jaw extends length of 0.7 eye diameter behind eye, its end rigid and truncate; anterior nostril with long tentacle, its height at least 4 times diameter of posterior nostril; lateral line ends below dorsal-fin ray 8. No teeth on vomer. GR 8 or 9/15 or 16. LSS ~40–42.

Body dusky, without distinct markings except pale spot at pectoral-fin bases; head dusky with indistinct pale spots on opercle; underside of maxilla with dark blotch externally visible posteriorly, and oral membrane between dentaries and ‘tongue’ dark brown; dorsal fin and anal fin uniformly dark; caudal fin dusky, with dark wedge-shaped mark at base. Attains at least 50 mm TL.



Opistognathus longinaris, 41 mm SL, male holotype (South Africa). Source: Smith-Vaniz 2010

DISTRIBUTION Known only from the holotype from South Africa.

REMARKS Dredged from ~65 m.

Opistognathus margaretae Smith-Vaniz 1983

Half-scaled jawfish

PLATE 119

Opistognathus margaretae Smith-Vaniz 1983: 2, Figs. 1–4 (Sodwana Bay, South Africa); SSF No. 225.1*; Heemstra & Heemstra 2004; Smith-Vaniz 2010.

Dorsal fin 11 spines, 13 or 14 rays; anal fin 3 spines, 13 or 14 rays. Upper jaw extends length of 0.6–0.8 eye diameter behind eye, its end rigid and truncate; lateral line ends below dorsal-fin rays 2–6. No teeth on vomer. GR 9–11/16–18. LSS ~38–52; body naked above lateral line and anteriorly below dorsal-fin spines 6–11.

Body pinkish brown; dorsal fin mostly dusky with a few rows of pale spots, and with black ocellus between spines 3–5; caudal fin with pair of large pale spots at base; underside of maxilla with dark blotch posteriorly, partially visible externally. Attains ~10 cm TL.



Opistognathus margaretae, 73 mm SL (S Mozambique). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Kenya (Shimoni) to South Africa (KwaZulu-Natal) and Madagascar.

REMARKS Found at 1–25 m.

Opistognathus muscatensis Boulenger 1888

Robust jawfish

PLATE 119

Opistognathus muscatensis Boulenger 1888: 662, Pl. 54, Fig. 1 (Muscat, Oman, Gulf of Oman); Gilchrist 1909; Barnard 1927*; SFA No. 385*. *Opistognathus muscatensis*: Smith-Vaniz 1983*, 2009*, 2010; SSF No. 225.2*; Randall 1995*; Heemstra & Heemstra 2004*; Smith-Vaniz *et al.* 2012.

Dorsal fin 11 spines, 15 rays; anal fin 3 spines, 15 rays; outermost pectoral-fin ray tightly bound to adjacent ray, interradial membrane not incised distally or only slightly incised at tip. Upper jaw extends length of 0.9–1.7 eye diameter behind eye, its end slightly flexible and rounded; lateral line ends below dorsal-fin rays 4–7. No teeth on vomer. GR 12–16/23–28. LSS ~104–123.

Body pale blue, with irregular variably sized yellowish brown blotches; dorsal fin with dark ocellus between spines 3–8, followed by 2 irregular dark blotches that extend onto body; other fins without distinctive markings; cheek with dark stripe bordering maxilla. Attains 45 cm TL.



Opistognathus muscatensis, 37 cm TL (South Africa). © M Fraser

DISTRIBUTION WIO: Persian/Arabian Gulf, Gulf of Oman, Kenya to South Africa (KwaZulu-Natal), Seychelles and Mauritius.

REMARKS Known from 30–50 m.

Opistognathus nigromarginatus Rüppell 1830

Bridled jawfish PLATES 119 & 120

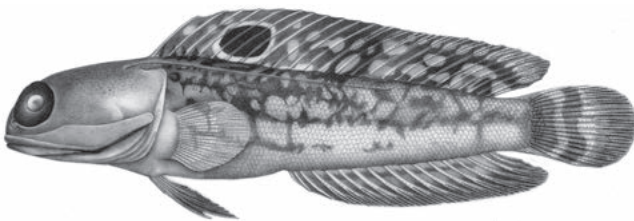
Opistognathus nigromarginatus Rüppell 1830: 114, Pl. 28, Fig. 4 (Massawa, Eritrea, Red Sea); SFSA No. 386* [as *Opisthognathus*]; Smith-Vaniz 1983*, 2009*, 2010; SSF No. 225.3*; Randall 1995*; Heemstra & Heemstra 2004.

Opisthognathus sonneratii Valenciennes in Cuv. & Val. (ex Cuvier) 1836: 498 (Puducherry, India).

Opisthognathus macrostomus Smith 1935: 186, Pl. 20, Fig. B (KwaZulu-Natal, South Africa); SFSA No. 387.

Dorsal fin 11 spines, 14 or 15 rays; anal fin 3 spines, 14 or 15 rays. Upper jaw extends length of 1.4–1.8 eye diameter behind eye, its end flexible and rounded; anterior nostril a short tube, its height subequal to diameter of posterior nostril; lateral line ends below dorsal-fin rays 3–8. No teeth on vomer. GR 13–16/23–29. LSS ~68–95.

Head and body brown, with rows of white spots on body and white speckles on head; fins brownish grey distally; dorsal fin with black ocellus between spines 4–8, otherwise dusky with irregular white spots; caudal-fin base usually with pair of pale spots; inner lining of maxilla white, bordered by black band. Attains ~18.5 cm TL.



Opistognathus nigromarginatus, 15 cm TL (Zanzibar).
Source: Smith-Vaniz 2009 (by JR Schroeder, FIN22297)

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea, Oman to South Africa (KwaZulu-Natal), Aldabra and southwestern India; elsewhere to Andaman Sea (Thailand) and South China Sea (Vietnam).

REMARKS Inhabits sandy or rubble bottom in shallow coastal waters, at 2–17 m.

Opistognathus pardus

Smith-Vaniz, Bineesh & Akhilesh 2012

Leopard jawfish

PLATE 120

Opistognathus pardus Smith-Vaniz, Bineesh & Akhilesh 2012: 20, Figs. 1–4 (off Quilon, Kerala, India).

Dorsal fin 11 spines, 11 rays; anal fin 2 spines, 11 rays. Upper jaw extends length of eye diameter behind eye, its end rigid and slightly rounded; anterior nostril a short simple tube; lateral line ends below dorsal-fin ray 2. No teeth on vomer. GR ~15–16/25. LSS ~42–44.

Head and body tan, with numerous small dark spots on head; throat, gill membranes, pectoral fins, anal fin, and dorsal- and caudal-fin margins bright yellow; dorsal fin mostly dusky yellow, proximal half with 3 pale blue ocelli with dark centres. Attains at least 10 cm SL.

DISTRIBUTION Known only from the holotype from southwestern India.

REMARKS Trawled from 110–220 m.

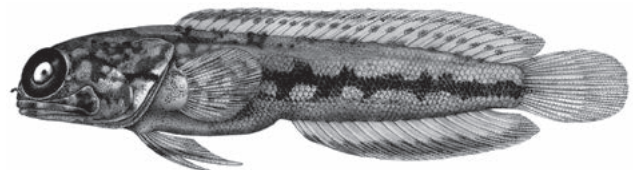
Opistognathus simus Smith-Vaniz 2010

Cargados jawfish

Opistognathus simus Smith-Vaniz 2010: 52, Figs. 2h, 17 (off Raphael I., St Brandon Shoals).

Dorsal fin 11 spines, 15 rays; anal fin 3 spines, 15 or 16 rays. Upper jaw extends length of 0.6–0.7 eye diameter behind eye, its end rigid and truncate; anterior nostril with small tentacle, its height 1.5–2 times diameter of posterior nostril; lateral line ends below dorsal-fin ray 6. No teeth on vomer. GR 10/15 or 16. LSS ~53–62.

Live colour unknown. Preserved specimens with mottled head with several indistinct pale spots and a few scattered dark specks; lips with faint bands; underside of maxilla with externally visible black blotch posteriorly; body with irregular dark midlateral stripe bordered above and below by adjacent series of large faint pale spots, and about 7–9 small pale brown spots evenly spaced beneath dorsal-fin base; dorsal-fin pale with narrow submarginal stripe and series of small dusky spots on spines and rays, extending from distal third of fin anteriorly and to middle of fin posteriorly. Attains 8 cm TL.



Opistognathus simus, 66 mm SL, female holotype (St Brandon Shoals).
Source: Smith-Vaniz 2010 (by JR Schroeder)

DISTRIBUTION Known only from the types collected from St Brandon Shoals.

REMARKS Taken to ~1.3 m deep.

Opistognathus variabilis Smith-Vaniz 2009

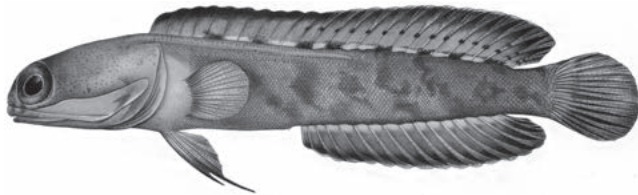
Variable jawfish

PLATE 120

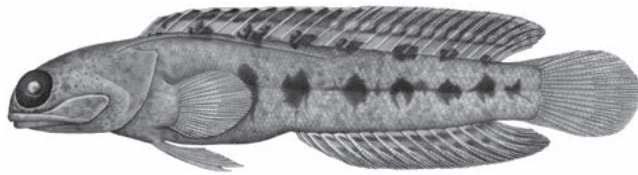
Opistognathus variabilis Smith-Vaniz 2009: 92, Figs. 1–4, 25–43
(Tanjung Bobo, western Halmahera, Indonesia); Smith-Vaniz 2010.

Dorsal fin 11 spines, 14–16 rays; anal fin 3 spines, 14–16 rays. Upper jaw extends length of 1.1–2.3 eye diameter behind eye, its end flexible and rounded; anterior nostril a short tube, its height ~½ diameter of posterior nostril; lateral line ends below dorsal-fin rays 3–6. No teeth on vomer. GR 10–15/19–24. LSS ~68–83.

Body background colour highly variable, from orangish brown to mostly blue, with 7 or 8 midlateral blotches, often faint in males; dorsal fin with narrow white margin, and 7 or 8 evenly spaced dark blotches along base, barely discernible in males; caudal fin either uniformly dark (males only), or pale with numerous indistinct bands (females); underside of maxilla with black stripe mostly confined to ventral margin. Attains 10 cm TL.



Opistognathus variabilis, 76 mm SL, male paratype (Maldives).
Source: Smith-Vaniz 2009 (by TD Pederson)



Opistognathus variabilis, 83 mm SL, female (Philippines).
Source: Smith-Vaniz 2009 (by JR Schroeder, FIN22299)

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to Vietnam, Indonesia, Philippines, Taiwan, Ryukyu Is. and Palau, but not known from Australia and New Guinea.

REMARKS Known from 0.5–37 m.

GENUS *Stalix* Jordan & Snyder 1902

All species with low numbers of anal-fin rays and upper jaw with rigid rear end, as in some species of *Opistognathus*, but differs in having short and transversely-forked anterior dorsal fin spines, some scarcely noticeable in lateral profile. Adults ~2.5–6 cm TL. Restricted to Indo-Pacific; known from continental areas, at 1–134 m. About 18 species, about a third of these undescribed; 2 species in WIO.

KEY TO SPECIES

- 1a Dorsal and anal fins each with dark stripe, and upper half of body with 4 broad dark blotches; top of head mottled brown, cheeks white, and most of opercle dark brown *S. davidsheni*
- 1b No dark stripe on dorsal and anal fins, and no dark blotches on body; top of head and cheeks freckled, but opercle spotless *S. omanensis*

Stalix davidsheni Klausewitz 1985

Bandfin jawfish

PLATE 120

Stalix davidsheni Klausewitz 1985: 18, Figs. 1–2, 4–7 (Marsa el Muqabila, Egypt, Gulf of Aqaba, Red Sea); Smith-Vaniz 1989*.

Dorsal fin 11 spines, 11 rays; anal fin 2 spines, 11 rays. Fork width of 5th dorsal-fin spine subequal to shank length; lateral line ends below 1st dorsal-fin ray. No teeth on vomer. GR 8/16. LSS ~45–49.

Dorsal and anal fins with brown stripe, all fins otherwise white; upper half of body with 4 broad, squarish, brown blotches, body white ventrally; top of head mottled brown, cheeks white but most of opercle dark brown. Attains at least 5 cm TL.

DISTRIBUTION Known only from two specimens collected from northern Red Sea.

REMARKS Taken at 9–17 m.

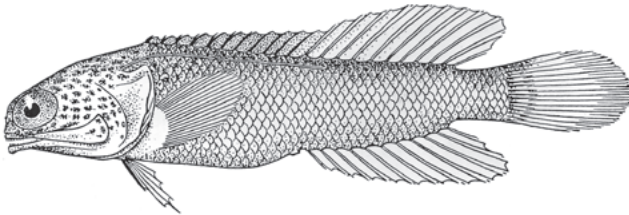
Stalix omanensis Norman 1939

Oman jawfish

Stalix omanensis Norman 1939: 66, Fig. 23 (Gulf of Oman);
Smith-Vaniz 1989*; Randall 1995.

Dorsal fin 11 spines, 11 rays; anal fin 2 spines, 11 rays. Fork width of 5th dorsal-fin spine ~½ shank length; lateral line ends below first 2 dorsal-fin rays. No teeth on vomer. GR 10/19. LSS ~43.

Preserved specimen without distinctive markings on body and fins, but spinous portion of dorsal fin darker than remainder of fin; head and cheeks freckled; lips dark; gular region with pair of dark spots. Attains at least 42 mm TL.



Stalix omanensis, 42 mm TL (Oman). Source: Norman 1939

DISTRIBUTION Known only from the holotype from the Gulf of Oman.

REMARKS Trawled from 73 m.

FAMILY CEPOLIDAE

Bandfishes

William F Smith-Vaniz

Small-sized, body moderately to noticeably elongate, compressed and tapering; caudal fin lanceolate. Mouth large, oblique, with small, slender, slightly curved teeth; upper jaw broad at end, ending below rear margin of eye. Dorsal fin continuous, with 0–4 very slender flexible spines, 19–89 rays; anal fin 0–3 flexible spines, 12–102 rays; pelvic fins 1 spine, 5 rays, with outermost ray unbranched or weakly branched and other rays fully branched. Lateral line high on body, close to dorsal-fin base. Scales cycloid.

Body generally red or pink; most species with a distinctive dark streak on membrane connecting the premaxilla and maxilla bones of the upper jaw (conspicuous when the mouth is open, hidden when the mouth is closed). Adults of *Acanthocepola* and *Cepola* are found on mud or sand bottom of continental margins at >30 m; they occur in small colonies and occupy burrows of their own construction. *Owstonia* species are not restricted to continental margins and are typically found on rocky substrates or ledges, at 200–550 m, where they occupy natural crevices or holes.

The Owstoniidae, formerly considered by many authors to be a distinct family, was synonymised with the Cepolidae following Okada & Suzuki (1956), Springer *et al.* (1977) and Mok (1988). Three genera and ~45 species; all genera and 5 species in WIO at depths of <250 m.

KEY TO GENERA

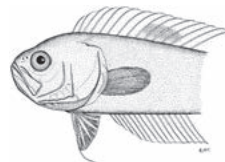
- 1a Last ray of dorsal and anal fins not connected to caudal fin by membrane; HL ~3–4 in SL; total dorsal-fin elements 24–27 *Owstonia*
- 1b Last ray of dorsal and anal fins broadly united to caudal fin by membrane; HL ~6.5–9 in SL; total dorsal fin elements 61–89 ... 2
- 2a Preopercle margin smooth *Cepola*
- 2b Preopercle margin with 4–7 blunt spines, largest spine at angle *Acanthocepola*

GENUS *Acanthocepola* Bleeker 1874

Body long and ribbon-like, tapering to pointed caudal fin, with last ray of dorsal and anal fins connected to caudal fin; dorsal fin without spines; anal fin 0–2 spines. Inhabit burrows and apparently vulnerable to predation because fish with a regenerated caudal fin or some missing caudal vertebrae are common. Restricted to Indo-Pacific; at least 4 species, 2 in WIO.

KEY TO SPECIES

- 1a Dorsal fin with large spot between rays 8–15; dorsal fin 82–89 rays; anal fin 91–102 rays *A. indica*



- 1b Dorsal fin without anterior spot; dorsal fin 69–80 rays; anal fin 70–84 rays *A. abbreviata*

Acanthocepola abbreviata (Valenciennes 1835)

Yellowspotted bandfish

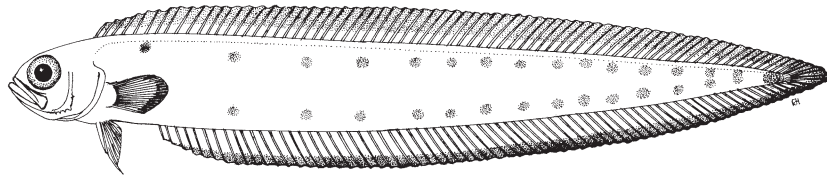
PLATE 120

Cepola abbreviata Valenciennes in Cuv. & Val. 1835: 403 (Anjer Strait, Java, Indonesia); Rao 1970.

Acanthocepola abbreviata: Randall 1995*.

Dorsal fin 69–80 rays; anal fin 0–2 spines, 70–84 rays. HL 6.3–8.4 in SL. Preopercle with 5 blunt spines, longest at angle. GR 16–18/30–32. Vertebrae 12 + 45–49.

Head and body orange-pink; double series of yellow spots (smaller than pupil) on sides; dorsal fin yellow-orange; anal fin yellow; median fins with narrow black margins; paired fins yellow with pink rays. Attains at least 30 cm TL.



Acanthocepola abbreviata, 20 cm TL, stippling on body and fins indicates yellow pigment (Persian/Arabian Gulf). Composite

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf to India; elsewhere to east coast of India, Indo-Malayan region, northern Australia and New Guinea.

REMARKS Occurs along continental margin; trawled in 35–80 m.

Acanthocepola indica (Day 1888)

PLATE 121

Cepola indica Day 1888: 796 (Chennai, India).

Acanthocepola cuneatus Smith 1935: 193, Pl. 21, Fig. A (KwaZulu-Natal, South Africa); SFSA No. 465*; Kotthaus 1976*.

Acanthocepola limbata: Rao 1969; SFSA No. 466*.

Dorsal fin 82–89 rays; anal fin 91–102 rays. Preopercle with 6 or 7 blunt spines, longest at angle. HL 6.7–8.6 in SL. GR 14–17/32–36. Vertebrae 12 + 60–66.

Head, body and median fins orange-red; 18–20 narrow yellow bands on sides; black spot (bright red in large adults) between dorsal-fin rays 8–15; anal-fin margin of large males red with white submarginal stripe of equal width, and females with wide orange margin without white submarginal stripe; paired fins yellow with orange rays. Attains 55 cm TL.

DISTRIBUTION Indian Ocean. WIO: Arabian Sea, Mozambique, South Africa (KwaZulu-Natal); elsewhere to Bay of Bengal.

REMARKS Occasionally taken by trawls in coastal waters, at ~50–100 m. Reports of *A. indica* from Japan may apply to a different species, based on dorsal-fin spot which has a very wide white border. A radiograph of the type of *A. cuneatus*

reveals at least 10 vertebrae missing and a regenerated caudal fin, a condition not noted in the original description.

GENUS *Cepola* Linnaeus 1764

Body long and ribbon-like, tapering to pointed caudal fin, with last ray of dorsal and anal fins connected to caudal fin; dorsal fin without spines, 55–70 rays; anal fin 48–60 rays. Occur in eastern Atlantic, Indian and central Pacific oceans; at least 5 species, 1 in WIO.

Cepola schlegelii Bleeker 1854

PLATE 121

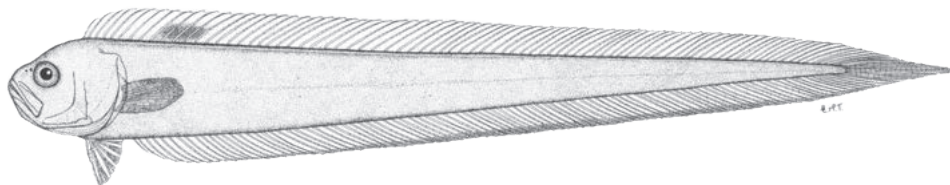
Cepola schlegelii Bleeker 1854: 412 (Kaminoseki, Japan); Smith-Vaniz 2001*.

WIO specimens: dorsal fin 61 rays; anal fin 0 or 1 spine, 55–56 rays. HL 8.4–8.8 in SL. Preopercle without spines. GR 15 or 16/25–28. Vertebrae 15 + 51 or 52.

Head and body orange, lower half of head and belly white; narrow white band on sides just in front of anal fin; median fins yellow, except dorsal fin slightly darker with reddish rays. Attains 50 cm TL.

DISTRIBUTION WIO: Agulhas Bank off South Africa; elsewhere, Indonesia, Philippines, Japan, northern Australia and New Guinea.

REMARKS In WIO, known only from two specimens (25 and 29 cm TL), trawled from ~138 m.



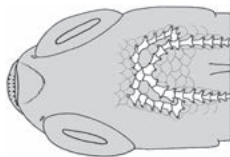
Acanthocepola indica, 39 cm TL (Arabian Sea). Source: SSF

GENUS *Owstonia* Tanaka 1908

Dorsal fin 3 or 4 spines; anal fin 1 or 2 spines; caudal fin large and lanceolate, not connected to dorsal or anal fins. *Owstonia* is the first described genus in the subfamily Owstoniinae. As many as 3 genera have been recognised in the subfamily by some recent authors, including *Sphenanthias* Weber 1913 and *Pseudocepola* Kamohara 1935. Other authors (Smith-Vaniz & Johnson 2016) combine all species under *Owstonia*. Differences in lateral-line patterns have traditionally been the basis for recognition of some genera; however, lateral-line patterns are not correlated with any other characters and therefore only *Owstonia* is here considered valid. Restricted to Indo-Pacific; at least 36 valid species (Smith-Vaniz & Johnson 2016), several others undescribed, and most occurring in depths >250 m; at least 2 species in WIO with records <250 m. Four other species occur in the WIO in our area. *Owstonia simotera* (Smith) is excluded based on a minimum depth of 450 m, and *O. lepiota*, *raredonae* (see Plate 121), and *similis* were described too recently to be included.

KEY TO SPECIES

- 1a Dorsal fin 3 spines, 21 or 22 rays; anal fin 1 spine, 13 or 14 rays; lateral line with small loop on each side of large loop crossing nape *O. weberi*



Dorsal view of *Owstonia weberi* head to show LL arrangement

- 1b Dorsal fin 4 spines, 21–23 rays; anal fin 1 spine, 16 rays; lateral line without small loop on sides of large loop that crosses nape *O. whiteheadi*

Owstonia weberi (Gilchrist 1922)

PLATE 121

Parasphenanthias weberi Gilchrist 1922: 69, Pl. 10, Fig. 2 (KwaZulu-Natal, South Africa); SFSA No. 464*.

Parasphenanthias microlepis Fowler 1934: 462, Fig. 35 (Durban, KwaZulu-Natal, South Africa).

Owstonia weberi: SSF No. 226.3*; Smith-Vaniz & Johnson 2016*.

Dorsal fin 3 spines, 21 or 22 rays; anal fin 1 spine, 13 or 14 rays. HL 3.1–3.9 in SL; pelvic fins probably sexually dimorphic (as in *O. whiteheadi* from India), in adults extending posteriorly to anal-fin origin or to 8th or 9th anal-fin ray. GR 14–18/29–31. LSS 38–41; scale rows on cheek 3 or 4.

Head and body reddish pink dorsally, paler ventrally; fins reddish pink, except pelvic fins mostly white; membrane between maxilla and premaxilla and posterior skin of dentary conspicuously black. Attains 52 cm TL.



Owstonia weberi, 21 cm TL (Mozambique). Source: SFSA

DISTRIBUTION WIO: Kenya, Mozambique and South Africa (KwaZulu-Natal).

REMARKS The only species of *Owstonia* in which the lateral line includes a pair of smaller closed loops near the end of the large loop that crosses the nape. Trawled from 190–350 m.

Owstonia whiteheadi (Talwar 1973)

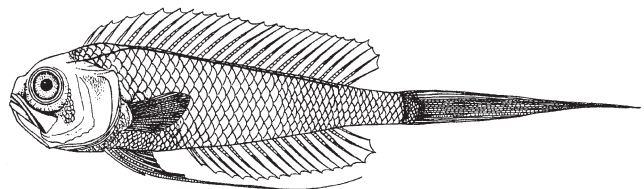
Indian bandfish

PLATE 122

Sphenanthias whiteheadi Talwar 1973: 87, Fig. 1 (off Quilon, India); Bineesh *et al.* 2011*; Smith-Vaniz & Johnson 2016*.

Dorsal fin 4 spines, 21–23 rays; anal fin 1 spine, 16 rays. HL 3.2–4 in SL; pelvic fins sexually dimorphic, longer in males (1.8–2.3 in SL), shorter in females (2.8–3.5 in SL). GR 15–21/35–39. LSS 39–41; scale rows on cheek 3 or 4.

Head and body reddish pink dorsally, white ventrally; fins reddish pink, except pelvic fins mostly white; membrane between maxilla and premaxilla and posterior skin of dentary conspicuously black. Attains 36 cm TL.



Owstonia whiteheadi, 23 cm SL (SW India). Source: Talwar 1973

DISTRIBUTION WIO: southwestern India.

REMARKS Known from bycatch of deep-sea shrimp trawlers, operating over rocky bottom, at 220–350 m.

FAMILY CHAMPSODONTIDAE

Gapers

Phillip C Heemstra

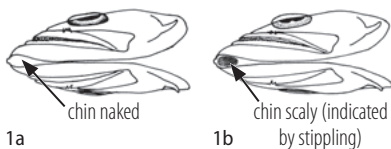
Small-sized, body elongate and compressed, head longer than body depth; scales unique, spinoid, resembling shark denticles, comprising a small conical base embedded in the skin and supporting a disc-like plate bearing 2–9 spinules along its rear edge. Two dorsal fins: 1st dorsal fin with 4–6 spines, 2nd dorsal fin with 18–23 segmented soft rays; anal fin similar to and opposite soft-rayed dorsal fin; pelvic fins large, subequal to HL, inserted under head, with 1 spine and 5 rays; pectoral fins midlateral, small, ~½ length of pelvic fins; caudal fin forked, with 13 branched rays. Mouth large, oblique, lower jaw projecting; maxilla scaly, exposed and extends past vertical at rear edge of eye; premaxilla with 2 rows of slender depressible teeth; dentary with 3 rows of teeth, the longer teeth with arrowhead-shaped tips; 2 patches of teeth on vomer, none on palatines. Preopercle with prominent posteriorly directed spine at angle, and 2 small serrae on ventral edge; preorbital edge with 2 spines projecting over maxilla. Two nostrils on each side of snout, set close to upper lip; anterior nostrils with large funnel-shaped dermal rim; posterior nostrils with hinged flap at front. Body with 2 horizontal lateral lines connected by several vertical series of sensory papillae. Vertebrae 29–32.

Epibenthic, in large schools, at 100–552 m; often migrate to the surface at night. Revised by Nemeth (1994). One genus, *Champsodon* Günther 1867, with 13 species, 5 in WIO.

KEY TO SPECIES

- 1a Chin naked between dentaries; midlateral row of 6–10 dark spots on body where dark dorsal colour meets pale ventral colour 2
 1b Chin scaly between dentaries; no lateral row of dark spots 3

ventral view of head



- 2a Breast (area from pelvic-fin bases to isthmus) completely scaly; anterior half of abdomen naked, posterior half scaly *C. capensis*
 2b Breast naked except for minute central patch of scales; abdomen naked from breast to anus *C. nudivittis*

Continued ...

KEY TO SPECIES

- 3a Abdomen completely scaly; GR on upper limb 1; fins dark brown, with melanophores along the rays *C. omanensis*
 3b Abdomen mostly naked, with slender strip of scales between pelvic- and pectoral-fin bases; GR on upper limb 1 or 2; fins pale, except distal part of spinous dorsal fin with a few melanophores 4
 4a GR on upper limb 2; snout length shorter than eye diameter *C. sechellensis*
 4b GR on upper limb 1; snout length subequal to eye diameter *C. vorax*

Champsodon capensis Regan 1908

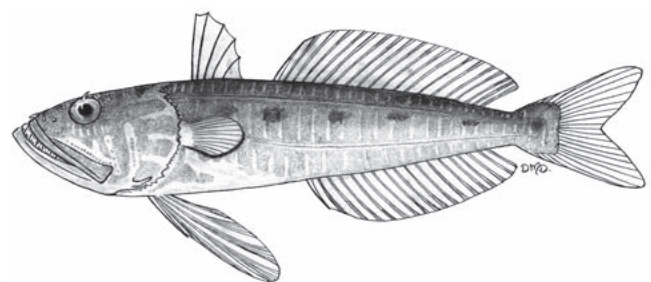
Cape gaper

PLATE 122

Champsodon capensis Regan 1908: 244, Pl. 27, Fig. 2 (south coast of Cape of Good Hope, South Africa); SFSA No. 376*; SSF No. 229.1*; Nemeth 1994*.

First dorsal fin 5 or 6 spines; 2nd dorsal fin 19–21 rays; anal fin 17–19 rays; pectoral fins 12–14 rays. Body depth 5.1–5.3 in SL; HL 3.3–3.8 in SL; eye diameter 3.7–4.9 in HL; maxilla reaches past eye. Premaxillae with deep notch lateral to symphysis. GR 1/10–12.

Body brownish dorsally, with golden brown spots on head and body, silvery laterally and ventrally; dorsal, caudal and pectoral fins golden brown; pelvic fins and anal fin white. Attains 12 cm SL.



Champsodon capensis, 7 cm TL (South Africa). Source: SSF

DISTRIBUTION WIO: Gulf of Aden, Kenya to South Africa (Cape Point), Seychelles and Mauritius.

REMARKS Found in 54–552 m.

Champsodon nudivittis (Ogilby 1895)

Striped gaper

PLATE 122

Centropercis nudivittis Ogilby 1895: 320 (Maroubra Bay, New South Wales, Australia).

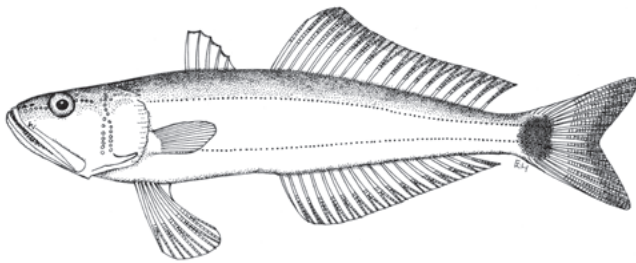
Champsodon arafurensis Regan 1908: 245 (Kai Is., Moluccas, Indonesia and Arafura Sea); Gloerfelt-Tarp & Kailola 1984*.

Champsodon omanensis (non Regan 1908): Dor 1970.

Champsodon nudivittis: Nemeth 1994*; Goren *et al.* 2011; Bogorodsky *et al.* 2014*.

First dorsal fin 4 or 5 spines; 2nd dorsal fin 19 or 20 rays; anal fin 17–19 rays; pectoral fins 14–16 rays. HL 3.2–3.8 in SL; maxilla reaches past eye. Premaxillae with deep notch lateral to symphysis. GR 1 or 2/10–12. Chin and belly naked; breast naked except for minute central patch of scales.

Body dark brown dorsally, with row of 6–10 dark spots along lateral midline; chin with small melanophores; large dark blotch covering caudal-fin base; fins pale except dorsal and caudal fins dark distally. Attains 11 cm SL.



Champsodon nudivittis, 7 cm SL (W Australia). Drawn from a photograph (most vertical sensory papillae not visible except those on the preopercle)

DISTRIBUTION Mediterranean Sea and Indo-Pacific. WIO: Red Sea, Madagascar and Mascarenes; elsewhere to Indonesia, Philippines and Australia.

REMARKS Found in 50–335 m.

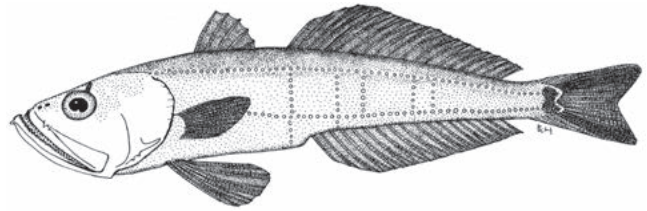
Champsodon omanensis Regan 1908

Oman gaper

Champsodon omanensis Regan 1908: 245, Pl. 27, Fig. 1 (Gulf of Oman); Klausewitz 1982; Nemeth 1994*; Randall 1995*.

First dorsal fin 4 or 5 spines; 2nd dorsal fin 18–20 rays; anal fin 17–19 rays; pectoral fins 12–14 rays. HL 3.3–3.5 in SL; maxilla reaches past eye. Premaxillae with notch lateral to symphysis. GR 1/10–12. Chin, breast and abdomen scaly.

Body silvery, dark brown dorsally; fins dark brown, with melanophores along rays. Attains 11 cm SL.



Champsodon omanensis, 10 cm SL (Oman). Composite, based on radiograph and Regan 1908

DISTRIBUTION WIO: Red Sea, Gulf of Aden, Oman, Gulf of Oman, Pakistan and northern India.

REMARKS Found in 135–1 120 m.

Champsodon sechellensis Regan 1908

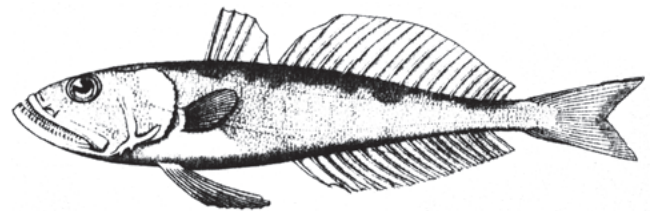
Seychelles gaper

PLATE 123

Champsodon sechellensis Regan 1908: 242, Pl. 31, Fig. 2 (Seychelles); Nemeth 1994*; Adam *et al.* 1998.

First dorsal fin 5 spines; 2nd dorsal fin 20 or 21 rays; anal fin 18 or 19 rays; pectoral fins 13 or 14 rays. HL 3.2–3.6 in SL; maxilla extends slightly past eye. Premaxillae with deep notch lateral to symphysis. GR 2/10–12. Chin and breast scaly; abdomen naked except for narrow strip between pelvic- and pectoral-fin bases.

Body silvery, slightly brown dorsally; 1st dorsal fin with a few melanophores distally, other fins pale; dusky blotch at caudal-fin base; opercular lining pale. Attains 10 cm SL.



Champsodon sechellensis, 7 cm SL, type (Seychelles). Source: Regan 1908

DISTRIBUTION WIO: Seychelles, Maldives and north of Mauritius.

REMARKS Found in 57–115 m.

Champsodon vorax Günther 1867

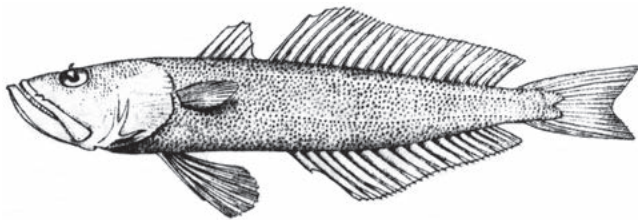
Palefin gaper

Champsodon vorax Günther 1867: 102 (China Seas); Nemeth 1994.

Champsodon microphthalmus Regan 1908: 243, Pl. 31, Fig. 3
(Mulaku, Maldives).

First dorsal fin 4 or 5 spines; 2nd dorsal fin 20 or 21 rays; anal fin 17–19 rays; pectoral fins 12–14 rays. HL 3.3–3.9 in SL. Premaxillae notched lateral to symphysis. GR 1/12. Chin and breast scaly; abdomen with large median naked area; scaly strip between pelvic- and pectoral-fin bases.

Body dark brown dorsally, silvery below; spinous dorsal-fin margin dark brown or black, other fins pale; chin and opercular lining pale. Attains 8 cm SL.



Champsodon vorax, ~5 cm SL (Maldives). Source: Regan 1908

DISTRIBUTION Indo-Pacific. WIO: Maldives; elsewhere to Indonesia, Philippines and Australia. Reported from Mediterranean Sea and Aegean Sea (Bariche 2010).

REMARKS Found in 34–84 m.

FAMILY URANOSCOPIDAE

Stargazers

Rachel J Arnold



Head large and cuboidal, encased in substantial bone; upward-directed eyes in most species; 4 infraorbitals. Mouth cavernous, strongly oblique to opening vertically, lips fringed, and some with worm-like prelingual filament extending from floor of mouth. Dorsal and anal fins moderately long. Lateral line on upper sides. Body naked or covered with small smooth scales; 2 prominent, double-grooved humeral spines, with venom gland at base of each, behind opercle and just above pectoral fin. Vertebrae 24–29.

Stargazers spend the majority of their time buried in the substrate, many of the species enticing prey with a filamentous

lure developed from tissue of the oral valve inside the lower jaw. Sometimes caught by hook and line, and often eaten by local populations.

Worldwide, with 8 genera and 53 species; 4 genera and 13 species in WIO at depths of <200 m. The genera summarised by Pietsch (1989).

KEY TO GENERA

- 1a Dorsal fin with 9 or 10 embedded, short, stumpy, rough spines, unconnected by membranes, followed by 9–10 rays joined by membrane; scales moderately small and very rough, or mostly smooth with low central bump, and mostly embedded *Pleuroscopus*
- 1b Dorsal fin without 8–10 embedded spines; two distinct dorsal fins or a single dorsal fin with or without leading spines 2
- 2a Edges of lower jaw with pair of prominent, flattened, bony flaps curved forward and inward, leaving hole-like space between the flaps and chin; scales tiny and embedded *Xenocephalus*
- 
- 2b Edges of lower jaw without a pair of flattened bony flaps 3
- 
- 3a Skin enclosing humeral spine and rear border of opercle with fleshy fringe; dorsal fin continuous, first few elements developed as spines *Ichthyscopus*
- 3b Skin surrounding humeral spine never with fleshy fringe and usually not enclosing entire spine; 2 distinct dorsal fins present, spinous fin mostly black *Uranoscopus*

GENUS *Ichthyscopus* Swainson 1839

Toothed portions of jaws, vomer and palatines densely covered with hundreds of minute, close-set teeth; lips with fleshy fringe; no lingual lure. Eyes small, dorsal. Spines and bony ridges not evident other than moderately large humeral spine, which is enveloped by large, tapering, fleshy extension of skin of the shoulder region; ventral margin of preopercle without spine-like processes. Dorsal fin continuous, first few elements developed as spines, fin origin just behind vertical through pectoral-fin bases; anal-fin base elongated. Occur in Indo-Pacific; 8 species, 1 in WIO.

Ichthyoscopus lebeck (Bloch & Schneider 1801)

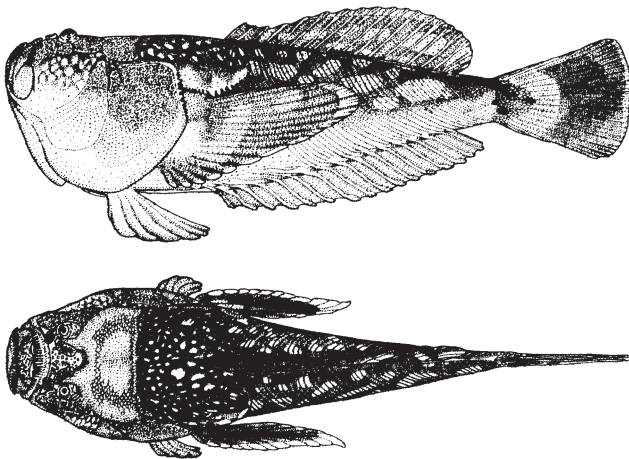
Long-nosed stargazer

PLATE 123

Uranoscopus lebeck Bloch & Schneider 1801: 47 (Tharangambadi, Tamil Nadu, India).*Ichthyoscopus lebeck*: Pietsch 1989; Chen *et al.* 1997* [as *Ichthyoscopus*]; Gomon & Johnson 1999; Kishimoto 2001* [with author as Schneider]; Manilo & Bogorodsky 2003; Vilasri 2013.

Dorsal fin continuous, with 2 spines, 16–20 rays; anal fin 16 or 17 rays. Humeral spine large, enveloped by fleshy extension of skin of shoulder region; dorsoposterior edge of opercle fringed.

Body bright yellow, with buff brown markings along sides, enclosing white round or oval spots, and some similar spots on dorsal and pectoral fins; dark bar across pectoral fins and caudal fin. Attains ~60 cm TL.

*Ichthyoscopus lebeck*, lateral and dorsal views. Source: Kishimoto 2001

DISTRIBUTION Indo-Pacific: most records from southern India; also known from Myanmar and 1 specimen from Singapore.

GENUS *Pleuroscopus* Barnard 1927

Dorsal-fin spines reduced to expanded bases, their distal ends more-or-less laterally compressed and emerging through skin of dorsal midline to form rigid series of blunt protuberances. Juveniles square in cross-section, adults depressed, with flabby belly; humeral spine large, mostly covered by skin; head with low horn-like bump above eye; pair of low bony ridges on top of head; low bony ridge on opercle and rough bony plate on either side of chin (lost with growth); eyes directed laterally to dorsolaterally; nares external; lower jaw with row of large canines, upper jaw with 2 rows of smaller canines; lips of upper and lower jaw without cutaneous cirri; scales moderately small,

very rough, covering most of body in juveniles, smooth with low central bump and increasingly embedded, adults with scales less ornamented, embedded, absent from belly and all fin bases except caudal-fin base; single scale row on cheek; lateral line approximately halfway between the lateral midline of the body and the insertion of the dorsal fin. Monotypic. Genus revised by Kishimoto *et al.* (1988).

Pleuroscopus pseudodorsalis Barnard 1927

Scaly stargazer

PLATE 123

Pleuroscopus pseudodorsalis Barnard 1927: 67 (west coast off Table Bay, South Africa); SSF 230.1*; Kishimoto *et al.* 1988; Pietsch 1989; Paulin *et al.* 1989; Kishimoto *in* Amaoka *et al.* 1990; Gomon *et al.* 1994; Hutchins 2001; Bray & Hoese 2006; Mincarone *et al.* 2007; Gomon 2008.

Dorsal fin 9 or 10 conical tubercles, 9 or 10 rays; anal fin 10 rays; pectoral fins 21 or 22 rays; first gill arch with 18–20 low, spiny plates. Body depth 19–28% SL; HL 32–37% SL; interorbital fossa 10–25% HL; eye diameter 19–23% HL. Head and body broad, slightly depressed anteriorly, tapering and becoming slightly compressed posteriorly; body scales arranged randomly; cheek with single scale row; tubiform scales embedded along lateral line; caudal fin truncate to slightly rounded; pelvic fins close together, situated on isthmus.

Body blue, greyish pink or purplish blue dorsally with large black spots or indistinct blotches and irregular marks; white, pink or purplish grey below; dorsal, anal and caudal fins blackish to dark purplish blue, with yellow rays in small individuals; pectoral fins blackish with distinct black spots; anal, caudal and pectoral fins with white to yellow margins. Attains 70 cm TL.

DISTRIBUTION Namibia to Algoa Bay, South Africa, southern coasts of Australia, New Zealand; single specimen captured near Rio Grande Plateau, western South Atlantic.

REMARKS In temperate waters from 40–800 m, usually 200–800 m.

GENUS *Uranoscopus* Linnaeus 1758

Body elongate, subcompressed; head large, cuboidal and flattened, bony plates fine-grained to rugose; tail compressed. Eyes dorsally directed. Mouth large, oblique to vertical, somewhat protractile; lips usually lined with cutaneous cirri. Teeth pointed, in several rows on jaws, and vomer and palatines. Preopercle with flat radiating ridges ending in spines along ventral edge; subopercle generally with an inferior spine; preorbital with 1–3 more-or-less developed spines; suprascapular bony plate usually

ending in 1 or 2 spines. Large humeral spine always present, more-or-less directed backwards. Two dorsal fins: 1st short, with 3–5 flexible spines; 2nd long, with 12–14 mostly bifurcate rays. Anal fin subequal to 2nd dorsal fin, its origin below 2nd dorsal-fin origin. Pectoral fins long, with very broad base. Pelvic fins inserted far forward, with 1 short spine, 5 rays; basipterygial process directed forward on pelvic girdle before fin base; elongate projection of cleithra forms blunt cleithral processes situated between and somewhat more forward than basipterygial processes. Caudal fin truncate or slightly rounded. Branchiostegal rays 6; pseudobranchiae present. Lateral line ascends anteriorly, running close below 2nd dorsal fin and along upper part of peduncle, then curves downwards to middle of peduncle and near caudal-fin base. Scales on body and tail small, cycloid, in non-overlapping oblique transverse series; head naked, and belly generally naked. Worldwide; ~24 species, probably 10 in WIO.

KEY TO SPECIES

- 1a Scales present dorsoposterior area between lateral lines of each side, and distinctly reaching to near 1st dorsal-fin origin 2
- 1b No scales on dorsoposterior area between lateral lines of each side or, if present, not reaching to 1st dorsal-fin origin; 2 blunt preorbital spines; suprascapular spines very short; prelingual filament fringed 3
- 2a Dorsal scales about as large as scales below lateral lines, and arranged in dense rows; suprascapular spines very strong 5
- 2b Dorsal scales smaller than scales below lateral lines, and scale rows not distinct; skull bones fine or coarse-grained but not rugose (except in juveniles) 7
- 3a Occipital knobs not developed or weakly developed; preopercular spines 5–7; body pale brown dorsally, with distinct dark spots forming more or less circular to horseshoe-shaped patterns dorsally and laterally, and dark spots present on caudal fin *U. rosette*
- 3b Occipital knobs strongly or weakly developed; spots pale, if present 4
- 4a Occipital knobs strongly developed; dorsal fins contiguous or slightly linked; no anterodorsal scales between lateral lines; body brown, with pale streaks or marbling *U. scaber*
- 4b Occipital knobs weakly developed; dorsal fins distinctly separate; a few anterodorsal scales sometimes present between lateral lines; body pale brown, with relatively close-set, large, pale spots on dorsum *U. marmoratus*
- 5a Head width ~71.4% HL; skull bones rugose, coarse-grained; post-interorbital knobs present; occipital lobes developed as knobs; body brown, with relatively large pale spots set somewhat apart dorsally and laterally *U. guttatus*
- 5b Head width >85% HL; skull bones less rugose or fine-grained (except rugose, coarse-grained in juveniles); no post-interorbital knobs; occipital lobes developed as longitudinal keels 6

Continued ...

KEY TO SPECIES

- 6a LSS 50–56; head width 33.6–34.6%, head depth 20.5–23.1%, and interorbital width 6.1–6.4% SL; body greyish brown, and pale round spots usually present dorsally *U. archionema*
- 6b LSS 46–50; head width 31.7–33.3%, head depth 23–24.2%, and interorbital width 6.9–7.6% SL; body reddish brown without distinct marks *U. dahlakensis*
- 7a Dorsal fins distinctly separate; prelingual filament present in juveniles only; suprascapular spines acute and short (stronger in adults); occipital lobes pointed in juveniles, obsolete in subadults, and forming blunt knobs in adults; 4 preopercular spines, and 3 blunt preorbital spines; LSS 38–50 (juveniles to adults); body greyish brown, with fine dark reticulation dorsally and laterally *U. marisrubri*
- 7b Dorsal fins not distinctly separate; prelingual filament present in adults; HL 37–39% SL; suprascapular spines acute and strong; no occipital knobs in subadults and adults; 4–6 preopercular spines; LSS 47–54 in adults; body pale, without distinct marks 8
- 8a Anterior nostrils without small brush-like appendix; entire area between lateral lines with small embedded scales; humeral spine 14–15% HL *U. affinis*
- 8b Anterior nostrils usually with small brush-like appendix; scales present between lateral lines only around rear of 1st dorsal fin; humeral spine 10.5–12% HL 9
- 9a Dorsal fins contiguous; skull bones somewhat coarse-grained; head width 31–34% SL, interorbital width 6.5–7.5% SL; 2 or 3 blunt preorbital spines; body whitish brown, and skull bones yellowish *U. dollfusi*
- 9b Dorsal fins close together, but separated; skull bones very coarse-grained; head width 28–30% SL, interorbital width 6–6.5% SL; 3 blunt to somewhat acute preorbital spines; body creamy reddish brown, and skull bones dark reddish brown *U. bauchotae*

Uranoscopus affinis Cuvier 1829

One-spined yellowtail stargazer

Uranoscopus affinis Cuvier in Cuv. & Val. 1829: 304 (Indian Ocean); Pietsch 1989; Manilo & Bogorodsky 2003; Vilasri 2013.

Dorsal fins contiguous: 1st dorsal fin 4 or 5 spines, 2nd dorsal fin 13 or 14 rays; anal fin 12–15 rays; dorsoposterior edge of pectoral fins straight when expanded. Posterior nostrils a slit-like pore. Skull bones coarse-grained, somewhat rugose; occipital lobes developed as weak knobs, somewhat pointed; preopercular spines >4. Anterodorsal area between both lateral lines completely scaly, and scales smaller than those below lateral line.

Body yellowish brown, without distinctive colour markings. Attains ~30 cm TL.

DISTRIBUTION Tropical and temperate Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Red Sea and Réunion; elsewhere to Japan and Australia.

REMARKS Occurs on continental shelf, from littoral areas to ~200 m deep.

Uranoscopus archionema Regan 1921

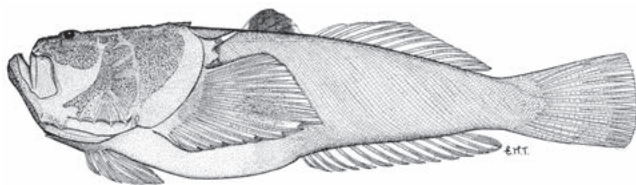
Stargazer

PLATE 123

Uranoscopus archionema Regan 1921: 416 (off Umvoti River mouth, KwaZulu-Natal, South Africa); SSF No. 230.2*; Pietsch 1989*; Fricke 1999; Fricke *et al.* 2009; Vilasri 2013.

Dorsal fins distinctly separated: 1st dorsal fin 4 or 5 spines, 2nd dorsal fin 13 rays; anal fin 13 or 14 rays; pectoral fins 17 or 18 rays. Body depth 22–27% SL; HL 34.5–35.7% SL. Preopercle with 4–6 spines along lower edge; 2 or 3 blunt preorbital spines; occipital lobes developed as longitudinal keels. Anterodorsal area between both lateral lines completely scaly, and scales as large as those below lateral line.

Body grey or brown, usually with numerous pale round spots dorsally; pectoral fins greyish with pale margin; caudal fin uniformly coloured. Attains 33 cm TL.



Uranoscopus archionema, 25 cm TL (South Africa). Source: SSF

DISTRIBUTION WIO: Kenya to South Africa (Mossel Bay), Madagascar, Réunion, Mauritius and India.

REMARKS Taken by trawls in 60–300 m.

Uranoscopus bauchotae Brüss 1987

Bauchot's stargazer

Uranoscopus bauchotae Brüss 1987: 960, Fig. 3 (Red Sea); Pietsch 1989; Goren & Dor 1994; Vilasri 2013.

Dorsal fins distinctly separated: 1st dorsal fin 4 spines, 2nd dorsal fin 12–14 rays; anal fin 13 or 14 rays; pectoral fins 17 rays. Body depth 21.7–26.3%, HL 37–38.5%, head width 28.6–30.3%, and interorbital width 6.3–6.5% SL. Skull bones very coarse-grained, not rugose; suprascapular spines

acute (less strong than in *U. dollfusi*); 5 or 6 preopercular spines; preorbital with 3 blunt spines; occipital knobs faintly developed; prelingual filament ~ $\frac{1}{3}$ HL, smooth-edged and slender or broad. Head and abdomen naked; few embedded scales on nape above anterior part of lateral line extending in front of 1st dorsal fin, and smaller than scales below lateral line; oblique transverse scale rows 49–51.

Body creamy reddish brown; visible bony structures (skull and opercular bones, teeth, fin rays and spines) dark reddish brown; no markings on dorsum. Attains at least 19.5 cm TL.

DISTRIBUTION Known only from two type specimens from northern Red Sea.

REMARKS Probably collected at <100 m.

Uranoscopus dahlakensis Brüss 1987

Dahlak stargazer

Uranoscopus dahlakensis Brüss 1987: 50, Figs. 1–2 (Dahlak Archipelago, Eritrea, Red Sea); Pietsch 1989; Goren & Dor 1994; Vilasri 2013.

Dorsal fins distinctly separated: 1st dorsal fin 4 spines, 2nd dorsal fin 13 rays; anal fin 13 rays; pectoral fins 17 or 18 rays. Body depth 25–27%, HL 37–38.5%, head width 31.7–33.3%, and interorbital width 6.9–7.6% SL. Prelingual filament present in juveniles only. Skull bones of adults fine-grained, not rugose (rugose and coarse-grained in juveniles); strong and very acute suprascapular spines above opercle; occipital lobes developed as longitudinal keels; preorbital with 3 blunt spines; preopercle with 4 spines. Scales present on rear part of dorsal area between lateral lines, distinctly reaching to near 1st dorsal-fin origin, and as large as scales below line lateral; juveniles and subadults with 46–50 oblique transverse scale rows (adults probably more).

Body reddish brown, without distinct marks. Attains at least 16 cm TL.

DISTRIBUTION WIO: Red Sea.

REMARKS Known from few specimens; collected in shallow water with sandy bottom.

Uranoscopus dollfusi Brüss 1987

Dollfus' stargazer

PLATE 124

Uranoscopus dollfusi Brüss 1987: 958, Fig. 2 (Gulf of Suez, Red Sea); Pietsch 1989; Goren & Dor 1994; Randall 1995*; Manilo & Bogorodsky 2003; Vilasri 2013; Psomadakis *et al.* 2015.

Dorsal fins barely linked: 1st dorsal fin 4 spines, 2nd dorsal fin 12–14 rays; anal fin 13 or 14 rays; pectoral fins 17–19 rays. Body depth 23.3–28.2%, HL 38.5%, head width 30.3–33.3%, and interorbital width 6.5–7.5% SL. Prelingual filament short and broad (about eye length in adults, about twice eye length in juveniles), with smooth edges. Surface of external bones of head rough from ridges around numerous tiny depressions; occipital lobes of adults faintly developed (probably more distinct in juveniles); suprascapular spines acute and very strong; preopercle with 4–6 spines; preorbital with 3 blunt spines. Head and abdomen naked; nape with a few embedded scales above anterior part of lateral line, extending approximately 1 eye diameter in front of 1st dorsal fin, and smaller than scales below lateral line; oblique transverse scale rows 47–54 (probably less in juveniles).

Body pale yellowish brown or reddish, dorsum without distinct marks; skull and opercular bones yellowish; belly creamy white. Attains 24 cm TL.

DISTRIBUTION WIO: Red Sea, Persian/Arabian Gulf, Gulf of Oman and Pakistan.

REMARKS Found on muddy sand and hard mud bottom, to at least 73 m deep.

Uranoscopus guttatus Cuvier 1829

PLATE 124

Uranoscopus guttatus Cuvier in Cuv. & Val. 1829: 305 (Puducherry, India); Dor 1984; Brüss 1987; Pietsch 1989; Goren & Dor 1994; Mishra & Krishnan 2003; Vilasri 2013.

Dorsal fins distinctly separated: 1st dorsal fin 4 spines, 2nd dorsal fin 12 or 13 rays; anal fin 13 rays; pectoral fins 19 rays. Rear edge of skull forming 5 small rounded lobes; preopercle with 6 spines; 2 strong suprascapular spines. Anterodorsal scales above lateral line arranged in dense rows, and as large as scales below.

Body purplish brown, with white under throat and chest; head and dorsum with widely scattered pale spots; fins grey or blackish with white margins. Attains 20 cm TL.

DISTRIBUTION Indian Ocean. WIO: northern Mozambique, Red Sea, southwestern India (Kerala) and southeastern India (Puducherry).

Uranoscopus marisrubri Brüss 1987

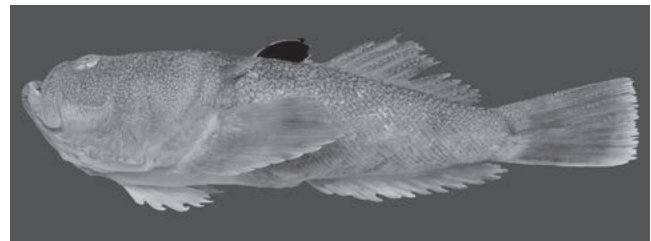
Red Sea stargazer

PLATE 124

Uranoscopus marisrubri Brüss 1987: 41, Figs. 2–4, 7 (Mismaris Trough, southwest of Jeddah, Saudi Arabia, Red Sea); Pietsch 1989; Baranes & Golani 1993; Goren & Dor 1994; Vilasri 2013.

Dorsal fins distinctly separated: 1st dorsal fin 4 spines, 2nd dorsal fin 13 rays; anal fin 13–15 rays; pectoral fins 17–19 rays. Body moderately elongate and strongly tapering; body depth 25–28.6%, HL 38.5–45.5%, head width 32.3–37%, and interorbital width 7–9% SL. Prelingual filament present in juveniles only. Skull bones scarcely rugose; pair of short, acute suprascapular spines above opercle; occipital lobes as blunt knobs in adults, obsolete in subadults, and somewhat pointed in juveniles; preorbital with 3 blunt spines; preopercle with 4 spines. Scales embedded on nape above anterior part of lateral line, extending short distance in front of 1st dorsal fin, and smaller than scales below lateral line; 38–50 transverse scale rows.

Body greyish brown, with dark reticulations dorsolaterally, whitish ventrally; dorsal surface of head with fine dark brown spots. Attains 25 cm TL.



Uranoscopus marisrubri, 11 cm SL (Gulf of Suez). © SV Bogorodsky

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Found on sandy bottom, in 20–383 m.

Uranoscopus marmoratus Cuvier 1829

PLATE 124

Uranoscopus marmoratus Cuvier in Cuv. & Val. 1829: 304 ('Indian seas'); Pietsch 1989; Manilo & Bogorodsky 2003; Vilasri 2013.

Dorsal fins distinctly separated: 1st dorsal fin 4 spines, 2nd dorsal fin 13 rays; anal fin 13 rays; pectoral fins 18 rays. Occipital knobs weakly developed; pair of short, acute suprascapular spines above opercle; 4 or 5 preopercular spines; preorbital with 3 blunt spines. Area between lateral lines with a few scales, generally not reaching to near 1st dorsal-fin origin.

Dorsum mottled with relatively large, close-set, pale spots on brown background, abdomen bluish white; pectoral fins and caudal fin darker brown with white margins; pelvic fins and anal fin whitish. Attains 21 cm TL.

DISTRIBUTION WIO: recorded from the Arabian Sea; unconfirmed report from the Red Sea; elsewhere known from near Madras, Bay of Bengal.

REMARKS *Uranoscopus crassiceps* Alcock 1890 is considered a junior synonym of *U. marmoratus* (H Kishimoto, pers. comm.).

Uranoscopus rosette Randall & Arnold 2012

Rosette stargazer

PLATE 124

Uranoscopus rosette Randall & Arnold 2012: 212, Figs. 4–9 (Eilat, Israel, Gulf of Aqaba, Red Sea).

Dorsal fins barely linked: 1st dorsal fin 4 spines, 2nd dorsal fin 12 or 13 rays; anal fin 13 rays; pectoral fins 16–19 rays; caudal fin slightly rounded. HL ~40% SL; spinous dorsal fin low, ~½ height of soft-rayed dorsal fin. Tentacle from inside lower jaw fringed. Occipital knobs absent or very slightly developed; preorbital with 2 blunt spines which project obliquely downward; preopercle with 5 or 6 small spines on lower edge; suprascapular spines blunt and very short. Head, nape and abdomen naked; scales absent anterodorsally or a few embedded on nape above anterior part of lateral line, but not extending anterior to 1st dorsal fin.

Body greyish brown dorsally, with many dark spots in circular or horseshoe-shaped patterns dorsolaterally; 1st dorsal fin mostly black, pelvic fins white, and other fins with white margins; caudal fin with dark spots. Attains at least 27 cm TL.

DISTRIBUTION WIO: northern Red Sea.

REMARKS Type specimens collected from sand patch with sparse seagrasses within reef, at ~15 m.

Uranoscopus scaber Linnaeus 1758

European stargazer

PLATE 124

Uranoscopus scaber Linnaeus 1758: 250 (Mediterranean Sea); Wheeler 1973; Pietsch 1989; Goren & Dor 1994; Fricke *et al.* 2007; Vilasri 2013.

Dorsal fins barely linked: 1st dorsal fin 4 spines, 2nd dorsal fin 13–15 rays; anal fin 13 or 14 rays; pectoral fins 17 or 18 rays. Body depth 23.8–27% SL; HL ~33.3% SL. Preopercle with 4 or 5 spines on lower edge; occipital knobs strongly developed. Anterodorsal area between lateral lines completely naked; oblique transverse scale rows 76–90.

Head and body greyish brown, mottled with dark brown on head, dark brown blotches on anterior body, and dark brown stripes on body, the blotches and stripes with pale interspaces; underside of head and abdomen pale yellowish grey; fins dark grey; pelvic, anal and caudal fins with pale blue margins. Attains 38 cm TL.

DISTRIBUTION Eastern Atlantic (British Isles to Morocco), Black Sea, Mediterranean Sea, and anti-Lessepsian migrant to Red Sea.

REMARKS Found on continental shelf and upper slope, on sandy or muddy bottom, in 5–200 m.

GENUS *Xenocephalus* Kaup 1858

Genus until recently referred to as *Gnathagnus* Gill 1861 (Springer & Bauchot 1994). Scales tiny and deeply embedded. Dorsal fin continuous, without spines. Opercle with strong horizontal ridge that terminates posteriorly as stout spine; 7 predorsal bones; lateral ethmoids sharing (with frontals, pterosphenoids and parasphenoid) in the formation of the orbital foramen; ventromedial flange of dentary meeting its counterpart from the opposite side to form an open tube-like structure. Four described species, widely distributed in moderately deep water, plus possibly 1 undescribed species in WIO.

Xenocephalus sp.

PLATE 124

Xenocephalus sp.: Manilo & Bogorodsky 2003.

Dorsal fin continuous, with 12 rays; anal fin 17 rays; pectoral fins 22 rays.

Preserved specimens dark brown, without distinct markings. Attains at least 22 cm SL.

DISTRIBUTION Known only from three specimens collected off southwestern India.

GLOSSARY

- basipterygial process** – processes on either side of the throat.
- cleithrum (pl. cleithra)** – the major bone of the pectoral girdle, extending upward from the pectoral-fin base and forming the rear margin of the gill cavity.
- lingual lure** – a worm-like lure on the tongue.
- occipital** – the upper rear part of the head.
- post-interorbital knobs** – bony knob posterior to the interorbital area.
- prelingual filament** – the worm-like filament on the floor of the mouth.
- pseudobranchiae** – small, gill-like organs on the inner surface of the operculum; the reduced first gill arch.
- suprascapular spines** – spines on the posttemporal area.

FAMILY BLENNIIDAE

Blennies

Jeffrey T Williams and Victor G Springer

Small-sized, body elongate and slender, slightly compressed posteriorly (most <15 cm TL, but species of the eel-like genus *Xiphasia* may reach 60 cm TL, although their body depth is only ~1 cm). Cirri often variously present on head. No scales. Dorsal fin 6–17 slender spines, 9–119 rays (typically fewer spines than rays); anal fin 2 spines, scarcely differentiated from rays, 1st spine not visible in females, and both spines in males often support fleshy, bulbous, rugose swellings at tips; pelvic fins inserted anterior to pectoral-fin bases, with 1 spine (not visible), 1–4 rays, or (rarely) no pelvic fins; all fin rays segmented and unbranched, except some species with some

branched caudal-fin rays. Mouth terminal or slightly ventral, lips well-developed, upper jaw not protrusile; 1 row of comb-like incisor-like teeth on each jaw, teeth fixed or moveable, and often a canine-like tooth at rear on each side of lower jaw and occasionally at rear in upper jaw; canines also present at front of lower jaw in *Ecsenius* (but obvious in only one species); teeth rarely present on vomer; no teeth on palatines. Gill membranes continuous across isthmus or restricted to sides of head. Lateral-line canal or tubes varying from complete (extending length of body) to present only anteriorly or absent.

A diverse group of predominately nearshore marine fishes, but several species are known only from freshwater. Many of the genera are in need of taxonomic revision and future studies will undoubtedly result in new species descriptions. Currently 57 genera and ~400 species; 34 genera and at least 115 species in WIO.

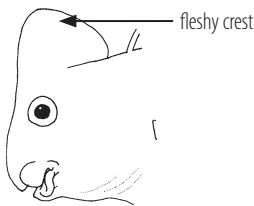
KEY TO GENERA OR SPECIES

- | | |
|--|--|
| <p>1a All caudal-fin rays unbranched; no supraorbital cirri in most genera (present in <i>Atrosalarias</i>, <i>Alticus</i>, <i>Cirrisalarias</i> and most species of <i>Petroscirtes</i>); gill opening restricted to side of head in all genera except <i>Atrosalarias</i>, <i>Alticus</i>, <i>Cirrisalarias</i> and <i>Ecsenius</i> 2</p> <p>1b Some (usually most) caudal-fin rays branched; supraorbital cirri present (may be minute) in most genera (absent in <i>Antennablennius</i>, some species and individuals of <i>Alloblennius</i>, and some <i>Glyptoparus</i>); gill opening unrestricted (no free fold across isthmus) in all genera except <i>Chalaroderma</i> 17</p> <p>2a Gill opening with free fold across isthmus 3</p> <p>2b Gill opening restricted to side of head 7</p> <p>3a No supraorbital cirrus and nape cirri 4</p> <p>3b Supraorbital cirrus present, nape cirri present or absent 5</p> <p>4a Pectoral fins 12 rays; dorsal fin 30–32 total elements; last anal-fin ray not attached by membrane to peduncle; teeth present on vomer (difficult to see); lower jaw with canines at rear but none at front <i>Dodekablennos fraseri</i></p> <p>4b Pectoral fins 12–16 (usually 13–15) rays; dorsal fin 24–34 total elements; last anal-fin ray attached by membrane to peduncle; no teeth on vomer; lower jaw with canines at rear and at front (the latter only obvious in one species) <i>Ecsenius</i></p> <p>5a No supraorbital cirrus; numerous cirri on anterior and posterior nostrils; <25 teeth in each jaw; maximum size ~2.5 cm SL <i>Cirrisalarias bunares</i></p> <p>5b Supraorbital cirrus present; simple cirrus on anterior nostrils, none on posterior nostrils; 100+ teeth in each jaw; maximum size >5 cm SL 6</p> | <p>6a Dorsal fin 11 spines; anal fin 2 spines, 18–20 rays; 2 obvious pelvic-fin rays (minute remnant of 3rd ray visible in skeletal preparations only); dorsal fin attached by membrane to upper edge of caudal fin well behind caudal-fin base <i>Atrosalarias fuscus</i></p> <p>6b Dorsal fin 13–17 spines; anal fin 2 spines, 24–28 rays; 3 or 4 obvious pelvic-fin rays; dorsal fin attached to peduncle at or anterior to caudal-fin base <i>Alticus</i></p> <p>7a Caudal fin 10 rays; dorsal-fin total elements 100+; anal fin ≥96 rays <i>Xiphasia</i></p> <p>7b Caudal fin ≥11 rays; dorsal-fin total elements 75+; anal fin <60 rays 8</p> <p>8a Cirri present on anterior and posterior nostrils <i>Laiphognathus multimaculatus</i></p> <p>8b No cirri on nostrils, anterior nostril may form short tube 9</p> <p>9a Cirri variably present on eyes, nape and/or preopercular pores <i>Petroscirtes</i></p> <p>9b No cirri on eyes, nape and preopercular pores 10</p> <p>10a Anal fin 14–17 (rarely 17) rays; dorsal fin 3–5 spines; deep groove along anterior surface of rear canine tooth on lower jaw <i>Meiacanthus</i></p> <p>10b Anal fin ≥19 rays; dorsal fin ≥6 spines; no groove along surface of rear canine tooth on lower jaw 11</p> <p>11a Caudal fin 11 rays; pelvic fins 3 rays 12</p> <p>11b Caudal fin ≥12 (usually 13) rays; pelvic fins 2 rays 13</p> |
|--|--|

Continued ...

KEY TO GENERA OR SPECIES

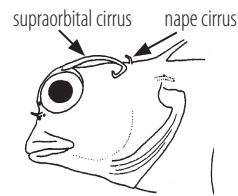
- 12a Pectoral fins 13–15 rays; upper jaw usually with canine tooth at rear; lateral line present dorsoanteriorly or absent 33
- 12b Pectoral fins 11–13 (rarely 13) rays; upper jaw without rear canine tooth; no lateral line *Plagiotremus*
- 13a Pectoral fins 14–17 (rarely 14) rays *Enchelyurus*
- 13b Pectoral fins usually 13 (rarely 12 or 14) rays 14
- 14a Dorsal fin 10 spines, 23 or 24 rays; broad, U-shaped black mark from orbit around snout, and body yellow in life *Oman ypsilon*
- 14b Dorsal fin 11–13 (usually 12) spines, 16–23 (rarely 23) rays; forehead not black, body colouration variable 15
- 15a Overall colour of head, body and median fins very dark to black, and body variably with fine blue spots in life *Parenchelyurus hepburni*
- 15b Colour of head, body and median fins variable but never dark overall 16
- 16a Gill opening extends to level of pectoral-fin rays 10–13; no median supratemporal pore; interorbital pores 4 (arranged roughly as corners of rectangle); no fleshy blade-like crest on top of head *Haptogenys bipunctata*
- 16b Gill opening extends to level of 7th pectoral-fin ray; median supratemporal pore present; interorbital pores usually 3 (rarely 4); fleshy blade-like crest on top of head present or absent *Omobranchus*



- 17a Gill openings restricted to sides of head *Chalaroderma*
- 17b Gill openings continuous from one side of head to the other 18
- 18a Last anal-fin ray attached by membrane to peduncle 19
- 18b Last anal-fin ray not attached to peduncle 26
- 19a Head with row of cirri on top *Scartella emarginata*
- 19b Head without row of cirri on top 20
- 20a Teeth in lower jaw 70+; teeth in upper jaw 90+ (usually 100+); anterior anal-fin rays of males greatly elongated and with free tips *Salarias*

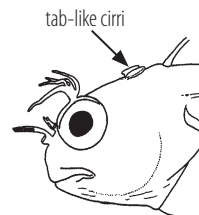
- 20b Teeth in lower jaw usually <40 (<60 in *Glyptoparus*); teeth in upper jaw <81; anterior anal-fin rays of males not elongated 21
- 21a Pectoral fins usually 13 rays; low, fleshy, blade-like crest present on top of head; lower jaw with 50–58 teeth, upper jaw with 74–80 teeth; 2 dark spots on gill membrane just in front of pelvic fins; maximum size ~3.5 cm SL *Glyptoparus delicatulus*
- 21b Pectoral fins usually 14 rays; usually no fleshy blade-like crest on top of head (present in some species of *Antennablennius*); lower jaw with <35 teeth, upper jaw with <40 teeth; no dark spots on gill membranes; maximum size >4 cm SL 22
- 22a Upper jaw with canine tooth at rear; no cirri on nape *Parablennius*
- 22b Upper jaw without canine tooth at rear; cirri present or absent on nape 23

- 23a Teeth present on vomer; supraorbital and nape cirri both present *Hirculops cornifer*



- 23b No teeth on vomer; either supraorbital or nape cirri present, or both absent 24
- 24a No supraorbital cirrus; cirri present on nape; canine tooth present posteriorly on each side of lower jaw ... *Antennablennius*
- 24b Either supraorbital or nape cirri present, or both supraorbital and nape cirri absent; lower jaw with canines present or absent 25

- 25a Nape midline with pair of tab-like cirri (edges may be frayed), with cirri bases adjacent; dorsal fin usually 13 (rarely 12 or 14) spines; canines present on lower jaw *Mimoblennius*



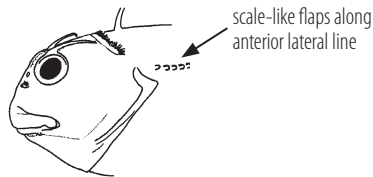
- 25b Nape cirri, if present, a pair of small simple filaments with bases well-separated; dorsal fin usually 12 (rarely 11 or 13) spines; no canines on lower jaw *Alloblennius*

Continued ...

KEY TO GENERA OR SPECIES

- 26a Transverse row of cirri extending across nape in front of dorsal fin 27
 26b Nape cirri, if present, a single filament or small patch on either side of dorsal midline 29

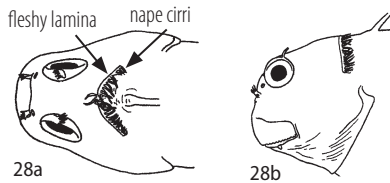
- 27a Anterior portion of lateral line with scale-like flaps; teeth present on vomer; dorsal fin 11 or 12 rays *Pereulixia kosiensis*



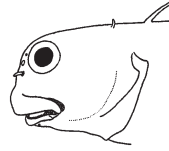
- 27b No scale-like flaps on anterior portion of lateral line; no teeth on vomer; dorsal fin 12–16 rays (12 rays only in *Exallias*) 28

- 28a Dorsal fin 12 or 13 rays; no canine at rear of lower jaw; nape cirri on single continuous, fleshy lamina, and lengths of individual cirri increasing towards centre *Exallias brevis*

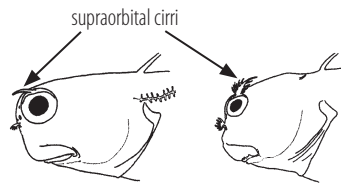
- 28b Dorsal fin usually 14–16 (rarely 13 or 17) rays; lower jaw with well-developed canine at rear in juveniles and adults; cirri on nape on ≥2 discontinuous fleshy laminae, and lengths of cirri not obviously increasing towards centre *Cirripectes*



- 29a No supraorbital cirri; dorsal fin usually 10 (rarely 9 or 11) rays; anal fin usually 11 (rarely 10 or 12) rays *Stanulus seychellensis*



- 29b Supraorbital cirri present; dorsal fin ≥11 rays; anal fin ≥15 rays 30



- 30a No canines at rear of lower jaw (except present in *Istiblennius flaviumbrinus*, which has 16 or 17 anal-fin rays) *Istiblennius*

- 30b Lower jaw with canines at rear 31

- 31a Teeth present on vomer; pelvic fins 4 rays; dorsal fin 13–17 rays *Entomacrodus*

- 31b No teeth on vomer; pelvic fins 3 or 4 rays; dorsal fin 17–24 rays 32

- 32a Upper jaw with canines at rear; pelvic fins 3 rays; dorsal fin 21–24 rays; lower jaw with 16–22 incisors *Salaria pavo*

- 32b Upper jaw without canines at rear; pelvic fins 4 rays; dorsal fin 17–22 rays; lower jaw with 75+ incisors *Blenniella*

- 33a Lateral line present dorsoanteriorly *Aspidontus*

- 33b No lateral line *Adelotremus leptus*

GENUS *Adelotremus* Smith-Vaniz & Rose 2012

Head with small cirri only on anteriormost pores of lower jaw; no fleshy blade-like crest on head. Infraorbital bones 3. Gill opening extends ventrally to opposite uppermost 5th or 6th pectoral-fin ray. No lateral line. Premaxillary teeth 26, dentary teeth 27; plus small canines at rear of upper jaw, and large canines at rear of lower jaw (but canines not grooved and without venom gland at base). Last ray of dorsal and anal fins bound to caudal-fin base by membrane. Dorsal fin 9 spines, 19 rays; anal fin 2 spines, 19 rays; pectoral fins 13 rays; pelvic fins 1 spine, 3 rays; caudal fin 11 rays, all unbranched, outermost rays filamentous. Dorsal-fin spine pterygiophores broadly contact robust vertebral neural spines. Total vertebrae 32. One species.

***Adelotremus leptus* Smith-Vaniz & Rose 2012**

Slender blenny

PLATE 125

Adelotremus leptus Smith-Vaniz & Rose 2012: 40, Figs. 1–6 (Sharm el-Sheikh, Marsa el At, Egypt, Red Sea).

Diagnosis as for genus.

Upper body tan with brown and pale speckles, extending onto dorsal fin; dark brown midlateral stripe from snout through eye to caudal-fin base; belly white; filamentous caudal-fin rays pale brown. Attains at least 45 mm TL.

DISTRIBUTION Known only from the holotype from the Red Sea.

REMARKS Found in a polychaete tube on sand and rubble bottom, at ~15 m.

GENUS *Alloblennius*

Smith-Vaniz & Springer 1971

Nasal cirri simple; supraorbital and nape cirri present or absent; no fleshy blade-like crest on head. Infraorbital bones 4 or 5. Gill opening continuous across isthmus. Lateral line tubular, continuous, with simple pores, restricted to body dorsoanteriorly; median supratemporal pores present. Free margins of lips smooth. Last rays of dorsal and anal fins attached by membrane to body near or at base of caudal-fin rays. Dorsal fin 11–13 (usually 12) spines, 16–20 (rarely 16 or 20) rays, fin weakly notched between spines and rays; anal fin 2 spines, usually 20–22 (rarely 19) rays; pectoral fins usually 14 (rarely 13 or 15) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 13 rays, middle 8 or 9 rays branched. Teeth firmly implanted: premaxillary teeth 30–38, dentary teeth 25–36; no canines at rear in either jaw; no teeth on vomer. Maximum size ~5 cm SL (most <3.5 cm SL). Found on coral reefs, in 3–25 m. At least 5 species, with 4 restricted to the Red Sea and/or WIO. *Alloblennius frondiculatus* Smith-Vaniz & Allen 2012 is known only from the Andaman Is.

KEY TO SPECIES

- | | | |
|----|---|---------------------------------------|
| 1a | No supraorbital cirri | <i>A. anuchalis</i> |
| 1b | Supraorbital cirri present | 2 |
| | | |
| 2a | Anterior nostril with slender cirrus on both the front and rear rim; posterior nostril with slender cirrus on front rim | <i>A. parvus</i> |
| 2b | Anterior nostril with slender cirrus on rear rim only; posterior nostril with broad flap on front rim, or flap absent | 3 |
| | | |
| 3a | No cirri on nape | <i>A. pictus</i> |
| 3b | Cirri present on nape | 4 |
| | | |
| 4a | Posterior nostril with broad, flap-like cirri on front rim; front of upper lip without free dorsal margin | <i>A. jugularis</i> |
| 4b | No cirri on rim of posterior nostril; front of upper lip with free dorsal margin | <i>A. frondiculatus</i> [Andaman Is.] |

Alloblennius anuchalis (Springer & Spreitzer 1978)

Bandtail blenny

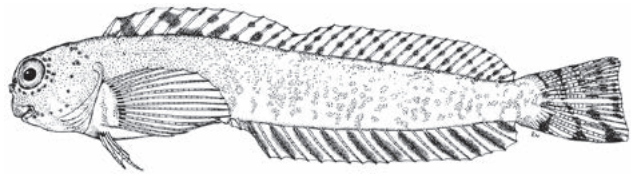
PLATE 125

Antennablennius anuchalis Springer & Spreitzer 1978: 8, Fig. 4 (east of Ste. Marie Bridge, Mauritius, Mascarenes).

Alloblennius anuchalis: Springer *et al.* 1998*; Fricke 1999; Manilo & Bogorodsky 2003.

Dorsal fin 12 spines, 18–20 rays; anal fin 2 spines, 20–22 rays; pectoral fins 14 rays; pelvic fins 1 spine, 3 rays (only 2 visible without dissection). Upper jaw teeth 28–31, lower jaw teeth 27–29. Simple cirrus on rear rim of anterior nostril, none on posterior nostril; no supraorbital cirri; usually no cirri on nape (minute cirri in specimen from Mauritius).

Preserved specimens with pale body: males with small dark spot distally between first 2 dorsal-fin spines; narrow streak of melanophores on fleshy base of pectoral fins. Females variously mottled brown and white, with many tiny white spots; anal fin with alternating dark and pale bars formed by dark pigment along every other ray and its adjacent membrane; fine, irregular dark bars on snout; eyes without ring of spots around pupil. Attains ~35 mm TL.



Alloblennius anuchalis, 24 mm SL, female (Mauritius).

Source: Springer *et al.* 1998

DISTRIBUTION WIO: Oman and Mauritius.

REMARKS Collected from rocky tidepools, to ~2 m deep.

Alloblennius jugularis (Klunzinger 1871)

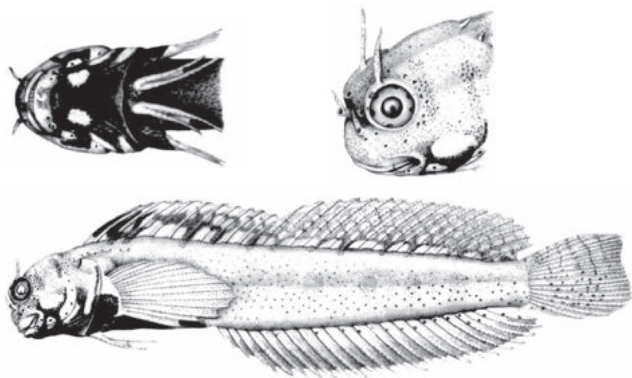
Jugular blenny

PLATE 125

Blennius jugularis Klunzinger 1871: 493 (Al-Qusayr, Egypt, Red Sea).
Alloblennius jugularis: Springer & Spreitzer 1978*; Goren & Dor 1994; Springer *et al.* 1998*.

Dorsal fin 11–13 spines, 16–20 rays; anal fin 2 spines, 20–22 rays; pelvic fins 1 spine, 3 rays, all visible; pectoral fins 14 rays. Upper jaw teeth 30–36, lower jaw teeth 30–34. Supraorbital cirrus simple; anterior nostril with simple cirrus on rear rim only, posterior nostril with broad flap-like cirrus on front rim; nape usually with small cirri.

Body pale and densely covered with tiny brown dots; ~8 dusky subdermal bars along body; dark spots between first 3 dorsal-fin spines; dark diagonal mark behind eyes; eyes with well-developed ring of spots around pupil; mature males may develop yellow pectoral fins, black throat, and large yellow spots on lower part of cheeks, gill membranes and bases of pectoral-fin rays. Attains ~50 mm TL.



Alloblennius jugularis, 33 mm SL, male (Red Sea).
Source: Springer & Spreitzer 1978 (by JR Schroeder)

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba to Dahlak Archipelago).

REMARKS Found on coral reefs, to ~25 m deep.

Alloblennius parvus Springer & Spreitzer 1978

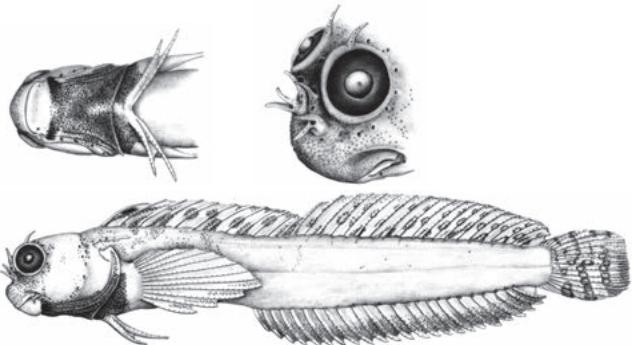
Dwarf blenny

PLATE 125

Alloblennius parvus Springer & Spreitzer 1978: 4, Fig. 1 (N'Gouni Reef, Grande Comore, Comoros); SSF No. 235.1*; Randall 1995*; Springer *et al.* 1998*; Fricke 1999; Manilo & Bogorodsky 2003.

Dorsal fin 12 or 13 spines, 18–20 rays; anal fin 2 spines, 20–22 rays; pelvic fins 1 spine, 3 rays (only 2 visible without dissection); pectoral fins 14 rays. Upper jaw teeth 30–35, lower jaw teeth 25–28. Supraorbital cirrus tiny, simple; anterior nostril with a simple cirrus on both front and rear rims, posterior nostril with simple cirrus on front rim; no nape cirri.

Body pale with clusters of pupil-sized brown spots, and series of similar spots along dorsal- and anal-fin bases; small dark spot between first 2 dorsal-fin spines; eyes with ring of spots around pupil, or at least dorsally; males with dark area under head and on pectoral-fin bases. Attains ~30 mm TL.



Alloblennius parvus, 23 mm SL, male paratype (Comoros).
Source: Springer & Spreitzer 1978 (by JR Schroeder)

DISTRIBUTION WIO: southern Oman, South Africa (Sodwana Bay), Madagascar, Comoros and Mauritius.

REMARKS Found on coral reefs and lava-flow tidal flats, to ~10 m deep.

Alloblennius pictus (Lotan 1970)

Bluebelly blenny

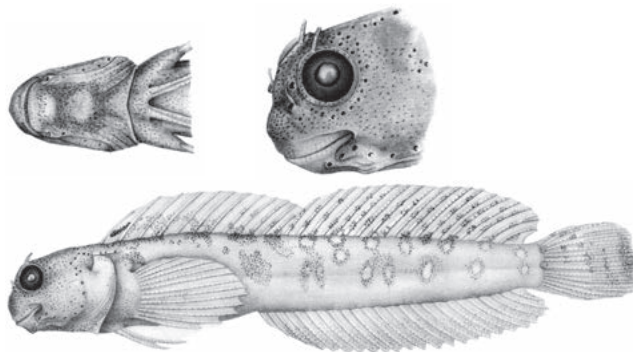
PLATE 125

Rhabdoblennius pictus Lotan 1970: 376, Fig. 7 (Norcra Islet, Sinai, Egypt, or Eilat, Israel, Gulf of Aqaba, Red Sea).

Alloblennius pictus: Springer & Spreitzer 1978*; Goren & Dor 1994; Springer *et al.* 1998*; Manilo & Bogorodsky 2003.

Dorsal fin 11–13 spines, 16–20 rays; anal fin 2 spines, 19–22 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 3 rays (only 2 visible without dissection). Upper jaw teeth 34–38, lower jaw teeth 32–36. Supraorbital cirrus small; anterior nostrils with simple cirrus on rear rim only; no cirri on posterior nostrils and nape.

Body pale, with small orangish brown spots scattered along sides and dorsal-fin base; series of iridescent blue spots laterally, from behind pectoral fins to above middle of anal fin; narrow bluish white diagonal streak on cheeks behind eyes; no ring of spots around pupils; small dark spot between first 3 dorsal-fin spines; 2 subdermal black blotches above gut behind pectoral-fin bases (visible through translucent skin, very distinctive in life); males may develop brilliant blue throat during courtship (Lieske & Myers 2004). Attains ~45 mm TL.



Alloblennius pictus, 31 mm SL (Red Sea).
Source: Springer & Spreitzer 1978 (by JR Schroeder)

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba to Gulf of Tadjoura).

REMARKS Inhabits coral reefs, to ~25 m deep.

GENUS *Alticus* Lacepède 1800

Supraorbital and nasal cirri present; fleshy blade-like crest on head in males and some females. Infraorbital bones 5. Gill openings unrestricted. Lateral line consisting of one to several bipored tubes restricted to body dorsoanteriorly; median supratemporal pore present. Free margin of lips smooth or crenulate. Dorsal fin 13–17 spines, 18–24 rays, fin notched between spines and rays, and attached by membrane to body at caudal-fin base; anal fin 25–28 rays, fin not attached by membrane to body at caudal fin; pectoral fins 12–15 (rarely 12) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 or 4 rays (all WIO species with 4 rays); caudal fin 12 or 13 rays (all WIO species with 12 rays), all unbranched. Premaxillary and dentary teeth comb-like, freely moveable; upper jaw teeth usually 200+, no canines at rear; lower jaw teeth usually 170+, rear canines present or absent; vomer with or without teeth. Maximum size ~11.5 cm TL. Inhabit the intertidal zone of exposed rocky shores, often 'skipping' out of the water. The taxonomy of species within *Alticus* has yet to be fully resolved, consequently species distributions may change from what is currently understood. Ten described species, plus ~4 undescribed; 4 species in WIO.

KEY TO SPECIES

- | | | |
|----|---|----------------------|
| 1a | Dorsal fin usually 16 or 17 (15–18) spines | 2 |
| 1b | Dorsal fin usually 14 (12–15) spines | 3 |
| | | |
| 2a | Dorsal fin usually 16 (15–17) spines; pectoral fins usually 13 (12–14) rays | <i>A. magnusi</i> |
| 2b | Dorsal fin usually 17 (16–18) spines; pectoral fins 14 or 15 rays | <i>A. kirkii</i> |
| | | |
| 3a | One or more dorsal-fin spines extending as filaments beyond membrane | <i>A. monochrus</i> |
| 3b | No dorsal-fin spines extending as filaments beyond membrane | <i>A. andersonii</i> |

Alticus andersonii (Day 1876)

Sri Lankan leaping blenny

PLATE 126

Salarias alticus Valenciennes *in* Cuv. & Val. 1836: 337 (Sri Lanka)

[name described in synonymy and not available].

Salarias andersonii Day 1876: 331 (Galle, Sri Lanka).

Fleshy crest on nape large and rounded in males, small in females. Dorsal fin 14 or 15 spines, 22 or 23 rays; anal fin 2 spines, 26 or 27 rays; pectoral fins 14 or 15 rays; pelvic fins

1 spine, 4 rays. Premaxillary teeth usually 200+; dentary teeth usually 170+, and rear canines present in males, absent in females; no teeth on vomer.

Head and body of preserved specimens with irregularly shaped alternating brown and pale bands. Attains ~80 mm TL.

DISTRIBUTION WIO: Sri Lanka; elsewhere, Christmas I.

REMARKS Valenciennes (*in* Cuv. & Val. 1836) included 'Blennie sauteur' of Lacepède (1800: 479) as a synonym in his description of *Salarias alticus*. Valenciennes apparently did not realise that Lacepède had indeed provided a binomial name (*Blennius saliens*). As *Salarias alticus* was designated a junior synonym of *Blennius saliens* Lacepède 1800, *Salarias alticus* is not an available name; the next available name for this species is *Salarias andersonii* Day 1876.

Alticus kirkii (Günther 1868)

Kirk's blenny

PLATE 126

Salarias kirkii Günther 1868: 458 (Zanzibar, Tanzania).*Alticus kirkii*: Randall 1995*; Fricke 1999.

Fleshy crest on nape of males and females, usually with pointed tip in males. Dorsal fin 16–18 spines, 19–22 rays; anal fin 2 spines, 25–28 rays; pectoral fins 14 or 15 rays; pelvic fins 1 spine, 3 rays. Premaxillary teeth usually 200+; dentary teeth usually 170+, no canines at rear; vomer with small patch of conical teeth.

Head and body with irregularly shaped alternating brown and pale bands; dorsal fin densely covered with fine dark brown and white streaks radiating from base towards margin; anal fin pale basally, with broad black distal stripe, ray tips pale. Attains ~10 cm TL.

*Alticus kirkii*, 63 mm SL (Red Sea). © JE Randall, Bishop Museum

DISTRIBUTION WIO: Red Sea, Oman and Persian/Arabian Gulf (Iran), Pakistan to India, Tanzania (Zanzibar), Kenya, Mozambique, Madagascar, Réunion and Mauritius.

REMARKS Found on rocky shores. Replaced in Red Sea by *A. magnusi*.

Alticus magnusi (Klausewitz 1964)

Magnus blenny

PLATE 126

Lophalticus kirkii magnusi Klausewitz 1964: 133, Figs. 9–10 (Al-Qusayr, Egypt, Red Sea).

Alticus kirkii (non Günther 1868): Randall 1983*.

Broadly rounded fleshy crest on nape of males and females. Dorsal fin 15–17 spines, 19–21 rays; anal fin 2 spines, 24–26 rays; pectoral fins 12–14 rays; pelvic fins 1 spine, 4 rays. Premaxillary teeth usually 200+; dentary teeth usually 170+, no canines at rear; vomer with small patch of conical teeth.

Resembles *A. kirkii*, but crest and cheeks covered with fine black spots. Attains ~90 mm TL.

DISTRIBUTION WIO: endemic to Red Sea (Gulf of Aqaba to Dahlak Archipelago).

REMARKS *Alticus magnusi* has been previously treated as a subspecies of *A. kirkii*. Because it can be distinguished from *A. kirkii* on the basis of several characters (see key) and has a distribution allopatric to that of *A. kirkii*, we have accorded the Red Sea form specific recognition.

Alticus monochrus Bleeker 1869

Filament blenny

PLATE 126

Alticus monochrus Bleeker 1869: 234 (Samberano River, Madagascar); Heemstra *et al.* 2004; Fricke *et al.* 2009.

Alticus aspilus Bleeker 1869: 235 (Samberano River, Madagascar).

Salarias aldabrensis Regan 1912: 302 (Aldabra, Seychelles).

Andamia anjouanae Fourmanoir 1955: 207, Fig. 4 (Domoni, Anjouan I., Comoros).

Damania anjouanae: Smith 1959.

Broadly rounded fleshy crest on nape of males only. Dorsal fin 13 or 14 spines (males with most spines filamentous and free from membrane for more than half their length, females usually with one filamentous spine), 21–23 rays; anal fin 2 spines, 26–28 rays; pectoral fins 15 rays. Premaxillary teeth usually 200+; dentary teeth usually 170+, no canines at rear; vomer with small patch of conical teeth.

Resembles *A. kirkii* in colour. Attains ~11 cm TL.



Alticus monochrus, 72 mm TL, female (top); 88 mm TL, male (bottom) (both Seychelles). © JE Randall, Bishop Museum

DISTRIBUTION WIO: Madagascar, Comoros, Seychelles and Mascarenes.

GENUS *Antennablennius* Fowler 1931

Nasal and nape cirri simple; no supraorbital cirri; fleshy blade-like crest on head (from occiput to dorsal-fin origin) present or absent. Infraorbital bones 5. Gill openings continuous across isthmus. Lateral line restricted to body dorsoanteriorly, tubular, continuous, with simple pores; median supratemporal pores present. Free margins of lips smooth. Dorsal fin 12 or 13 spines, 15–21 (rarely 15 or 16) rays, fin weakly to moderately notched between spines and rays; anal fin 2 spines, 16–23 (rarely 16 or 23) rays, last ray attached by membrane to body near or at base of caudal-fin rays; pectoral fins usually 14 (rarely 13 or 15) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 13 rays, middle 7–9 rays branched. Teeth firmly implanted: premaxillary teeth 26–45, dentary teeth 21–36; no canines at rear in either jaw; no teeth on vomer. Maximum size ~8.5 cm TL. Typically occur in shallow water along rocky shores and in tidepools, but one species found to at least 37 m deep. Seven species, all restricted to Red Sea and/or WIO.

KEY TO SPECIES

- | | | |
|----|--|-----------------------|
| 1a | No dark or pale spots on cheeks and underside of head | <i>A. ceylonensis</i> |
| 1b | Cheeks and underside of head with various patterns of small dark and/or pale spots | 2 |

Continued ...

KEY TO SPECIES

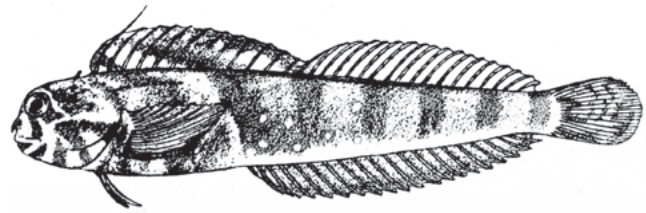
- 2a Opercle with oval ocellated spot with dark centre and pale edge (in life, dark grey centre, ringed with orange then yellow); males with bilateral pair of crests on head *A. simonyi*
- 2b Opercle without ocellated spot; males without crest or with single fleshy crest on head 3
- 3a Males with simple crest on nape; sharply defined small black, red or brown dots on lower part of cheeks, underside of head and pectoral-fin bases; nasal cirri very long, usually extending to or below mouth *A. hypenetes*
- 3b No crest on nape for either sex; head with white or brown spots or punctulations on lower part of cheeks and underside of head; nasal cirri short or moderately long (except very long in *A. variopunctatus*) 4
- 4a Pair of long cirri on nape *A. bifilum*
- 4b Nape cirri short or absent 5
- 5a Nasal cirri very long, reaching to mouth in adults; dorsal fin usually ≥ 20 (rarely 19) rays; anal fin typically ≥ 21 (rarely 20) rays *A. variopunctatus*
- 5b Nasal cirri usually short, not reaching to mouth; dorsal fin usually ≤ 18 (rarely 19) rays; anal fin ≤ 20 rays 6
- 6a Upper jaw teeth ≥ 37 , lower jaw teeth ≥ 29 *A. adenensis*
- 6b Upper jaw teeth ≤ 30 , lower jaw teeth ≤ 28 *A. australis*

Antennablennius adenensis Fraser-Brunner 1951Aden blenny PLATE 127

Antennablennius adenensis Fraser-Brunner 1951: 219, Fig. 6 (tidepool at Aden, Yemen, Gulf of Aden); Bath 1983*; Randall 1995*; Carpenter *et al.* 1997*.

Dorsal fin 12 spines, with semicircular flap of skin on front margin of 1st spine, 17–19 rays; anal fin 2 spines, 18–20 rays; pectoral fins 14 rays. Upper jaw teeth 37–45, lower jaw teeth 29–36. Anterior nostril with simple cirrus on rear rim; nape cirri small; no fleshy crest on nape.

Head with tiny white and brownish spots; body with ~8 faint dark bars, and tiny white spots over rear half of body; spinous dorsal fin with white margin and black submarginal stripe; anal fin of females with alternating dark and pale bars formed by dark pigment along every other ray and its adjacent membrane. Attains ~50 mm TL.



Antennablennius adenensis, holotype (Yemen). Source: Fraser-Brunner 1951

DISTRIBUTION WIO: southern Red Sea to Persian/Arabian Gulf and Pakistan.

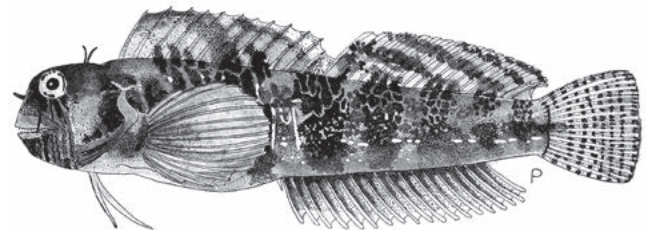
REMARKS Inhabits rocky habitats, to ~2 m deep.

Antennablennius australis Fraser-Brunner 1951Moustache blenny PLATE 127

Antennablennius australis Fraser-Brunner 1951: 218, Fig. 5 (Maputo Bay, Mozambique); Bath 1983*; SSF No. 235.2*; Goren & Dor 1994; Randall 1995*; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004.

Dorsal fin 12 or 13 spines, 16–18 rays; anal fin 2 spines, 16–19 rays; pectoral fins 14 rays. Upper jaw 26–30 teeth, lower jaw 23–28 teeth. Anterior nostril with simple cirrus on rear rim, usually not reaching to mouth; 2 short cirri on nape; no fleshy crest on nape.

Head with numerous tiny brownish spots; body with ~8 faint dark bars containing narrow pale lines, and alternating pale interspaces containing narrow brown bars; tiny white spots ventrolaterally along rear half of body; anal fin without alternating dark and pale bars. Attains ~80 mm TL.



Antennablennius australis, 60 mm TL (S Mozambique). Source: SSF

DISTRIBUTION WIO: southern Red Sea, Oman, Mozambique and South Africa (Algoa Bay).

Antennablennius bifilum (Günther 1861)

Horned blenny

PLATE 127

Blennius bifilum Günther 1861: 225 [South Africa].

Blennius persicus Regan 1905: 327, Pl. 2b, Fig. 1 (Persian/Arabian Gulf).

Salarias sexfasciatus Von Bonde 1923: 34, Pl. 3, Fig. 1 (Durban Beach, KwaZulu-Natal, South Africa).

Croaltus bifilum: Smith 1959*; Bath 1983*; Randall 1995*.

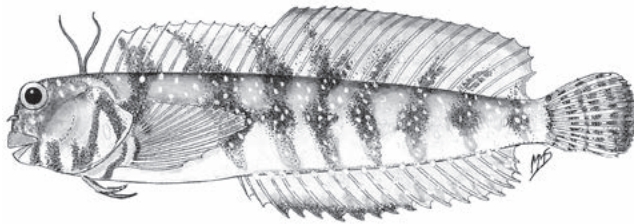
Antennablennius bifilum: Bath 1983*; SSF No. 235.3*; Randall 1995*;

Carpenter *et al.* 1997*; Fricke 1999; Manilo & Bogorodsky 2003;

Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Fricke *et al.* 2009.

Dorsal fin 12 or 13 spines, 17–21 rays; anal fin 2 spines, 17–21 rays; pectoral fins 14 rays; pelvic fins 1 spine, 3 rays. Upper jaw teeth 26–35, lower jaw teeth 22–30. Anterior nostril with simple short cirrus on rear rim; pair of nape cirri very long with close-set bases; no fleshy crest on nape.

Head with tiny brownish punctulations, and 3 bands on underside; body with ~8 faint dark bars extending onto dorsal fin, numerous pale spots and short streaks, and tiny brown spots midlaterally along rear half of body; anal fin without alternating dark and pale bars. Attains ~85 mm TL.



Antennablennius bifilum, 75 mm TL (South Africa). Source: SSF

DISTRIBUTION WIO: Persian/Arabian Gulf and northwestern India, Mozambique to South Africa (Eastern Cape), Madagascar, Comoros, Aldabra and Mascarenes; not known from Red Sea.

Antennablennius ceylonensis Bath 1983

Ceylon blenny

PLATE 127

Antennablennius ceylonensis Bath 1983: 58, Figs. 1, 10, 11, 21, 22 (Trincomalee, Sri Lanka).

Dorsal fin 12 spines, 17 or 18 rays; anal fin 2 spines, 17–19 rays; pectoral fins 14 rays. Upper jaw teeth 31–38, lower jaw teeth 25–31. Anterior nostril with simple short cirrus on rear rim; nape cirri present, moderate in length with close-set bases (much shorter than in *A. bifilum*); no fleshy crest on nape.

Head brown without spots, chin pale; body with ~7 pale dark bars, tiny brown spots midlaterally along rear half of body; anal fin without alternating dark and pale bars. Attains ~55 mm TL.

DISTRIBUTION WIO: Sri Lanka.

Antennablennius hypenetes (Klunzinger 1871)

Arabian blenny

PLATE 127

Blennius hypenetes Klunzinger 1871: 492 (Al-Qusayr, Egypt, Red Sea).

Antennablennius hypenetes: Bath 1983*; Randall 1995*;

Carpenter *et al.* 1997*.

Dorsal fin 12 or 13 spines, 16–20 rays; anal fin 2 spines, 19–21 rays; pectoral fins 14 rays. Upper jaw teeth 33–39, lower jaw teeth 21–34. Nasal cirrus very long, extending to or below mouth; nape cirri simple and short. Males with single, slender fleshy crest on nape.

Body with ~8 large dark midlateral blotches; small dark spots on lower part of head and pectoral-fin bases; small white or blue spots midlaterally along rear three-quarters of body; anal fin without alternating dark and pale bars. Attains ~65 mm TL.

DISTRIBUTION WIO: Red Sea, Arabian Peninsula, Gulf of Oman and Persian/Arabian Gulf.

REMARKS Found inshore on rocky substrates.

Antennablennius simonyi (Steindachner 1902)

Simony's blenny

PLATE 127

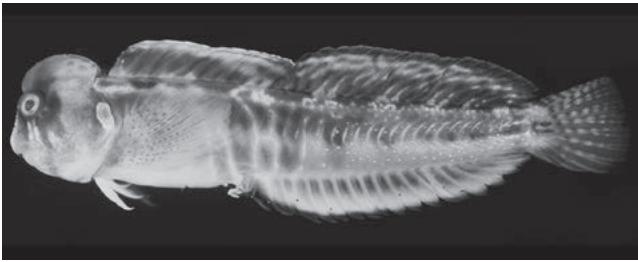
Salarias simonyi Steindachner 1902: 317 (Socotra; Balhaf, Yemen, Gulf of Aden); Steindachner 1903*.

Antennablennius girad Fraser-Brunner 1951: 217, Fig. 4 (Henjam I.,

Persian/Arabian Gulf); Bath 1983*; Randall 1995*; Carpenter *et al.* 1997*.

Dorsal fin 12 or 13 spines, 18–20 rays; anal fin 2 spines, 19–21 rays; pectoral fins 14 rays. Upper jaw teeth 27–32, lower jaw teeth 25–26. Nasal cirrus short in females, extending to mouth in males; nape cirri simple and short. Males with 2 parallel, slender fleshy crests on nape.

Body with ~8 large, dark midlateral bands or blotches, and small white or blue spots midlaterally along rear half of body; upper part of gill cover with large ocellated oval spot with dark grey centre ringed by orange, then yellow or white; anal fin without alternating dark and pale bars. Attains ~55 mm TL.



Antennablennius simonyi, 44 mm SL (Oman). © JE Randall, Bishop Museum

DISTRIBUTION WIO: Gulf of Aden to Persian/Arabian Gulf (United Arab Emirates and Iran).

REMARKS Found inshore on rocky substrates.

Antennablennius variopunctatus

(Jatzow & Lenz 1898)

Orangedotted blenny

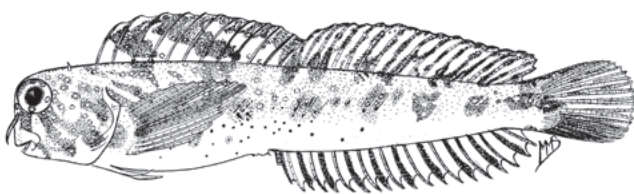
PLATE 128

Blennius variopunctatus Jatzow & Lenz 1898: 511, Pl. 35, Fig. 8 (Zanzibar, Tanzania).

Antennablennius (Litanchus) velifer Smith 1959: 249, Fig. 15; Pl. 15, Fig. 2 (Cape Delgado, Mozambique); Bath 1983*; Randall 1995*.

Dorsal fin 12 spines, 19–21 rays; anal fin 2 spines, 20–23 rays; pectoral fins 14 rays. Upper jaw teeth 32–39, lower jaw teeth 26–34. Anterior nostril with long cirrus on rear rim; nape cirri small; no fleshy crest on nape.

Head, anterior part of body and dorsal-fin base with small orangish brown dots; ~8 irregular dark bands on body, and varied dark and white punctulations mostly on upper half of body; anal fin with alternating dark and pale bars formed by dark pigment on every other ray and its adjacent membrane. Attains ~75 mm TL.



Antennablennius variopunctatus, 48 mm TL, female holotype of *A. velifer* (Kenya). Source: Smith 1959

DISTRIBUTION WIO: Kenya to Mozambique, Persian/Arabian Gulf and Gulf of Oman to Pakistan; not known from Red Sea.

REMARKS Found in tidepools and rocky habitats, to ~7 m deep.

GENUS *Aspidontus* Cuvier 1834

Head with single minute cirrus only on rear rim of posterior nostril and occasionally another associated with anteriormost mandibular pore on chin; no fleshy blade-like crest on head. Infraorbital bones 4. Free margin of upper lip smooth. Gill openings restricted to sides of head, ventral extent ranging from opposite base of 3rd uppermost pectoral-fin ray to opposite lowermost ray (level of restriction generally increasing with SL). Lateral line of 4–10 bipored tubes restricted to body dorsoanteriorly; median supratemporal pore present. Dorsal and anal fins attached by membrane to body at caudal-fin base. Dorsal fin 9–12 (usually 10 or 11) spines, 26–34 rays, fin not notched between spines and rays; anal fin 25–30 rays; pectoral fins 13 or (usually) 14 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 11 rays, all unbranched. Number of teeth generally increasing with SL (tooth counts exclude canines at rear): premaxillary teeth 16–39, rear canines present or absent; dentary teeth 11–36, and rear canines present. Maximum size ~11 cm SL. Inhabit coral reefs. Three species, 2 in WIO. We recognise *Aspidontus taeniatus* Quoy & Gaimard 1834 as restricted to the eastern Indian Ocean and western Pacific, and previous records of that species in WIO as attributable to *Aspidontus tractus*. The latter species is questionable and may only be a colour variant.

KEY TO SPECIES

- 1a Dorsal fin 10–12 (usually 11) spines; total dorsal-fin elements 37–40 (rarely 40); dark stripe on body widens posteriorly, covering much of caudal fin to rear margin; middle caudal-fin rays of adults not noticeably longer than outer rays; 1st dorsal-fin spine often elongate in prejuveniles (4–6 cm SL) 2
- 1b Dorsal fin 9–11 (rarely 11) spines; total dorsal-fin elements 38–44; dark stripe on body, if present, of uniform width (may be fainter anteriorly) and extending at most onto basal third of caudal fin; middle caudal-fin rays much longer than outer rays; 1st dorsal-fin spine never elongate *A. dussumieri*
- 2a Pectoral-fin bases with narrow black bar *A. tractus*
- 2b No black bar on fleshy pectoral-fin base *A. taeniatus* [eastern Indian Ocean and western Pacific]

Aspidontus dussumieri (Valenciennes 1836)

Floating blenny

PLATE 128

Blennechis dussumieri Valenciennes in Cuv. & Val. 1836: 282
(Réunion, Mascarenes).

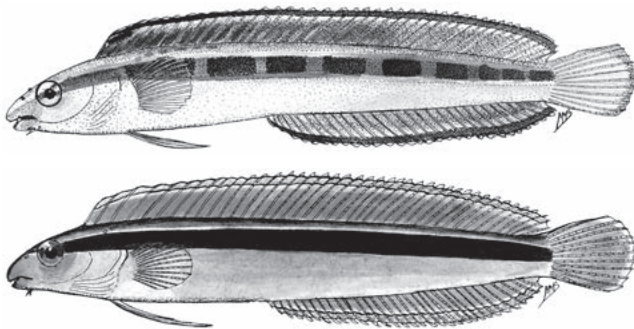
Petroscirtes striatus Day 1888: 262 (Sri Lanka).

Aspidontus (Escadotus) wamiziensis Smith 1959: 235, Pl. 17, Fig. 10
(Wamizi I., Mozambique).

Aspidontus dussumieri: SSF No. 235.4*; Goren & Dor 1994; Fricke 1999;
Springer 2001*; Manilo & Bogorodsky 2003; Heemstra *et al.* 2004;
Heemstra & Heemstra 2004; Fricke *et al.* 2009.

Dorsal fin 9–11 spines, 28–34 rays; anal fin 2 spines, 25–30 rays;
pectoral fins 13–15 rays; middle caudal-fin rays much longer
than outer rays. Premaxillary teeth 15–39, dentary teeth 11–36.

Body pale (not blue posteriorly), with dark stripe from
eyes to caudal-fin base; dorsal fin and caudal fin often hyaline
yellow. Attains ~11 cm TL.



Aspidontus dussumieri, 82 mm TL (top); 85 mm TL, holotype of
A. wamiziensis (bottom) (both N Mozambique). Source: Smith 1959

DISTRIBUTION Indo-Pacific. WIO: Gulf of Oman, Red
Sea, Kenya to South Africa (Park Rynie), Comoros, Aldabra,
Seychelles, Mascarenes, St Brandon Shoals and Sri Lanka;
elsewhere to Indonesia, southern Japan, Australia and Tonga.

Aspidontus tractus Fowler 1903

Blackbar mimic blenny

PLATE 128

Aspidontus tractus Fowler 1903: 170, Pl. 7 (Zanzibar, Tanzania);
Smith 1959; Smith & Smith 1963*; Heemstra & Heemstra 2004*;
Fricke *et al.* 2009.

Aspidontus taeniatus (non Quoy & Gaimard 1834): Barnard 1927;
Wickler 1968*; Springer & Smith-Vaniz 1972* [in part]; Randall 1983,
1992*, 1995; Cornic 1987*; Kuiter 1998*; Letourneur 1998.

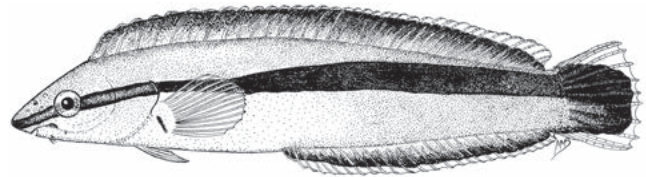
Aspidontus filamentosus (non Valenciennes 1836): Smith 1949*.

Petroscirtes filamentosus (non Valenciennes 1836): Harmelin-Vivien 1976.

Aspidontus taeniatus tractus: Smith-Vaniz 1976*; SSF No. 235.5*;
Winterbottom *et al.* 1989*; Fricke 1999; Winterbottom & Anderson 1999;
Letourneur *et al.* 2004.

Dorsal fin 10–12 spines, 26–29 rays; anal fin 2 spines,
25–28 rays; pectoral fins 13–15 rays. Premaxillary teeth 16–29;
dentary teeth 11–30.

Body greyish white anteriorly becoming pale blue
posteriorly; adults with dark stripe from snout to caudal
fin, widening posteriorly (stripe brownish on head, black
posteriorly); caudal fin black centrally, upper and lower edges
broadly blue, margin whitish; dorsal and anal fins mostly
brownish black (occasionally pale blue proximally), with
narrow whitish or hyaline margin; pelvic and pectoral fins
pale, except for narrow black bar at pectoral-fin bases. Pelagic
prejuveniles with banded dorsal and anal fins, and less distinct
midlateral stripe. Attains 11 cm TL.



Aspidontus tractus, ~11 cm TL. Source: SFSA

DISTRIBUTION WIO: Red Sea, Oman, Tanzania (Zanzibar)
to South Africa (Aliwal Shoal), Madagascar, Comoros,
Seychelles, Réunion, Mauritius and Chagos.

REMARKS Replaced in eastern Indian Ocean (Christmas I.
and Australia) by *A. taeniatus*. Often treated as a subspecies
of *A. taeniatus*, but can be completely separated from that
species on the basis of colour pattern and an exceedingly broad
distribution that is completely allopatric to the distribution
of *A. taeniatus*; therefore, we follow Heemstra & Heemstra
(2004) in according the western Indian Ocean form specific
recognition. Additional taxonomic study is needed.

GENUS *Atrosalaris* Whitley 1933

All fin rays unbranched. Cirri present on nape, orbit and
anterior nostrils, usually short and simple, but occasionally
with a fine branch; no fleshy blade-like crest on head.
Free margin of upper lip irregularly crenulate. Infraorbital
bones 5. Lateral line a continuous tube restricted to body
dorsoanteriorly, extending at most to slightly beyond tip of
appressed pectoral fin. Dorsal fin 9–11 spines, 18–21 rays,
fin not notched between spines and rays, and attached by
membrane to upper edge of caudal fin well beyond base of
rays; anal fin 2 spines, 18–21 rays, fin attached by membrane
to peduncle; pectoral fins 15 or (usually) 16 rays; pelvic fins
1 embedded spine, 2 rays (spine and a 3rd vestigial ray which

is closely applied to base of innermost ray both visible only in skeletal preparations); caudal fin 11–13 (usually 12) rays, tips frequently exerted. Teeth comb-like, freely moveable: premaxillary teeth usually 135+, no canines at rear; dentary teeth usually 100+, plus tiny canine usually present at rear on each side; no teeth on vomer. Maximum size 14.5 cm TL, relatively deep-bodied. Usually associated with coral reefs. Three species currently recognised, 1 in WIO.

Springer & Smith-Vaniz (1968), who last revised the genus, recognised only one species with two allopatrically distributed subspecies. The type species (and subspecies) *A. fuscus fuscus* is endemic to the Indian Ocean. The other subspecies is found in the southeastern Indian Ocean, South China Sea and Pacific Ocean, and should be raised to full species level, *Atrosalarias holomelas* (Günther 1872), as it differs in having 9–11 (usually 10, rarely 11) dorsal-fin spines. The other currently recognised species, *A. hosokawai* Suzuki & Senou 1999, is restricted to the western Pacific.

Atrosalarias fuscus (Rüppell 1838)

Brown coral blenny

PLATE 128

Salarias ruficaudus Valenciennes (ex Ehrenberg) in Cuv. & Val. 1836: 328 (Massawa, Eritrea, Red Sea).

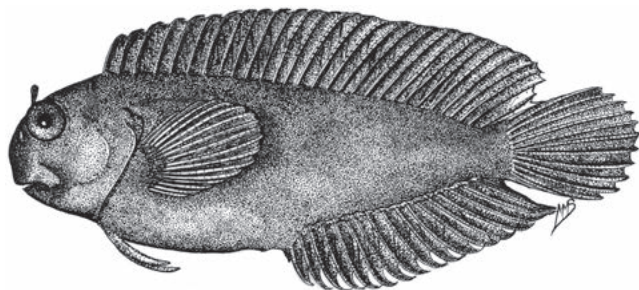
Salarias fuscus Rüppell 1838: 135, Pl. 32, Fig. 2 (Massawa, Eritrea, Red Sea); Smith 1949.

Salarias niger Kossmann & Rüber 1877: 402 (Massawa, Eritrea, Red Sea).

Atrosalarias fuscus: Smith 1959*; Maugé 1967; Springer & Smith-Vaniz 1968*.

Diagnosis as for genus. Dorsal fin 9–11 spines, 18–20 rays; anal fin 2 spines, 18–20 rays.

Head and body dark brown to black, pigment intensified posteriorly on dorsal fin and dorsolaterally on fleshy pectoral-fin bases and adjoining ray bases; caudal fin usually paler than body. Attains 14.5 cm TL.



Atrosalarias fuscus, 70 mm TL (Tanzania). Source: Smith 1959

DISTRIBUTION Indian Ocean. WIO: Pakistan, Red Sea, Tanzania (Zanzibar), Kenya to Mozambique; elsewhere, Andaman Is. and Mentawai Is. (Indonesia); not known from Comoros, Seychelles, Chagos, Maldives and Cocos (Keeling) Is.

REMARKS Inhabits reefs, at 2–12 m.

GENUS *Blenniella* Reid 1943

Nasal and supraorbital cirri present; nape cirri present or absent; fleshy blade-like crest on head present or absent. Gill openings continuous across isthmus. Lateral line tubular and continuous, with vertically paired pores anteriorly, sometimes followed by ≤ 7 separated bipored tubes; median supratemporal pores present. Free margins of lips smooth or crenulate. Dorsal fin 12–14 (usually 13) spines, 17–22 rays, fin moderately notched between spines and rays; anal fin 2 spines, 19–23 (rarely 19 or 23) rays, last ray not attached to body; pectoral fins usually 14 (rarely 13 or 15) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin usually 13 (rarely 12) rays, middle 9 rays branched. Premaxillary teeth 100+, no canines at rear; dentary teeth 75+, plus canine at rear on each side (males and females); no teeth on vomer. Maximum size ~15.5 cm TL. At least 9 species, 4 in WIO.

KEY TO SPECIES

- | | | |
|----|--|-------------------------|
| 1a | Most or all dorsal-fin spines with conspicuous black tips, appearing as series of small black dots; each supraorbital cirrus with one to several branches at tip | <i>B. chrysoptilos</i> |
| 1b | Dorsal-fin spines variously pale or pigmented, tips lacking conspicuous small black dots; supraorbital cirrus a simple slender filament | 2 |
| 2a | Well-developed fleshy crest or ridge on head | <i>B. cyanostigma</i> |
| 2b | No fleshy crest or ridge on head | 3 |
| 3a | Margin of upper lip crenulate; nape cirri present | <i>B. periphthalmus</i> |
| 3b | Margin of upper lip smooth; no cirri on nape (except may be present in Pacific populations) | <i>B. gibbifrons</i> |

Blenniella chrysopilos (Bleeker 1857)

Red-spotted blenny

PLATE 128

Salaria chrysopilos Bleeker 1857: 66 (Ambon I., Moluccas, Indonesia).

Istiblennius chrysopilos insulinus Smith 1959: 243, Pl. 16, Figs. 4–5

(Aldabra, Seychelles).

Blenniella chrysopilos: Springer & Williams 1994*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 12–14 spines, 18–22 rays; anal fin 2 spines, 20–23 rays; pectoral fins 12–15 rays. Nape with small cirri on each side; each supraorbital cirrus with one to several branches at tip; nasal cirri short and palmate; no fleshy crest on nape. Free margin of upper lip crenulate. Lateral line with vertically paired, bilaterally branched pores anteriorly.

Head and body with ~8 irregular or broken bars (all red, brown or pale, or a combination of brown or red anteriorly and brilliant white posteriorly), and small dark or pale spots scattered over body; dorsal fin with dusky submarginal stripe, and most or all spines with conspicuous black tips, appearing as series of small black dots, often bordered by white spot below. Attains ~13 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya to Mozambique, Madagascar, Comoros, Seychelles, Mascarenes, Chagos and Maldives; not known from Red Sea to Persian/Arabian Gulf; elsewhere to Indonesia, southern Japan, Australia and Society Is.

REMARKS Found in shallow high-energy environments of reef crests and fringing reefs.

Blenniella cyanostigma (Bleeker 1849)

Striped rockskipper

PLATE 129

Salaria cyanostigma Bleeker 1849: 18 (Pagotang, Java, Indonesia).

Salaria fronto Günther 1861: 255 (Moluccas, Indonesia).

Salaria andamanensis Day 1870: 611 (Andaman Is.).

Salaria andamanensis: Day 1876.

Salaria striolatus Day 1876: 333 (Andaman Is.).

Entomacrodus calurus Fowler 1904: 555, Pl. 26 (Padang, Sumatra, Indonesia).

Istiblennius andamanensis: Smith 1959*; Goren & Dor 1994.

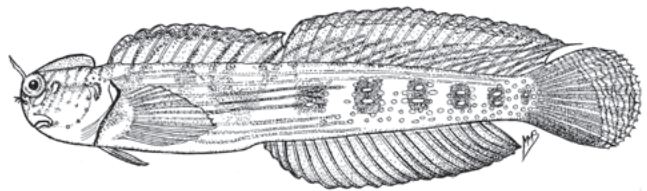
Istiblennius andamanensis: SSF No. 235.16*.

Blenniella cyanostigma: Springer & Williams 1994*; Fricke *et al.* 2009.

Dorsal fin 12–14 spines, 19–22 rays; anal fin 2 spines, 19–22 rays; pectoral fins 13–15 rays. Supraorbital cirri simple; nasal cirri short and simple or palmate; no cirri on nape; adult

males with well-developed fleshy crest on head, adult females with ridge or low crest. Free margin of upper lip smooth. Lateral line with simple pores anteriorly.

Head and body with 8 or 9 irregular dark splotches midlaterally; males with vertically paired small dark ocelli in ~3 bars at midbody and posteriorly, and bar beneath rear part of spinous dorsal fin usually with ~3 short, narrow, parallel pinstripes within it; females with 5 or 6 narrow, dark brown midlateral stripes from beneath rear part of spinous dorsal fin almost to peduncle, there breaking up into small dark spots. Attains ~85 mm TL.



Blenniella cyanostigma, 90 mm TL (N Mozambique). Source: Smith 1959

DISTRIBUTION Indian Ocean: Kenya to Mozambique, Madagascar, Comoros, Réunion and Sri Lanka; not known from Red Sea to Persian/Arabian Gulf; elsewhere to Andaman Is. and Indonesia (Bali).

REMARKS Found in shallow high-energy environments of reef crests and fringing reefs.

Blenniella gibbifrons (Quoy & Gaimard 1824)

Hump-headed blenny

PLATE 129

Salaria gibbifrons Quoy & Gaimard 1824: 253 (Hawaii).

Istiblennius gibbifrons insolitus Smith 1959: 242, Pl. 16, Fig. 2 (Assumption I., Seychelles).

Istiblennius gibbifrons: SSF No. 235.20*; Winterbottom *et al.* 1989*.

Blenniella gibbifrons: Springer & Williams 1994*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 12–14 spines, 18–20 rays; anal fin 2 spines, 19–21 rays; pectoral fins 12–15 rays. Supraorbital cirri simple; no cirri on nape (except may be present on specimens from Pacific); no fleshy crest on nape. Free margin of upper lip smooth. Lateral line with vertically paired, bilaterally branched pores anteriorly.

Head and body with ~8 irregular dark bars (bars all reddish brown, brown or pale, or a combination of brown or red anteriorly and brilliant white posteriorly), and small dark or pale spots scattered over body; dorsal fin dusky distally, spines without conspicuous black tips. Attains ~11 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Tanzania to South Africa (Sodwana Bay), Madagascar, Comoros, Seychelles, Mascarenes and Chagos; elsewhere to Japan, Marshall Is., Pitcairn Is., Marquesas Is. and Hawaii; not known from Red Sea to Persian/Arabian Gulf and absent from Indo-Australia region.

REMARKS Found on intertidal reef flats.

Blenniella periophthalmus (Valenciennes 1836)

Bullethead rockskipper

PLATE 129

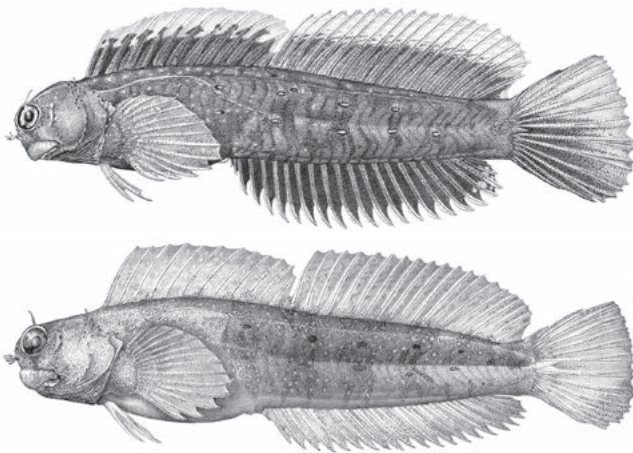
Salarias periophthalmus Valenciennes in Cuv. & Val. 1836: 311, Pl. 328 (Tikopia I., Solomon Is.).

Istiblennius periophthalmus: SSF 235.22*; Winterbottom *et al.* 1989*.

Blenniella periophthalmus: Springer & Williams 1994*; Randall 1995*; Carpenter *et al.* 1997*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 12–14 spines, 18–22 rays; anal fin 2 spines, 19–23 rays; pectoral fins 12–15 rays. Supraorbital cirri simple; nape cirri small; no fleshy crest on nape. Free margin of upper lip crenulate. Lateral line with simple pores anteriorly.

Upper half of head and body dark, with ~8 irregular dark bars, each bar (from beneath rear part of spinous dorsal fin to rear part of soft-rayed dorsal fin) with small, vertically paired blue or white ocelli (last bar with ocelli usually without upper member of pair); conspicuous black spot often present on upper part of gill cover; dorsal-fin spines without conspicuous black tips. Adult males often with dark body and densely scattered small pale dots. Females typically with sprinkling of tiny black spots over most or all of body, but not on head. Attains ~15.5 cm TL.



Blenniella periophthalmus, 73 mm SL, male (top); 70 mm SL, female (bottom) (both Agaléga Is.).

Source: Springer & Williams 1994 (by PK Hollingsworth)

DISTRIBUTION Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Red Sea, Oman to South Africa, Madagascar, Comoros, Seychelles, Mascarenes and Chagos; elsewhere to Indonesia, southern Japan, Australia, Solomon Is. and Marquesas Is.

REMARKS Found in shallow high-energy environments of reef flats and fringing reefs.

GENUS *Chalaroderma* Norman 1944

Supraorbital cirri palmate; anterior nostrils with small group of palmate cirri on rear rim; no median longitudinal row of cirri, and no cirri or fleshy blade-like crest on head. Gill openings restricted to sides of head. Lateral line consisting of continuous anterior portion with paired dorsal and ventral branches to near pectoral-fin tips, and posterior series of bipored tubes present or absent. Dorsal and anal fins attached by membrane to body well in front of caudal-fin base. Dorsal fin usually 12–14 spines, 17–21 rays, fin with slight or no notch between spines and rays; anal fin 2 spines, 21–23 rays; pectoral fins 14 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 or 4 rays; caudal fin 13 rays, middle 9 rays branched. Premaxillary teeth 26–37, dentary teeth 25–40; no canines at rear in either jaw. Maximum size ~20 cm TL. Inhabit nearshore rocky areas and tidepools. Two species, both in WIO. Accounts here modified from Springer *in* Smith & Heemstra (1986) and Froese & Pauly (2008).

KEY TO SPECIES

- 1a Lateral line extending as separated bipored tubes onto peduncle; pelvic fins 1 spine, 4 rays (innermost 1 or 2 rays difficult to see without dissection) *C. capito*
- 1b Lateral line ending at midbody, near appressed pectoral-fin tips; pelvic fins 1 spine, 3 rays (innermost ray difficult to see without dissection) *C. ocellata*

Chalaroderma capito (Valenciennes 1836)

Looseskin blenny

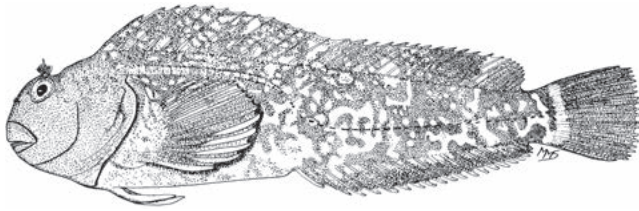
PLATE 129

Blennius capito Valenciennes in Cuv. & Val. 1836: 260 (Cape of Good Hope, South Africa).

Chalaroderma capito: Smith 1964*; Penrith & Penrith 1972*; Bath 1977, 1996; SSF No. 235.6*.

Dorsal fin 12–14 spines, 17–21 rays; anal fin 2 spines, 21–23 rays; pelvic fins 1 spine, 4 rays. Lateral line extending as separated bipored tubes to peduncle. Skin of large specimens may appear flabby.

Preserved specimens: head and body mottled brown and pale, brown areas sometimes appearing to form ~5 irregular bars extending onto dorsal fin. Attains ~20 cm TL.



Chalaroderma capito, 18 cm TL (South Africa). Source: SSF

DISTRIBUTION South Africa: Saldanha Bay in southeastern Atlantic, to Eastern Cape in WIO.

Chalaroderma ocellata (Gilchrist & Thompson 1908)

Two-eyed blenny

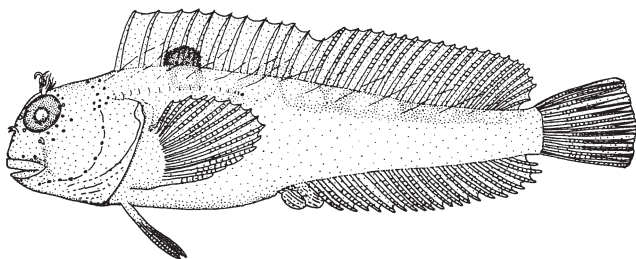
PLATE 130

Blennius ocellatus Gilchrist & Thompson 1908: 103 (False Bay, South Africa).

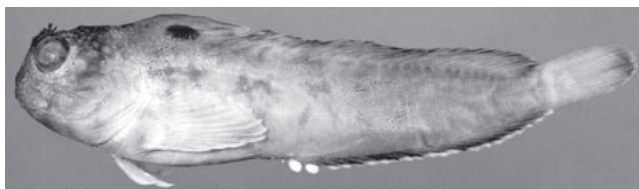
Chalaroderma ocellata: Penrith & Penrith 1972*; Bath 1977; SSF No. 235.7*.

Dorsal fin 12 or 13 spines, 19–21 rays; anal fin 2 spines, 21 or 22 rays; pelvic fins 1 spine, 3 rays. Lateral line ending at midbody.

Head and body mottled brown and pale, brown areas sometimes appearing to form ~5 irregular bars extending onto dorsal fin; conspicuous black spot at bases of dorsal-fin spines 3–5. Attains ~70 mm TL.



Chalaroderma ocellata, 20 mm TL, holotype (South Africa). Source: Penrith & Penrith 1972



Chalaroderma ocellata, 64 mm SL, male (South Africa). Source: SSF (by K Bruwelheide)

DISTRIBUTION South Africa: Saldanha Bay in southeastern Atlantic, to Eastern Cape in WIO.

GENUS *Cirripectes* Swainson 1839

Nasal and supraorbital cirri present; nape with transverse row of cirri anterior to dorsal-fin origin; no fleshy blade-like crest on nape. Gill openings continuous across isthmus. Lateral line tubular and continuous, with vertically paired pores anteriorly, then descending and continuing as separated bipored tubes to near midbody or onto peduncle; median supratemporal pores present. Dorsal fin 11–13 (usually 12) spines, 13–17 rays, fin moderately notched or not notched between spines and rays; anal fin 2 spines, 14–18 rays, last ray not attached to body by membrane; pectoral fins 14–16 (usually 15) rays; pelvic fins 1 spine, 3 or 4 rays (spine embedded, visible only in skeletal preparations; innermost ray difficult to detect without dissection); caudal fin 13 rays, middle 9 rays branched. Free margin of upper lip crenulate, lower lip smooth or crenulate. Premaxillary teeth 100+; dentary teeth 80+, plus canines present at rear; no teeth on vomer. Maximum size ~13 cm TL. At least 22 species, 10 in WIO.

KEY TO SPECIES

- 1a Each side of nape with large fleshy flap fringed with small cirri; row of several cirri with separate bases across nape between flaps 11
- 1b Cirri on nape not as above 2

- 2a Dorsal fin usually 15 or 16 (13–16) rays; anal fin usually 16 or 17 (14–17) rays 3
- 2b Dorsal fin usually 14 (13–15) rays; anal fin usually 15 (14–17) rays 5

- 3a Lower lip crenulate medially; each preopercular pore (POP) position (but especially upper positions) with ≥6 pores *C. quagga*
- 3b Lower lip smooth medially; each POP position with 1 or 2 pores, upper positions occasionally with 4 or 5 pores 4

- 4a Last LL tube at or behind vertical at base of 9th dorsal-fin ray *C. stigmaticus*
- 4b Last LL tube in front of vertical at base of 9th dorsal-fin ray *C. filamentosus* [IN PART]

- 5a Pelvic fins 3 rays 6
- 5b Pelvic fins 4 rays (inner ray may be difficult to detect) 8

Continued ...

KEY TO SPECIES

- 6a Last LL tube at or behind vertical at base of 7th dorsal-fin ray; most POP positions with ≥ 6 pores; small pale spots on throat, and body with alternating dark and pale bars *C. polyzona*
- 6b Last LL tube not reaching beyond vertical at base of 7th dorsal-fin ray; most POP positions with 1 or 2 pores; colour not as above 7
- 7a Dorsal fin notched between spines and rays; preserved specimens (males and females) with uniformly brown body and small pale spots on head (red spots in life) *C. filamentosus* [IN PART]
- 7b Dorsal fin continuous; preserved specimens: head and body of males uniformly brown (in life, anterior half of body yellowish brown and rear half reddish brown), body of females brown with small dark brown spots *C. perustus*
- 8a Each POP position with 1 or 2 pores, except upper positions occasionally with 4 or 5 pores in large specimens 9
- 8b Each POP position with ≥ 6 pores 10
- 9a Snout and cheeks with tiny red spots or bars (pale in preservative), body otherwise uniformly brown; last LL tube at or before vertical at base of 6th dorsal-fin ray *C. filamentosus* [IN PART]
- 9b Colour not as above; last LL tube at or behind vertical at 6th dorsal-fin ray *C. castaneus*
- 10a Lateralmost cirri on nape a greatly expanded fleshy flap; typically ≥ 43 distinct nuchal cirri bases *C. gilberti*
- 10b Lateralmost cirri on nape a small fleshy flap; ≤ 42 distinct nuchal cirri bases *C. randalli*
- 11a Head and body dark brown; caudal fin brilliant yellow (pale in preservative), contrasting sharply with brown body; pelvic fins brown *C. heemstraorum*
- 11b Head tan, body tan anteriorly and pinkish posteriorly; caudal fin pale yellowish to pinkish, not contrasting with body colour; pelvic fins pale to dusky *C. auritus*

Cirripectes auritus Carlson 1981

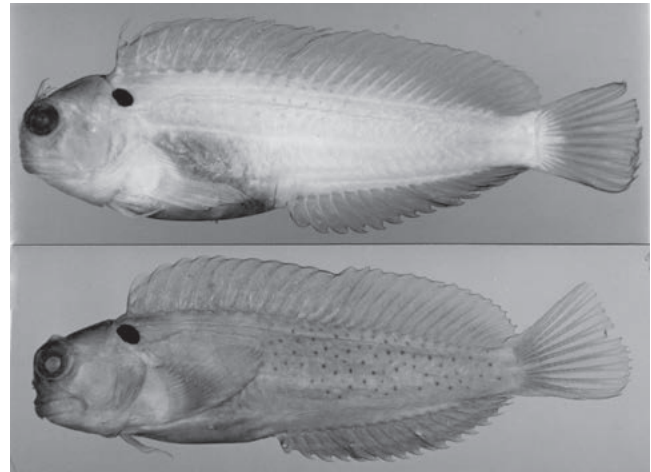
Blackflap blenny

PLATE 130

Cirripectes auritus Carlson 1981: 408, Figs. 1–3 (Fanning I., Line Is.);
SSF No. 235.8*; Williams 1988*; Heemstra & Heemstra 2004*.

Dorsal fin 12 or 13 spines, 15–17 rays, fin continuous; anal fin 2 spines, 16–18 rays; pectoral fins 15 rays; pelvic fins 1 spine, 4 rays. Large fleshy (black) flap on each side of nape, fringed with tiny cirri forming (yellow) margin on each flap; total cirri on nape < 35 ; supraorbital cirri 2–7; nasal cirri 4–6.

WIO specimens: adults pale brown, pinkish brown or mottled, but always with tiny dark brown spots on rear half to three-quarters of body; nuchal flap black; 2 pale bars from orbit onto upper lip, remainder of head brown with irregular pale bars and spots, and broad brown band on underside across throat; pelvic fins pale to dusky. Attains ~90 mm TL.



Cirripectes auritus, 50 mm SL, male (top); 4 cm SL, male (bottom)
(both South Africa). Source: SSF (by K Bruwelheide)

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (KwaZulu-Natal), Comoros, Mauritius and Maldives; elsewhere to Philippines and Line Is.

REMARKS Found on shallow coral reefs, to ~20 m deep.

Cirripectes castaneus (Valenciennes 1936)

Chestnut eyelash blenny

PLATE 130

Salaria sebae Valenciennes in Cuv. & Val. 1836: 323 [no locality given].

Salaria castaneus Valenciennes in Cuv. & Val. 1836: 324 (Mauritius, Mascarenes).

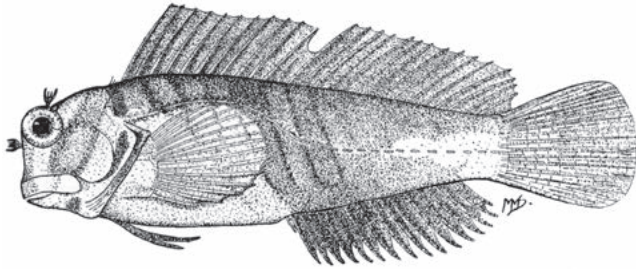
Cirripectes reticulatus Fowler 1946: 173, Fig. 39 (Aguni Shima, Ryukyu Is., Japan).

Cirripectes gibbifrons Smith 1947: 815 (Inhaca I., Mozambique).

Cirripectes castaneus: SSF No. 235.9*; Williams 1988*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004; Fricke *et al.* 2009.

Dorsal fin 11–13 spines, 13–15 rays; anal fin 2 spines, 14–16 rays; pectoral fins 15 rays; pelvic fins 1 spine, 4 rays. Cephalic sensory pore pattern simple; 1 pore behind lower part of each nuchal flap. Total cirri on nape 29–44; supraorbital cirri 6–49; nasal cirri 6–49. LL tubes 1–13, last tube at vertical at or beyond 6th dorsal-fin ray.

Head and body dark grey, with brown or reddish brown bars or spots. Males with alternating dark brown and paler bars on body, pale bars varying in colour (red, rusty brown, pinkish red, grey or yellow); tips of dorsal-fin rays and upper caudal-fin rays varying from bright yellow to red. Females uniformly brown or often with barred or reticulate patterns; head with pale greyish brown spots separated by narrow brown wavy lines or bars; sides of upper lip with pale bar below eyes; peduncle usually with pale spots on brown background. Attains ~95 mm TL.



Cirripectes castaneus, 76 mm TL, holotype of *Cirripectes gibbifrons* (S Mozambique). Source: Smith 1947

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to South Africa (Goss Point, Eastern Cape), Madagascar, Comoros, Seychelles, Mascarenes and India; not known from northern Arabian Sea and Persian/Arabian Gulf; elsewhere to southern Japan, Caroline Is., Australia, Lord Howe I. and Tonga.

REMARKS Found on shallow coral-reef crests.

Cirripectes filamentosus (Alleyne & Macleay 1877)

Filamentous blenny PLATE 130

Salarias filamentosus Alleyne & Macleay 1877: 337, Pl. 14, Fig. 1 (Cape York, Queensland, Australia).

Salarias cruentipinnis Day (ex Tickell) 1888: 797 (Saddle I., off Kyaukpyu, Myanmar).

Cirripectes filamentosus: Williams 1988*; Carpenter *et al.* 1997*; Heemstra *et al.* 2004.

Cirripectes castaneus (*non* Valenciennes 1836): Kuitert 1998*.

Dorsal fin 11–13 spines, 13–16 rays, fin slightly notched between spines and rays; anal fin 2 spines, 14–17 rays; pectoral fins 15 rays; pelvic fins 1 spine, 3 or 4 rays. Cephalic sensory pore system simple; 2 pores behind nuchal flap; total cirri on nape 22–39; supraorbital cirri 4–13; nasal cirri 4–34. LL tubes 0–8, last tube or end of lateral-line canal (if no tubes) between verticals at 12th dorsal-fin spine and 11th dorsal-fin ray (usually at dorsal-fin rays 2–6).

Adults dark brown; some specimens with faint darker brown stripe (its width subequal to eye diameter) on upper half of body from above pectoral-fin base nearly to caudal-fin base (stripe retained from juvenile patterns, but barely contrasting with dark body in adults); several pale brown spots (pupil-sized) frequently above pectoral-fin bases; head brown, with red spots (pale in preservative) on cheeks and around eyes, often with red streak (pale in preservative) from just behind eye to rear part of upper lip, in front of which may be 2 faint yellowish bars (pale in preservative) (width of each bar ~½ pupil diameter) under eye, one bar from posteroventral margin of eye to upper lip beneath middle of orbit, the other bar from anteroventral margin of eye onto upper lip near symphysis. Attains ~80 mm TL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea, Somalia, Kenya, Madagascar, Seychelles, Mauritius and Maldives; elsewhere to Philippines, Taiwan, southern Japan, Solomon Is. and Australia.

REMARKS Found on shallow coral-reef crests, to ~20 m deep.

Cirripectes gilberti Williams 1988

Carter's blenny

PLATE 130

Cirripectes gilberti Williams 1988: 41, Pl. 3d–e, Figs. 14–15 (Pulo Boenta, Sumatra, Indonesia).

Cirripectus fuscoguttatus (*non* Strasburg & Schultz 1953): Smith 1963*.

Dorsal fin 12 spines, 14 rays; anal fin 2 spines, 15 rays; pectoral fins 15 rays; pelvic fins 1 spine, 4 rays. Cephalic sensory pore pattern complex. Lateralmost nuchal cirri a greatly expanded fleshy flap; total cirri on nape 50–64, and cirri in 4 groups: 2 or 3 groups may be connected basally by a slightly notched membrane, uppermost groups usually overlap at midpoint on nape, and lowermost group on each side borne on expanded nuchal flaps; supraorbital cirri 17–48; nasal cirri 11–37. LL tubes 7–14, last tube usually on peduncle.

Males with uniformly dark brown head, body and median fins, except tips of dorsal-fin rays and uppermost caudal-fin rays pale. Females with head and body mottled pale olive and dark brown, throat and belly white; head and body entirely covered with reddish orange spots (spots progressively reddish brown then dark brown posteriorly), and series of similar orangish brown spots on dorsal, anal, caudal and pectoral fins; tips of dorsal-fin spines yellow, ray tips orange; tips of lowermost pectoral-fin rays orange; caudal fin dusky orange, uppermost rays bright orange. Attains ~11 cm TL.



Cirripectes gilberti (Christmas I.). © GR Allen

DISTRIBUTION Indian Ocean: South Africa (Sodwana Bay), Comoros, Seychelles, St Brandon Shoals and Chagos; elsewhere to Christmas I. and western Indonesia.

REMARKS Found on shallow rocky and coral reefs, to ~8 m deep.

Cirripectes heemstraorum Williams 2010

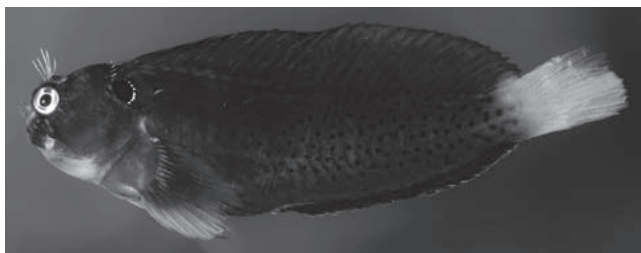
Yellowtail blenny

PLATE 131

Cirripectes heemstraorum Williams 2010: 5, Figs. 1–3 (Cape Vidal, KwaZulu-Natal, South Africa).

Dorsal fin 12 spines, 16 rays, fin continuous; anal fin 2 spines, 17 rays; pectoral fins 15 rays. Large fleshy (black) flap on either side of nape, with tiny cirri forming (yellow) fringe at margin of each flap, and 10–13 independently distributed cirri between flaps; total cirri on nape <31; supraorbital cirri 5 or 6; nasal cirri 6–8. LL tubes 4–14, last tube between verticals at dorsal-fin rays 4–16; no scale-like flaps along lateral line.

Adults dark orange-brown, with tiny dark brown spots on rear half to three-quarters of body (in males, spots on peduncle coalescing into short black stripes); head slightly paler brown, with whitish bar on sides of upper lip, short whitish streaks from eyes; nuchal flap black with yellow fringe; dorsal and anal fins darker brown, anal-fin rugosities of males black; caudal fin of males dusky brown basally, outer half yellow; caudal fin of females brilliant yellow. Attains ~80 mm TL.



Cirripectes heemstraorum, 54 mm SL, paratype (South Africa).

PC Heemstra © NRF-SAIAB

DISTRIBUTION Indian Ocean: South Africa (KwaZulu-Natal) in WIO; and Indonesia (photographs only).

REMARKS Known in South Africa from artificial reefs, in 17–30 m; elsewhere photographed on coral and rocky reefs, by JE Randall at Pura, Indonesia, in 2.5 m, and by GE Barrall at Wayag I., Indonesia.

Cirripectes perustus Smith 1959

Flaming blenny

PLATE 131

Cirripectes perustus Smith 1959: 238, Pl. 17, Fig. 5 (Malindi, Kenya); Williams 1988*; Winterbottom *et al.* 1989*.

Dorsal fin 11 or 12 spines, 14 or 15 rays, fin continuous; anal fin 2 spines, 14–16 rays; pectoral fins 15 rays; pelvic fins 1 spine, 3 rays. Cephalic sensory pore system simple; 2 pores on body behind nuchal flap. Total cirri on nape 30–46, in 3 or 4 groups (3-group condition results from fusion of bases of uppermost groups of cirri at apex of nape; 4-group condition frequently has uppermost groups of cirri meeting or overlapping at apex of nape); supraorbital cirri 6–23; nasal cirri 5–25. LL tubes 0–3, last tube (end of lateral line) between verticals at dorsal-fin rays 5–11.

Males with head, anterior half of body and dorsal fin yellow; rear half of body and dorsal fin and caudal fin reddish brown to brown (preserved specimens uniformly brown); tips of dorsal- and anal-fin rays orange; pectoral fins yellow, the tips of ~5 lowermost rays streaked red; pelvic fins yellow basally, red distally; fleshy swellings (rugosities) on anal-fin spines red; nuchal and nasal cirri reddish brown; supraorbital cirri red-orange. Females with brown head and body, with darker brown spots (~1 mm diameter); narrow, diagonal, pale bar extending anteroventrally from nape, along rear margin of orbit, onto rear part of upper lip; dorsal fin dark brown with pale stripe near base; other colours as for males. Attains ~85 mm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya, Madagascar, Seychelles and Chagos; elsewhere to Nicobar Is., Philippines, Caroline Is., New Guinea and Kiribati.

REMARKS Found on shallow coral-reef crests, to ~25 m deep.

Cirripectes polyzona (Bleeker 1868)

Barred blenny

PLATE 131

Salarias (*Cirripectes*) *polyzona* Bleeker 1868: 278 (Ambon I., Moluccas, Indonesia).

Cirripectes polyzona: Williams 1988*; Winterbottom *et al.* 1989*; Fricke *et al.* 2009.

Dorsal fin 11–13 spines, 13–15 rays; anal fin 2 spines, 14–16 rays; pectoral fins 15 rays; pelvic fins 1 spine, 3 rays. Cephalic sensory pore system complex; 1 pore behind ventral edge of lowermost group of nuchal cirri. Total cirri on nape 32–44, in 4 groups, with slightly expanded nuchal flap; supraorbital cirri 4–15; nasal cirri 5–24. LL tubes 2–9, last tube (end of lateral line) between verticals at 7th dorsal-fin ray and caudal-fin base (usually between dorsal-fin rays 8–13).

Young (<4.5 cm SL) with reddish brown spot above pectoral-fin base; reddish brown stripe (its width ~1½ pupil diameter) from behind that spot to above pectoral-fin base and to end of caudal-fin rays, stripe becoming black posteriorly, and frequently broken (starting with rounded spot above pectoral-fin base); body tan above stripe and white to lavender below (generally paler above stripe than below it); small pale yellow spots on sides and underside of head; pale bar beneath eyes; reddish brown reticulations on snout; reddish brown bars on upper part of cheeks and nape; lowermost nuchal cirri with narrow yellow-orange band basally, remainder of cirri and their bases dark brown; iris with inner yellow ring and outer red ring; pectoral fins and upper caudal-fin rays with yellowish tint. Adults with stripe breaking into distinct dark bars on body, otherwise similar to striped juvenile phase except reddish brown reticulations and bars on head more pronounced; pectoral-fin base with 2 reddish brown bars; spot above pectoral-fin base and subsequent bars purplish black to dark brown. Attains ~75 mm TL.

DISTRIBUTION Indo-Pacific. WIO: Gulf of Aden, Kenya to South Africa, Comoros, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Indonesia, southern Japan, Marshall Is., Australia and Line Is.

REMARKS Found on shallow coral-reef crests, to ~3 m deep.

Cirripectes quagga (Fowler & Ball 1924)

Squiggly blenny

PLATE 131

Rupiscartes quagga Fowler & Ball 1924: 273 (Wake I.).

Cirripectes quagga: Williams 1988*; Winterbottom *et al.* 1989*; Heemstra & Heemstra 2004; Fricke *et al.* 2009.

Dorsal fin 11–13 spines (1st spine elongate in males), 14–16 rays; anal fin 2 spines, 15–17 rays; pectoral fins 15 rays; pelvic fins 1 spine, 4 rays. Lower lip crenulate medially. Cephalic sensory pore system complex; 2 pores behind ventral edge of lowermost group of nuchal cirri. Total cirri on nape 23–36, in 2 groups separated at midpoint, no nuchal flap; supraorbital cirri 2–15; nasal cirri 6–16. LL tubes 7–18, last tube (end of lateral line) between verticals at 7th dorsal-fin ray and caudal-fin base (usually at 11th dorsal-fin ray).

Adults and juveniles of both sexes show extreme variability in body colour pattern, within and among populations. Head usually with pale and dark brown bars, sometimes broken into spots; ocellated spot occasionally present on opercle; underside of head uniformly brown or with 1–3 dark brown bars with pale interspaces; branchiostegal membranes with pale margin, frequently preceded by brown bar between lower edges of opercle; nasal and supraorbital cirri brown, nuchal cirri brown to black. Body pigmentation variable: some fish uniformly dark brown, some with ~12–14 dark brown bars with pale interspaces, the interspaces frequently reduced to vertical rows of small pale spots (~1 mm diameter), and other fish with bright yellow to tan area posteriorly on body (from beneath dorsal-fin rays 11–13 to caudal-fin base), bordered anteriorly by 1 or 2 broad dark brown bars on upper half of body; tips of anterior dorsal-fin spines yellow to red-orange, remainder of fin brown; distal half of upper (and sometimes lower) caudal-fin rays yellow to red-orange, the remainder of fin brown; pelvic and pectoral fins dusky, with dark brown band on tips of lowermost pectoral-fin rays; anal fin dark brown, spine rugosities pale to brown. Attains ~80 mm TL.

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Sodwana Bay), Comoros, Seychelles, Mauritius, Réunion, St Brandon Shoals, Chagos, southern India and Sri Lanka; elsewhere to Taiwan, Great Barrier Reef, Pitcairn Is., Marquesas Is. and Hawaii.

REMARKS Found on shallow coral-reef crests, to ~10 m deep.

Cirripectes randalli Williams 1988

Randall's blenny

PLATE 131

Cirripectes randalli Williams 1988: 60, Pl. 5g–h, Fig. 6a

(coral surge channel off Raphael I., St Brandon Shoals); Williams 1988*; Fricke *et al.* 2009.

Dorsal fin 12 spines, 14 or 15 rays; anal fin 2 spines, 15 or 16 rays; pectoral fins 15 rays; pelvic fins 1 spine, 4 rays. Cephalic sensory pore pattern complex. Lateralmost cirri a

small fleshy flap; total cirri on nape 36–42, in 4 groups with lowermost group of cirri on slightly expanded nuchal flap; supraorbital cirri 12–26; nasal cirri 10–18. LL tubes 1–7, last tube usually at caudal-fin base.

Males uniformly dark brown with small darker brown spots on body (not continuing onto median fins); head dark brown, with a few scattered pale spots on cheeks and narrow pale bars on upper lip. Females with dense covering of pupil-sized dark brown spots over body, overlying ~6–8 slightly irregular, broad, brown bars and pale interspaces (~½ width of bars); spots extend about halfway onto all median fins; head brown, with faint brown diagonal bar from nape to rear part of upper lip; head and throat covered with small dark brown or pale spots (~½ pupil diameter); 8–10 narrow bars (pale or dark brown) on upper lip. Attains ~10 cm TL.

DISTRIBUTION WIO: Réunion, Mauritius and St Brandon Shoals.

REMARKS Found on shallow rocky and coral reefs, to ~8 m deep.

Cirripectes stigmaticus Strasburg & Schultz 1953

Red-streaked blenny

PLATE 131

Cirripectes stigmaticus Strasburg & Schultz 1953: 132, Fig. 2 (lagoon reef at Rongerik Atoll, Marshall Is.).

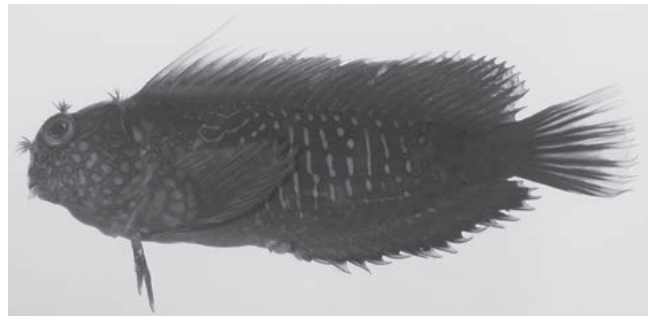
Cirripectes cruentus Smith 1959: 238, Pl. 18f (Pinda, Mozambique).

Cirripectes stigmaticus: Williams 1988*; Winterbottom *et al.* 1989*; Kuitert 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004; Fricke *et al.* 2009.

Dorsal fin 11–13 spines, 14–16 rays; anal fin 2 spines, 15–17 rays; pectoral fins 15 rays; pelvic fins 1 spine, 4 rays. Lower lip smooth medially. Cephalic sensory pore system simple; 1 pore behind ventral edge of lowermost group of cirri. Total cirri on nape 34–47, in 4 groups: lowermost group on each side on slightly expanded nuchal flap; supraorbital cirri 7–22; nasal cirri 8–29. LL tubes 1–10, last tube (end of lateral line) between verticals at 7th dorsal-fin ray and caudal-fin base (usually between dorsal-fin rays 9 and 15).

Males with dark brown head and body and reddish reticulations, and rear half of body with bright red spots and wavy lines; bright red spots and lines extending onto base of soft-rayed dorsal fin, rays bright red above these lines, yellowish orange at tips, membranes brown; tips of anterior dorsal-fin spines yellowish orange; tips of upper and lower caudal-fin rays yellow to orange, remainder of fin bright red; anal fin with bright red spots basally, and orange line submarginally; tips of lower pectoral-fin rays orange, tips

of upper rays yellow; pelvic fins brown with bright red line submarginally; anal-fin spine rugosities brown. Females greyish brown with rust-coloured reticulations on head and anterior half of body enclosing pale olive spots; spots become larger and less defined near midbody and reticulations begin to break apart; reticulations near caudal-fin base reduced to several brown spots and short wavy lines on yellowish brown background; nuchal cirri black, lowermost group with yellow bar basally on each cirrus; tips of dorsal-fin spines and rays yellowish orange, most rays with red line on basal third, remainder of fin yellowish brown; anal fin dusky brown with 2 longitudinal red lines; caudal fin yellow basally, uppermost and lowermost rays orange, and distal half of other rays yellowish orange. Attains ~10.5 cm TL.



Cirripectes stigmaticus, 73 mm SL (Rodrigues). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa (Sodwana Bay), Madagascar, Comoros, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to southern Japan, Marshall Is. and Samoa.

REMARKS Found on shallow coral-reef crests, to ~20 m deep.

GENUS *Cirrisalarias* Springer 1976

All fin rays unbranched. Supraorbital cirri usually branched, occasionally simple; clumps of cirri on nostrils give appearance of bushy pad; no cirri on nape; no fleshy blade-like crest on head. Lateral line of 1 or 2 bipored tubes below front end of dorsal fin; median supratemporal pore present. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body well in front of caudal-fin base. Dorsal fin usually 12 (rarely 10 or 11) spines, 16 or 17 rays, fin weakly notched between spines and rays; anal fin 2 spines, usually 18 (rarely 17 or 19) rays; pectoral fins 14 rays, uppermost ray tiny (difficult to see); pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 13 rays. Teeth firmly

implanted; premaxillary teeth 23–28, dentary teeth 22–26; no canines at rear in either jaw; no teeth on vomer. Infraorbital bones 4. Gill opening continuous across isthmus. One species.

Cirrisalarias bunares Springer 1976

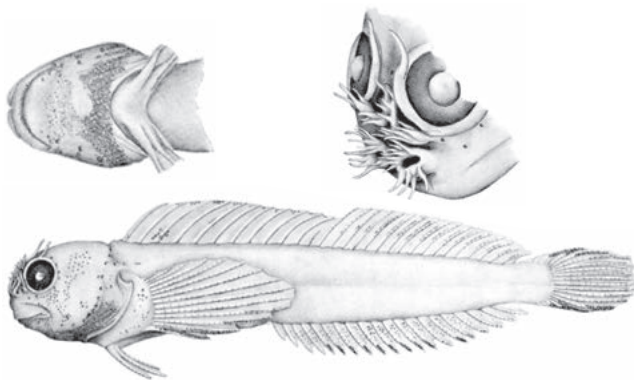
Frilly-nose blenny

PLATE 132

Cirrisalarias bunares Springer 1976: 202, Fig. 1 (N'Gouni Reef, Grande Comore, Comoros); Fricke 1999.

Diagnosis as for genus.

Fresh specimen from Tonga: most conspicuous for presence of 7 broad, irregular, brownish bands on body, separated below midline by roughly equal whitish interspaces with pale yellowish inclusions; extensions of bands enter dorsal and anal fins; fine black stripe on most bands and body midline; head brownish anterolaterally, cheeks white; upper and lower caudal-fin lobes dark brown, fin base with vertical dark brown line. Preserved specimens pale and mostly plain, with melanophores notably concentrated along upper and lower edges of caudal fin; dusky patch on underside of head of males; melanophores variably along dorsal-, anal- and pectoral-fin rays. Attains 35 mm TL (few specimens >20 mm SL).



Cirrisalarias bunares, 17 mm SL, paratype (Comoros).

Source: Springer 1976 (by JR Schroeder, FIN17771); © Proc. Biol. Soc. Wash., Allen Press Publ. Services

DISTRIBUTION Indo-Pacific (widespread but with large gaps). WIO: Comoros, Réunion, Mauritius and Sri Lanka; elsewhere, Christmas I., Similan Is. (Thailand), Batanes Is. (northernmost Philippines), Santa Cruz Is. (Solomon Is.), Fiji, Tonga and Samoa. Apparently absent from Indonesia, Philippines south of Batanes Is., Taiwan, Ryukyu Is. and Great Barrier Reef.

REMARKS Tiny; associated with surge zones, tidepools, and spur and groove habitats near coral reefs, at 2–10 m.

GENUS *Dodekablennos*

Springer & Spreitzer 1978

Fin rays unbranched, except 2–6 caudal-fin rays may be branched. No cirri on nape, eyes or interorbital area; tiny cirrus on rim of anterior nostril; fleshy blade-like crest on head present in males only. Infraorbital bones 5. Gill openings unrestricted. Lateral line of continuous tubes dorsoanteriorly to below ~6th dorsal-fin spine, followed by 0–3 bipored tubes to below ~8th dorsal-fin spine; median supratemporal pore present. Dorsal and anal fins attached by membrane to body well in front of caudal-fin base. Dorsal fin usually 12 spines, 18–20 rays, fin notched (halfway) between spines and rays; anal fin 2 spines, 20–22 (rarely 22) rays; pectoral fins 12 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 12 rays (2–8 rays weakly forked). Free margin of upper lip smooth. Teeth movably attached to jaws: premaxillary teeth 55–65, dentary teeth 44–51; enlarged canines at rear of lower jaw only; teeth present on vomer (difficult to see except in skeletal preparations). One species.

Dodekablennos fraseri Springer & Spreitzer 1978

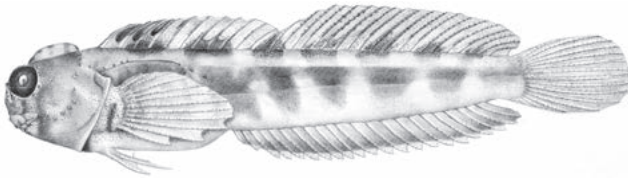
Fraser's blenny

PLATE 132

Dodekablennos fraseri Springer & Spreitzer 1978: 11, Fig. 5 (tidepool at Jacotet Bay, Mauritius, Mascarenes); Fricke 1999; Fricke *et al.* 2009.

Diagnosis as for genus.

Preserved specimens (males): upper lip with 5 short, fine, dark bands (2 on each side, 1 in middle); just above middle band on each side, a short, fine, dark dorsolaterally oriented stripe; other scattered fine dark spots anteriorly on head extending onto fleshy blade-like crest; 2 fine dark spots on each side of lower lip aligned with pair of fine dark bands on each side of upper lip; medial pair of lower lip spots converge to form chevron on underside of head; diffuse dusky spot behind eyes; body with 6–8 dark bands, some extending onto dorsal fin: anteriormost band under front end of dorsal fin, posterior 2 bands may split dorsally, and posteriormost band may continue as dark spot onto caudal-fin base; dorsal fin with dark spot on anteriormost 1–3 membranes; anal fin with dusky stripe submarginally; pectoral fins with dark stripe on fleshy base; pelvic fins and caudal-fin rays dusky. Preserved females similar to males but paler, most dark markings indistinct, and without dark spot on anterior dorsal-fin membranes. Attains at least 40 mm SL.



Dodekablennios fraseri, 30 mm SL, male (Mauritius).
Source: Springer & Spreitzer 1978 (by JR Schroeder)

DISTRIBUTION WIO: Réunion and Mauritius.

REMARKS Known from shallow tidepools and rocky nearshore areas.

GENUS *Ecsenius* McCulloch 1923

All fin rays unbranched; uppermost and lowermost caudal-fin rays frequently exerted or filamentous (particularly in males). Cirri on head present only as 1 or 2 filaments on rim of anterior nostril; no fleshy blade-like crest on head. Free margin of upper lip smooth. Lateral line restricted to body dorsoanteriorly, extending at most to below base of 1st dorsal-fin ray. Lower jaw with canines at rear and at front (the latter frequently difficult to distinguish from the fine moveable incisors). Premaxillary teeth 26–34 or 100+, no canines at rear; dentary teeth 11–14 (rarely 11 or 12) or 29–64, including canines at front but excluding canines at rear; no teeth on vomer. Dorsal fin 10–14 (usually 12 or 13) spines, 12–21 rays, total elements 24–34; anal fin 2 spines (1st reduced and usually not visible in females), 13–23 rays; pectoral fins 12–16 rays; caudal fin 12–15 rays (usually 13 or 14 rays, depending on species). Infraorbital bones 4. Median ethmoid absent. Medial end of each anterior 3 or 4 epineurals raised dorsally at its attachment to associated pleural rib. Maximum size ~8 cm SL (most <6 cm SL). Usually associated with coral reefs, generally in <40 m. Genus last revised by Springer (1988), but several species have been described since then. At least 53 species, 11 in WIO.

KEY TO SPECIES

- 1a Lower jaw incisors + anterior canines 11–14, canines at front prominent; dorsal fin not notched between spines and rays; maximum size ~8 cm SL *E. midas*
- 1b Lower jaw incisors + anterior canines 35–64, canines at front subequal to adjacent incisors; dorsal fin not notched to deeply notched; maximum size <8 cm SL, most species ~6 cm SL ... 2

Continued ...

KEY TO SPECIES

- 2a Anterior nostril with 2 cirri on rim; LL pores in vertical pairs; caudal fin usually 14 (rarely 13) rays *E. bicolor*
- 2b Anterior nostril with 1 cirrus on rim; LL pores not in vertical pairs; caudal fin usually 13 (rarely 12 or 14) rays 3
- 3a Dorsal fin not notched between spines and rays; pectoral fins 14–16 (usually 15 or 16) rays *E. frontalis*
- 3b Dorsal fin notched between spines and rays; pectoral fins 12–14 (usually 13) rays 4
- 4a Dorsal fin 16–20 rays; anal fin 18–23 rays 5
- 4b Dorsal fin 12–15 rays; anal fin 13–17 rays 8
- 5a Dorsal fin usually 12 (rarely 13) spines; 8 or 9 sub-quadrate black blotches along entire midlength of body and on to midbase of caudal-fin rays, or less commonly the blotches replaced by dark stripe from eye to base of middle caudal-fin rays *E. lineatus*
- 5b Dorsal fin usually 13 (12–14) spines; no series of black blotches along midsides, and dark stripe, when present, attenuates to fine point well onto middle caudal-fin rays 6
- 6a Dorsal-fin interspinous membranes with series of black spots or streaks (progressively paler posteriorly); uppermost and lowermost caudal-fin rays distinctly dusky to black; black bar through centre of eye (from 2 to 7 o'clock positions), usually connecting to finer black stripe from rear of eye and along upper body, ending well before caudal-fin base but breaking into round black spots towards peduncle *E. gravieri*
- 6b No black spots or streaks in dorsal-fin membranes; uppermost and lowermost caudal-fin rays clear to faintly dusky; no dark bar through eyes, and no fine black stripe or series of round black spots on body 7
- 7a Dorsal fin 18–20 rays; anal fin 20–23 (usually 21 or 22) rays; pale ring around pupil with 5 evenly spaced pale spokes radiating outward, and no second pale ring surrounding tips of spokes (usually visible only in live specimens); head and body colour variable: uniformly purplish brown or posteriorly with brilliant yellow to reddish orange areas isolating several vertical purplish brown bands (yellow and red areas lost in preservative), or upper half of head and body more or less uniformly brownish and lower half white [the latter pattern may indicate an undescribed species from Socotra] *E. pulcher*
- 7b Dorsal fin 16–18 rays; anal fin 19 or 20 rays; pale ring around pupil without pale spokes radiating outward, and second pale ring around iris separate from pale ring around pupil; front of head dusky with bluish overtones, rest of head and body brownish, with diffuse dark dusky spot at caudal-fin base *E. aroni*

Continued ...

KEY TO SPECIES

- 8a Pectoral-fin bases with horizontally oriented Y-shaped dark mark (arms directed posteriorly) *E. yaeyamaensis*
- 8b Mid-pectoral-fin bases with horizontal dark stripe 9

- 9a Dark line curving from above opercle on each side joining underneath head behind chin *E. minutus*
- 9b Dark line curving from middle of opercular margin on each side joining underneath head 10

- 10a Moveable teeth in lower jaw 49–59 (rarely <51) in males, 53–63 in females *E. dentex*
- 10b Moveable teeth in lower jaw 41–52 (rarely 52) in males, 45–54 in females *E. nalolo*

Ecsenius aroni Springer 1971

Aron's blenny

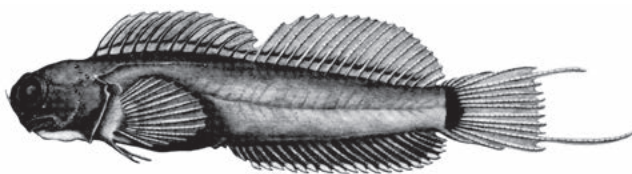
PLATE 132

Ecsenius (Ecsenius) aroni Springer 1971: 24, Fig. 19 (El Himeira, Gulf of Aqaba, Red Sea).

Ecsenius aroni: Randall 1983*; Springer 1988*, 1989*; Debelius 1993; Lieske & Myers 2004*.

Dorsal fin 12 or 13 spines, 16–18 rays, fin notched between spines and rays; anal fin 2 spines, 19 or 20 rays; pectoral fins 13–15 rays; caudal fin 13 rays. Upper jaw teeth 100+; lower jaw teeth 49–57 (not including canines at rear), canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rim. LL pores not paired vertically.

Front of head darkly dusky with bluish overtones, remainder of head and body orangish brown, with diffuse dark dusky spot at caudal-fin base, and pale to whitish ventrally; occasionally with fine yellow-orange stripe on dorsal body contour at dorsal-fin base; fins hyaline, rays dusky; in life, outer pale ring around iris separated by dark ring from fine pale ring around pupil. Attains ~40 mm SL.



Ecsenius aroni, 37 mm SL, male (Gulf of Aqaba).

Source: Springer 1988 (by JR Schroeder, FIN18637)

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba to Jeddah, Saudi Arabia, and Towartit Reef, Sudan).

REMARKS Usually found in 10–37 m.

Ecsenius bicolor (Day 1888)

Bicolour blenny

PLATE 132

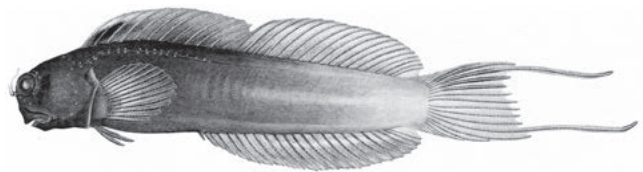
Salarias bicolor Day (ex Tickell) 1888: 798 (Saddle I., off Kyaukpyu, Myanmar).

Salarias furcatus Johnstone 1904: 213, Pl. 1, Fig. 4 (Chilaw Paar, Gulf of Mannar, Sri Lanka) [objectively invalid; preoccupied by *Salarias furcatus* De Vis 1884].

Ecsenius bicolor: Springer 1971, 1988*; McKinney & Springer 1976*; Kuitert 1998*.

Dorsal fin 11 or 12 spines, 16–18 rays, fin moderately notched between spines and rays; anal fin 2 spines, 18–20 rays; pectoral fins 12–14 rays; caudal fin 13 or 14 rays. Upper jaw teeth 100+; lower jaw teeth 35–46 (not including canines at rear), canines at front subequal to adjacent teeth. Anterior nostril with 2 simple cirri on rim. LL pores paired vertically.

Three colour forms, all forms without pale spokes radiating from pupil or pale stripes passing through iris; black spot present in anteriormost interspinous membranes of dorsal fin; and frequently with slender pinkish crescentic mark parallelling, but slightly separated from, rear orbital margin. Bicolour form: head and body to beneath anterior dorsal-fin rays dark grey (may appear bluish in natural light), then body abruptly orange-yellow posteriorly. Uniform colour form with dark brown head and body, but head with pinkish overtones. Striped form (least common) with head dark brown dorsally and upper half of body dark brown to black for most of body length, then changing to bright orange posteriorly; sides and underside of head pale pinkish grey to white, and extending onto body as brilliant white stripe-like area (beneath black and then orange area of upper body); body pale greyish to pinkish below the white stripe. Attains ~75 mm SL (usually <60 mm SL).



Ecsenius bicolor, 66 mm SL, male (Australia).

Source: Springer 1988 (by SL Chambers)

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to Myanmar, Indonesia, Philippines, Taiwan, Ryukyu Is., Marshall Is., Australia and Samoa.

REMARKS Found in 1–25 m.

Ecsenius dentex Springer 1988

Red Sea combtooth blenny

PLATE 132

Ecsenius dentex Springer 1988: 69, Pl. 8, Fig. 4 (reef near Marsa el Muqabila, Egypt, Gulf of Aqaba, Red Sea); Springer 1989*; Debelius 1993*; Lieske & Myers 2004*.

Ecsenius nalolo (non Smith 1959): Springer 1971 [in part].

Dorsal fin 11–13 spines, 13–15 rays, fin deeply notched between spines and rays; anal fin 2 spines, 15–17 rays; pectoral fins 12–14 rays; caudal fin 13 rays. Upper jaw teeth 100+; lower jaw teeth (not including canines at rear) 49–59 in males, 53–63 (usually >56) in females, and canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rear rim. LL pores not paired vertically.

Colour pattern highly variable, and strongly resembles *E. nalolo*, *E. yaeyamaensis* and *E. minutus*; fleshy pectoral-fin base with horizontal dark stripe (dash-shaped mark) extending onto middle fin ray, and dark spot often present on rays above and below stripe; dark line curving from middle of opercular margin on each side joining underneath head. Attains ~50 mm SL, 65 mm TL.



Ecsenius dentex, 37 mm SL, female (Red Sea).

Source: Springer 1988 (by TB Griswold)

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba and adjacent northeastern coast).

REMARKS Type specimens collected in ~4 m.

Ecsenius frontalis (Valenciennes 1836)

Smooth-fin blenny

PLATES 132 & 133

Salarias frontalis Valenciennes (ex Ehrenberg) in Cuv. & Val. 1836: 328 (Massawa, Eritrea, Red Sea).

Salarias nigrovittatus Rüppell 1838: 136 (Massawa, Eritrea, Red Sea).

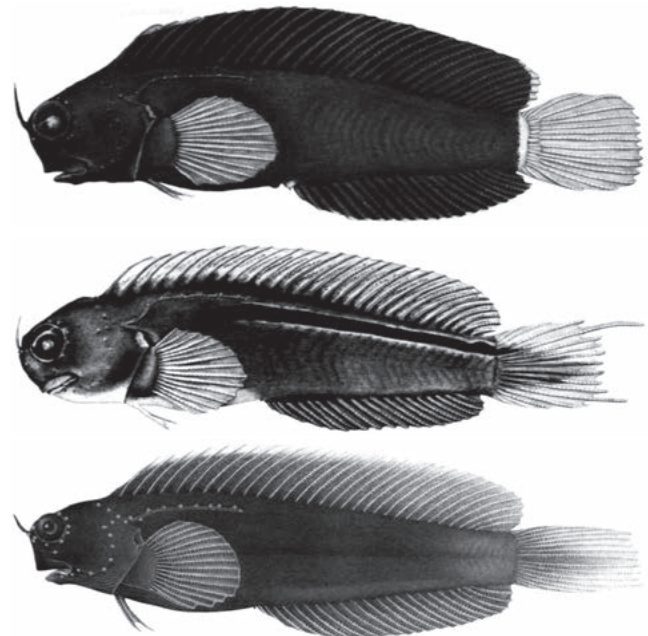
Ecsenius albicaudatus Lotan 1970: 372, Fig. 5 (Marsa Murach, Egypt, Gulf of Aqaba, Red Sea).

Ecsenius frontalis: Lotan 1970; Springer 1971*, 1988*, 1989; Randall 1983*; Lieske & Myers 2004*.

Ecsenius nigrovittatus: Lotan 1970*.

Dorsal fin 10–13 spines, 18–21 rays, fin only slightly notched between spines and rays; anal fin 2 spines, 17–22 rays; pectoral fins 14–16 rays; caudal fin 13 or 14 rays. Upper jaw teeth 100+; lower jaw teeth 40–53 (not including canines at rear), canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rim. LL pores not paired vertically.

Three colour forms, all forms with fine pale stripe passing above and below pupil. *Frontalis* form (most common): head bluish brown, grading to brownish or orangish brown on body, and orange on peduncle and caudal fin. *Albicaudatus* form: most of head and body dark brown or blackish, intensely black near caudal-fin base, with slender white area at caudal-fin base, and caudal fin unmarked. *Nigrovittatus* form (unknown from the Gulf of Aqaba): head orangish brown, body brownish grey, with pale-edged dark stripe dorsally on body beginning near midlength and extending to caudal fin. Attains ~70 mm SL.



Ecsenius frontalis, 37 mm SL, female (top); 39 mm SL, male (middle); 59 mm SL, male (bottom) (all Red Sea).

Source: Springer 1988 (top, by JR Schroeder, FIN18641; middle, by JR Schroeder, FIN18642; bottom, by MH Lester, FIN18636)

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba to Gulf of Tadjoura) and Gulf of Aden (one record).

REMARKS Found in 3–27 m.

Ecsenius gravieri (Pellegrin 1906)

Red Sea mimic blenny

PLATE 133

Salarias gravieri Pellegrin 1906: 93 (Gulf of Tadjoura, Djibouti, Gulf of Aden).

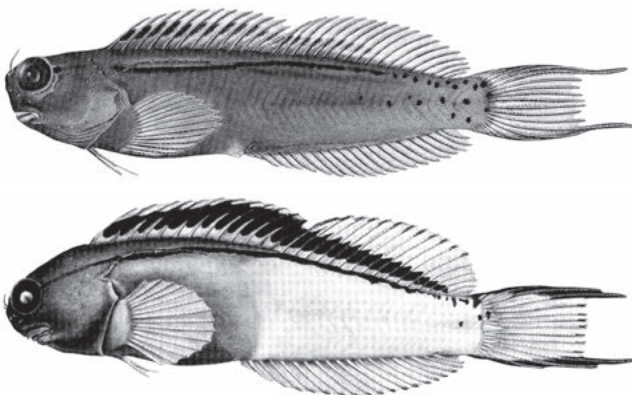
Ecsenius klausewitzi Lotan 1970: 371, Fig. 4 (Entedebir I., Dahlak Archipelago, Eritrea, Red Sea).

Ecsenius gravieri: ?Smith 1959*; Springer 1971*, 1988*, 1989*; Springer & Smith-Vaniz 1972*; Randall 1983*; Debelius 1993*; Lieske & Myers 2004.

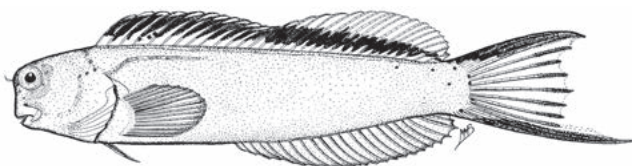
Ecsenius nigrovittatus (non Rüppell 1838): Klausewitz 1960*.

Dorsal fin 12–14 spines, 18–20 rays, fin notched between spines and rays; anal fin 2 spines, 19–23 rays; pectoral fins 13–15 rays; caudal fin 13–15 rays. Upper jaw teeth 100+; lower jaw teeth 44–54 (not including canines at rear), canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rear rim. LL pores not paired vertically.

Head and front half of body bluish or bluish grey, rear half of body yellowish; black stripe divides eye diagonally and continues along upper part of head and body, extending for variable distance along body, but usually represented on rear portion by isolated black spots; dorsal-fin membranes with black spots or streaks on spinous portion to half of soft-rayed portion (Gulf of Aqaba), or entire length of dorsal fin with continuous broad black stripe and occasionally dark spots distally on soft-rayed membranes (Red Sea to Gulf of Tadjoura); caudal-fin lobes dusky (Gulf of Aqaba) or black (Red Sea to Gulf of Tadjoura). Attains ~55 mm SL.



Ecsenius gravieri, 39 mm SL, male (top); 40 mm SL, female (bottom) (both Red Sea). Source: Springer 1988 (by SL Chambers)



Ecsenius gravieri, 75 mm TL, holotype (Gulf of Aden). Source: Smith 1959

DISTRIBUTION WIO: Red Sea (Gulf of Aqaba to Gulf of Tadjoura) and adjacent Gulf of Aden.

REMARKS Found to ~27 m deep. Mimics the slightly larger blackline fangblenny *Meiacanthus nigrolineatus* in both colouration and behaviour.

Ecsenius lineatus Klausewitz 1962

Lined blenny

PLATE 133

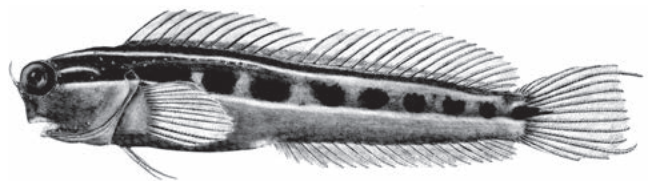
Ecsenius lineatus Klausewitz 1962: 145, Fig. 1 (lagoon reef at Madewaru I., Maldives); Springer 1988*, 1989*; Kuitert 1998*; Fricke 1999; Springer & Randall 1999; Fricke *et al.* 2009; Fricke *et al.* 2013.

Ecsenius pulcher [in part non Murray 1887]: Randall 1995* [only Fig. 893].

Ecsenius stigmatura [in part non Fowler in Chapman & Schultz 1952]: Springer 1971*.

Dorsal fin 12 or 13 spines, 16–19 rays, fin deeply notched between spines and rays; anal fin 2 spines, 18–20 rays; pectoral fins 12–14 rays; caudal fin 13 rays. Upper jaw teeth 100+; lower jaw teeth 45–51 (not including canines at rear), canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rim. LL pores not paired vertically.

Two colour forms, both forms with iris brilliant white below pupil, and occasionally with fine yellow border just below pupil margin; remainder of iris dark brown or black, variably with pale stripe through iris just above pupil, and 1 or 2 small pale yellow or white spots in iris above the pale stripe. Striped form: lower half of head and body brownish, with slender pale stripe; margining broad, dark-brown to black stripe extending from orbit to basal caudal-fin rays; pale pinstripe extending back from orbit dorsally near dorsal body contour; several broad diffusely dusky bands indicated on rear part of body. Banded form: whitish to tan on lower half of body, bordered dorsally by brilliant white stripe extending back from eyes; above this, broad black stripe extends back from eyes, becoming deeper on body, breaking into up to 8 squarish black blotches, last at caudal-fin base; area surrounding blotches yellow to olive-yellow. Attains ~65 mm SL.



Ecsenius lineatus, 48 mm SL, male (Taiwan). Source: Springer 1988 (by MR Davis)

DISTRIBUTION Indo-Pacific. WIO: southern Oman, Gulf of Aden, Mozambique Channel, Réunion, Mauritius, Maldives and Sri Lanka; elsewhere to Malaysia, Philippines, Taiwan and Ryukyu Is. and northwestern Australia.

REMARKS Found in 1–28 m.

Ecsenius midas Starck 1969

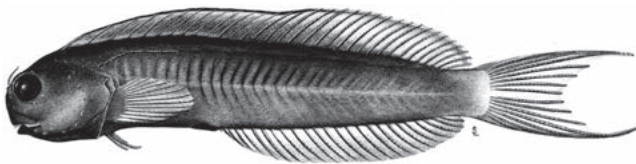
Golden blenny PLATE 133

Ecsenius (Anthiiblennius) midas Starck 1969: 2, Figs. 1, 3, 4 (D'Arros I., Amirante Is., Seychelles); Springer 1971*.

Ecsenius midas: McKinney & Springer 1976; Randall 1983*; SSF No. 235.10*; Springer 1988*, 1989*; Winterbottom *et al.* 1989*; Baissac 1990; Debelius 1993*; Kuitert 1998*; Fricke 1999; Winterbottom & Anderson 1999; Heemstra & Heemstra 2004*; Lieske & Myers 2004*; Fricke *et al.* 2009.

Dorsal fin 12–14 spines, 18–21 rays, dorsal fin continuous; anal fin 2 spines, 20–23 rays; pectoral fins 12–14 rays; caudal fin 13–15 rays. Upper jaw teeth 26–34; lower jaw teeth 13–16 (not including rear canines), canines at front about twice size of adjacent teeth. Anterior nostril with simple cirrus on rim. LL pores not paired vertically.

Colour highly variable: from entirely yellow to dusky brown dorsally and pale bluish elsewhere, with darker markings on body and dorsal fin, and irregular yellow spots on head; dusky diagonal band through eye, but not interrupting pale ring around pupil, and dusky band with narrow pale margin dorsoanteriorly and ventroposteriorly; dorsal fin with fine dark margin in all colour forms; dark dusky spot around and forward of anus. Attains ~85 mm SL.



Ecsenius midas, 75 mm SL, male (Seychelles).
Source: Springer 1988 (by SL Chambers)

DISTRIBUTION Indo-Pacific. WIO: Red Sea (Gulf of Aqaba), East Africa to South Africa (Sodwana Bay), Seychelles, Mascarenes, Chagos and Maldives; elsewhere to southern Japan, northern Australia, Tonga, Marquesas Is. and Line Is.; not known from Persian/Arabian Gulf, west and east coasts of India and Sri Lanka.

REMARKS Found in 2–40 m on coral reefs. Reported to mimic an anthiinine Anthiadidae.

Ecsenius minutus Klausewitz 1963

Little combtooth blenny PLATE 133

Ecsenius minutus Klausewitz 1963: 357, Figs. 1–2 (Addu Atoll, Maldives); Springer 1988*, 1989*; Kuitert 1998*; Seno 2000*.

Ecsenius nalolo (*non* Smith 1959): Springer 1971 [in part].

Dorsal fin 12 or 13 spines, 13 or 14 rays, fin deeply notched between spines and rays; anal fin 2 spines, 15 or 16 rays; pectoral fins 12–14 rays; caudal fin 13 rays. Upper jaw teeth 100+; lower jaw teeth (not including rear canines) 46–51 in males, 48–53 in females, and canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rear rim. LL pores not paired vertically.

Colour pattern highly variable, and strongly resembles *E. nalolo*, *E. yaeyamaensis* and *E. dentex*; fleshy pectoral-fin base with horizontal dark stripe (dash-shaped mark) extending onto middle fin ray, and dark spot often present on rays above and below stripe; dark line curving from middle of opercular margin on each side (not beginning at point beneath level of eyes) and joining underneath head. Attains ~35 mm SL, 40 mm TL.



Ecsenius minutus, 31 mm SL, male (Maldives).
Source: Springer 1988 (by TB Griswold)

DISTRIBUTION WIO: Maldives.

REMARKS Found in 1–10 m. Differs from *E. dentex* in having fewer teeth on lower jaw.

Ecsenius nalolo Smith 1959

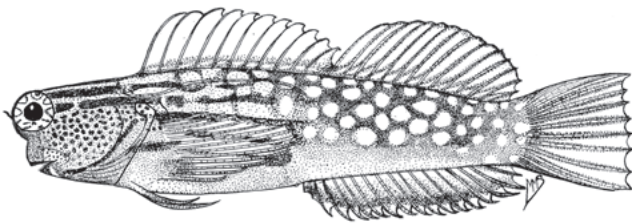
Nalolo blenny PLATE 133

Ecsenius nalolo Smith 1959: 245, Fig. 10 (Pinda, Mozambique); Springer 1971* [in part], 1988*, 1989*; Randall 1983*, 1995*; SSF No. 235.11*; Winterbottom *et al.* 1989*; Winterbottom & Anderson 1999.

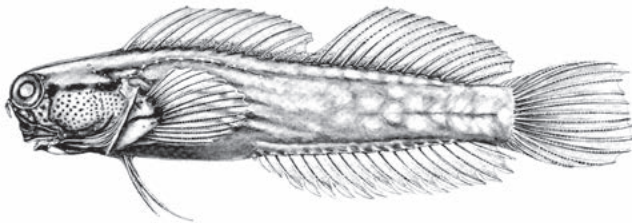
Dorsal fin 11–13 spines, 12–15 rays, fin deeply notched between spines and rays; anal fin 2 spines, 14–17 rays; pectoral

fins 12–14 rays; caudal fin 13 or (rarely) 14 rays. Upper jaw teeth 100+; lower jaw teeth (not including rear canines) 42–52 in males, 45–54 in females, and canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rear rim. LL pores not paired vertically.

Colour pattern highly variable, and strongly resembles *E. dentex*, *E. yaeyamaensis* and *E. minutus*; horizontal dark stripe (dash-shaped mark) on fleshy pectoral-fin base extending onto middle fin ray; dark spot often present on rays above and below the stripe; slender dark crescentic mark on head beginning at point beneath level of eyes. Attains ~55 mm SL.



Ecsenius nalolo, 50 mm TL, holotype (N Mozambique). Source: Smith 1959



Ecsenius nalolo, 43 mm SL (Aldabra). Source: Springer 1988 (by B Holden)

DISTRIBUTION WIO: Red Sea (not Gulf of Aqaba) to South Africa (Sodwana Bay), Comoros, Seychelles, Aldabra, St Brandon Shoals, Agaléga Is., Chagos and Maldives; not known from Persian/Arabian Gulf and Arabian Sea.

REMARKS Found to ~21 m deep.

Ecsenius pulcher (Murray 1887)

Gulf blenny

PLATES 133 & 134

Salarias pulcher Murray 1887: 47 (Manora Rocks, Karachi, Pakistan).

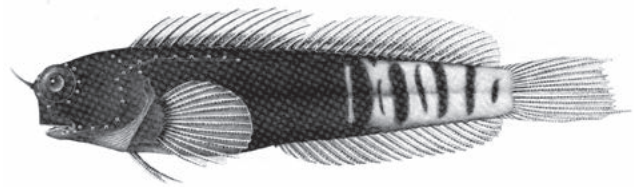
Salarias phantasticus Boulenger 1897: 422 (Makran coast, Iran, Persian/Arabian Gulf).

Salarias anomalus Regan 1905: 327, Pl. 2b, Fig. 4 (Makran coast, Iran, Persian/Arabian Gulf).

Ecsenius pulcher: Springer 1971*, 1988*, 1989*; Debelius 1993*; Randall 1995* [only Figs. 892, 894]; Carpenter *et al.* 1997*; Lieske & Myers 2004*.

Dorsal fin 12–14 spines, 16–19 rays, fin notched between spines and rays; anal fin 2 spines, 18–21 rays; pectoral fins 13–15 rays; caudal fin 13 rays. Upper jaw teeth 100+; lower jaw teeth 44–54 (not including rear canines), canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rear rim. LL pores not paired vertically.

In life, distinguished by 5 yellow evenly spaced spokes radiating from pupil across iris, and no pale ring surrounding tips of spokes; head and body colour variable: uniformly purplish brown, or with brilliant yellow to reddish orange areas posteriorly and isolating several vertical purplish brown bands, or upper half of head and body more or less uniformly brownish and lower half white; no dark dusky spot around anus. Attains at least 70 mm SL.



Ecsenius pulcher, 33 mm SL, male (Persian/Arabian Gulf).

Source: Springer 1988 (by MH Lester)

DISTRIBUTION WIO: southern Oman to Persian/Arabian Gulf and northwestern India.

REMARKS Found to ~25 m deep. Probably a species-complex.

Ecsenius yaeyamaensis (Aoyagi 1954)

Coral blenny

PLATE 134

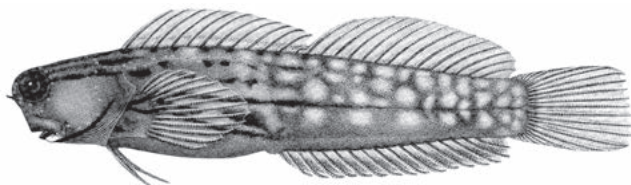
Salarias yaeyamaensis Aoyagi 1954: 213 [37], Figs. 2–3 (Iriomote I., Ryukyu Is., Japan)

Ecsenius yaeyamaensis: Springer 1971*, 1988*, 1989*.

Dorsal fin 11–13 spines, 13–15 rays, fin deeply notched between spines and rays; anal fin 2 spines, 14–17 rays; pectoral fins 12–13 (rarely 12); caudal fin 13 rays. Upper jaw teeth 100+; lower jaw teeth (not including rear canines) 41–52 (usually 44–50) in males, 44–54 (usually 47–52) in females, and canines at front subequal to adjacent teeth. Anterior nostril with simple cirrus on rear rim. LL pores not paired vertically.

Colour pattern highly variable, most consistent markings include: iris dark, punctuated with pale dash or spoke-like markings (more numerous dorsally than ventrally), and pale ring around pupil; head with slender dark crescentic mark from lower edge of opercle to chin; ≥2 broken dark stripes appearing as 1–3 dark spots (black, brown or rusty in life) from head to various length onto anterior half of body; occasionally

a pair of similar dark dusky spots on each side of body behind pectoral-fin base; cheeks plain or with fine dark spots; upper and rear half of body pale tan with whitish spots, which appear in irregular columns of 3 or 4 spots; fleshy pectoral-fin base with distinctive horizontally oriented Y-shaped dark mark (arms directed posteriorly). Attains ~50 mm SL.



Ecsenius yaeyamaensis, 43 mm SL (Taiwan).
Source: Springer 1988 (by MH Lester)

DISTRIBUTION Indo-Pacific. WIO: Sri Lanka; elsewhere to Gulf of Thailand, Malaysia, Indonesia, Taiwan, southern Japan, New Guinea, Australia and Vanuatu.

REMARKS Found to ~35 m deep.

GENUS *Enchelyurus* Peters 1869

All fin rays unbranched. No cirri or fleshy blade-like crest on head. Gill opening restricted to above level of lowermost pectoral-fin ray. Lateral line of 3–10 (rarely >8) bipored tubes dorsoanteriorly on body, extending at most to below 13th dorsal-fin element; line of pits occasionally present from end of lateral line for a variable distance; median supratemporal pore present. Free margin of upper lip smooth. Dorsal fin 6–11 (rarely 11) spines, 19–27 (rarely 19 or 27) rays, fin not notched between spines and rays; anal fin 2 spines, 18–24 rays; pectoral fins 13–17 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 2 rays; caudal fin 13 rays. Teeth firmly attached to jaws; small recurved canines at rear on each side of upper jaw, and much larger canine at rear on each side of lower jaw; no teeth on vomer. Infraorbital bones 3. Maximum size ~60 mm TL. Found in shallow waters of coral reefs and rocky areas. Five species, 2 in WIO.

KEY TO SPECIES

- | | | |
|----|--|--------------------|
| 1a | Dorsal and anal fins attached well onto edge of caudal fin; dorsal fin 6–9 (rarely 9) spines; body uniformly brown, without stripe on sides | <i>E. kraussii</i> |
| 1b | Dorsal and anal fins attached at or near caudal-fin base; dorsal fin 10 spines; body pale, with black stripe on sides from snout to caudal fin | <i>E. petersi</i> |

Enchelyurus kraussii (Klunzinger 1871)

Krauss's blenny

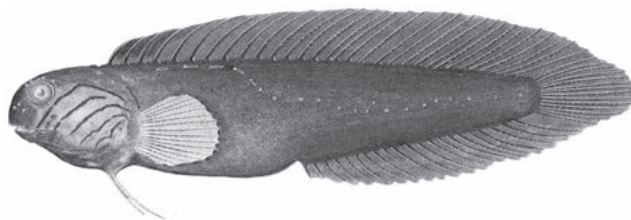
PLATE 134

Petrosirtes kraussii Klunzinger 1871: 497 (Al-Qusayr, Egypt, Gulf of Aqaba, Red Sea).

Enchelyurus analis Smith 1934: 318, Pl. 13 (Koh Tao, Gulf of Thailand); Smith 1959*; Springer 1972*; Winterbottom *et al.* 1989*; Fricke 1999; Fricke *et al.* 2009.

Dorsal fin 6–9 spines, 22–24 rays, fin not notched between spines and rays; anal fin 18–20 rays; pectoral fins 14–16 rays. Dorsal and anal fins attached by membrane to upper edge of caudal fin (well beyond fin base).

Males with brown head, with thin, dark blue, wavy diagonal stripes; body, and dorsal and anal fins blackish brown, becoming yellowish posteriorly; anal-fin margin pale, centre of fin with stripe of discontinuous narrow blue streaks. Females with dusky brown head and body, all fins essentially unmarked. Attains ~45 mm SL.



Enchelyurus kraussii, 41 mm SL, male (Australia).
Source: Springer 1972 (by SL Collum)

DISTRIBUTION Indo-Pacific (widespread but patchy). WIO: Red Sea, Gulf of Aden, Comoros, Seychelles, Mascarenes and Chagos; elsewhere to Gulf of Thailand, southern Japan, Mariana Is., Australia and Fiji.

Enchelyurus petersi (Kossmann & Räuber 1877)

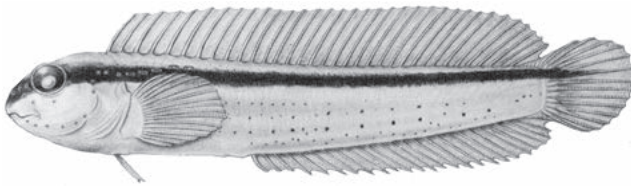
Yellowback blenny

PLATE 134

Petrosirtes petersi Kossmann & Räuber 1877: 21, Pl. 2, Fig. 9 (Red Sea).
Enchelyurus petersi: Springer 1972*.

Dorsal fin 10 spines, 23–25 rays, fin not notched between spines and rays; anal fin 2 spines, 22–24 rays; pectoral fins 16 or 17 rays. Dorsal and anal fins attached by membrane to near caudal-fin base.

Head and body golden dorsally, pale ventrally; black stripe midlaterally from snout tip, through eye, to caudal-fin margin; tiny black dots scattered along sides, above and below stripe. Attains ~60 mm TL.



Enchelyurus petersi, 48 mm SL, male (Gulf of Aqaba). Source: Springer 1972

DISTRIBUTION WIO: northern Red Sea.

GENUS *Entomacrodus* Gill 1859

Teeth present on vomer. Nasal, supraorbital and nape cirri present (except no cirri on nape in *E. thalassinus*); no fleshy blade-like crest on head. Gill openings continuous across isthmus. Lateral line tubular and continuous, sometimes with vertically paired pores to near midbody, then descending and extending as separated bipored tubes, variably ending from midbody to near caudal-fin base; median supratemporal pores present. Free margin of upper lip either smooth or crenulate, margin of lower lip smooth. Dorsal fin 13 or 14 (usually 13) spines, 13–18 rays, fin moderately notched between spines and rays; anal fin 2 spines, 15–19 rays, last ray usually split to base and not attached to body; pectoral fins 12–15 (usually 14) rays; pelvic fins 1 spine (embedded, readily visible only in skeletal preparations), 4 rays; caudal fin usually 13 rays, middle 9 rays branched. Total freely moveable teeth 100+, more on premaxillae than on dentaries; canines usually present at rear on each side of lower jaw in males and females (rarely absent). Maximum size ~16 cm TL. This genus is in need of taxonomic revision. At least 25 species (including 2 subspecies), 7 in WIO.

KEY TO SPECIES

- 1a Free margin of upper lip entirely smooth *E. thalassinus*
- 1b Free margin of upper lip somewhat crenulate (portions of lip may be smooth) 2
- 2a Free margin of upper lip with central third smooth, sides crenulate 3
- 2b Free margin of upper lip with at least central third crenulate ... 6
- 3a Preopercular pore positions with single pore; 1 pore anterior to nostril on each side *E. striatus*
- 3b Most preopercular pore positions with pairs or clusters of pores; 2–4 pores anterior to nostril on each side 4

Continued...

KEY TO SPECIES

- 4a Supraorbital cirri heavily branched, usually 10+ branches in fish >4 cm SL; upper lip irregularly dusky or with 2 or 3 broad dusky and pale bars *E. vermiculatus*
- 4b Supraorbital cirri weakly branched (<10 branches); upper lip with ~20 narrow dusky and pale bars 5
- 5a Nape with ≥2 cirri on each side *E. epalzeocheilos*
- 5b Nape with 1 cirrus on each side *E. niuafoouensis*
- 6a Preopercular pore positions each with single pore; upper lip, head and body with small white spots *E. solus*
- 6b Usually 3–5 (rarely 1 or 2) preopercle pore positions with ≥2 pores; upper lip with alternating dark and pale bars, and no small white spots *E. lemuria*

Entomacrodus epalzeocheilos (Bleeker 1859)

Fringelip rockskipper

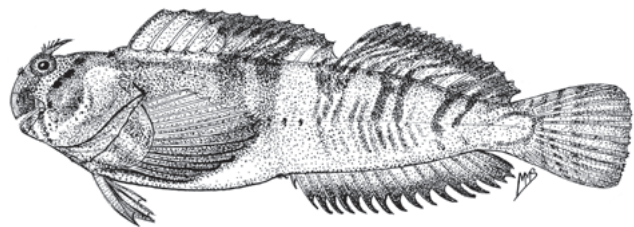
PLATE 134

Salarias epalzeocheilos Bleeker 1859: 344 (Nusa Kambangan I., Java, Indonesia).

Entomacrodus epalzeocheilos: Springer 1967*; SSF No. 235.12* [as *epalzeocheilus*]; Fricke 1999; Fricke *et al.* 2009.

Dorsal fin 13 spines, 14–16 rays; anal fin 2 spines, 15–17 rays. Nape with 2–10 cirri on each side; supraorbital cirri 3–9 on each side. Free margin of upper lip entirely crenulate. Preopercular pore positions with multiple pores; 1–3 pores on each side above upper lip and anterior to nostril.

Head and body mottled, with irregular dark bars and small white spots midlaterally; upper lip with numerous narrow dark and pale bars. Attains ~11.5 cm TL.



Entomacrodus epalzeocheilus, 11 cm TL (South Africa). Source: SSF

DISTRIBUTION Indo-Pacific (patchy). WIO: South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Réunion, Mauritius, southern India and Sri Lanka; elsewhere to Indonesia, southern Japan, New Caledonia and Samoa.

REMARKS Found in shallow-water environments on rocky coasts.

Entomacrodus lemuria Springer & Fricke 2000

Lemuria rockskipper

Entomacrodus lemuria Springer & Fricke 2000: 391, Figs. 3–4 (Réunion, Mascarenes); Fricke *et al.* 2009.

Dorsal fin 13 spines, 14–17 rays; anal fin 2 spines, 16 or 17 rays. Nape with simple cirri; supraorbital cirri 3–8 on each side. Free margin of upper lip with central third smooth, sides crenulate. Preopercular pore positions with multiple pores.

Head and body mottled, with irregular dark bars and small white spots midlaterally; dark spot on side above pectoral fin; upper lip with numerous narrow dark and pale bars. Attains ~75 mm TL.

DISTRIBUTION WIO: Madagascar, Réunion and Mauritius.

REMARKS Known from shallow-water environments on rocky coasts.

Entomacrodus niuafoouensis (Fowler 1932)

Tattoo-chin rockskipper

PLATE 134

Salarias niuafoouensis Fowler 1932: 7, Fig. 3 (Niuafou I., Tonga).
Entomacrodus niuafoouensis: Springer 1967*, 1972.

Dorsal fin 13 spines, 15 or 16 rays; anal fin 2 spines, 16 or 17 rays. Nape with simple cirri; supraorbital cirri 4–7 on each side. Free margin of upper lip entirely crenulate. Preopercular pore positions with multiple pores; 2 pores above upper lip anterior to nostril on each side.

Head and body mottled with irregular dark bars and small white spots; underside of head with several pale-margined dark chevrons; upper lip with numerous narrow dark and pale bars. Attains ~12 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Madagascar and Mauritius; elsewhere, South China Sea, Japan, Mariana Is., New Zealand, Tonga and Pitcairn Is. (Henderson I.).

REMARKS Found in shallow-water environments on rocky coasts.

Entomacrodus solus Williams & Bogorodsky 2010

Lonely blenny

PLATES 134 & 135

Entomacrodus solus Williams & Bogorodsky 2010: 64, Fig. 1 (Ras Muhammad, Sinai Peninsula, Egypt, Gulf of Aqaba, Red Sea).

Dorsal fin 13 spines, 14 or 15 rays; anal fin 2 spines, 15–17 rays. Nape with simple cirri; supraorbital cirri usually simple, 0–4 on each side. Free margin of upper lip with central third smooth, sides crenulate. Preopercular pore positions each with 1 pore.

Lips, head and body with small white spots; oblique dark bar behind eyes; no contrasting dark spot above pectoral fins. Attains ~75 mm TL.

DISTRIBUTION WIO: Northern Red Sea (Ras Muhammad, Egypt, and Al Wajh, Saudi Arabia).

REMARKS Type specimens collected from along rocky shore at end of mangrove channel, in <20 cm. The only *Entomacrodus* species known from the Red Sea.

Entomacrodus striatus (Valenciennes 1836)

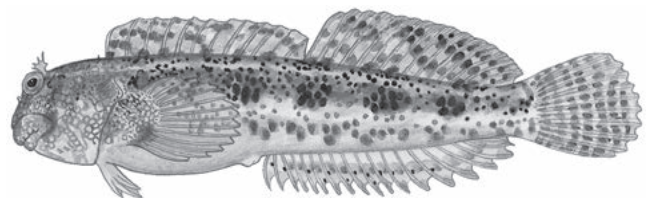
Pearly rockskipper

PLATE 135

Salarias striatus Valenciennes (ex Quoy & Gaimard) *in* Cuv. & Val. 1836: 309 (Mauritius, Mascarenes).*Salarias fraenatus* Valenciennes *in* Cuv. & Val. 1836: 342 (Malabar coast, India).*Salarias penotus* Liénard *in* Sauvage 1891: 389, Pl. 41a, Fig. 5 (Madagascar) [name not available, misspelling of *Salarias frenatus*].*Entomacrodus striatus*: Smith 1959*; Springer 1967*; SSF No. 235.13*; Winterbottom *et al.* 1989*; Fricke 1999; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Fricke *et al.* 2009.

Dorsal fin 13 spines, 14–17 rays; anal fin 2 spines, 15–18 rays. Nape usually with 1 cirrus on each side (rarely absent); supraorbital cirri 1–20 on each side. Free margin of upper lip entirely crenulate (crenulae sometimes weakly developed). Preopercular pore positions each with 1 pore.

Head and body colour variable: usually pale with small dark spots along sides, and sometimes mottled with faint dark bars; upper lip uniformly tan or with alternating dusky and pale bars; irregular blue-green mark behind eye and just above pectoral-fin base. Attains ~11 cm TL.

*Entomacrodus striatus*, 75 mm TL (Rodrigues). Source: CFSA

DISTRIBUTION Indo-Pacific (widespread). WIO: Kenya to South Africa (KwaZulu-Natal), Madagascar, Comoros, Seychelles, Mascarenes, Maldives, Chagos, India and Sri Lanka; not known from Red Sea and Persian/Arabian Gulf; elsewhere to southern Japan, New Guinea, Australia, Lord Howe I. and Pitcairn Is. (Dulcie I.).

REMARKS Common; found in tidepools and on shallow reefs.

Entomacrodus thalassinus (Jordan & Seale 1906)

Reef-margin blenny

PLATE 135

Alticus thalassinus Jordan & Seale 1906: 425, Fig. 103 (Apia, Upolu I., Samoa).

Entomacrodus thalassinus: Springer 1967*; Fricke 1999.

Dorsal fin 13 spines, 13–15 (usually 14) rays; anal fin 2 spines, 15–17 (rarely 17) rays. Nape usually with 1 cirrus on each side (rarely absent); supraorbital cirri 1–8 on each side. Free margin of upper lip smooth. Preopercular pore positions each with 1 pore.

Head and body colour variable, usually with small dusky to dark spots (sometimes with scattered white spots intermingled) along sides of body and overlying 7 or 8 irregular dark bars; upper lip uniformly tan or with scattered melanophores. Preserved specimens uniformly pale with no trace of banding patterns. Attains ~45 mm TL.

DISTRIBUTION Indo-Pacific (disjunct). WIO: Seychelles, Mauritius, Maldives and Sri Lanka; elsewhere to Philippines, southern Japan, Australia, New Caledonia, Samoa, Tuamotu Is. and Line Is.

REMARKS Found in ocean-side surge channels of outer reefs. The subspecies *E. thalassinus longicirrus* from the South China Sea and Gulf of Thailand geographically separates the Pacific and Indian Ocean populations of *E. t. thalassinus*.

Entomacrodus vermiculatus (Valenciennes 1836)

Vermiculated blenny

PLATE 135

Salarias vermiculatus Valenciennes in Cuv. & Val. 1836: 301 (Seychelles).

Salarias reuteri Lenz 1881: 506 (Nosy Be, Madagascar).

Entomacrodus vermiculatus: Smith 1959*; Springer 1967*; Fricke 1999.

Salarias reticulatus Madhusoodana Kurup, Manojkumar & Radhakrishnan 2005: 195, Fig. 1 (Vettillappara, Chalakudy River, Kerala, India).

Dorsal fin 13 spines, 15–17 rays; anal fin 2 spines, 16–18 rays. Nape with 1 cirrus on each side (and cirrus rarely with small lateral branches); supraorbital cirri 2–38 on each side (usually ≥ 10 in fish >4 cm SL), and numerous lateral branches along the main cirrus. Free margin of upper lip entirely crenulate (crenulae sometimes weakly developed). Preopercular pore series complex, with either multiple pores or pairs of pores at all positions.

Head and body colouration complex, with network of tiny vermiculations, spots and reticulations over faint indications of bars along sides; upper lip uniformly tan or with 2 or 3 alternating dusky and pale bars. Attains ~11 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Mozambique, Madagascar, Seychelles, Mauritius, southern India and Sri Lanka; elsewhere to Indonesia (Java) and Solomon Is.; not known from Red Sea and Persian/Arabian Gulf.

REMARKS Found in tidepools and near shallow reefs. The counts provided in the original description of *Salarias reticulatus* appear to be inaccurate, although the colour pattern of the holotype figured is distinctive and allows us to identify it as *Entomacrodus vermiculatus*.

GENUS *Exallias* Jordan & Evermann 1905

Nasal and supraorbital cirri present; nape with transverse row of cirri anterior to dorsal-fin origin; no fleshy blade-like crest on nape. Gill openings continuous across isthmus. Lateral line tubular and continuous, with vertically paired pores to near midbody, then descending and extending to caudal-fin base, with 0–6 separated bipored tubes on peduncle; median supratemporal pores present. Free margin of upper lip crenulate, lower lip with numerous folds. Dorsal fin 12 spines, 12 or (usually) 13 rays, fin deeply notched between spines and rays; anal fin 2 spines, 13 or (usually) 14 rays, last ray not attached to body; pectoral fins 15 rays; pelvic fins 1 spine, 4 rays; caudal fin 13 rays, middle 9 rays branched. Teeth moveable, no canines at rear in either jaw; premaxillary teeth 100+, dentary teeth 40+; no teeth on vomer. One species.

Exallias brevis (Kner 1868)

Leopard blenny

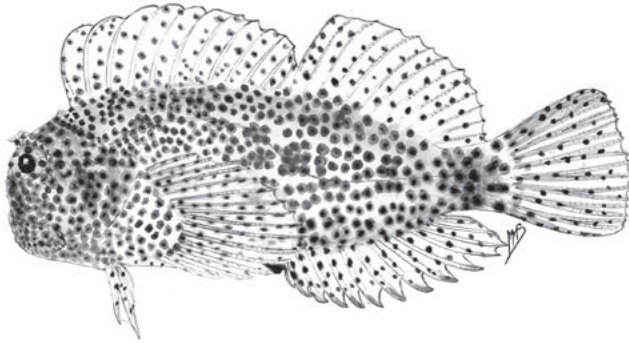
PLATE 135

Salarias brevis Kner 1868: 29 (Savai'i I., Samoa).

Exallias brevis: SSF No. 235.14*; Debelius 1993*; Kuitert & Debelius 1997*; Kuitert 1998*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004; Lieske & Myers 2004*; Froese & Pauly 2008*; Fricke *et al.* 2009.

Diagnosis as for genus.

Adults of both sexes with pale body densely covered with dark spots (brown on females, red on males), often clustered; rear half to three-quarters of body may be yellowish or reddish. Attains 14.5 cm TL.



Exallias brevis, 13 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa (Sodwana Bay), Comoros, Seychelles, Mascarenes and Sri Lanka; elsewhere to southern Japan, Australia, New Caledonia, Samoa, Society Is., Pitcairn Is., Marquesas Is. and Hawaii.

REMARKS Found on live corals, in 3–20 m.

GENUS *Glyptoparus* Smith 1959

Tiny cirrus present on orbits, anterior nostrils and each side of nape; low fleshy blade-like crest on head of males, crest absent or present as low ridge in females. Lateral line a continuous tube restricted to body dorsoanteriorly, above appressed pectoral fin. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body at peduncle. Dorsal fin 12 or (rarely) 13 spines, 15–17 (rarely 15) rays, fin shallowly notched between spines and rays; anal fin 18 or 19 rays, fin attached by membrane to peduncle; pectoral fins 12 or 13 (rarely 12) rays; caudal fin 12 or 13 (usually 12) rays, middle 9 rays branched; pelvic fins 1 spine, 2 rays (spine embedded, and a 3rd vestigial ray, in segments, lying close to base of innermost ray, both visible only in skeletal preparations). Teeth fairly rigid; premaxillary teeth 74–80, no canines at rear; dentary teeth 50–58, plus tiny canine usually present at rear; no teeth on vomer. Infraorbital bones 5. One species.

Glyptoparus delicatulus Smith 1959

Delicate blenny

PLATE 135

Glyptoparus delicatulus Smith 1959: 249, Pl. 16, Fig. 3 (Malindi, Kenya); Smith & Smith 1963*; Maugeé 1967; Lotan 1970; Smith-Vaniz & Springer 1971*; Harmelin-Vivien 1976; Winterbottom *et al.* 1989*; Fricke 1999; Winterbottom & Anderson 1999.

Diagnosis as for genus.

Body tan, with pale brown and white markings; distinguished by 2 dark spots on rear of gill membrane, just in front of pelvic fins; dark band (females) or dark smudge (males) in pre-pelvic area hidden by gill membrane. Males more conspicuously marked than females, with clusters of dusky spots on body, and 3 dusky spots on fleshy crest on top of head; 1 curved dusky brown band behind eye, and dusky band extending from one side of head and across underside. Attains ~30 mm SL.

DISTRIBUTION Indo-Pacific. WIO: Kenya, Mozambique (Pinda), Madagascar, Seychelles, Mauritius and Chagos; not known from Red Sea, Persian/Arabian Gulf, India and Sri Lanka; elsewhere to Andaman Sea, Indonesia, southern Japan, Mariana Is., Caroline Is., New Guinea, Australia, Great Barrier Reef and Rowley Shoals, Vanuatu, Tonga and Tuamotu Is.

REMARKS Usually associated with rocks and rubble on nearshore coral reefs, usually in <1 m.

GENUS *Haptogenys* Springer 1972

All fin rays unbranched. No cirri or fleshy blade-like crest on head. Gill opening restricted, extending to opposite lowermost 10th–13th pectoral-fin ray. No lateral line. Median supratemporal pore present. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body well in front of caudal-fin base. Dorsal fin usually 12 spines, 18 or 19 rays, fin weakly notched between spines and rays; anal fin 20 or 21 rays; pectoral fins 13 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 2 rays; caudal fin 13 rays. Teeth firmly affixed to jaws; premaxillary teeth 18–22, dentary teeth 20–26; both jaws with enlarged recurved canine at rear on each side, although upper canine much smaller than lower canine; no teeth on vomer. Infraorbital bones 4. One species.

Haptogenys bipunctata (Day 1876)

Two-spot blenny

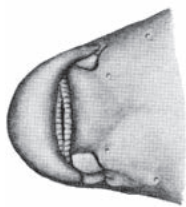
Petrosirtes bipunctatus Day 1876: 327, Pl. 71, Fig. 3 (Kozhikode, Malabar coast, India).

Omobranchus bipunctatus: Springer 1972*.

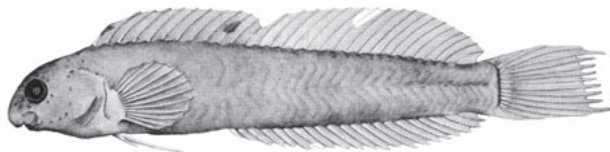
Haptogenys bipunctata: Springer & Gomon 1975.

Diagnosis as for genus.

Preserved specimens pale and mostly plain, most notably with dark spot at anterior end of dorsal fin and another at spines 10 or 11; description of holotype notes narrow blue band from eye to eye across underside of head, and another band just behind eyes across top of head; 2 bands from opercle onto pectoral-fin base. Attains at least 62 mm SL.



Haptogenys bipunctata, 62 mm SL, male holotype; ventral head (left) (Gulf of Thailand). Source: Springer 1972



DISTRIBUTION Indian Ocean: southern to east coast of India, southeastern Andaman Sea (Strait of Malacca), Thailand and Gulf of Thailand (likely more continuously distributed than currently known).

REMARKS Known from estuaries, possibly enters freshwater.

GENUS *Hirculops* Smith 1959

All fin rays unbranched, except most caudal-fin rays branched. Small cirrus on each side of nape and on rear rim of posterior nostril; supraorbital cirrus simple, its length usually much greater than eye diameter (but infrequently subequal to eye diameter in females); no fleshy blade-like crest on head. Gill openings unrestricted. Lateral line a continuous tube dorsoanteriorly, followed by a few bipored tubes, which descend to body midline, ending below spinous dorsal fin; several pores present in median supratemporal area. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body in front of caudal-fin base. Dorsal fin 12 or (rarely) 13 spines, 18–21 (usually 20 or 21) rays, fin scarcely

notched between spines and rays; anal fin 2 spines, 20–23 rays; pectoral fins 14 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays (innermost ray inconspicuous, easily overlooked); caudal fin 13 rays (middle 9 rays usually deeply branched). Teeth firmly attached to jaw bones; premaxillary teeth 34–44, dentary teeth 22–26 (or possibly to 30); small recurved canine at rear on each side of lower jaw, relatively smaller in females than males; teeth present on vomer (difficult to see except in skeletal preparations). Infraorbital bones 5. One species.

Hirculops cornifer (Rüppell 1830)

Highbrow blenny

PLATES 135 & 136

Blennioides cornifer Rüppell 1830: 112 (Jeddah, Saudi Arabia, Red Sea).

Hirculops cornifer menos Smith 1959: 247, Pls. 16, 19 (Mozambique); Maugé 1967.

Hirculops cornifer cornifer: Smith 1959.

Rhabdoblennioides cornifer: Lal Mohan 1969*.

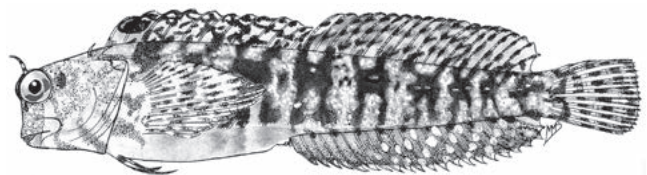
Hirculops cornifer: Lotan 1970; Smith-Vaniz & Springer 1971*;

SSF No. 235.15*; Randall 1995*; Carpenter *et al.* 1997*;

Heemstra & Heemstra 2004.

Diagnosis as for genus.

Colour in life variable: generally mottled greenish brown with irregular brownish and pale bars; snout with fine white spots; cheek with pinkish-red crescent behind eye; irregular rows of tiny pinkish spots midlaterally on body, and fine dark spots on trunk beneath rear of pectoral-fin bases. Attains ~60 mm SL.



Hirculops cornifer, 60 mm TL, female type of *H. c. menos* (N Mozambique).

Source: Smith 1959

DISTRIBUTION WIO (mainland coasts and closely adjacent islands): Persian/Arabian Gulf, Red Sea (including Gulf of Aqaba), Kenya to South Africa (Eastern Cape), southwestern Madagascar, and northwestern India (Gujarat coast); not known from Seychelles, Mascarenes, Chagos and Maldives.

REMARKS Inhabits shallow rocky nearshore waters and tidepools. A specimen labelled *Rhabdoblennioides cornifer*, reported by De Beaufort & Chapman (1951: 348) as obtained in 1909 at Saonek, Waigeu, eastern Indonesia, appears to be

Hirculops, and is almost certainly erroneously labelled. No other *Hirculops* specimens have been reported from localities east of northwestern India.

GENUS *Istiblennius* Whitley 1943

Nasal and supraorbital cirri present; nape cirri present or absent; fleshy blade-like crest on nape present or absent. Gill openings continuous across isthmus. Lateral line tubular and continuous, with vertically paired pores to midbody, then descending and extending posteriorly as none or a few separate bi-pored tubes, ending near midbody in some species; median supratemporal pores present. Free margin of upper and lower lips smooth or crenulate. Dorsal fin usually 13 spines, 16–25 rays, fin moderately notched between spines and rays; anal fin 2 spines, 19–23 (rarely 19 or 23) rays, last ray not attached to body; pectoral fins usually 14 rays (except usually 12 rays in *I. rivulatus*); pelvic fins 1 spine (embedded, visible only in skeletal preparations), 2–4 rays; caudal fin usually 13 rays, middle 9 rays branched. Premaxillary teeth 100+; dentary teeth 75+, usually no canines at rear of lower jaw in males and females (present or absent in *I. dussumieri* and *I. flaviumbrinus*); no teeth on vomer. Maximum size ~18 cm TL. Fourteen species, 10 in WIO.

KEY TO SPECIES

- | | | |
|----|--|-------------------------|
| 1a | Pectoral fins usually 12 (occasionally 13) rays; supraorbital cirrus simple, long, broad and ribbon-like | <i>I. rivulatus</i> |
| 1b | Pectoral fins usually 14 rays; supraorbital cirrus simple or branched, but not ribbon-like | 2 |
| 2a | Cirri present on nape | <i>I. edentulus</i> |
| 2b | No cirri on nape | 3 |
| 3a | Dorsal fin 16–19 rays | 4 |
| 3b | Dorsal fin usually 19–26 (rarely 17 or 18) rays | 6 |
| 4a | Free margin of lower lip smooth | <i>I. flaviumbrinus</i> |
| 4b | Free margin of lower lip crenulate | 5 |
| 5a | Upper lip with up to 12 slender dark bars, some extending towards orbit | <i>I. unicolor</i> |
| 5b | Upper lip and cheeks with small white spots (particularly conspicuous in life) | <i>I. spilotos</i> |
| 6a | Free margin of both lips smooth | <i>I. dussumieri</i> |
| 6b | Free margin of one or both lips crenulate | 7 |

Continued ...

KEY TO SPECIES

- | | | |
|-----|--|-----------------------------------|
| 7a | Supraorbital cirrus simple, slender, rod-like (rarely with a branch at base or tiny branches at tip) | <i>I. bellus</i> |
| 7b | Supraorbital cirrus branched, but shape and branching pattern variable | 8 |
| 8a | Fleshy crest present on head (males) | 9 |
| 8b | No fleshy crest on head (females) | 11 |
| 9a | Fleshy crest on head of males uniformly banded or dusky | <i>I. lineatus</i> [IN PART] |
| 9b | Fleshy crest on head of males spotted | 10 |
| 10a | Dorsal-fin spines + rays usually 34 or 35 (rarely 36) | <i>I. pox</i> |
| 10b | Dorsal-fin spines + rays usually 37 or 38 (rarely 36) | <i>I. steindachneri</i> [IN PART] |
| 11a | Females with black spots on peduncle and anteriorly almost to beneath middle of dorsal-fin rays, pinstripes restricted to rear 40% of body | <i>I. steindachneri</i> [IN PART] |
| 11b | Females with black spots on peduncle present or absent, and/or narrow black lines on peduncle | 12 |
| 12a | Females with black spots on peduncle | <i>I. lineatus</i> [IN PART] |
| 12b | Females with narrow black lines on peduncle | <i>I. pox</i> |

Istiblennius bellus (Günther 1861)

Impspringer

PLATE 136

Salarias bellus Günther 1861: 256 ('China Seas' [probably erroneous]).

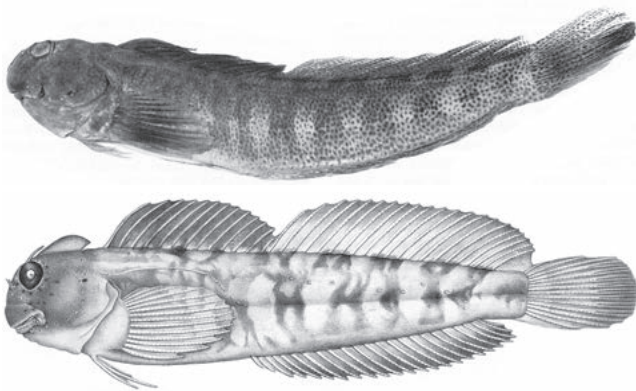
Istiblennius bellus impudens Smith 1959: 242, Pls. 14, 16 (St Pierre I., Seychelles).

Istiblennius impudens: SSF No. 235.21*.

Istiblennius bellus: Springer & Williams 1994*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 12–14 spines, 20–22 rays; anal fin 2 spines, 20–22 rays; pectoral fins 13 or 14 rays; pelvic fins 1 spine, 3 rays. No cirri on nape; supraorbital cirri slender, usually simple, rarely with a few small branches laterally or at tip; adult males with well-developed fleshy crest on nape, adult females without crest but some large females may have low mid-dorsal ridge. Free margin of lips crenulate (crenulae may be poorly developed in small fish). Lateral line continuous with simple pores anteriorly, followed by 1–16 separated bipored tubes.

Head and body dusky to dark, with up to 7 irregular dark bars midlaterally; males with small blue spots on head and body (spots fade in preservative); females densely covered with small dark spots (on head, body and fins). Attains ~13.5 cm TL.



Istiblennius bellus, 12 cm SL, female (top) (South Africa); 8 cm SL, male (bottom) (Vanuatu). Source: Springer & Williams 1994 (by TB Griswold)

DISTRIBUTION Indo-Pacific. WIO: Somalia to South Africa (KwaZulu-Natal), Madagascar, southern Seychelles and Mauritius; not known from Red Sea and northern Indian Ocean; elsewhere to Christmas I., southern Japan, New Caledonia, Vanuatu, Marquesas Is. and Hawaii.

REMARKS Found in shallow-water environments, such as reef crests and fringing reefs.

Istiblennius dussumieri (Valenciennes 1836)

Streaky rockskipper

PLATE 136

Salarias dussumieri Valenciennes in Cuv. & Val. 1836: 310 (Malabar, India).

Salarias striatamaculatus Kner & Steindachner 1867: 368 [13], Pl. 1, Fig. 4 (Mauritius, Mascarenes).

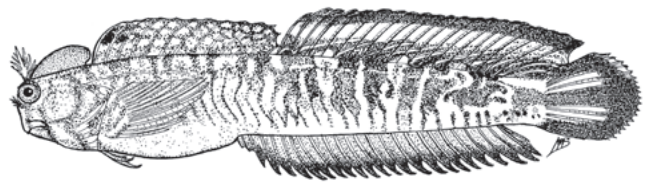
Salarias doliatus Sauvage 1880: 217 [7] (Atlantic [erroneous: possibly New Guinea]).

Salarias barbatus Gilchrist & Thompson 1908: 108 (Bluff, Durban, KwaZulu-Natal, South Africa).

Istiblennius dussumieri: SSF No. 235.17*; Springer & Williams 1994*; Heemstra *et al.* 2004.

Dorsal fin 12–14 spines, 19–24 rays; anal fin 2 spines, 21–25 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 3 rays. No cirri on nape; supraorbital cirri highly variable in shape, usually with ~5 branches; adult males with well-developed fleshy crest on nape, adult females without crest but large females may have low mid-dorsal ridge. Free margins of lips smooth. Lateral line continuous with simple pores anteriorly, followed by 1–11 separated bipored tubes.

Head and body dusky to dark, with ~7 or 8 irregular dark bars midlaterally; males with dark spot covering dorsal-fin membranes 1–3; females often with small dark spots on peduncle and caudal fin. Attains at least 12 cm TL.



Istiblennius dussumieri, 12 cm TL, male (Seychelles). Source: SSF

DISTRIBUTION Indo-Pacific. WIO (disjunct): Kenya to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes, and Pakistan to southern India and Sri Lanka; elsewhere to Taiwan, southern Japan, Palau, Australia, Lord Howe I., Fiji and Society Is. (apparently absent from Pacific Plate).

REMARKS Found in rocky intertidal areas.

Istiblennius edentulus (Forster & Schneider 1801)

Rippled rockskipper

PLATE 136

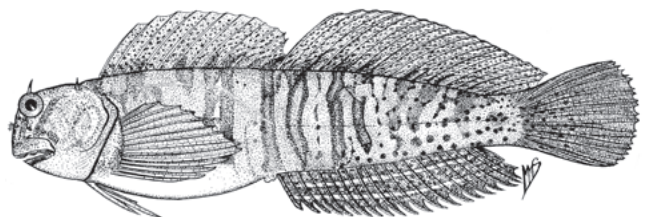
Blennius edentulus Forster & Schneider in Bloch & Schneider 1801: 172 (Tahiti, Society Is.).

Salarias quadricornis Valenciennes in Cuv. & Val. 1836: 329, Pl. 329 (Mauritius, Mascarenes).

Istiblennius edentulus: SSF No. 235.18*; Winterbottom *et al.* 1989*; Springer & Williams 1994*; Randall 1995*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 12–14 spines, 18–23 rays; anal fin 2 spines, 20–24 rays; pectoral fins 13 or 14 rays; pelvic fins 1 spine, 3 rays. Nape cirri present; supraorbital cirri slender, usually simple, rarely with a few small branches laterally or at tip; adult males with well-developed fleshy crest on nape, adult females with or without crest (crest frequently present in Indian Ocean populations). Free margin of lips smooth. Lateral line continuous with simple pores anteriorly, followed by 2–18 separated bipored tubes.

Head and body dusky to dark, with ~8 irregular, pale-bordered, dark bars midlaterally (each dark bar usually with narrow pale bar in centre); females usually with small dark spots on peduncle. Attains ~15 cm TL.



Istiblennius edentulus, 12 cm TL, female (Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Gulf of Oman, Red Sea (including Gulf of Aqaba), East Africa to South Africa (KwaZulu-Natal), Madagascar, Seychelles, Mascarenes and Chagos; elsewhere to east coast of India, Indonesia, southern Japan, Mariana Is., Australia, Lord Howe I. and Pitcairn Is.

REMARKS Found in rocky intertidal areas.

Istiblennius flaviumbrinus (Rüppell 1830)

Shady rockskipper

Salarias flaviumbrinus Rüppell 1830: 113 (Al Muwaylih, Saudi Arabia, Red Sea).

Salarias dama Valenciennes (ex Ehrenberg) in Cuv. & Val. 1836: 366 (Red Sea).

Salarias cervus Sauvage (ex Hemprich & Ehrenberg) 1880: 218 [8] (Red Sea).

Blennius dama Hemprich & Ehrenberg 1899: 9, Pl. 9, Fig. 3 (Red Sea) [name not available, published in synonymy of *Salarias flaviumbrinus* Rüppell 1830].

Halmablennius steinitzii Lotan 1970: 367, Fig. 2 (Dahlak Archipelago, Eritrea, Red Sea).

Istiblennius flaviumbrinus: SSF No. 235.19*; Springer & Williams 1994*; Randall 1995*.

Dorsal fin 13 or 14 spines, 16 or 17 rays; anal fin 2 spines, 16 or 17 rays; pectoral fins 12–15 rays; pelvic fins 1 spine, 2 or 3 rays. No cirri on nape; supraorbital cirri short, variable in shape, but each usually with ~5 branches; adult males with well-developed fleshy crest on nape, adult females without crest (except one female specimen with a crest). Free margin of both lips smooth. Lateral line continuous with simple pores anteriorly, followed by 3–13 separated bipored tubes.

Head and body dusky to dark, with ~7 or 8 irregular dark bars midlaterally; females densely covered with tiny dark spots on rear three-quarters of body. Attains ~95 mm TL.



Istiblennius flaviumbrinus, 60 mm SL, male (top); 69 mm SL, female (bottom) (both Red Sea). Source: Springer & Williams 1994 (by TB Griswold)

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Found in rocky intertidal areas.

Istiblennius lineatus (Valenciennes 1836)

Lined rockskipper

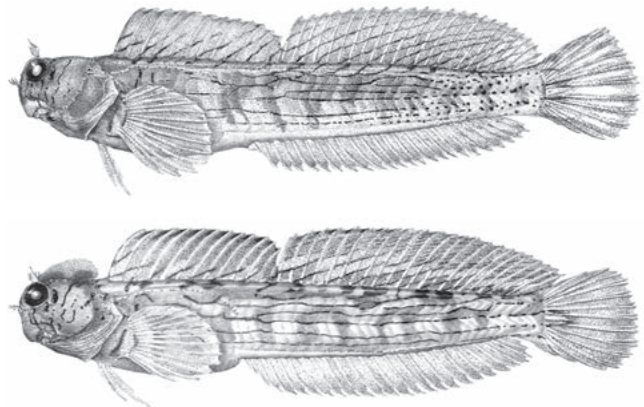
PLATE 137

Salarias lineatus Valenciennes in Cuv. & Val. 1836: 314 (Java, Indonesia).

Istiblennius lineatus: Springer & Williams 1994*; Randall 1995*.

Dorsal fin 12–14 spines, 22–24 rays; anal fin 2 spines, 23–25 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 3 rays. No cirri on nape; supraorbital cirri variable, usually short with a few small branches laterally or at tip. Adult males with well-developed fleshy crest on nape (without spots), adult females without crest, but some large females may have low mid-dorsal ridge. Free margin of upper lip crenulate, margin of lower lip smooth. Lateral line continuous with simple pores anteriorly, followed by 1–12 separated bipored tubes.

Head and body dusky to dark, with up to 9 dark stripes from behind pectoral-fin base to peduncle, often breaking into fine irregular streaks or spots on peduncle; small white spot on snout in front of each nostril. Attains ~14.5 cm TL.



Istiblennius lineatus, 65 mm SL, female (top), 71 mm SL, male (bottom) (both New Guinea). Source: Springer & Williams 1994 (by PK Hollingsworth)

DISTRIBUTION Indo-Pacific. WIO: Maldives, Lakshadweep, southern India and Sri Lanka; elsewhere to Indonesia, Japan, Australia, New Guinea, New Caledonia and Pitcairn Is.

REMARKS Found in shallow-water environments of reef crests and fringing reefs.

Istiblennius pox Springer & Williams 1994

Scarface rockskipper

PLATE 137

Istiblennius pox Springer & Williams 1994: 96, Fig. 30 (tidepools at Boleji Point, Karachi, Pakistan); Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003.

Dorsal fin 12–14 spines, 21–23 rays; anal fin 2 spines, 22–25 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 3 rays. No cirri on nape; supraorbital cirri variable, usually short with a few small branches laterally or at tip; adult males with well-developed fleshy crest on nape (with dark spots), adult females without crest, but some large females may have low mid-dorsal ridge. Free margin of upper lip crenulate, lower lip smooth. Lateral line continuous with simple pores anteriorly, followed by 1–12 separated bipored tubes.

Head and body dusky to dark, with up to 9 dark stripes from behind pectoral-fin base to peduncle, often breaking into fine irregular streaks on peduncle; small white spot on snout in front of each nostril. Attains ~10.5 cm TL.

DISTRIBUTION WIO: southern Red Sea, Gulf of Aden, Oman, Persian/Arabian Gulf and Pakistan.

REMARKS Found in shallow-water environments of reef crests and fringing reefs.

Istiblennius rivulatus (Rüppell 1830)

Stream rockskipper

PLATE 137

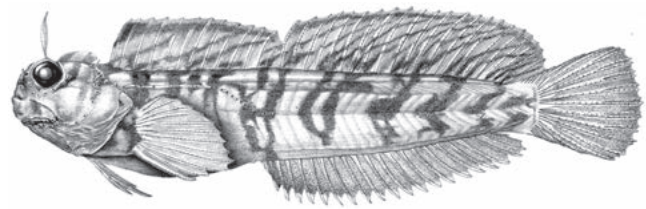
Salaris rivulatus Rüppell 1830: 114 (El Tur, Sinai Peninsula, Gulf of Suez, Red Sea).

Salarias oryx Valenciennes (ex Ehrenberg) *in* Cuv. & Val. 1836: 335 (Red Sea).

Istiblennius rivulatus: Goren & Dor 1994; Springer & Williams 1994*; Froese & Pauly 2008*.

Dorsal fin 13 or 14 spines, 20–23 rays; anal fin 2 spines, 20–23 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 2 or 3 rays. Nape cirri simple; supraorbital cirri long, ribbon-like, and usually simple (rarely with single small branch); adult males with or without well-developed fleshy crest on nape, adult females without crest, but may have ridge or low crest. Free margin of lips smooth. Lateral line continuous with simple pores anteriorly, followed by 1–8 separated bipored tubes.

Head and body pale dusky to dark dusky, with ~7 or 8 irregular dark bars midlaterally; black spot on first 3 dorsal-fin membranes. Attains ~10 cm TL.



Istiblennius rivulatus, 54 mm SL, male (Saudi Arabia).

Source: Springer & Williams 1994 (by PK Hollingsworth)

DISTRIBUTION WIO: Gulf of Suez and Gulf of Aqaba to northern half of Red Sea.

REMARKS Found in shallow-water environments on sandy and rocky reef flats.

Istiblennius spilotos Springer & Williams 1994

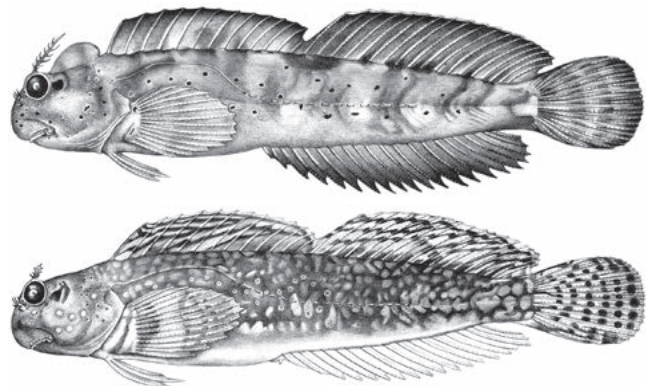
Spotted rockskipper

PLATE 137

Istiblennius spilotos Springer & Williams 1994: 155, Figs. 52–54 (tidepools at Boleji Point, Karachi, Pakistan); Randall 1995*; Heemstra *et al.* 2004; Fricke *et al.* 2009.

Dorsal fin 13 or 14 spines, 16–19 rays; anal fin 2 spines, 17–19 rays; pectoral fins 13 or 14 rays; pelvic fins 1 spine, 2 or 3 rays. No cirri on nape; supraorbital cirri short, variable in shape, each cirrus usually a central stalk with multiple side branches; adult males with well-developed fleshy crest on nape, adult females without crest, but large females may have low ridge. Free margin of lips crenulate. Lateral line continuous anteriorly, with simple pores, followed by 6–20 separated bipored tubes.

Head and body mottled with pale and dusky areas, and ~6 irregular dark bars midlaterally; males with small ocellated blue spots ringed with white on head and midlaterally; females with many more and larger white spots on body. Attains ~95 mm TL.



Istiblennius spilotos, 88 mm SL, male holotype (top); 84 mm SL, female (bottom) (both Pakistan). Source: Springer & Williams 1994 (by JR Schroeder)

DISTRIBUTION WIO: Pakistan, Gulf of Oman, Socotra (Samhah I.), Somalia to South Africa (Sodwana Bay), northern Madagascar, Comoros, Seychelles and Mascarenes.

REMARKS Found in shallow-water environments in rocky intertidal areas.

Istiblennius steindachneri (Pfeffer 1893)

Steindachner's rockskipper

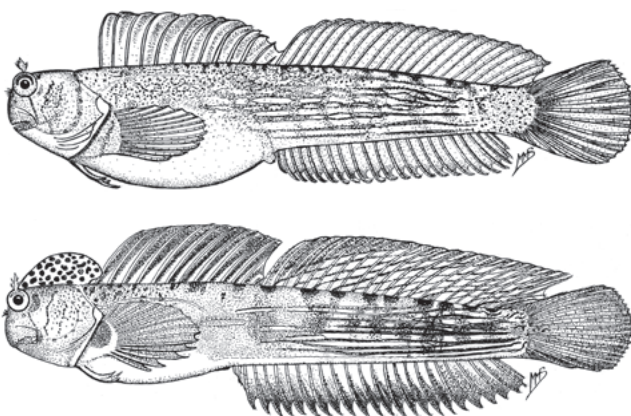
PLATE 137

Salarias steindachneri Pfeffer 1893: 143 [15], Pl. 3, Fig. 3 (Zanzibar, Tanzania).

Istiblennius steindachneri: Springer & Williams 1994*; Randall 1995*; Fricke 1999; Heemstra *et al.* 2004.

Dorsal fin 12–14 spines, 22–26 rays; anal fin 2 spines, 23–25 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 3 rays. No cirri on nape; supraorbital cirri variable, usually short with a few small branches laterally or at tip; adult males with well-developed fleshy crest on nape, adult females without crest but some large females may have low mid-dorsal ridge. Free margin of upper lip crenulate, lower lip smooth. Lateral line continuous with simple pores anteriorly, followed by 1–12 separated bipored tubes.

Head and body dusky to dark, with up to 9 dark stripes posteriorly, often breaking into fine irregular streaks or spots on peduncle; females with short lines extending to midbody, breaking into small dark spots on peduncle and beneath dorsal fin; small white spot on snout in front of each nostril; fleshy crest on head of males with dark spots. Attains 15 cm TL.



Istiblennius steindachneri, 11 cm TL, female (top); 15 cm TL, male (bottom) (both Mozambique). Source: Smith 1959

DISTRIBUTION WIO: Kenya to Mozambique, Madagascar, Seychelles and Mascarenes.

REMARKS Found in shallow-water environments of reef crests and fringing reefs.

Istiblennius unicolor Rüppell 1838

Pallid rockskipper

PLATES 137 & 138

Istiblennius unicolor Rüppell 1838: 136 (Massawa, Eritrea, Red Sea); Goren & Dor 1994; Springer & Williams 1994*; Randall 1995*.

Dorsal fin 13 spines, 17 or 18 rays; anal fin 2 spines, 17–19 rays; pectoral fins 14 rays; pelvic fins 1 spine, 4 rays. No cirri on nape; supraorbital cirri short, variable in shape, each cirrus consisting of central stalk with side branches; adult males with well-developed fleshy crest on nape, adult females without crest but may have low ridge. Free margin of both lips crenulate. Lateral line continuous with simple pores anteriorly, followed by 9–14 separated bipored tubes.

Head and body mottled, with ~4 irregular narrow pale stripes along body superimposed on ~6 irregular dark bars midlaterally; upper lip with ~12 slender dark bars, some extending upwards from lip. Attains ~10.5 cm TL.



Istiblennius unicolor, 77 mm SL, female (top); 82 mm SL, male, head crest depressed (bottom) (both Red Sea). Source: Springer & Williams 1994 (by R Gibbons, top; TB Griswold, bottom)

DISTRIBUTION WIO: endemic to Red Sea, including Gulf of Aqaba.

REMARKS Found in shallow-water environments.

GENUS *Laiphognathus* Smith 1955

All fin rays unbranched. Cirri present on rims of anterior and posterior nostrils; no cirri on nape or orbits; no fleshy blade-like crest on head; margin of skin flap along lateral edge of lower jaw notched and/or irregular. Gill opening restricted to

above level of 4th pectoral-fin ray. Lateral line of 1–5 bipored tubes dorsoanteriorly on body, extending at most to below 8th dorsal-fin spine; median supratemporal area with 1 to several pores. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body in front of caudal-fin base. Dorsal fin usually 11 (rarely 10 or 12) spines, 18–21 rays, fin scarcely notched between spines and rays; anal fin 2 spines, 19–25 rays; pectoral fins usually 13 (rarely 12 or 14) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 2 rays; caudal fin 13 rays. Teeth firmly attached to jaws (counts exclude canines at rear): premaxillary teeth 15–21, plus small recurved canine at rear on each side; dentary teeth 16–22, plus larger canine at rear on each side; no teeth on vomer. Infraorbital bones 5. Inhabit nearshore shallow rocky or coral-reef areas. Two species, 1 in WIO. *Laiphognathus longispinis* Murase 2007 is known only from southern Japan and Taiwan.

Laiphognathus multimaculatus Smith 1955

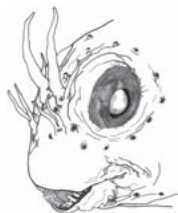
Spotted blenny

PLATE 138

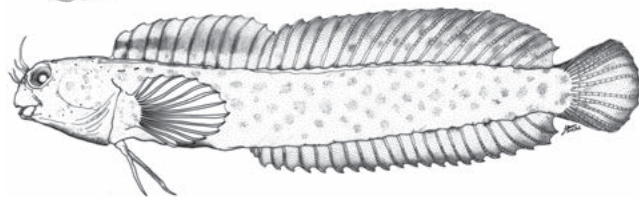
Laiphognathus multimaculatus Smith 1955: 24, Fig. 29 (Bazaruto I., Mozambique); Smith 1959*; Springer 1972*; SSF No. 235.23*.

Diagnosis as for genus. Dorsal fin usually 11 (rarely 10 or 12) spines, 7th and 8th elongated; anal fin 2 spines; usually 2 cirri on rim of each posterior and anterior nostrils.

Body pale, with numerous small, round, red or brown spots; sides of head with irregular dusky markings; males with dusky spot on abdomen, dusky stripe on underside of head, and red blotch over pectoral-fin bases to pelvic-fin bases. Attains ~40 mm SL.



Laiphognathus multimaculatus, 39 mm SL, male holotype (South Africa).
Source: Murase 2007



DISTRIBUTION Indo-Pacific (widespread). WIO: Tanzania, Mozambique (Inhaca I.), South Africa (Aliwal Shoal) and Sri Lanka; elsewhere to Thailand, Indonesia, Japan, New Guinea, Australia and Solomon Is.

GENUS *Meiacanthus* Norman 1944

All caudal-fin rays unbranched, uppermost and lowermost rays often filamentous in males. No cirri on head, except a tiny cirrus on anteriormost dentary pore in some WIO species; no fleshy blade-like crest on head. Gill opening restricted to above uppermost pectoral-fin ray. Lateral line a series of bipored tubes dorsoanteriorly on body; median supratemporal pore present. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body at caudal-fin base. Dorsal fin 3–5 spines, 23–28 rays, fin not notched between spines and rays; anal fin 2 spines, 14–17 rays; pectoral fins 12–15 (usually 13 or 14) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 11–13 rays. Number of teeth generally increasing with SL (tooth counts exclude canines at rear): premaxillary teeth 14–23, and rear canines present or absent; dentary teeth 14–27, plus large grooved canine with venom gland at base at rear on each side. Infraorbital bones 3. Maximum size ~75 mm SL. Occur on coral reefs. Twenty-eight species, 4 in WIO.

KEY TO SPECIES

- | | | |
|----|--|-------------------------|
| 1a | Anal fin pale; caudal fin unmarked, yellow in life | <i>M. mossambicus</i> |
| 1b | Anal fin dark; caudal fin with dark stripe along upper and lower rays | 2 |
| 2a | Dark stripe from eyes to dorsal-fin origin; caudal-fin lobes not elongated | <i>M. smithi</i> |
| 2b | No dark stripe from eyes to dorsal-fin origin; caudal-fin lobes elongated | 3 |
| 3a | Narrow dark stripe from eyes along body below dorsal-fin base to peduncle | <i>M. nigrolineatus</i> |
| 3b | No dark stripe along head or body | <i>M. fraseri</i> |

Meiacanthus fraseri Smith-Vaniz 1976

Fraser's fangblenny

PLATE 138

Meiacanthus fraseri Smith-Vaniz 1976: 98, Fig. 149 (St Brandon Shoals); Smith-Vaniz *et al.* 2001.

Dorsal fin 4 or 5 spines, 24 or 25 rays; anal fin 2 spines, 15 or 16 rays; pectoral fins 14 or 15 rays. Premaxillary teeth 18–23; dentary teeth 18–22.

Preserved specimens with brown head, anterior two-thirds of body dusky, rear third pale; dorsal fin black, with narrow pale margin; anal fin pale; caudal fin pale, with dark submarginal stripe on upper and lower edges. Attains ~70 mm TL.

DISTRIBUTION WIO: northwestern Madagascar, St Brandon Shoals and Mascarenes.

Meiacanthus mossambicus Smith 1959

Mozambique fangblenny

PLATE 138

Meiacanthus mossambicus Smith 1959: 233, Pl. 17, Fig. 8 (Pinda, Mozambique); Debelius 1993*; Froese & Pauly 2008*.

Dorsal fin 4 or 5 spines, 24–27 rays; anal fin 2 spines, 15–17 rays; pectoral fins 13–15 rays. Premaxillary teeth 16–23; dentary teeth 17–27.

Adults with head and body uniformly dusky to dark brown, becoming abruptly pale yellow at peduncle; dorsal and anal fins mostly black, with narrow dusky stripe at bases, ray tips dusky to pale; caudal fin yellow. Juveniles with pale body, black midlateral stripe, large black spot on peduncle, and narrow black stripe along dorsal and ventral contours of body on each side. Attains ~10 cm TL.



Meiacanthus mossambicus, 61 mm SL (Comoros). PC Heemstra © NRF-SAIAB

DISTRIBUTION WIO: Kenya to Mozambique and Comoros.

Meiacanthus nigrolineatus Smith-Vaniz 1969

Blackline fangblenny

PLATE 138

Meiacanthus nigrolineatus Smith-Vaniz 1969: 351, Fig. 1 (Strait of Jubal, Red Sea); Smith-Vaniz 1976*; Debelius 1993*; Goren & Dor 1994; Manilo & Bogorodsky 2003; Lieske & Myers 2004*; Froese & Pauly 2008*.

Dorsal fin 4 or 5 spines, 23–26 rays; anal fin 2 spines, 14–16 rays; pectoral fins 12–15 rays. Premaxillary teeth 14–21; dentary teeth 14–23.

Adults bicoloured: head and front half of body bluish to pale greyish, often with densely distributed white dots, becoming pale yellow posteriorly; narrow black stripe from eye and along dorsal contour of body to top of peduncle, often breaking into series of small black spots posteriorly, and occasionally continuing to tip of caudal-fin upper lobe; dorsal fin varying from mostly black with narrow pale margin, to dusky yellow with series of black streaks on membranes forming broken stripe along middle of fin; anal fin pale with dusky submarginal stripe; caudal fin pale with submarginal

dark stripe on upper and lower edges. Juveniles with pale body, black midlateral stripe, large black spot on peduncle, and narrow black stripe along dorsal and ventral contours of body on each side. Attains ~95 mm TL.

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba) and Gulf of Aden.

REMARKS *Ecsenius gravieri* is a mimic of this species.

Meiacanthus smithi Klausewitz 1962

Smith's fangblenny

PLATE 138

Meiacanthus smithi Klausewitz 1962: 17, Fig. 1 (Addu Atoll, Maldives); Smith-Vaniz 1976*; Debelius 1993*; Kuiter & Debelius 1997*; Smith-Vaniz *et al.* 2001*; Froese & Pauly 2008*.

Dorsal fin 3–5 spines, 24–26 rays; anal fin 2 spines, 15–17 rays; pectoral fins 13–15 rays. Premaxillary teeth 16–22; dentary teeth 17–27.

Head and body of adults whitish to dusky grey; narrow white-margined black stripe from eyes to dorsal-fin origin, connecting with broad black stripe along middle of dorsal fin to peduncle; dorsal fin white or dusky above and below the broad black stripe; anal fin pale; caudal fin pale, with dark submarginal stripe on upper and lower edges, and with ~5 fine black horizontal stripes along rear half of rays. Attains 85 mm TL.

DISTRIBUTION Indian Ocean: Chagos, Maldives, India, Andaman Sea and western Java Sea.

GENUS *Mimoblennius*

Smith-Vaniz & Springer 1971

Nape, nasal and supraorbital cirri present; no fleshy blade-like crest on head. Gill openings continuous across isthmus. Lateral line tubular and continuous with simple pores anteriorly, and breaking into short separated bipored tubes posteriorly, but restricted to body dorsoanteriorly and ending beneath spinous dorsal fin; median supratemporal pores present. Upper and lower lips smooth. Dorsal and anal fins attached by membrane to body near or at base of caudal-fin rays. Dorsal fin 12–14 (usually 13) spines, 15–19 (rarely 15) rays, fin notched between spines and rays; anal fin 2 spines, 19–22 rays; pectoral fins 13–15 (usually 14) rays; pelvic fins 1 spine (hidden), 3 rays (only 2 visible without dissection); caudal fin 13 rays, middle 9 rays branched. Teeth firmly implanted on jaws, no canines at rear in either jaw: premaxillary teeth 30–38, dentary teeth 24–32; no teeth on vomer. Maximum size ~5.5 cm SL. Found on coral reefs and rocky shores, at 3–25 m. Five species, all in WIO.

KEY TO SPECIES

- 1a No dark spot on anterior dorsal-fin membranes *M. cas*
- 1b Small black or dark spot on anterior dorsal-fin membranes ... 2

- 2a Posterior nostril with cirri on front rim *M. cirrosus*
- 2b Posterior nostril without cirri on rim 3

- 3a No cirri on nape, but each eye with 2 or 3 long slender cirri *M. atrocinctus*
- 3b Cirri present on nape 4

- 4a Underside of head with 3 slender black bars; fleshy pectoral-fin bases with slender black diagonal bar *M. lineathorax*
- 4b No slender black bars on underside of head or on fleshy pectoral-fin bases *M. rusi*

Mimoblennius atrocinctus (Regan 1909)

Banded blenny

PLATE 138

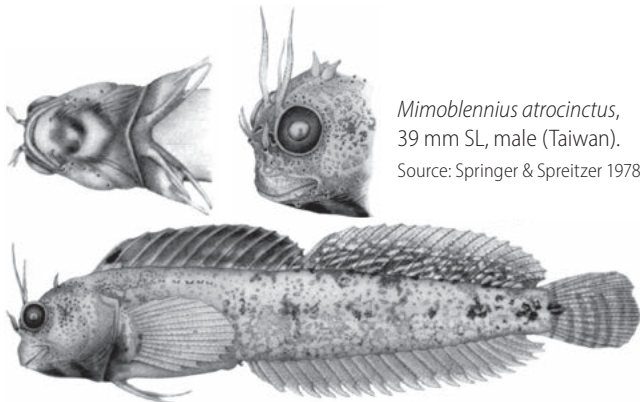
Blennius atrocinctus Regan 1909: 405, Pl. 66, Fig. 1 (Christmas I.).

Mimoblennius atrocinctus: Springer & Spreitzer 1978*;

Froese & Pauly 2008*.

Dorsal fin 13 spines, 15–19 rays (usually 16 or 17 rays in WIO fish); anal fin 2 spines, 19–22 rays; pectoral fins 14 rays. Upper jaw teeth 30–37; lower jaw teeth 24–32. Supraorbital cirri 2 or 3 (rarely 1) on each eye; no cirri on posterior nostrils.

Males and females varying from dusky to dark brown, with most of head and body densely covered with white dots; body with 7 or 8 irregular dark bars laterally, with dusky interspaces and irregularly spaced small black spots overlying bars; small dark spot on first dorsal-fin membrane; dark brown area on body at pelvic-fin bases and beneath gill membranes; underside of head with dark chevrons crossing chin and gill membranes. Attains ~50 mm TL.



Mimoblennius atrocinctus, 39 mm SL, male (Taiwan). Source: Springer & Spreitzer 1978

DISTRIBUTION Indo-Pacific. WIO: southern India and Sri Lanka; elsewhere to Christmas I., Western Australia, Indonesia, Philippines, Taiwan and Japan.

REMARKS Inhabits rocky reefs, to ~10 m deep. The southern India and Sri Lanka population has modally fewer dorsal- and anal-fin rays and vertebrae than the eastern Indian Ocean and western Pacific populations, and may be a distinct species.

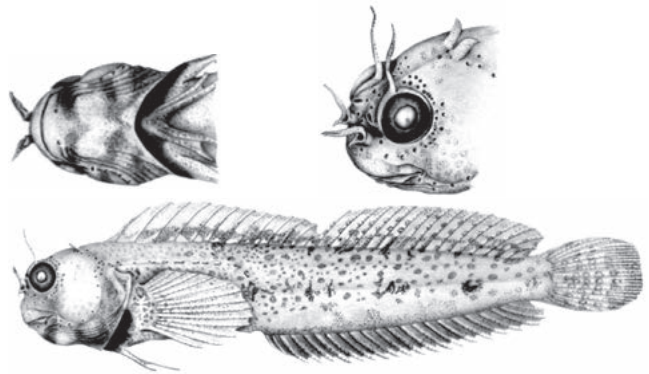
Mimoblennius cas Springer & Spreitzer 1978

Cas blenny

Mimoblennius cas Springer & Spreitzer 1978: 18, Fig. 9 (tidal flats at Grande Comore, Comoros).

Dorsal fin 12–14 spines, 16–18 rays; anal fin 2 spines, 19–21 rays; pectoral fins 14 rays. Upper jaw teeth 34–37; lower jaw teeth 26–29. Supraorbital cirri 1 (rarely 2) on each eye; posterior nostril with 0–3 cirri on front rim.

Preserved specimens (males and females) generally pale and variably pigmented, but most of head and body densely covered with brown dots; 7 or 8 irregular dark blotches with pale interspaces on sides; dark brown area on body at pelvic-fin bases and beneath gill membranes; underside of head with dark chevrons crossing chin and gill membranes. Attains ~50 mm TL.



Mimoblennius cas, 32 mm SL, male (Comoros). Source: Springer & Spreitzer 1978

DISTRIBUTION Known only from type specimens from Comoros.

REMARKS Collected from tidepools and surge channels on rocky and coral reef, to ~5 m deep.

Mimoblennius cirrosus Smith-Vaniz & Springer 1971

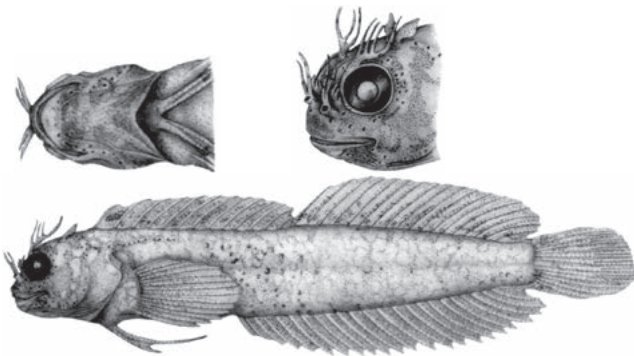
Fringed blenny

PLATE 139

Mimoblennius cirrosus Smith-Vaniz & Springer 1971: 31, Figs. 13b, 39 (Harat I., Eritrea, Red Sea); Springer & Spreitzer 1978*; Randall 1995*; Carpenter *et al.* 1997*; Lieske & Myers 2004*; Froese & Pauly 2008*.

Dorsal fin 12 or 13 spines, 17–19 rays; anal fin 2 spines, 20–22 rays; pectoral fins 14 rays. Upper jaw teeth 30–34; lower jaw teeth 24–30. Supraorbital cirri 2–6 on each eye; posterior nostril with palmate flap on front rim bearing 2–5 short branches.

Head and body of males and females generally pale, densely covered with red dots and red blotches, overlying 7 or 8 irregular reddish bars with pale interspaces on sides; underside of head with reddish spots forming irregular chevrons across chin and gill membranes. Attains ~55 mm TL.



Mimoblennius cirrosus, 35 mm SL, male holotype (Harat I., Dahlak Archipelago). Source: Springer & Spreitzer 1978

DISTRIBUTION WIO: northern Red Sea to Persian/Arabian Gulf.

REMARKS Found on rocky and coral reefs, in 3–25 m.

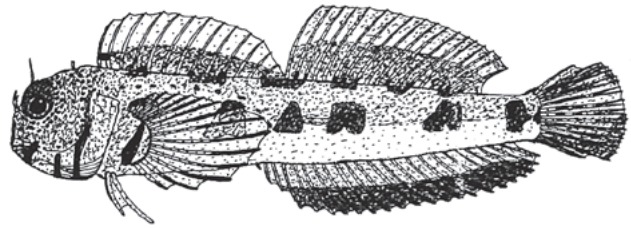
Mimoblennius lineathorax Fricke 1999

Chinbar blenny

Mimoblennius lineathorax Fricke 1999: 484, Fig. 8 (Réunion, Mascarenes).

After Fricke 1999: dorsal fin 13 spines, 18 rays; anal fin 2 spines, 20 rays; pectoral fins 14 or 15 rays. Upper jaw teeth 37–42; lower jaw teeth 30–32. Single supraorbital cirrus on each eye; no cirri on posterior nostril.

Body greenish dorsally, pale ventrally; series of irregular dark blotches laterally to caudal-fin base; dark brown streak on fleshy pectoral-fin bases; underside of head with 3 dark brown chevrons crossing chin and gill membranes. Attains at least 30 mm TL.



Mimoblennius lineathorax, 26 mm SL, holotype (Réunion). Source: Fricke 1999

DISTRIBUTION Known only from type specimens from Réunion.

REMARKS Collected to ~1.5 m deep, among algal-covered rocks in heavy surf.

Mimoblennius rusi Springer & Spreitzer 1978

Rusi blenny

PLATE 139

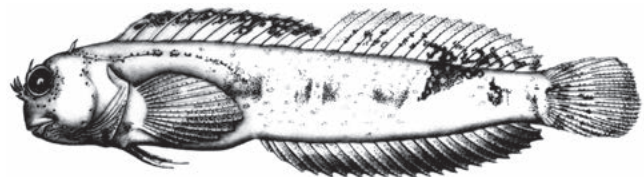
Mimoblennius rusi Springer & Spreitzer 1978: 14, Fig. 8 (deep gully in reef, north of Island Rock, KwaZulu-Natal, South Africa); SSF No. 235.24*; Fricke 1999; Froese & Pauly 2008*.

Dorsal fin 12 spines, 17 or 18 rays; anal fin 2 spines, 20 or 21 rays; pectoral fins 14 rays. Upper jaw teeth 34–38; lower jaw teeth 29–32. Single supraorbital cirri on each eye; no cirri on posterior nostril.

Preserved specimens (males and females) generally pale and variably pigmented, with most of head and body covered with brown dots; body sometimes with series of irregular dark blotches and pale interspaces laterally; underside of head with pale chin, centrally positioned narrow bar, and dark spot on either side of gill membrane. Attains ~45 mm TL.



Mimoblennius rusi, 40 mm SL, paratype (South Africa). Source: Springer & Spreitzer 1978



DISTRIBUTION Indian Ocean. WIO: South Africa (KwaZulu-Natal), Comoros and Mauritius; elsewhere, Andaman Is.

REMARKS Found in tidepools and in surge channels on rocky and coral reefs, at 1–10 m.

GENUS *Oman* Springer 1985

All fin rays unbranched. No cirri or fleshy blade-like crest on head. Gill opening restricted to above level of 2nd uppermost pectoral-fin ray. Lateral line absent or with up to 4 bipored tubes dorsoanteriorly on body; no median supratemporal pore. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body well in front of base of caudal-fin rays. Dorsal fin 10 spines, 25 or 26 rays, fin not notched between spines and rays; anal fin 2 spines, 23 or 24 rays; pectoral fins 13 rays; pelvic fins 1 spine, 2 rays (spine embedded, and a 3rd vestigial ray is closely applied to base of innermost ray, both visible only in skeletal preparations); caudal fin 12 or 13 rays. Teeth firmly implanted on jaws; premaxillary teeth 23 or 24, plus small recurved canine at rear on each side; dentary teeth 23–26, plus greatly enlarged canine at rear on each side; no teeth on vomer. Infraorbital bones 4. One species.

Oman ypsilon Springer 1985

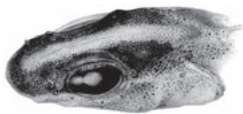
Oman blenny

PLATE 139

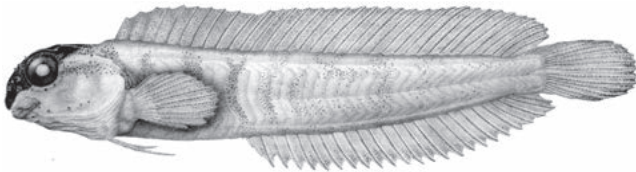
Oman ypsilon Springer 1985: 92, Fig. 1 (Sür, Oman, Arabian Sea); Randall 1995*; Zogaris *et al.* 2015.

Diagnosis as for genus.

Body and fins yellow; head with broad reddish brown U-shaped mark beginning at orbit and extending around snout, with white areas filling 'U' shape. Attains at least 40 mm TL.



Oman ypsilon, 33 mm SL, male (Oman).
Source: Springer 1985 (by PK Hollingsworth);
© Proc. Biol. Soc. Wash., Allen Press Publ. Services



DISTRIBUTION WIO: Arabian Sea, coast of Oman and Persian/Arabian Gulf (Kuwait).

REMARKS Known from rocky bottom, in 2–6 m.

GENUS *Omobranchus* Valenciennes 1836

All fin rays unbranched. No cirri on head; fleshy blade-like crest on head present or absent. Gill openings restricted to

sides of head. Lateral line absent or consisting of series of bipored tubes dorsoanteriorly on body, ending beneath spinous dorsal fin. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body in front of caudal-fin base. Dorsal fin 10–14 (rarely 10) spines, 16–26 rays, fin scarcely notched between spines and rays; anal fin 2 spines, 18–27 rays; pectoral fins usually 13 (rarely 12 or 14) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 2 rays; caudal fin 12–15 (usually 13) rays. Teeth firmly implanted on jaws (tooth counts exclude rear canines): premaxillary teeth 14–38, plus 1 (rarely 2) small recurved canines at rear on each side; dentary teeth 16–48, plus 1 larger canine at rear on each side; no teeth on vomer. Infraorbital bones 4 or 5. Maximum size ~4 cm SL. Inhabit shallow nearshore marine waters and estuaries. At least one species (*O. punctatus*) is known to have been transported to localities outside its natural range in the ballast water of ships (including probably to Mozambique). Accordingly, it is possible that other species of *Omobranchus* may be expected to have invaded areas outside their natural distribution, thus making it impossible to determine the species' natural distributions. Twenty-three species, at least 9 in WIO.

KEY TO SPECIES

- 1a Dorsal-fin total elements 28; anal fin 18 rays; no pores in front of nostrils *O. steinitzi*
- 1b Dorsal-fin total elements ≥29; anal fin ≥19 rays; pores present in front of nostrils 2
- 2a Large kidney-shaped black spot on fleshy pectoral-fin base *O. hikkaduwendis*
- 2b No large kidney-shaped black spot on pectoral-fin base 3
- 3a No flap of skin at sides of lower lip *O. banditus*
- 3b Lower lip with flap of skin posteriorly on each side 4
- 4a Interorbital pores 2 (median pore in interorbital region usually absent); males with low fleshy crest on head 5
- 4b Interorbital pores 3 (median pore in interorbital region usually present); males with or without fleshy crest on head 6
- 5a Dorsal fin 20 or 21 rays *O. mekranensis*
- 5b Dorsal fin 18 or 19 rays *O. fasciolatus*
- 6a Males (>30 mm SL) with fleshy crest on head *O. woodi*
- 6b No fleshy crest on head of males 7

Continued...

KEY TO SPECIES

- 7a Dorsal fin usually 13 spines; body with narrow oblique dark bands; males usually with small dark spots on underside of head and numerous narrow dark lines in rayed portion of dorsal fin *O. elongatus*
- 7b Dorsal fin usually 12 spines; narrow dark bands on body present or absent; males usually with small dark spots on underside of head 8
- 8a Gill opening extends well below uppermost pectoral-fin ray; separated bipored LL tubes 0–4; no dark band across nape *O. ferox*
- 8b Gill opening not extending below level of uppermost pectoral-fin ray; separated bipored LL tubes 4–8; dark band across nape *O. punctatus*

Omobranchus banditus Smith 1959

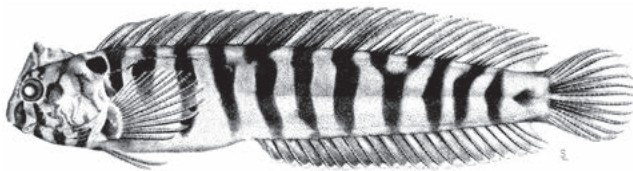
Bandit blenny

PLATE 139

Omobranchus banditus Smith 1959: 232, Pl. 14d (Mngazi River, Eastern Cape, South Africa); Springer & Gomon 1975*; SSF No. 235.25*.

Dorsal fin 11–13 spines, 19–21 rays; anal fin 2 spines, 21–23 rays. Males (>30 mm SL) with low fleshy crest on head. Interorbital pores usually 3; prenasal pores present. No skin flap posteriorly on each side of lower lip. Gill opening not extending below level of uppermost pectoral-fin ray. LL tubes 5–9.

Body and head with well-defined dark bars and pale interspaces; prominent dark round spot above gill opening. Attains ~65 mm TL.



Omobranchus banditus, 50 mm SL, male (South Africa).

Source: Springer & Gomon 1975 (by SL Chambers)

DISTRIBUTION WIO: Mozambique and South Africa (northern Eastern Cape).

REMARKS Inhabits rocky reefs, to ~10 m deep. A record from Mauritius (Fricke 1999) is questionable.

Omobranchus elongatus (Peters 1855)

Cloister blenny

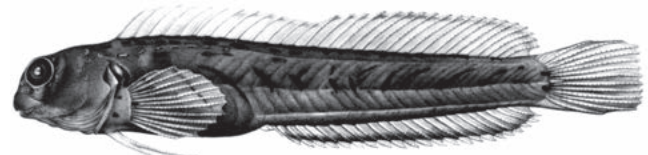
PLATE 139

Petroscirtes elongatus Peters 1855: 440 (Mozambique).

Omobranchus elongatus: Springer & Gomon 1975*; SSF No. 235.26*; Randall 1995*; Froese & Pauly 2008*.

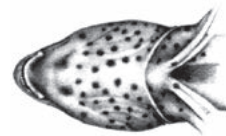
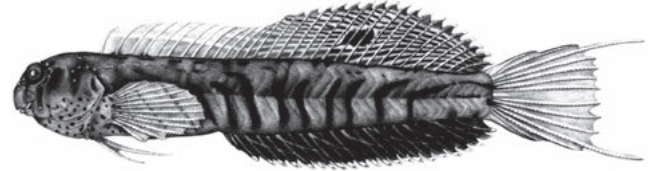
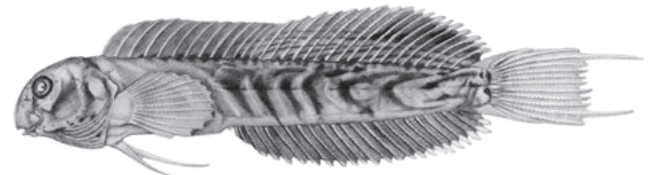
Dorsal fin 12–14 spines, 17–20 rays; anal fin 2 spines, 21–23 rays. No fleshy crest on head. Interorbital pores usually 3; prenasal pores present. Skin flap present posteriorly on each side of lower lip. Gill opening extending below level of uppermost pectoral-fin ray. LL tubes 0–9 (usually 0–2).

Males with slanted dark bars and pale interspaces on body; underside of head pale with small dark round spots; soft-rayed dorsal fin with numerous narrow dark lines, and ocellated dark spot at centre of fin; prominent dark round spot above gill opening. Females with irregular bands or dark spots on body. Attains ~55 mm TL.



Omobranchus elongatus, 34 mm SL, female (above) and ventral head (left) (Gulf of Thailand).

Source: Springer & Gomon 1975 (by JR Schroeder, FIN17676)



Omobranchus elongatus, 46 mm SL, male (top) (Madagascar); 39 mm SL, male and ventral head (bottom) (Gulf of Thailand).

Source: Springer & Gomon 1975 (by JR Schroeder, FIN17683)

DISTRIBUTION Indo-Pacific. WIO: Oman, Kenya to Mozambique (Inhaca I.), Madagascar, Seychelles, Mauritius, Chagos, Maldives and Sri Lanka; not known from Red Sea, Persian/Arabian Gulf and northern Indian Ocean; elsewhere to Andaman Sea, Gulf of Thailand, Ryukyu Is., New Guinea, northern Australia, Solomon Is. and Fiji; invasive in Hawaii and Guam.

REMARKS Found in rocky areas, to ~2 m deep.

Omobranchus fasciolatus (Valenciennes 1836)

Arab blenny

PLATE 139

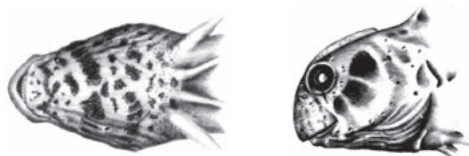
Blennechis fasciolatus Valenciennes (ex Ehrenberg) in Cuv. & Val. 1836: 287 (Massawa, Eritrea, Red Sea).

Petroscirtes striatus Jatzow & Lenz 1898: 512, Pl. 35, Fig. 9 (Zanzibar, Tanzania).

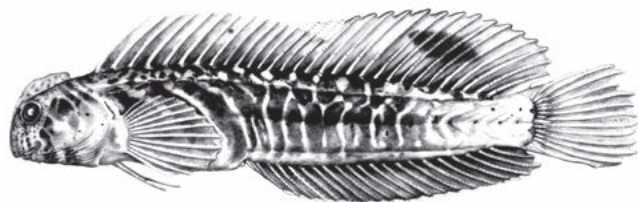
Omobranchus fasciolatus: Springer & Gomon 1975*; SSF No. 235.26*; Goren & Dor 1994; Randall 1995*; Carpenter *et al.* 1997*; Fricke 1999; Manilo & Bogorodsky 2003; Froese & Pauly 2008*; Fricke *et al.* 2009.

Dorsal fin 11 or 12 spines, 18 or 19 rays; anal fin 2 spines, 20–22 rays. Males (>30 mm SL) with fleshy crest on head. Interorbital pores usually 3; prenasal pores present. Skin flap present posteriorly on each side of lower lip. Gill opening usually not extending below level of uppermost pectoral-fin ray (rarely to 3rd ray). LL tubes 3–8.

Body greenish brown, with broad dark bars and narrow pale interspaces; green spot on side of head behind eye; males with broad, elongate, dark spot slightly past centre of soft-rayed dorsal fin. Attains ~70 mm TL.



Omobranchus fasciolatus, 48 mm SL, female, ventral and lateral head (W Pakistan). Source: Springer & Gomon 1975 (by JR Schroeder, FIN17694a&b)



Omobranchus fasciolatus, 44 mm SL, male (W Pakistan). Source: Springer & Gomon 1975 (by JR Schroeder, FIN17694c)

DISTRIBUTION WIO: Persian/Arabian Gulf to Pakistan and northwestern India, Red Sea (including Gulf of Suez and Suez Canal) and Gulf of Aden, East Africa to Mozambique, Madagascar and Réunion.

REMARKS Found in rocky areas and tidepools, to ~2 m deep.

Omobranchus ferox (Herre 1927)

Gossamer blenny

PLATES 139 & 140

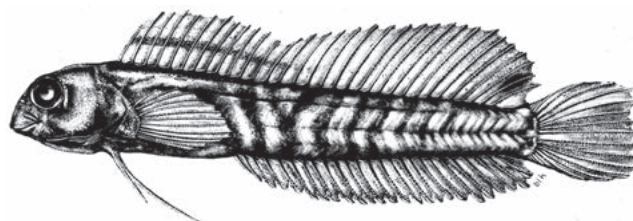
Petroscirtes ferox Herre 1927: 277, Pl. 3, Figs. 2–3 (Lake Taal, Luzon, Philippines).

Omobranchus dealmeida Smith 1949: 104 (Maputo Bay, Mozambique).

Omobranchus ferox: Springer & Gomon 1975*; SSF No. 235.28*; Froese & Pauly 2008*.

Dorsal fin 11–13 spines, 20–23 rays; anal fin 2 spines, 22–26 rays. No fleshy crest on head. Interorbital pores usually 3; prenasal pores present. Skin flap present posteriorly on each side of lower lip. Gill opening extending below level of uppermost pectoral-fin ray. LL tubes 0–4.

Body pale, with up to 12 or 13 narrow dark bars and broad pale interspaces; head with distinctive, narrow, vertical white bar, bordered posteriorly by similar black bar at rear of eye; some fish with diffuse dark spot on posteriormost 3 or 4 dorsal-fin rays. Attains ~65 mm TL.



Omobranchus ferox, 35 mm SL, male (Indonesia). Source: Springer & Gomon 1975 (by BL Holden)

DISTRIBUTION Indo-Pacific. WIO: Mozambique (Lake Poelela and Maputo Bay) and Sri Lanka; not known from East Africa north of Mozambique, northern Indian Ocean, Red Sea and Persian/Arabian Gulf; elsewhere to east coast of India, Philippines, Indonesia, Thailand, Vietnam, Taiwan, New Guinea and Australia; invasive in Hawaii and continental United States.

REMARKS Known from brackish waters, mangroves, estuaries and freshwater lakes, to 2 m deep.

Omobranchus hikkaduensis Bath 1983

Hikkadu blenny

Omobranchus sp.: Springer & Gomon 1975*.

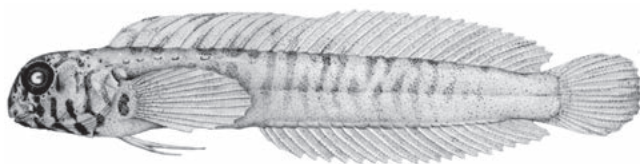
Omobranchus hikkaduensis Bath 1983: 26, Figs. 1–5 (Hikkaduwa, Sri Lanka).

Dorsal fin 12 spines, 19 rays; anal fin 2 spines, 21 rays. No fleshy crest on head. Interorbital pores 3; prenasal pores present. Skin flap present posteriorly on each side of lower lip. Gill opening extending below level of uppermost pectoral-fin ray. LL tubes 7.

Preserved specimens: body pale, with up to 12 or 13 narrow dark bars and spots with pale interspaces; eye-sized brown spot behind eyes; ~5 narrow dark bars on cheeks extending to underside of head, but not meeting at ventral midline; fleshy pectoral-fin base with distinctive large oblong or kidney-shaped black spot; some fish with diffuse dark spot on posteriormost 3 or 4 dorsal-fin rays. Attains at least ~30 mm TL.



Omobranthus hikkaduensis, 23 mm SL (Sri Lanka). Source: Springer & Gomon 1975 (by JR Schroeder, FIN17693)



DISTRIBUTION Indian Ocean: Sri Lanka and Indonesia (Bali).

REMARKS Known from few specimens, collected from rocky offshore habitats, to ~14 m deep.

Omobranthus mekranensis (Regan 1905)

Mekran blenny

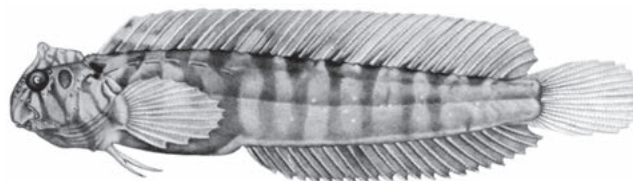
Petroscirtes mekranensis Regan 1905: 328 (Jask, Makran coast, Iran).

Petroscirtes cristatus Zugmayer 1913: 20 (Ormara, Pakistan).

Omobranthus mekranensis: Springer & Gomon 1975*; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Froese & Pauly 2008*.

Dorsal fin 11 or 12 spines, 20 or 21 rays; anal fin 2 spines, 22 or 23 rays. Males and females (>30 mm SL) with fleshy crest on head. Interorbital pores 2; prenasal pores present. Skin flap present posteriorly on each side of lower lip. Gill opening not extending below level of uppermost pectoral-fin ray. LL tubes 6 or 7.

Body pale, with ~14 dark bars becoming faint posteriorly; distinct dark spot behind eye; no dark spot on dorsal-fin rays; males with broad, elongate, dark spot slightly past centre of soft-rayed dorsal fin. Attains ~60 mm TL.



Omobranthus mekranensis, 46 mm SL (W Pakistan).

Source: Springer & Gomon 1975 (by JR Schroeder, FIN17708)

DISTRIBUTION WIO: Pakistan, Gulf of Oman and Persian/Arabian Gulf.

REMARKS Found in shallow water, among rocks, over sand and in sparse coral areas.

Omobranthus punctatus (Valenciennes 1836)

Muzzled blenny

Blennechis punctatus Valenciennes *in* Cuv. & Val. 1836: 286 (Mumbai, India).

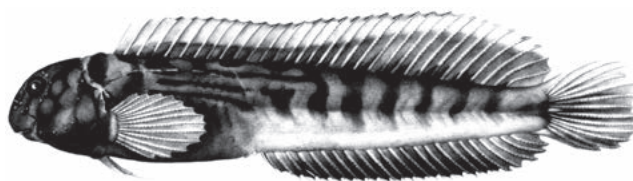
Salarias sindensis Day 1888: 263 (Karachi, Pakistan).

Omobranthus japonicus scalatus Smith 1959: 232, Pl. 19d–e (Maputo Bay, Mozambique).

Omobranthus punctatus: Springer & Gomon 1975*; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Froese & Pauly 2008*.

Dorsal fin 11–13 spines, 19–22 rays; anal fin 2 spines, 21–24 rays. No fleshy crest on head, but top of head of large specimens may appear swollen. Interorbital pores 2–4; prenasal pores present. Skin flap present posteriorly on each side of lower lip. Gill opening not extending below level of uppermost pectoral-fin ray. LL tubes 2–8.

Head with alternating narrow dark and dusky bars anteriorly and on underside, and small pale spots dorsally; large dark blotch on either side of nape in front of dorsal-fin origin (blotches on either side sometimes forming band across nape); body varying from uniformly greenish brown to mottled with irregular faint dark bars or lateral blotches and narrow dusky interspaces; usually with series of short alternating pale and dark stripes from near pectoral-fin base to above anus. Attains ~10 cm TL.



Omobranthus punctatus, 49 mm SL (Sri Lanka).

Source: Springer & Gomon 1975 (by JR Schroeder, FIN17711)

DISTRIBUTION Indo-Pacific. WIO: Suez Canal (Lessepsian migrant to Mediterranean Sea), Red Sea, Persian/Arabian Gulf, Pakistan to northwestern India, Sri Lanka, Mozambique and Maldives; elsewhere to Philippines, Japan, northern Australia and Fiji. Introduced in various western Atlantic localities (Caribbean to Brazil, especially near ports).

REMARKS Tolerates a wide range of salinities and is common in a variety of nearshore habitats, from rivermouths and mangroves to coralline and rocky areas, to ~2 m deep.

Omobranchus steinitzi Springer & Gomon 1975

Dahlak blenny

Omobranchus steinitzi Springer & Gomon 1975: 70, Fig. 30
(Dahlak Archipelago, Eritrea, Red Sea).

Dorsal fin 11 or 12 spines, 16 or 17 rays; anal fin 2 spines, 18 rays. No fleshy crest on head. Interorbital pores usually 3; no prenasal pores. Skin flap present posteriorly on each side of lower lip. Gill opening not extending below level of uppermost pectoral-fin ray. LL tubes 4–6.

Head and body mottled with irregular faint dark bars or blotches and pale interspaces; large dusky spot with pale margin just behind eyes. Attains at least 35 mm TL.



Omobranchus steinitzi, 32 mm SL, male holotype (Red Sea).
Source: Springer & Gomon 1975 (by JR Schroeder, FIN17695)

DISTRIBUTION Known only from the holotype from the southern Red Sea.

Omobranchus woodi (Gilchrist & Thompson 1908)

Kappie blenny

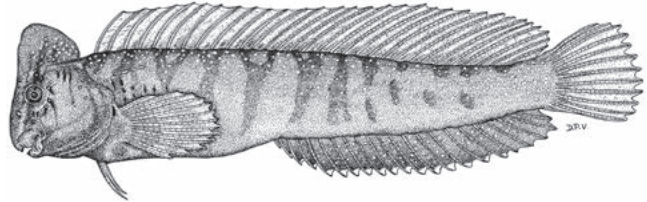
Aspidontus woodi Gilchrist & Thompson 1908: 105 (Nahoon River, Eastern Cape, South Africa).

Omobranchus woodi: Springer & Gomon 1975*; SSF No. 235.30*.

Dorsal fin 11–13 spines, 19–21 rays; anal fin 2 spines, 20–22 rays. Fleshy crest on head in both sexes. Interorbital pores usually 3 (rarely 2 or 4); prenasal pores present. Skin flap present posterolaterally on each side of lower lip. Gill opening

not extending below level of uppermost pectoral-fin ray. LL tubes 0–6 (usually ≥2).

Head and body tan, with faint dark bars and dusky interspaces; small dark spots behind eyes; circumorbital pores ringed with dark pigment. Attains ~85 mm TL.



Omobranchus woodi, 72 mm SL (South Africa). Source: Whitfield 1998

DISTRIBUTION WIO: South Africa (south and southeastern coasts), in estuaries.

GENUS *Parablennius* Miranda Ribeiro 1915

Supraorbital cirrus/cirri present; anterior nostril with cirrus on rear rim. Gill openings continuous across isthmus. Lateral line consisting of continuous anterior portion, with or without paired pores (branches), ending beneath rear of spinous dorsal fin, and with or without series of bipored tubes extending along body midline. Canine tooth present at rear in both jaws. Dorsal and anal fins attached by membrane to peduncle. Dorsal fin usually 12 (rarely 11 or 13) spines, 13–18 rays; anal fin 14–20 rays; pectoral fins 14 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 or 4 rays; caudal fin 13 rays, middle 9 rays branched. Maximum size ~15.5 cm TL. Inhabit nearshore rocky areas and tidepools. Twenty-six species, 6 in WIO.

KEY TO SPECIES

1a	Pelvic fins 4 rays	2
1b	Pelvic fins 3 rays	3
2a	Dorsal fin 14–16 rays; anterior portion of lateral line with <12 dorsoventrally paired pores (branches)	<i>P. lodosus</i>
2b	Dorsal fin usually 17–19 (rarely 16) rays; anterior portion of lateral line with >16 dorsoventrally paired pores (branches)	<i>P. cornutus</i>
3a	Dentary pores 4 on each side; lateral line without series of short, separated, bipored tubes posteriorly	<i>P. pilicornis</i>
3b	Dentary pores 5 on each side; lateral line with series of short, separated, bipored tubes posteriorly	4

Continued ...

KEY TO SPECIES

- 4a Dorsal fin usually 14 or 15 (rarely 13) rays; anal fin 14–17 (rarely 14) rays *P. thysanius*
- 4b Dorsal fin usually 16–18 (rarely 15) rays; anal fin 17–20 (rarely 17) rays 5
- 5a Supraorbital cirrus short and broad, irregularly rounded, and with short filaments along edge; cheeks with dusky spot, overlain with ~3 fine black longitudinal lines, often broken into series of irregular dots or dashes *P. cyclops*
- 5b Supraorbital cirrus a long slender filament with several short branches along rear edge (usually branching off from near base of cirrus to ~2/3 length); cheeks with large (unlined) dark brown eye-sized spot *P. opercularis*

Parablennius cornutus (Linnaeus 1758)

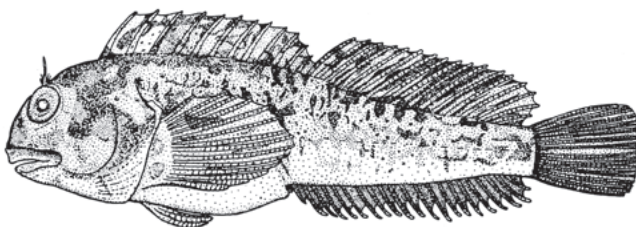
Horned blenny

PLATE 140

Blennius cornutus Linnaeus 1758: 256 (India).*Blennius grandicornis* Valenciennes in Cuv. & Val. 1836: 258 (Cape of Good Hope, South Africa).*Blennius scullyi* Gilchrist & Thompson 1908: 103 (Walvis Bay, Namibia).*Parablennius cornutus*: SSF No. 235.31*; Bath 1990*; Froese & Pauly 2008*.

Dorsal fin 11 or 12 spines, 16–20 rays; anal fin 2 spines, 16–23 rays; pelvic fins 1 spine, 4 rays. Supraorbital cirrus usually a long central stalk with numerous short side branches. Lateral line with 17–28 dorsoventrally paired pores (branches) anteriorly, and series of short bipored tubes posteriorly; dentary pores 5 on each side.

Body dusky, with ~6 irregular bands, often variably coalescing into 1 or 2 irregular (non-continuous) lateral stripes; head dusky, sometimes with dark diagonal bar from beneath eye towards preopercular angle; dark spot usually present anteriorly in spinous dorsal fin. Attains ~15.5 cm TL.

*Parablennius cornutus*, 87 mm SL (South Africa).

Source: Penrith & Penrith 1972

DISTRIBUTION Southern Africa: northern Namibia in southeastern Atlantic, to South Africa (Sodwana Bay) in WIO.

REMARKS Inhabits tidepools and rocky reefs, to at least 10 m deep.

Parablennius cyclops (Rüppell 1830)

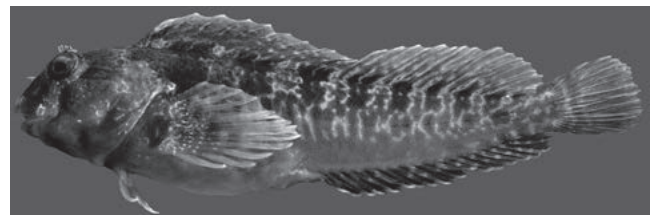
Cyclops blenny

PLATE 140

Salarias cyclops Rüppell 1830: 113, Pl. 28, Fig. 3 (El Tur, Egypt, Gulf of Suez, Red Sea).*Blennius semifasciatus* Rüppell 1838: 134 (Massawa, Eritrea, Red Sea).*Blennius cyclops* var. *guttatus* Kossmann & Räuber 1877: 402 (Massawa, Eritrea, Red Sea).*Blennius cyclops* var. *punctatus* Kossmann & Räuber 1877: 402 (Massawa, Eritrea, Red Sea).*Parablennius cyclops*: Bath 1989*; Goren & Dor 1994.

Dorsal fin 12 spines, 17 or 18 rays; anal fin 2 spines, 18–20 rays; pelvic fins 1 spine, 3 rays. Supraorbital cirrus usually short and broad, with fringe of short filaments along edge. Lateral line with 8–14 dorsoventrally paired pores (branches) anteriorly, and series of short bipored tubes posteriorly; dentary pores 5 on each side.

Body dusky, with 6 or 7 irregular bands, each often overlain with 1 or 2 pairs of small black spots; head dusky, with alternating dark and pale bars from eyes across underside of head; cheeks with large dusky spot, overlain with ~3 fine black longitudinal lines, but often broken into series of irregular dots or dashes. Attains ~65 mm TL.

*Parablennius cyclops*, 48 mm SL (Red Sea). © SV Bogorodsky

DISTRIBUTION WIO: Red Sea, including Gulf of Aqaba and Gulf of Suez.

Parablennius lodosus (Smith 1959)

Mud blenny

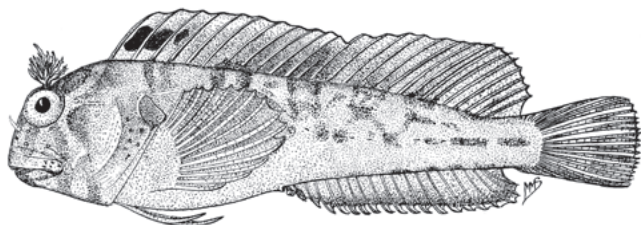
PLATE 140

Blennius lodosus Smith 1959: 230, Fig. 1 (Maputo Bay, Mozambique).*Parablennius lodosus*: SSF No. 235.32*; Bath 1989*; Froese & Pauly 2008*.

Dorsal fin 12 spines, 14–16 rays; anal fin 2 spines, 17 or 18 rays; pelvic fins 1 spine, 4 rays. Supraorbital cirrus short and fleshy, with fringe of filaments along edge. Lateral line with 9–11

dorsoventrally paired pores (branches) anteriorly, and series of short bipored tubes posteriorly; dentary pores 5 on each side.

Body dusky, with ~6 irregular bands or blotches; head with 2 or 3 dark diagonal bars from eye to underside of head; dorsal fin usually with dark spots on first 2 or 3 membranes. Attains ~55 mm TL.



Parablennius lodosus, 4 cm TL, male holotype (S Mozambique). Source: SSF

DISTRIBUTION WIO: Mozambique (Maputo Bay) to South Africa (KwaZulu-Natal).

Parablennius opercularis (Murray 1887)

Cheekspot blenny

PLATE 140

Salarias opercularis Murray 1887: 48 (Manora Rocks, Kurachee, India).

Salarias neilli Day 1888: 263 (Karachi, Pakistan).

Salarias curtus Boulenger 1897: 422 (Makran coast, Iran).

Parablennius opercularis: Bath 1989*, 1996; Randall 1995*;

Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003;

Froese & Pauly 2008*.

Dorsal fin 12 spines, 15–18 rays; anal fin 2 spines, 17–19 rays; pelvic fins 1 spine, 3 rays. Supraorbital cirrus long and slender, with one or several slender filaments along rear edge. Lateral line with 9–14 dorsoventrally paired pores (branches) anteriorly, and series of short bipored tubes posteriorly; dentary pores 5 on each side.

Body dusky, with 6 or 7 irregular bands or blotches; head dusky, with dark bars or series of spots from eyes to underside of head; preopercle and opercle sometimes with small white and red or orangish brown spots; cheeks with large dusky spot. Attains ~65 mm TL.

DISTRIBUTION WIO: Persian/Arabian Gulf and Oman to northern India.

REMARKS Found in tidepools and shallow coastal waters, to ~12 m deep.

Parablennius pilicornis (Cuvier 1829)

Ringneck blenny

PLATE 140

Blennius pilicornis Cuvier 1829: 237 (Brazil).

Blennius fascigula Barnard 1927: 73 (South Africa).

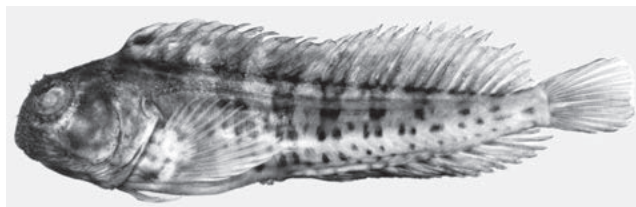
Blennius trifascigula Fowler 1935: 404, Fig. 36 (Durban, KwaZulu-Natal, South Africa).

Parablennius pilicornis: SSF No. 235.33*; Bath 1990*; Randall 1995*;

Froese & Pauly 2008*.

Dorsal fin 12 spines, 19–21 rays; anal fin 2 spines, 22 or 23 rays; pelvic fins 1 spine, 3 rays. Supraorbital cirrus with short fleshy base, and bearing long slender filaments. Lateral line with 20–22 dorsoventrally paired pores (branches), and no separated bipored tubes thereafter; dentary pores 4 pores on each side.

Body dusky, with 8 or 9 irregular bands dorsally, paired dark blotches midlaterally, and small dark spots ventrolaterally; head dusky, with small dark spot on cheek, and dark bars or series of spots from eyes to underside of head; preopercle and opercle sometimes with small orangish brown dots. Attains ~13 cm TL.



Parablennius pilicornis, 6 cm SL, male (South Africa).

Source: SSF (by K Bruwelheide)

DISTRIBUTION Mediterranean Sea (southwestern coast), western Atlantic (Brazil), eastern Atlantic (Bay of Biscay to South Africa), and Indian Ocean. WIO: Oman, Somalia and South Africa (KwaZulu-Natal).

REMARKS Occurs on rocky shores, often on steep rock walls and surf-exposed sites, to ~25 m deep.

Parablennius thysanius (Jordan & Seale 1907)

Tasseled blenny

PLATE 141

Blennius thysanius Jordan & Seale 1907: 47, Fig. 19 (Cavite, Luzon, Philippines).

Parablennius thysanius: Bath 1989*; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Patzner *et al.* 2009.

Dorsal fin 12 spines, 13–15 rays; anal fin 2 spines, 14–17 rays; pelvic fins 1 spine, 3 ray. Supraorbital cirrus a broad fleshy flap, with fringe of numerous short filaments along edge.

Lateral line with 9–11 dorsoventrally paired pores (branches) anteriorly, and series of short bipored tubes posteriorly; dentary pores 5 on each side.

Body dusky, with 7 or 8 irregular bands dorsally, paired dark blotches midlaterally, and small dark spots ventrolaterally; head and anterior part of body densely covered with small dark spots; underside of head with narrow yellowish brown and white reticulations and/or dots; dark spot on first dorsal-fin membrane. Attains ~65 mm TL.

DISTRIBUTION Indo-Pacific. WIO: Oman, Persian/Arabian Gulf, southwestern India and Sri Lanka; elsewhere, Gulf of Thailand and Philippines; introduced in Hawaii.

REMARKS Benthic, in algae on sheltered turbid coastal reefs and in estuaries, to ~10 m deep.

GENUS *Parenchelyurus* Springer 1972

All fin rays unbranched. No cirri on head (tiny tube supporting posterior nostril might be mistaken for a cirrus); no fleshy blade-like crest on head. Gill opening restricted to above level of 2nd uppermost pectoral-fin ray (usually completely above uppermost ray). Lateral line of 5–8 (rarely >6) bipored tubes dorsoanteriorly on body, ending no further back than below 11th dorsal fin ray; occasionally followed by line of pits descending to body midline and continuing posteriorly for a variable distance; median supratemporal pore present. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body at caudal-fin base. Dorsal fin usually 11 (rarely 12) spines, usually 18 or 19 (rarely 17 or 20) rays, fin not notched between spines and rays; anal fin 18–21 (usually 19 or 20) rays; pectoral fins usually 13 (rarely 14) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 2 rays; caudal fin 13 rays. Teeth firmly implanted on jaws (tooth counts exclude canines at rear): premaxillary teeth 16–24 (rarely <18 or >22), dentary teeth 8–25 (rarely <20); small recurved canine at rear on each side of upper jaw, and much larger canine at rear on each side of lower jaw; no teeth on vomer. Infraorbital bones 3 or 4. Maximum size <4 cm SL. Inhabit nearshore rocky areas, in usually <1 m. Two species, 1 in WIO.

Parenchelyurus hepburni (Snyder 1908)

Hepburn's blenny

PLATE 141

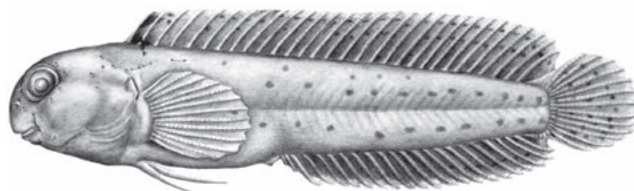
Enchelyurus hepburni Snyder 1908: 110 (Okinawa I., Ryukyu Is., Japan).

Enchelyurus caeruleopunctatus Herre 1939: 340, Pl. 1 (Nasugbu, Luzon, Philippines).

Parenchelyurus hepburni: Springer 1972*, 1981, 1985; Winterbottom *et al.* 1989*; Fricke 1999; Winterbottom & Anderson 1999; Heemstra *et al.* 2004.

Diagnosis as for genus.

Preserved specimens: males with head, body, and dorsal and anal fins blackish brown; black spot anteriorly on dorsal fin; body and median fins often with scattered small blue spots (faint and dusky in preservative); pectoral-fin rays dusky; pelvic fins unmarked; anal-fin margin pale; caudal fin mostly dusky. Females with dusky brown head and body, and all fins essentially unmarked (no dark spot anteriorly on dorsal fin). Attains ~40 mm TL.



Parenchelyurus hepburni, 30 mm SL, male (Vanuatu).

Source: Springer 1972 (by JR Schroeder, FIN17679)

DISTRIBUTION Indo-Pacific (widespread but patchy). WIO: southwestern Madagascar, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to Philippines, southern Japan, Marshall Is., Australia, Vanuatu and Samoa.

REMARKS Occurs in shallow rocky nearshore areas, in <2 m.

GENUS *Pereulixia* Smith 1959

Nasal cirri with multiple branches; supraorbital cirrus long and tapering to point, and sometimes with tiny branch at tip; nape with transverse row of cirri anterior to dorsal-fin origin (cirri broken into 4 overlapping patches, sometimes with tiny gap mid-dorsally); no fleshy blade-like crest on head. Gill openings continuous across isthmus. Lateral line tubular and continuous, with vertically paired pores anteriorly, extending along dorsal part of body to midbody, and then midlaterally to caudal-fin base; scale-like flaps cover most LL pores; median supratemporal pores present. Free margin of lips smooth. Dorsal fin 12 spines, 11 or (usually) 12 rays, fin deeply notched between spines and rays; anal-fin spines 2 spines, 12–14 (usually 13) rays, last ray not attached to body by membrane, and males with fleshy rugosities on anal-fin spines; pectoral fins 15 or 16 (usually 15) rays; pelvic fins 1 spine, 4 rays; caudal fin 13 rays, middle 9 rays branched. Premaxillary teeth 100+; dentary teeth 40+, plus canine at rear on each side of lower jaw; teeth present on vomer. One species.

Pereulixia kosiensis (Regan 1908)

Kosi rockskipper

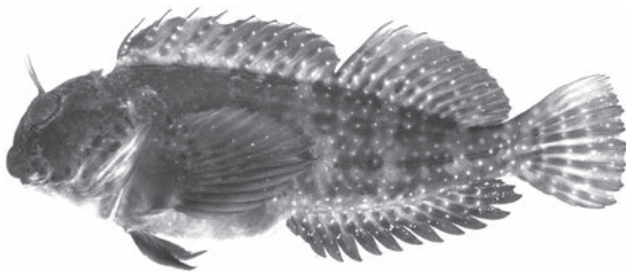
PLATE 141

Salarias kosiensis Regan 1908: 254, Pl. 42, Fig. 3 (Kosi Bay, KwaZulu-Natal, South Africa).

Pereulixia kosiensis: Smith 1959*; SSF No. 235.34*; Randall 1995*; Froese & Pauly 2008*.

Diagnosis as for genus.

Body of adults dark; fins mottled with irregular dark and dusky bars, and densely covered with tiny white spots. Attains 20 cm TL.



Pereulixia kosiensis, 14 cm TL (South Africa). © RE Stobbs

DISTRIBUTION WIO: Pakistan and Oman to South Africa (KwaZulu-Natal).

REMARKS Known from tidepools and exposed rocky shores, to ~2 m deep.

GENUS *Petroscirtes* Rüppell 1830

Dorsal-fin spines may be sexually dimorphic: males sometimes with one or more anterior spines longer than those in females. Cirri present on head (absent only in *P. marginatus* Smith-Vaniz 1976 from western Pacific); no fleshy blade-like crest on head. Gill opening restricted to area above uppermost pectoral-fin ray. Lateral line a series of bipored tubes, extending dorsoanteriorly and then laterally on body. Dorsal and anal fins attached by membrane to body at caudal-fin base. Dorsal fin 10–12 spines, 14–21 rays, fin not notched between spines and rays; anal fin 2 spines, 14–21 rays; pectoral fins 13–16 (usually 13 or 14) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 11 rays, all unbranched. Number of teeth generally increasing with SL (tooth counts exclude canines at rear): premaxillary teeth 20–45, plus canines at rear; dentary teeth 20–48, plus canines at rear (but not grooved and without venom gland at base). Infraorbital bones 4. Maximum size ~15 cm TL. Inhabit coastal lagoons, seagrass beds, and flotsam such as *Sargassum* seaweed. Ten species, 5 in WIO.

KEY TO SPECIES

[Modified from Smith-Vaniz 1976]

- 1a First spine of dorsal fin distinctly longer than 4th spine, giving fin notched appearance, and 1st spine usually longer than 2nd (sometimes subequal); dark spot near base of outermost pelvic-fin ray *P. mitratus*
- 1b First spine of dorsal fin subequal to or shorter than 4th spine, and 1st spine shorter than 2nd; no dark spot near base of outermost pelvic-fin ray 2
- 2a Lower jaw symphysis with multifid cirrus; cirri present on 3–6 preopercular pores on each side *P. xestus*
- 2b Lower jaw symphysis with simple cirrus or no cirrus; preopercular pores without cirri 3
- 3a Adults pale with ≥ 2 dark stripes (sometimes broken into series of large dark spots midlaterally); typically 3 supratemporal pores *P. breviceps*
- 3b No dark stripes on body; 3–5 supratemporal pores 4
- 4a Posterior nostril with simple short flap on front rim; dorsal- and anal-fin rays with narrow bars or small dark spots, frequently forming diagonal rows posteriorly on fins; anal fin 16–19 (usually 17) rays *P. variabilis*
- 4b Posterior nostril a simple opening (without flap on front rim); dorsal- and anal-fin rays with large dark blotches; anal fin 17–20 (rarely 17) rays *P. ancylodon*

Petroscirtes ancylodon Rüppell 1835

Arabian fangblenny

PLATE 141

Petroscirtes ancylodon Rüppell 1835: 1, Pl. 1, Fig. 1 (Massawa, Eritrea, Red Sea).

Petroscirtes ancylodon: Smith-Vaniz 1976*; Goren & Dor 1994; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Froese & Pauly 2008*.

Dorsal fin 10–12 spines (anterior spines not elongate), 17–19 rays; anal fin 2 spines, 17–19 rays; pectoral fins 13–15 rays. Premaxillary teeth 18–40; dentary teeth 18–41. Symphyseal dentary cirrus simple. Supratemporal pores 3–5. Posterior nostril a simple opening without a flap.

Head and body mottled with dark blotches and pale spots; dorsal and anal fins with line of large dark blotches (fins not covered with small dark spots or irregular bars). Attains ~11.5 cm TL.

DISTRIBUTION WIO: Persian/Arabian Gulf to northern Red Sea, and Lessepsian migrant to Mediterranean Sea.

REMARKS Adults found in seagrass beds and on substrates with thick algae.

Petroscirtes breviceps (Valenciennes 1836)

Sabretooth blenny

PLATE 141

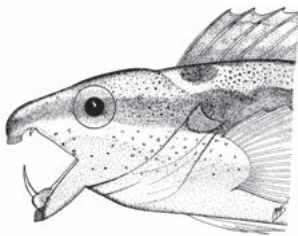
Blennechis breviceps Valenciennes in Cuv. & Val. 1836: 283 (Bay of Bengal).

Petroscirtes cynodon Peters 1855: 439 (Mozambique).

Petroscirtes breviceps: SSF No. 235.35*; Smith-Vaniz 1976*; Randall 1995*; Froese & Pauly 2008*.

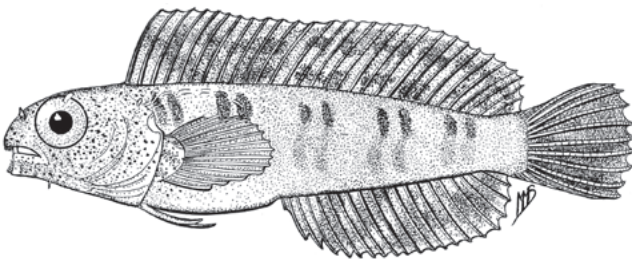
Dorsal fin 10–12 spines (anterior spines not elongate), 17–21 rays; anal fin 2 spines, 17–21 rays; pectoral fins 13–16 rays. Premaxillary teeth 17–41; dentary teeth 17–44. Symphyseal dentary cirrus simple. Supratemporal pores 3–5 (usually 5). Posterior nostril a simple opening without a flap.

Colour pattern variable; mimics *Meiacanthus* species. Head and body with broad dark stripe from snout, through eye, to caudal fin; narrower dark stripe along dorsal contour of body and extending onto dorsal fin-base, sometimes broken into series of bars; remainder of dorsal fin with tiny spots or reticulations. Attains ~11.5 cm TL.



Petroscirtes breviceps, head to show large canines.

Source: Smith-Vaniz 1976, Monographs of the ANSP



Petroscirtes breviceps, 27 mm TL, juvenile (WIO). Source: Smith 1959

DISTRIBUTION Indo-Pacific. WIO: Kenya to South Africa, Madagascar and India; elsewhere to Bay of Bengal, Philippines, Taiwan, Solomon Is., Australia and New Caledonia.

REMARKS Found in estuaries and on coastal reefs, to ~10 m deep, and on lagoon reefs to ~15 m deep; often shelters and nests inside abandoned worm tubes or discarded bottles.

Petroscirtes mitratus Rüppell 1830

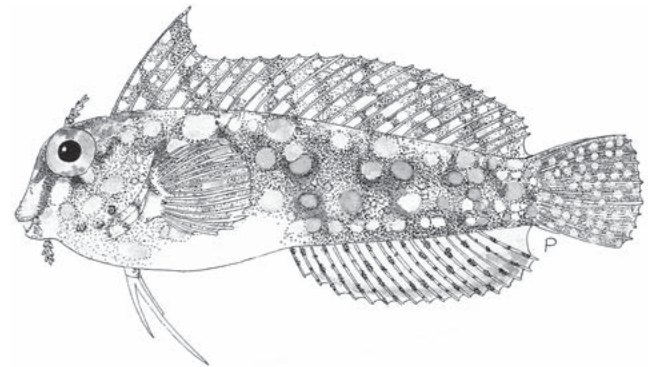
Floral blenny

PLATE 141

Petroscirtes mitratus Rüppell 1830: 111, Pl. 28, Fig. 1 (Jubal I., Egypt, Red Sea); Smith-Vaniz 1976*; SSF No. 235.36*; Randall 1995*; Kuitert 1998*; Manilo & Bogorodsky 2003; Lieske & Myers 2004*; Froese & Pauly 2008*.

Dorsal fin 10–12 spines (1st spine elongate, subequal to or longer than 2nd spine, and distinctly longer than 4th spine, giving fin a notched appearance), 14–16 rays; anal fin 2 spines, 14–16 rays; pectoral fins 13–16 rays. Premaxillary teeth 20–33; dentary teeth 20–36. Symphyseal dentary cirrus simple and broad. Supratemporal pores 3–5 (usually 5). Posterior nostril with well-developed flap on front rim.

Head, body and median fins mottled brownish with white speckles; ~5 or 6 dark bands or blotches on sides, the centre of each usually with whitish and dark-bordered ocelli; pelvic fins with dark spot near base of outer rays. Attains ~85 mm TL.



Petroscirtes mitratus, 55 mm TL, female (Kenya). Source: SFSA



Petroscirtes mitratus, 55 mm SL, male. Source: Smith-Vaniz 1976, Monographs of the ANSP

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Persian/Arabian Gulf to South Africa, Madagascar, Seychelles, Mascarenes, Chagos, Maldives and Sri Lanka; elsewhere to southern Japan, Australia, Samoa and Line Is.

REMARKS Found in shallow lagoons and on reef flats with algae and seagrasses, in 1–5 m.

Petroscirtes variabilis Cantor 1849

Variable sabretooth blenny

PLATE 142

Petroscirtes variabilis Cantor 1849: 1182 [200] (Sea of Penang, Malaysia; Singapore); Smith-Vaniz 1976*; Froese & Pauly 2008*.

Dorsal fin 10 or 11 spines (anterior spines not elongate), 16–19 rays; anal fin 2 spines, 16–19 rays; pectoral fins 13–15 rays. Premaxillary teeth 24–45; dentary teeth 24–48. Symphyseal dentary cirrus simple and broad. Supratemporal pores 3–5. Posterior nostril with short flap on front rim.

Head and body mottled, brownish and speckled, with 5 or 6 broad dark bands on sides, and usually with tiny blue specks; median fins with numerous small dark spots; dorsal fin often with small black spot distally on first membrane; no dark spot near base of outer pelvic-fin rays. Attains ~15 cm TL.

DISTRIBUTION WIO: Sri Lanka; elsewhere to Malaysia, Philippines, Indonesia, Taiwan, southern Japan (Yaeyama Is.), Great Barrier Reef and Fiji.

REMARKS Adults found in seagrasses in shallow lagoons, to ~5 m deep.

Petroscirtes xestus Jordan & Seale 1906

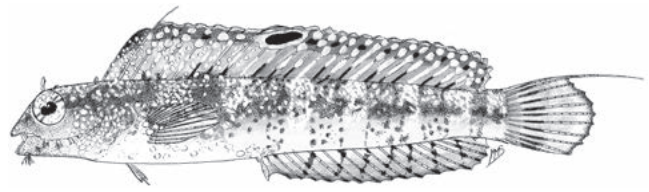
Xestus sabretooth blenny

Petroscirtes xestus Jordan & Seale 1906: 433, Fig. 110 (Pago Pago, American Samoa); Smith-Vaniz 1976*; Kuitert 1998*; Winterbottom *et al.* 1989*; Froese & Pauly 2008*.

Petroscirtes pindae Smith 1959: 231, Pl. 17, Fig. 4 (Pinda, Mozambique).

Dorsal fin 10 or 11 spines (1st spine shorter than 2nd and 4th spines; 2nd spine may be elongate in males), 14–16 rays; anal fin 2 spines, 14–16 rays; pectoral fins 13–15 rays. Premaxillary teeth 17–30; dentary teeth 19–32. Symphyseal dentary cirrus multifid, with 8–26 filaments. Supratemporal pores usually 5. Posterior nostril with short flap on front rim.

Head and body mottled, brownish and speckled, usually with narrow dark stripe dorsolaterally along body; dorsal fin with series of small black spots submarginally (in life, bordered above and below by blue spots), pupil-sized black spot submarginally over spines 9–11, and often with small black spot distally on 1st spine; no dark spot near base of outer pelvic-fin rays. Attains ~70 mm TL.



Petroscirtes xestus, 51 mm TL, type of *P. pindae* (N Mozambique).
Source: Smith 1959

DISTRIBUTION Indo-Pacific. WIO: Mozambique, Chagos and Maldives; elsewhere to Andaman Is., Philippines, Australia, American Samoa, Society Is. and Line Is.

GENUS *Plagiotremus* Gill 1865

Dorsal-fin spines not sexually dimorphic. No cirri and no fleshy blade-like crest on head. Gill opening restricted to above uppermost 1–6 pectoral-fin rays. No lateral line. Dorsal and anal fins attached by membrane to body at caudal-fin base. Dorsal fin 6–12 spines, 25–61 rays, fin not notched between spines and rays; anal fin 2 spines, 19–58 rays; pectoral fins 11–14 (usually 13 or 14) rays; pelvic fins minute or absent; caudal fin 11 rays, all unbranched. Number of teeth generally increasing with SL: premaxillary teeth 18–44, and no canines at rear; dentary teeth 20–87, plus canine at rear on each side (not grooved and without venom gland at base). Infraorbital bones 4. Maximum size ~18 cm TL. Inhabit coral reefs and rocky areas. Eleven species, 4 in WIO.

KEY TO SPECIES

- | | | |
|----|---|-------------------------|
| 1a | Anal fin 19–24 rays; no stripes on body; snout of adults blunt, not fleshy | 2 |
| 1b | Anal fin 28–33 rays; body longitudinally striped (midlateral stripe may be broken into regular series of blackish bars); snout of adults conical and fleshy | 3 |
| 2a | Dorsal fin with black stripe with white borders along entire length; total dorsal-fin elements 35–37 | <i>P. phenax</i> |
| 2b | Dorsal fin with short black stripe restricted to anterior fourth of fin; total dorsal-fin elements 32–34 | <i>P. townsendi</i> |
| 3a | Interorbital pores 2; dorsal fin 7–9 spines; middle ray of caudal fin darker than adjacent rays, forming narrow black stripe at centre of fin | <i>P. tapeinosoma</i> |
| 3b | Interorbital pores 4; dorsal fin 10–12 (usually 11) spines; middle ray of caudal fin not darker than adjacent rays ... | <i>P. rhinorhynchos</i> |

Plagiotremus phenax Smith-Vaniz 1976

Imposter fangblenny

PLATE 142

Plagiotremus phenax Smith-Vaniz 1976: 131, Fig. 166 (Trincomalee, Sri Lanka); Kuitert 1998*; Froese & Pauly 2008*.

Dorsal fin 7 or 8 spines, 27–29 rays, total elements 35–37; anal fin 2 spines, 20–23 rays; pectoral fins 11 or 12 rays. Premaxillary teeth 20–37; dentary teeth 38–61, plus canines present at rear. Interorbital pores 2.

Body uniformly pale bluish or greenish tan (no stripes on body); head with 2 narrow pale turquoise stripes around snout between eyes (one across interorbital region and one across snout); dorsal fin with broad black submarginal stripe for length of fin, bordered by white above and below; caudal fin with irregular, narrow, alternating black and white stripes, and narrow black stripe from middle of peduncle widening and extending onto basal quarter of middle rays. Attains ~80 mm TL.

DISTRIBUTION Indian Ocean. WIO: Maldives and Sri Lanka; elsewhere to Thailand (Similan Is.).

REMARKS Mimics *Meiacanthus smithi* (Smith's fangblenny).

Plagiotremus rhinorhynchus (Bleeker 1852)

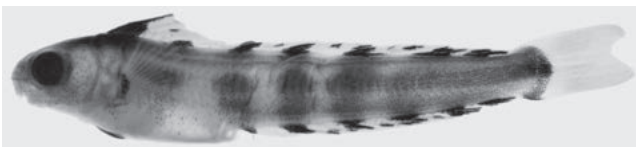
Bluestriped fangblenny

PLATE 142

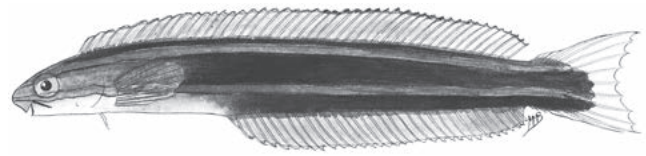
Petrosirtes rhinorhynchus Bleeker 1852: 273 (Seram I., Moluccas, Indonesia).
Plagiotremus rhinorhynchus: Smith-Vaniz 1976*; SSF No. 235.37*; Randall 1995*; Kuitert 1998*; Lieske & Myers 2004*; Heemstra & Heemstra 2004*; Froese & Pauly 2008*.

Dorsal fin 10–12 spines, 31–37 rays, total elements 43–48; anal fin 2 spines, 29–33 rays; pectoral fins 11–13 rays. Premaxillary teeth 18–40; dentary teeth 29–58, plus canines present at rear. Interorbital pores 4.

Head and body with 2 pale blue horizontal stripes from snout tip to caudal fin (upper stripe narrower); upper half of head and body above and between stripes yellowish to dark brown; dorsal fin without stripes; caudal fin yellowish to translucent, but basal portion of middle rays may be dark. Attains ~12 cm TL.



Plagiotremus rhinorhynchus, 34 mm SL, juvenile (Central Pacific).
Source: Smith-Vaniz 1976, Monographs of the ANSP



Plagiotremus rhinorhynchus, 80 mm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Gulf of Oman, Red Sea, Kenya to South Africa (Aliwal Shoal), Madagascar, Comoros, Seychelles and Mauritius; elsewhere to Indonesia, southern Japan, Society Is. and Marquesas Is.

Plagiotremus tapeinosoma (Bleeker 1857)

Piano fangblenny

PLATE 142

Petrosirtes tapeinosoma Bleeker 1857: 64 (Ambon I., Moluccas, Indonesia).
Plagiotremus tapeinosoma: Smith-Vaniz 1976*; SSF No. 235.38*; Kuitert 1998*; Lieske & Myers 2004*; Froese & Pauly 2008*.

Dorsal fin 7–9 spines, 34–39 rays, total elements 42–47; anal fin 2 spines, 28–33 rays; pectoral fins 11–13 rays. Premaxillary teeth 18–43; dentary teeth 40–87, plus large canines present at rear. Interorbital pores 2.

Upper half of head and body yellowish brown to dark brown; head and body with 2 whitish horizontal stripes (ventral stripe usually very broad) from snout tip to peduncle; broad dark stripe midlaterally between white stripes usually broken into series of regular blackish bars from pectoral fin to peduncle and usually narrowing onto middle rays of caudal fin; caudal fin otherwise hyaline; dorsal fin dusker distally, with thin whitish margin. Attains ~14 cm TL.



Plagiotremus tapeinosoma, 10 cm TL (S Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Kenya to South Africa (south coast), Comoros, Seychelles and Mauritius; elsewhere to Indonesia, Marshall Is., Australia, Tuamotu Is. and Marquesas Is.

Plagiotremus townsendi (Regan 1905)

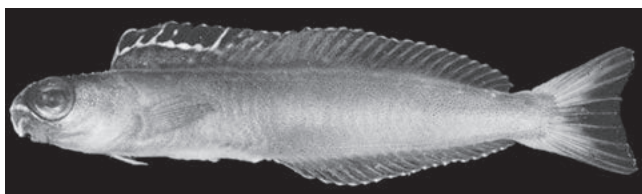
Townsend's fangblenny

PLATE 142

Petrosirtes townsendi Regan 1905: 328, Pl. 3c, Fig. 7 (Jask, Makran coast, Iran).
Plagiotremus townsendi: Smith-Vaniz 1976*; Goren & Dor 1994; Randall 1995*; Kuitert 1998*; Manilo & Bogorodsky 2003; Froese & Pauly 2008*.

Dorsal fin 6–8 spines, 25–27 rays, total elements 32–34; anal fin 2 spines, 19–21 rays; pectoral fins 11–13 rays. Premaxillary teeth 19–34; dentary teeth 33–56, plus canines present at rear. Interorbital pores 2.

Head and body bluish grey anteriorly, gradually shading to pale yellow at midbody and yellow posteriorly (no horizontal stripes), and body colour extending onto adjacent parts of dorsal fin; narrow white stripe across snout between eyes; lips dusky reddish; dorsal fin with broad black submarginal stripe on anterior third, bordered by narrow white lines above and below, basal portion of fin orangish red; caudal fin hyaline, but middle rays may be yellow or dusky. Attains ~60 mm TL.



Plagiotremus townsendi, 23 mm SL (Red Sea). © JE Randall, Bishop Museum

DISTRIBUTION WIO: Red Sea (including Gulf of Aqaba), Gulf of Aden and Gulf of Oman.

REMARKS Mimics *Meiacanthus nigrolineatus* (blackline fangblenny).

GENUS *Salaria* Forsskål 1775

Short supraorbital cirrus present; fleshy blade-like crest on head, but weakly developed or absent in juveniles and females. Gill openings continuous across isthmus. Lateral line present. Free margin of upper lip smooth. Dorsal and anal fins not attached by membrane to body at caudal-fin base. Dorsal fin 11–13 (usually 12) spines, 21–24 rays, fin not notched between spines and rays; anal fin 2 spines, 22–26 rays; pectoral fins 14 rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin with middle 9 rays branched. Premaxillary teeth 22–30, plus canines present at rear; dentary teeth 16–22, plus canines present at rear; no teeth on vomer. Large ocellated spot on each side of head behind eyes is distinctive in the genus. Maximum size ~13 cm TL. Inhabit rocky intertidal areas and enter brackish water. Five species, plus probably other undescribed species; at least 1 species in WIO.

Salaria pavo (Risso 1810)

Peacock blenny

PLATE 142

Blennius pavo Risso 1810: 133 (Nice, France, Mediterranean Sea).

Salaria pavo: Bath 1996; Froese & Pauly 2008*.

Diagnosis as for genus.

Head and body with irregular broad grey-brown bars alternating with broad yellowish grey bars; numerous narrow white or bluish irregular vertical lines along body, breaking into small dots posteriorly; eye-sized ocellated dusky spot on side of head behind eye; dusky bar extends from eye onto middle of fleshy head crest; series of white dots on cheeks and snout. Attains ~13 cm TL.

DISTRIBUTION Eastern Atlantic (France to Morocco), Black Sea, Mediterranean Sea, and anti-Lessepsian migrant to Suez Canal in WIO.

GENUS *Salaris* Cuvier 1816

Nasal, supraorbital and nape cirri present; fleshy blade-like crest on head present or absent. Gill opening continuous across isthmus. Lateral line tubular and continuous, with simple pores anteriorly, and series of short separated bipored tubes posteriorly; median supratemporal pores present. Dorsal and anal fins attached by membrane to body near base of caudal-fin rays. Dorsal fin 12 or 13 spines, 16–20 rays, fin notched between spines and rays; anal fin 2 spines, 19–22 rays, males with several anterior rays elongated; pectoral fins 13–15 (rarely 15) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 13 rays, middle 9 rays branched. Teeth freely moveable; premaxillary teeth 110–168, dentary teeth 72–134; canines present at rear of lower jaw; no teeth on vomer. Maximum size ~15 cm TL. At least 13 species, 2 marine species in WIO. A freshwater species, *Salaris reticulatus* Madhusoodana Kurup, Manojkumar & Radhakrishnan 2005, was described from the Chalakudy River, Kerala, India. However, the specimen appears to belong in the genus *Entomacrodus* (and is here synonymised with *Entomacrodus vermiculatus*). A report of *Salaris alboguttatus* from Sri Lanka (Froese & Pauly 2008) is probably incorrect.

KEY TO SPECIES

- 1a Upper lip smooth; cirri on nape broad, with multiple branches *S. fasciatus*
- 1b Upper lip crenulate; cirri on nape small and unbranched *S. sinuosus*

Salarias fasciatus (Bloch 1786)

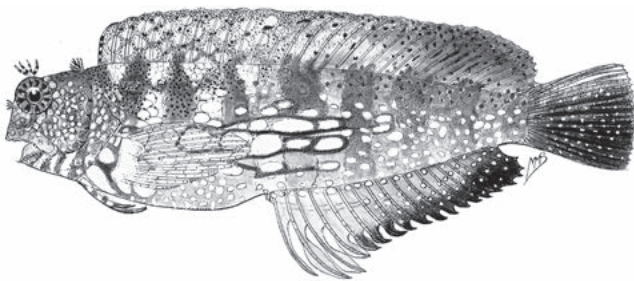
Fringelip blenny

PLATES 142 & 143

Blennioides fasciatus Bloch 1786: 110, Pl. 162, Fig. 1 (Pacific).*Salarias quadripennis* Cuvier 1816: 251 (Red Sea).*Salarias fasciatus*: Smith 1959*; SSF No. 235.39*; Debelius 1993*;Kuitert 1998*; Fricke 1999; Heemstra *et al.* 2004; Lieske & Myers 2004*;Froese & Pauly 2008*; Fricke *et al.* 2009.

Dorsal fin 12 spines, 18–20 rays; anal fin 2 spines, 19–21 rays (anterior 2–5 rays elongated in males); pectoral fins 14 rays. Supraorbital, nasal and nuchal cirri bushy, with multiple branches.

Body dusky to dark brown, with most of head and body densely mottled with white spots of various sizes, 7 or 8 irregular dark bars laterally, and irregularly spaced small bluish white dots along dorsolateral contour of body; underside of head with dark chevrons crossing chin and gill membranes. Attains ~14 cm TL.

*Salarias fasciatus*, 11.5 cm TL (N Mozambique). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Red Sea to South Africa, Madagascar, Comoros, Seychelles, Mascarenes, Maldives and Sri Lanka; elsewhere to southern Japan, Marshall Is., Australia, New Caledonia and Samoa.

REMARKS Found in estuaries and shallow lagoons, and on seaward reefs.

Salarias sinuosus Snyder 1908

Banded blenny

PLATE 143

Salarias sinuosus Snyder 1908: 109 (Okinawa, Ryukyu Is., Japan);

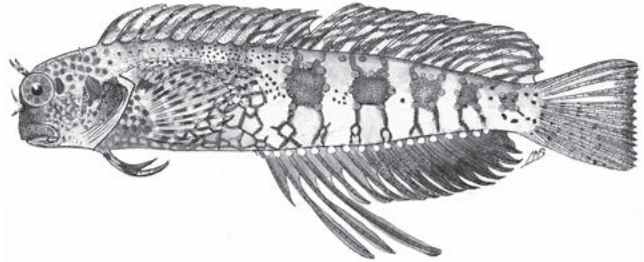
Randall 2005*.

Salarias sinuosus indicus Smith 1959: 241, Pl. 15, Fig. 3 (Pinda,

Mozambique); Froese & Pauly 2008*.

Dorsal fin 12 or 13 spines, 16 or 17 rays; anal fin 2 spines, 17 or 18 rays (anterior 2–5 rays elongated in males); pectoral fins 14 rays. Supraorbital cirri each with 1–4 filaments; nasal cirri bifid; nuchal cirri a small simple filament on each side.

Body of males and females varying from dusky to dark brown, with most of head and body densely mottled with white spots of various sizes, body with ~5 irregular dark blotches posterolaterally, and each blotch irregularly ringed with small bluish white dots; underside of head dark in males. Attains ~60 mm TL.

*Salarias sinuosus*, 62 mm TL, male holotype of *S. sinuosus indicus* (Mozambique). Source: Smith 1959

DISTRIBUTION Indo-Pacific. WIO: Mozambique, Comoros, Seychelles and Sri Lanka; elsewhere to Indonesia, southern Japan, Australia and Tonga.

REMARKS Found in shallow lagoons and estuaries.

GENUS *Scartella* Jordan 1886

Head with median longitudinal row of cirri beginning near dorsal-fin origin; palmate cirri above eyes; small group of palmate cirri on rear rim of anterior nostrils; no fleshy blade-like crest on head; no sensory pores in median supratemporal area (area occupied by cirri). Gill openings continuous across isthmus. Lateral line continuous anteriorly, with paired dorsal and ventral branches extending to below ~10th dorsal-fin spine, followed by midlateral series of bipored tubes to below ~8th–12th dorsal-fin ray. Free margin of upper lip smooth. Dorsal and anal fins attached by membrane to body well in front of caudal-fin base. Dorsal fin usually 12 (rarely 11) spines, 12–16 (usually 14 or 15) rays, fin moderately notched between spines and rays; anal fin 2 spines, 14–18 (usually 16 or 17) rays; pectoral fins usually 14 (rarely 13) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 3 rays; caudal fin 13 rays, middle 9 rays branched. Premaxillary teeth 22–32, no canines at rear; dentary teeth 20–34, plus canines at rear. Infraorbital bones 5. Maximum size ~10 cm TL. Inhabit tidepools and nearshore rocky areas. At least 7 species and probably other undescribed species, 1 in WIO.

Scartella emarginata (Günther 1861)

Maned blenny

PLATE 143

Blennius emarginatus Günther 1861: 224 [possibly Pakistan].

Blennius steindachneri Day 1873: 110 (Karachi, Pakistan); Smith 1959*.

Blennius punctifer Regan 1908: 254, Pl. 42, Fig. 2 (Kosi Bay, KwaZulu-Natal, South Africa).

Blennius cristatus (non Linnaeus 1758): Smith 1949*.

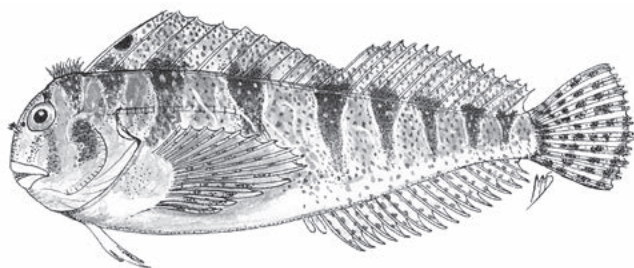
Scartella emarginata: Bath 1977; Shen *et al.* 1986*; SSF No. 235.40*; Randall 1995*; Sadovy & Cornish 2000*.

Diagnosis as for genus. (Distinguished from other species of *Scartella* by colour.)

Head, body and fins tan, covered with fine brown to black spots (extent of spotting greater with size); ~6–8 evenly spaced dark saddles on body (1st above pectoral-fin bases, last on peduncle); 2 or 3 dusky bands radiating downwards from eyes; each predorsal cirrus with alternating dark and pale rings; ventral margin of pectoral fins yellowish orange; anal-fin margin bluish white; caudal fin with irregular dark and pale spots forming irregular bands. Attains 10 cm SL.



Scartella emarginata, 80 mm TL, male (South Africa). Source: SSF



Scartella emarginata, 75 mm TL. Source: SFSA

DISTRIBUTION Atlantic Ocean (southern Angola) and Indo-Pacific (widespread but patchy). WIO: Gulf of Oman to Pakistan and India, and southern Mozambique to South Africa; elsewhere, Hong Kong, Taiwan and Japan.

GENUS *Stanulus* Smith 1959

Tiny cirrus present on each side of nape and on anterior nostrils, none on orbits; no fleshy blade-like crest on head. Lateral line continuous dorsoanteriorly on body, with pores with scale-like flaps (difficult to see), continuing midlaterally as a few disjunct bipored tubes to below dorsal-fin rays 4–6. Free margin of upper lip smooth. Dorsal fin 12 spines, 9 or 10 rays, fin deeply notched between spines and rays, and attached by membrane to body in front of caudal-fin base; anal fin 2 spines, 10 or 11 rays, last ray often split to base, and fin not attached by membrane to peduncle; pectoral fins usually 15 (rarely 14) rays; pelvic fins 1 spine (embedded, visible only in skeletal preparations), 4 rays (innermost ray reduced, difficult to see); caudal fin 12 or 13 (usually 12) rays, middle 9 rays branched. Incisor teeth loosely attached to jaws: 100+ premaxillary teeth, <90 dentary teeth; recurved canine present at rear on each side of lower jaw, relatively large in males (no canine at rear in upper jaw); no teeth on vomer. Infraorbital bones 5. Tiny, maximum size ~30 mm SL (ripe females <20 mm SL). Usually associated with surge channels, and rocks and rubble near coral reefs. At least 2 species, 1 in WIO.

Stanulus seychellensis Smith 1959

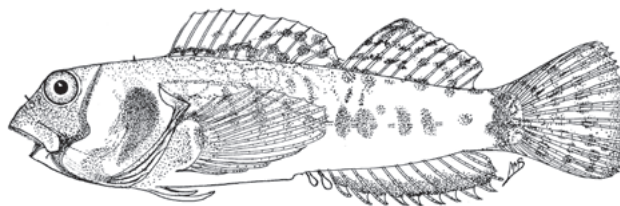
Seychelles blenny

PLATE 143

Stanulus seychellensis Smith 1959: 246, Pl. 17, Fig. 13 (La Digue I., Seychelles); Smith & Smith 1963*; Springer 1968*; Fricke *et al.* 2009.

Diagnosis as for genus. Dorsal fin usually 10 rays; anal fin usually 11 rays. No supraorbital cirrus. Total vertebrae 29.

Body reddish orange, with irregular round white blotches, and white ventrally, and most fins with barring; preserved colour pattern not distinctive, except for small dark spot usually present on fleshy part of pectoral fins at base of 2 uppermost rays. Attains at least 30 mm SL.



Stanulus seychellensis, 35 mm TL, holotype (Seychelles). Source: Smith 1959

DISTRIBUTION Indo-Pacific (disjunct). WIO: Comoros, Seychelles, Mascarenes and Chagos; elsewhere to Indonesia (Moluccas: one record), Batanes Is. (northernmost Philippines) and southernmost Taiwan (otherwise absent from Indo-Malayan Archipelago), Mariana Is., Minami-Tori-shima,

Caroline Is., Marshall Is., Trobriand Is., Santa Cruz Is. (Solomon Is.), southern Great Barrier Reef, New Caledonia, Tonga and Tuamotu Is.

GENUS *Xiphasia* Swainson 1839

Dorsal-fin spines not sexually dimorphic. No cirri and no fleshy blade-like crest on head. Gill opening restricted to level of uppermost 1–7 pectoral-fin rays. Lateral line present. Dorsal-fin origin over eyes in adults; last ray of dorsal and anal fins bound by membrane to edge of caudal fin. Dorsal fin 11–14 spines, 99–119 rays, fin not notched between spines and rays; anal fin 2 spines, 97–119 rays; pectoral fins 10–14 rays; pelvic fins 1 spine, 3 rays; caudal fin 10 rays, all unbranched. Number of teeth generally increase with SL; premaxillary teeth 12–30, dentary teeth 10–34; canines present at rear in both jaws, dentary canines not grooved (without venom gland at base); no teeth on vomer. Infraorbital bones 4. Body long and slender, to ~60 cm TL. Inhabit worm tubes, and burrow into mud or sand bottom. Two species, both in WIO.

KEY TO SPECIES

- 1a Pectoral fins 10 or 11 rays; dorsal fin 11 spines *X. matsubarai*
 1b Pectoral fins 12–14 rays; dorsal fin 13 or 14 spines *X. setifer*

Xiphasia matsubarai Okada & Suzuki 1952

Japanese snakeblenny

PLATE 143

Xiphasia matsubarai Okada & Suzuki 1952: 75, Fig. (off Owashi, Japan);
 Smith-Vaniz 1976*; SSF No. 235.41*; Heemstra & Heemstra 2004;
 Froese & Pauly 2008*.

Dorsal fin 11 spines, 99–104 rays, total elements 110–115; anal fin 2 spines, 97–104 rays; pectoral fins 10 or 11 rays; caudal fin of males rounded, without filamentous rays. Premaxillary teeth 17–20; dentary teeth 16–22.

Body with alternating broad dark and dusky bands; anal-fin leading edge narrowly white; caudal-fin margin narrowly white. Attains ~30 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: northern Red Sea, East Africa to South Africa (False Bay), Madagascar,

Mauritius and Maldives; elsewhere to Andaman Is., Indonesia, Japan, Mariana Is. and Solomon Is.

REMARKS Rarely seen or collected.

Xiphasia setifer Swainson 1839

Snake blenny

PLATE 143

Xiphasia setifer Swainson 1839: 259 (Visakhapatnam, India);
 Smith-Vaniz 1976*; SSF No. 235.42*; Randall 1995*; Carpenter *et al.*
 1997*; Heemstra & Heemstra 2004*; Lieske & Myers 2004*; Froese &
 Pauly 2008*; Fricke *et al.* 2009.

Xiphogadus madagascariensis Playfair 1868: 11 (from stomach of fish taken in Morondava River, Madagascar).

Dorsal fin 13 or 14 spines, 105–119 rays, total elements 118–133; anal fin 2 spines, 107–119 rays; pectoral fins 12 or 14 rays; caudal fin of males with middle 2 rays elongated and filamentous. Premaxillary teeth 12–30; dentary teeth 10–34.

Body with alternating broad dark and yellowish bands, bands extending well onto dorsal fin; dorsal fin yellowish anteriorly, with pupil-sized ocellated spot (black with blue ring) distally between spines 5 and 7, large black blotch between spines 10 and 14, irregular narrow blue stripe along middle of anterior third of fin (stripe passing along ventral border of 2 black spots), blackish submarginal stripe, and ray tips yellow anteriorly and blue then white posteriorly; anal fin yellowish basally, distal half blackish, ray tips pale; caudal fin dark brown. Attains ~60 cm TL.

DISTRIBUTION Indo-Pacific (widespread). WIO: Persian/Arabian Gulf, Red Sea, Oman to South Africa (False Bay), Madagascar, Mascarenes, Chagos and southern India; elsewhere to central Japan, Australia, Lord Howe I. and Vanuatu; not known from Pacific Plate.

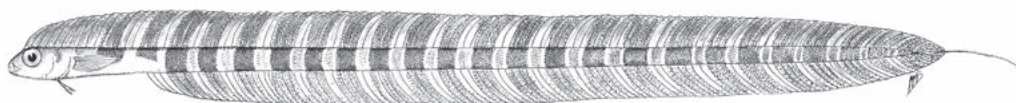
REMARKS Rarely seen or collected.

GLOSSARY

allopatric distribution – populations or species occupying mutually exclusive geographic areas.

crenulate – having a margin shaped into small, rounded scallops.

rugosities – wrinkles and lumps on a surface.



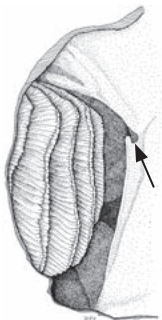
Xiphasia setifer, 30 cm TL (South Africa). Source: SSF

FAMILY CLINIDAE

Klipfishes

Wouter Holleman

Small-sized (generally 5–30 cm SL), body elongate and somewhat compressed. Single dorsal fin extending from head to peduncle, with numerous spines and 0–14 rays, and fin often with anterior crest formed of first 3–5 spines. Anal fin long, with 2 short spines and numerous rays. Pelvic fins inserted in front of pectoral fins, with 1 hidden spine and 2 or 3 rays (innermost ray often reduced). Caudal fin truncate or rounded, with 13 segmented rays in most species. All fin rays unbranched. Body usually covered with small, inconspicuous, embedded, cycloid scales. Lateral line anteriorly with conspicuous adjacent scales, typically either with vertically paired pores or with pores opening either dorsally or ventrally, lateral line thereafter curving downwards beyond pectoral fin and continuing midlaterally to peduncle, usually as a series of short, separated, horizontal tubes with a pore at each end (LL scales counted from anterior end to first separate tube). Teeth present on vomer (except in *Cancelloxus*); no teeth on palatines (except present in *Springeratus*). Cleithrum usually with small upturned hook visible under opercular flap (hook reduced in some species and absent in *Xenopoclinus leprosus*). Branchiostegal rays 6 or 7; gill membranes united and forming free fold across isthmus.



Upturned hook-like projection under opercular flap, as found in most clinid species.

All Indo-Pacific clinids are viviparous; males with an intromittent organ immediately posterior to the anus. Young of southern African species are reputedly born from August to October, and settle into a benthic lifestyle after a short larval phase. Generally cryptic, with some species assuming the colour of the substrate that the young first settle on, and are thus well-camouflaged. Inhabit intertidal areas, especially tidepools among algae, seaweeds and stones, and also the subtidal zone, often among seaweeds, bryozoans and soft corals, to at least 50 m. The southern African species form the continent's largest group of endemic marine fishes; they are particularly speciose and numerous on the western and

southeastern coasts of South Africa. The family is similarly diverse in southern Australia.

About 26 genera and 88 species; 14 genera and 46 species in WIO.

KEY TO GENERA

- 1a Barbels present on chin and snout *Cirrhibarbis*



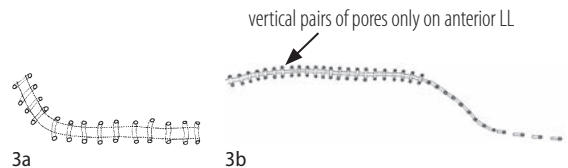
- 1b No barbels on chin 2

- 2a Dorsal fin 0–1 rays 3

- 2b Dorsal fin >2 rays 4

- 3a Dorsal fin 33–38 spines; lateral line with vertical pairs of pores to caudal-fin base *Climacoporus*

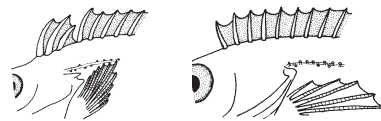
- 3b Dorsal fin 41–48 spines; lateral line with vertical pairs of pores anteriorly only *Muraenoclinus*



- 4a Dorsal fin with tall anterior crest of first 5 spines, fin origin above rear margin of eye, and fin margin undulating *Smithichthys*



- 4b Dorsal fin with anterior crest of first 3 spines or without crest, fin margin straight 5



- 5a Pelvic fins with 3 well-developed rays, upcurved, with membrane between rays 6

- 5b Pelvic fins 2 or 3 rays (3rd usually reduced), rays not upcurved and with partial membrane between rays 7



Continued ...

KEY TO GENERA

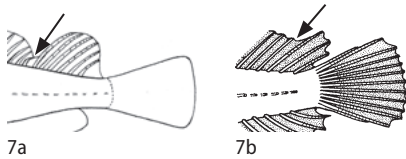
- 6a Lateral line anteriorly with single pores; lower jaw longer than upper jaw *Cancelloxus*



- 6b Lateral line anteriorly with mostly vertical pairs of pores; upper and lower jaw subequal *Xenopodinus*

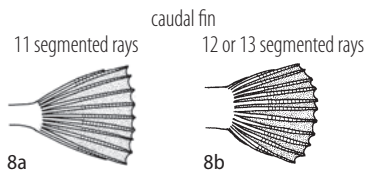
- 7a Dorsal fin deeply notched between spines and rays *Blennioclina*

- 7b Dorsal fin not notched between spines and rays 8



- 8a Caudal fin 11 rays; pectoral fins 10 rays; body highly compressed *Fucomimus*

- 8b Caudal fin 12 or 13 rays; pectoral fins 11 or 12 rays 9



- 9a No orbital cirrus 10

- 9b Orbital cirrus present (sometimes minute) 11

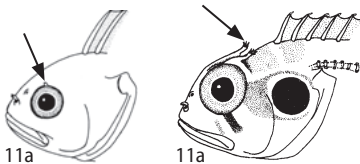


- 10a Body naked; lateral line with vertical pairs of pores to caudal-fin base *Clinoporus*

- 10b Body scales small, cycloid, embedded; lateral line with vertical pairs of pores anteriorly only *Pavodinus*

- 11a Orbital cirrus minute; body compressed; dorsal-fin margin undulating [west coast of southern Africa only] *Gynutodinus*

- 11b Orbital cirrus branched (except unbranched in *Clinus spatulatus* and *C. exasperatus*); body not compressed; dorsal-fin margin straight, sometimes with anterior crest of first 3 spines 12



Continued...

KEY TO GENERA

- 12a Last anal-fin ray joined to peduncle by membrane; body elongate *Blennophis*

- 12b Last anal-fin ray not joined to peduncle by membrane 13

- 13a Palatine teeth present; genital valves (folds of skin around genitalia) present *Springeratus*

- 13b No palatine teeth; no genital valves *Clinus*

GENUS *Blennioclina* Gill 1860

Body slightly compressed, with small embedded scales, fins naked; dorsal-fin margin deeply notched after last spine, anterior rays longer than spines; pelvic fins 3 rays; no orbital cirrus; anterior lateral line with vertical pairs of pores. Two species, both in WIO.

KEY TO SPECIES

- 1a Dorsal fin 8–11 rays; anterior dorsal-fin spines with cirri at tips; dorsal fin with shallow or no notch between 3rd and 4th spines *B. brachycephalus*

- 1b Dorsal fin 6 or 7 rays; no cirri on tips of anterior dorsal-fin spines; dorsal fin deeply notched between 3rd and 4th spines *B. stella*

Blennioclina brachycephalus

(Valenciennes 1836)

Lace klipfish

PLATES 144 & 145

Clinus brachycephalus Valenciennes in Cuv. & Val. 1836: 371 (Cape of Good Hope, South Africa).

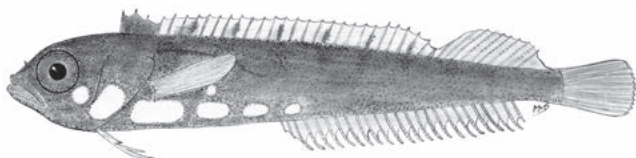
Labrisomus linearis Swainson 1839: 277 [unnecessary new name].

Blennioclina brachycephalus: Gill 1860; Smith 1946, 1949*; SFSA No. 995*; Penrith 1969*; SSF No. 237.1*.

Dorsal fin 26–30 spines, 8–11 rays, rays about twice length of spines, anterior spines with cirri at tips, no crest; anal fin 2 spines, 19–25 rays; pectoral fins 12–15 rays; pelvic fins 1 spine, 3 rays, inner ray short and slender. Body slightly compressed, depth 5–5.8 in SL; head small, HL 4–5 in SL; eyes placed well forward, eye diameter 2.5–3.5 in HL. Anterior LL pored scales 30–36. Male intromittent organ oval, with small tip between 2 lateral wings. Vertebrae 17 + 28–30.

Colour variable to match substrate: body with alternating, irregular, dark and pale rings, dark rings of olive-green, purple or reddish, rings of similar but paler colours; white blotches

often along midsides, both pale and dark areas extending onto dorsal fin; large dark green or blue-black ocellus surrounded by dark red above pectoral fin; head dark above, with dark 'chin strap' from below each eye to underneath head, behind which a pale to white area extending from eye to about rear margin of preopercle; anal fin with alternating coloured and white bars; pelvic fins striped red and white. Juveniles dark red, with silvery blotches along sides. Preserved specimens uniformly yellow. Attains 15 cm SL.



Blennioclinus brachycephalus, 30 mm TL, juvenile (South Africa). Source: SFSA

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (Kei River) in WIO.

REMARKS Fairly common; found in tidepools and shallow coastal waters with pebbles, sea urchins and anemones.

Blennioclinus stella Smith 1946

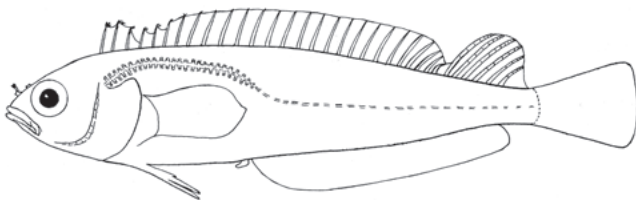
Silverbubble klipfish

PLATE 145

Blennioclinus stella Smith 1946: 543, Fig. 4 (Great Kei River to Mthatha River, South Africa); SFSA No. 994*; Penrith 1969*; Winterbottom 1976; SSF No. 237.2*.

Dorsal fin 24–28 spines (first 3 spines forming a separate crest), 6 or 7 rays, longest ray little longer than longest spine; anal fin 2 spines, 19–21 rays; pectoral fins 12 rays; pelvic fins 1 spine, 3 rays, inner ray minute. Body slightly compressed, depth 5.3–5.8 in SL; head short, HL 3.8–5.2 in SL; eye diameter 2.5–3.3 in HL. Anterior LL pored scales 20–25. Male intromittent organ a pair of long, tapering segments. Vertebrae 13 + 25–27.

Colour variable to match substrate: body green, brown, red or orange, mottled with silvery 'bubbles' along midsides. Preserved specimens uniformly yellow. Attains 50 mm SL.



Blennioclinus stella, ~30 mm TL (South Africa).

DISTRIBUTION WIO: South Africa (Algoa Bay to KwaZulu-Natal).

REMARKS Smallest of the clinids, matures at ~38 mm SL. Found in intertidal and subtidal zones, to 10 m deep.

GENUS *Blennophis* Swainson 1839

Body eel-like; dorsal fin low and even, and spines without cirri at tips; body, cheeks, upper edge of opercle, and bases of median fins scaly; orbital cirrus a flat stalk with fringe of cirri; lateral line with vertical pairs of pores anteriorly, followed by disjointed tubes with a pore at each end. Two species, both in WIO.

KEY TO SPECIES

- 1a Dorsal fin 46–50 spines; pelvic fins 1 spine, 3 rays, inner ray stout; body not striped in life *B. anguillaris*
- 1b Dorsal fin 40–45 spines; pelvic fins 1 spine, 2 or 3 rays, inner ray minute if present; body striped in life *B. striatus*

Blennophis anguillaris (Valenciennes 1836)

Snaky klipfish

PLATES 145 & 146

Blennius rubescens Lichtenstein 1823: 117 (Cape of Good Hope, South Africa) [*nomen oblitum*].

Clinus anguillaris Valenciennes in Cuv. & Val. 1836: 390, Pl. 334 (Cape of Good Hope, South Africa).

Blennophis anguillaris: Swainson 1839; Smith 1946; SFSA No. 980*; SSF No. 237.3*.

Blennophis rubescens: Smith 1962.

Clinus (*Blennophis*) *anguillaris*: Penrith 1969*.

Dorsal fin 46–50 spines, 2–4 rays; anal fin 2 spines, 33–37 rays; pectoral fins 13 or 14 rays; pelvic fins 1 spine, 3 rays, rays subequal. Body robust and eel-like, depth 6–7.8 in SL; head blunt and wedge-shaped, HL 4.8–5.8 in SL; eye diameter 3.3–5 in HL. Anterior LL pored scales 20–22, pores mostly in vertical pairs. Male intromittent organ short, oval, with tip between 2 lateral lips. Vertebrae 18 + 38–40.

Body brown or reddish brown; large oval black blotch above opercle, sometimes with pale edge; numerous black spots around eyes and on body; orbital cirrus black; juveniles nearly all black with red median-fin margins; very small juveniles purple-black with white caudal fin. Preserved specimens uniformly buff. Attains 30 cm SL.

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (East London) in WIO.

REMARKS Found in tidepools and subtidal zone, and more commonly in kelp beds on west coast of South Africa, particularly north of Lambert's Bay.

Blennophis striatus (Gilchrist & Thompson 1908)

Striped klipfish

PLATE 145

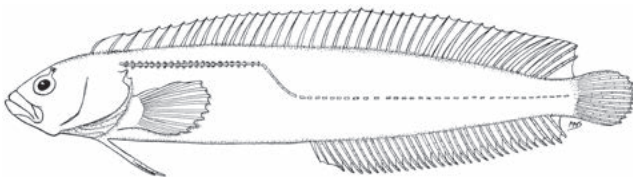
Clinus striatus Gilchrist & Thompson 1908: 134 (Simonstown, South Africa).

Blennophis striatus: Smith 1946; SFSA No. 981*; SSF No. 237.4*.

Clinus (Blennophis) striatus: Penrith 1969*.

Dorsal fin 40–45 spines, 2–4 rays; anal fin 2 spines, 28–31 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray reduced when present. Body robust, elongate, depth 6–8.3 in SL; head short, wedge-shaped, HL 4.5–5.3 in SL; eye diameter 3.5–5 in HL. Anterior LL pored scales ~22, with vertical pairs of pores. Male intromittent organ small, triangular, tapering, with small upturned tip. Vertebrae 17 + 34 or 35.

Adults reddish, with faint white stripes; dark ocellus with pale edge on shoulder. Juveniles striped yellow-white and red; belly white; dorsal- and anal-fin margins yellow; anal fin brownish, rays tips pink. Preserved specimens pale yellow. Attains 18 cm SL.



Blennophis striatus, 15 cm TL (South Africa). Source: SFSA

DISTRIBUTION South Africa: Saldanha Bay in southeastern Atlantic, to East London in WIO.

REMARKS Rare; found in tidepools and subtidal zone.

GENUS *Cancellopus* Smith 1961

Body elongate; dorsal fin low, its origin over opercle or vent; scales on body minute and embedded, but head and fin bases naked; anterior LL of tubed scales with median pores; pelvic fins with 3 upcurled rays connected by membranes (resembling a webbed foot); lower jaw protruding; no teeth on vomer; no orbital cirrus; cleithral hook reduced to small knob

(absent in *C. elongatus*). The placement of *C. elongatus* in this genus is dubious and requires further study. Live in sand or coarse gravel, depending on species. Three species, all in WIO.

KEY TO SPECIES

- | | | |
|----|--|---------------------|
| 1a | Dorsal-fin origin above vent | 2 |
| 1b | Dorsal-fin origin above opercle | <i>C. elongatus</i> |
| 2a | Dorsal fin with anterior rays longer than spines;
anal fin ≥ 51 rays | <i>C. longior</i> |
| 2b | Dorsal fin with anterior rays same length as spines;
anal fin with ≤ 43 rays | <i>C. burrelli</i> |

Cancellopus burrelli Smith 1961

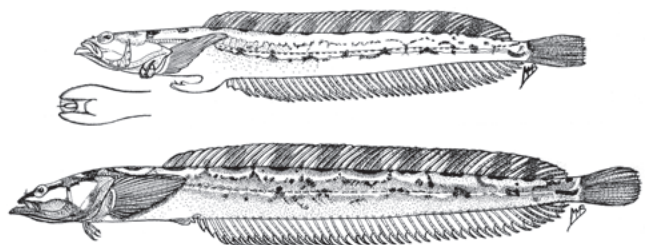
Slender platanna-klipfish

PLATES 144 & 145

Cancellopus burrelli Smith 1961: 355, Fig. 4 (Lambert's Bay, South Africa); Penrith 1969*; SSF No. 237.5*.

Dorsal fin 33–39 spines, 10–14 rays, fin origin above vent; anal fin 2 spines, 38–43 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 3 rays; caudal fin 13 rays. Body elongate, compressed, depth 8–11 in SL; head depressed, HL 4.3–5.5 in SL; eye diameter 3.9–4.8 in HL. Anterior LL tubed scales 18–21. Male intromittent organ oval and expanded, with small enclosed tip. Vertebrae 19 + 43–46 (males) or 20 or 21 + 44 or 45 (females).

Body semi-translucent to cream, with 12 pale brown saddles (first on nape, last at end of dorsal fin); cream line along midsides, with brown blotches or mottled lines; head pinkish, with cream streak below eye and onto opercle; median fins hyaline. Attains 12 cm SL.



Cancellopus burrelli, 80 mm TL, male paratype (top); 10 cm TL, female holotype (bottom) (both South Africa). Source: Smith 1961

DISTRIBUTION South Africa: Orange River mouth in southeastern Atlantic, to Cape Point and south coast (Algoa Bay) in WIO.

REMARKS Found on coarse pebbles at lowest part of intertidal zone, to at least 20 m deep.

Cancellopus elongatus Heemstra & Wright 1986

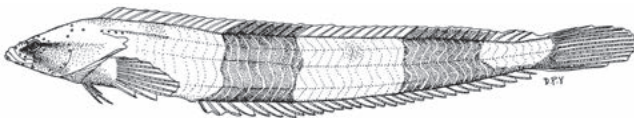
Whiteblotched klipfish

PLATES 144 & 145

Cancellopus elongatus Heemstra & Wright 1986: 2, Figs. 1–4, Pl. 1 (off Storms River mouth, South Africa); SSF No. 237.6*; Prochazka & Griffiths 1992.

Dorsal fin 38–43 flexible spines (last 5–7 spines pungent), 3 or 4 rays, fin origin above opercle; anal fin 2 spines, 27–32 rays; pectoral fins 11 or 12 rays; pelvic fins 1 spine, 3 rays; caudal fin 11 or 12 rays. Body elongate, compressed, depth 7.1–9.6 in SL; head pointed, HL 4.2–4.6 in SL; eyes small, diameter 6.4–7.2 in HL. Head and body naked except for a few minute embedded scales near lateral line; anterior LL tubed scales ~7. Male intromittent organ cylindrical, with expanded end and small enclosed tip. Vertebrae 15 or 16 + 33 or 34.

Body white, with 2 broad dark brown bars (1st from middle of dorsal fin to anal-fin origin, 2nd below rear quarter of dorsal fin and extending along lower part of peduncle to include caudal fin); head whitish, with numerous small brown spots and brown V-shaped mark (upper limb through eye, lower limb across cheek to preopercle). Attains ~55 mm SL.



Cancellopus elongatus, 46 mm SL, female holotype (South Africa). Source: Heemstra & Wright 1986

DISTRIBUTION WIO: South Africa (Tsitsikamma to Algoa Bay).

REMARKS Found in 5–25 m, on sand and gravel near rocks.

Cancellopus longior Prochazka & Griffiths 1991

Elongate sand klipfish

PLATES 144 & 146

Cancellopus longior Prochazka & Griffiths 1991: 2, Figs. 1–4 (off Miller's Point, Cape Peninsula, South Africa); Prochazka & Griffiths 1992.

Dorsal fin 38–43 spines, 11–15 rays, rays longer than spines, fin origin above vent; anal fin 2 spines, 51–57 rays, fin origin slightly in advance of dorsal-fin origin; pectoral fins 13–15 rays; pelvic fins 1 spine, 3 rays; caudal fin 11–15 (usually 14) rays. Body elongate and compressed, depth 8.6–12.7 in SL; head depressed, short, HL 5.1–6.7 in SL; eye diameter 4.2–5.4 in HL; lower jaw projects prominently. Body naked except for small embedded scales near lateral line; anterior LL tubed

scales 28–30. Male intromittent organ curved, apex dilated, comprised of 2 outer and 2 inner lobes, with long, thin, curved terminal hook surrounded by membrane. Vertebrae 17 or 18 + 56 or 57.

Body whitish, with pale brown and cream blotches dorsally, many close-set brownish spots above lateral midline, and thin brown line midlaterally with pale lines either side, from eyes to caudal-fin base; body below line whitish with some mottling; head whitish below brown line, mottled above it; median fins hyaline. Attains 12 cm SL.

DISTRIBUTION South Africa: Green River mouth (Northern Cape) in southeastern Atlantic, to False Bay in WIO.

REMARKS Fairly common; found on loose fine-grained sand, from close inshore to ~20 m deep.

GENUS *Cirrhibarbis* Valenciennes 1836

Barbels present on snout and chin; cheeks and median-fin bases with small scales. One species.

Cirrhibarbis capensis Valenciennes 1836

Barbelled klipfish

PLATES 144 & 145

Cirrhibarbis capensis Valenciennes in Cuv. & Val. 1836: 406, Pl. 337 (Cape of Good Hope, South Africa); Swainson 1839*; Smith 1946; SFSA No. 977*; SSF No. 237.7*.

Clinus capensis: Günther 1861; Gilchrist & Thompson 1908; Barnard 1927. *Clinus (Cirrhibarbis) capensis*: Penrith 1969*.

Diagnosis as for genus. Dorsal fin 37–44 spines, most spines with clusters of cirri at tips, 5–9 rays; anal fin 2 spines, 26–34 rays; pectoral fins 12–14 rays; pelvic fins 1 spine, 2 or 3 rays. Body elongate, slightly compressed, depth 5–6 in SL; head narrow, pointed, HL 3.5–4.5 in SL; eye diameter 3.5–5.5 in HL. Orbital cirrus flat with fine fringe of cirri; 3 barbels on snout, 8 barbels on chin. Head pores double or multiple; anterior LL scales 33 or 34, with vertical pairs of pores. Male intromittent organ oval, tip small and covered by pair of ventral lips. Vertebrae 18–21 + 32–37.

Body colour variable: creamy white with pink bars, or with cream-coloured bars containing many small spots and alternating with dark red bars, or body entirely dark red; dark forms with dark red spot on shoulder, with white above and below. Preserved specimens pale yellow, but ocellus slow to fade. Attains 35 cm SL.

DISTRIBUTION South Africa: Lambert's Bay to Cape Point in southeastern Atlantic (uncommon), to False Bay and East London in WIO (common).

REMARKS Found in rock pools and subtidal zone.

GENUS *Climacoporus* Barnard 1935

Head naked, head pores double; lateral line of vertical pairs of pores extending to peduncle; body and median-fin bases with small embedded scales. One species.

Climacoporus navalis Barnard 1935

Fleet klipfish

PLATE 146

Climacoporus navalis Barnard 1935: 646, Fig. 1 (Simonstown, False Bay, South Africa); Smith 1946; SFSA No. 978*; SSF No. 237.8*.

Nemacoclinus navalis: Smith 1937.

Clinus (*Climacoporus*) *navalis*: Penrith 1969*.

Clinus navalis: Winterbottom 1976.

Diagnosis as for genus. Dorsal fin 33–38 spines (first 4 spines more widely spaced than remainder), 0 or 1 ray, fin margin even; anal fin 2 spines, 22–24 rays; pectoral fins 12 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray reduced or absent. Body elongate, slightly compressed, depth 5–6.3 in SL; HL 4–5.2 in SL; eye diameter 3–4 in HL. Orbital cirrus a flat stalk with terminal fringe of fine cirri. Lateral line narrows posteriorly and may become obscure towards peduncle. Male intromittent organ simple, tapering and curved. Vertebrae 15 + 27–29.

Body colour variable: yellowish brown, greenish or reddish, and streaked, mottled or barred with darker shades; pale-edged dark ocellus on shoulder; caudal fin barred. Preserved specimens plain buff. Attains 70 mm SL.

DISTRIBUTION WIO: South Africa (Stilbaai to Transkei region and southern KwaZulu-Natal).

REMARKS Fairly abundant in rock pools. Originally collected from barnacles on the bottom of a ship at Simonstown, but subsequent extensive collecting indicates it does not occur in False Bay.

GENUS *Clinoporus* Barnard 1927

Body naked; lateral line broad, with large paired pores, ending in single median pore below end of dorsal fin; no cirri on dorsal-fin spines; no orbital cirrus. One species.

Clinoporus biporosus (Gilchrist & Thompson 1908)

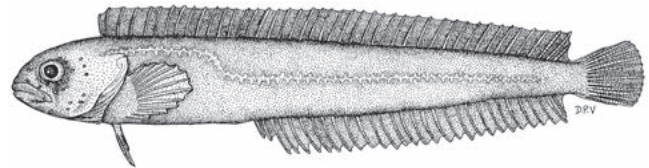
Ladder klipfish

Clinus biporosus Gilchrist & Thompson 1908: 137 (False Bay, South Africa).

Clinoporus biporosus: Barnard 1927; Smith 1946; SFSA No. 1003*; Penrith 1969*; SSF No. 237.9*.

Diagnosis as for genus. Dorsal fin 38–41 spines, 2 or 3 rays, fin margin even; anal fin 2 spines, 27–29 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 3 rays. Body robust and elongate, depth 6.3–6.9 in SL; head rounded, HL 4.5–6.3 in SL; eye diameter 2.8–4.3 in HL. Male intromittent organ small, conical, with narrow tip between 2 large lateral lobes. Vertebrae 17 + 32–35.

Body uniformly red, brown or orange. Preserved specimens uniformly buff. Attains 13 cm SL.



Clinoporus biporosus, 13 cm TL (South Africa). Source: SSF

DISTRIBUTION South Africa: Saldanha Bay in southeastern Atlantic, to False Bay in WIO.

REMARKS Rare; found in subtidal zone to ~30 m deep.

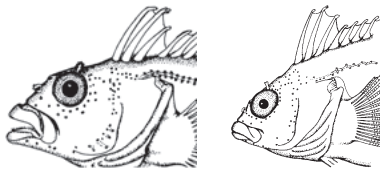
GENUS *Clinus* Cuvier 1816

Orbital cirrus distally flattened, at least bifid, but simple in *C. exasperatus* and *C. spatulatus*, and minute in some *C. spatulatus*; dorsal fin with >2 rays; pelvic fins 2 or 3 rays (3rd always reduced, sometimes minute); caudal fin 13 rays. Body moderately robust, depth 3–5 in SL, covered with small, embedded, cycloid scales. Jaws with 2 bands of villiform teeth, those in outer band larger; teeth present on vomer. Lateral line anteriorly usually with double pores per scale, or with single

pores opening dorsally or ventrally; lateral line after pectoral curve usually a series of short, disjointed, horizontal tubes with a pore at each end (except in *C. taurus*). Male intromittent organ usually fairly long; basal portion with small tip retractile between 1 or 2 pairs of fleshy lips. Several of the species adopt the colour of their surroundings when the young settle out of the plankton. About 21 species, all in southern Africa, 6 of which belong to the same species-complex.

KEY TO SPECIES

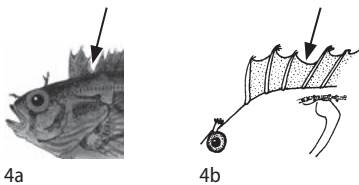
- 1a Dorsal fin with anterior crest of first 3 spines, with notch of varying depth between 3rd and 4th spines 2



- 1b Dorsal fin without anterior crest 11
- 2a Crest low, first 3 spines little longer than 4th spine 3
- 2b Crest tall, 1st spine usually much longer than 4th spine 5

- 3a Interorbital region markedly concave; multiple sensory pores on head and in anterior part of lateral line *C. taurus*
- 3b Interorbital region not concave; no multiple sensory pores on head or in lateral line 4

- 4a Dorsal fin with deep notch after 3rd spine, 4–7 rays *C. brevicristatus*
- 4b Dorsal fin with slight notch after 3rd spine, 9–14 rays *C. robustus*

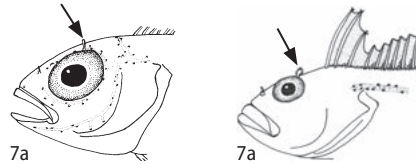


- 5a Orbital cirrus simple or with a few short branches 6
- 5b Orbital cirrus tree-like, with many long branches 8
- 6a Dorsal fin not notched between 3rd and 4th spines; body compressed, depth ~3.4 in SL; lips and chin with regular pattern of dark marks *C. exasperatus*
- 6b Dorsal fin notched between 3rd and 4th spines; body depth >3.5 in SL 7

Continued ...

KEY TO SPECIES

- 7a Bases of dorsal fin and caudal fin naked; orbital cirrus simple, sometimes small, rarely bifid *C. spatulatus*
- 7b Bases of dorsal fin and caudal fin scaly; orbital cirrus with a few short branches *C. superciliosus*



- 8a Spines of dorsal-fin crest subequal, and with tufts of cirri at tips; dorsal fin usually 34 or 35 spines *C. ornatus*
- 8b Dorsal-fin crest triangular, with or without cirri at spine tips; dorsal fin usually 38 or 39 spines 9

- 9a Dorsal fin with usually 5 or 6 rays 10
- 9b Dorsal fin with usually 8 rays; colour in life includes pale mosaic patterns below lateral midline *C. musaicus*

- 10a Dorsal fin 36–41 (usually 38 or 39) spines *C. arborescens*
- 10b Dorsal fin 27–31 spines *C. woodi*

- 11a Dorsal-fin membranes deeply incised between first 9 or 10 spines; anterior 7–10 spines each with tuft of long cirri at tip *C. nematopterus*



- 11b Dorsal fin not as above 12
- 12a Dorsal fin with 2–4 (usually 3) rays 13
- 12b Dorsal fin with 4–10 (rarely 4) rays 14

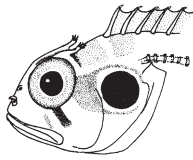
- 13a Dorsal-fin rays longer than preceding spines; slight notch between 3rd and 4th dorsal-fin spines, spine tips without cirri *C. marmoratus*
- 13b Dorsal-fin rays same length as preceding spines; no notch between 3rd and 4th dorsal-fin spines, anterior spines with single cirri at tip *C. venustris*

- 14a Orbital cirrus with many long filaments 15
- 14b Orbital cirrus without branches or with few, simple branches 19

Continued ...

KEY TO SPECIES

- 15a Conspicuous dark round mark on opercle (purple in life) *C. cottoides*



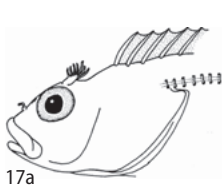
- 15b No dark round mark on opercle 16

- 16a Dorsal fin with 5 or 6 rays 17

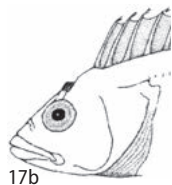
- 16b Dorsal fin with 7–10 rays 18

- 17a Interorbital region concave, and with low bony ridges over eyes; no cirri at tips of dorsal-fin spines *C. helenae*

- 17b Interorbital region flat; no bony ridges over eyes; dorsal-fin spines with clusters of 3 cirri at tips *C. berrisfordi*



17a



17b

- 18a Pectoral fins 13 or 14 rays; dorsal fin 7–9 (usually 8) rays *C. latipennis*

- 18b Pectoral fins 12 rays; dorsal fin 9 or 10 rays *Clinus* cf. *latipennis*

- 19a Dorsal fin 8 or 9 rays, first rays longer than last spines; dorsal-fin spines without cirri *C. rotundifrons*

- 19b Dorsal fin 5–7 rays; dorsal-fin spines with cirri at tips 20

- 20a Caudal fin rounded; anterior dorsal-fin spines shorter than posterior spines *C. acuminatus*

- 20b Caudal fin truncate; all dorsal-fin spines about same length *C. heterodon*

Clinus acuminatus (Bloch & Schneider 1801)

Sad klipfish

PLATES 145 & 147

Blennius acuminatus Bloch & Schneider 1801: 169 [no locality given].

Blennius ignobilis Gronow in Gray 1854: 98 (Cape of Good Hope, South Africa).

Ophthalmolophus acuminatus: Smith 1946.

Clinus acuminatus: Hubbs 1952; Smith 1966; SSF No. 237.10*.

Clinus (*Clinus*) *acuminatus*: Penrith 1967*, 1969*.

Dorsal fin 30–34 spines, anterior spines with 2 or 3 cirri at tips, 5–7 rays, no anterior crest or notch in membrane; anal fin 2 spines, 20–24 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 2 or 3 rays (3rd reduced or absent). Body slightly compressed, depth 4.5–6 in SL; head wedge-shaped, HL 3.2–4 in SL; eye diameter 2.8–5 in HL. Orbital cirrus flat, with short, simple branches. Anterior LL scales ~18, with pores opening alternately dorsally and ventrally; dorsal-fin base scaly; head, and bases of anal fin and caudal fin naked. Male intromittent organ moderate, dorsoventrally flattened, with tip between pair of large ventral lips and a pair of small dorsal lips. Vertebrae 16 + 27–29.

Body colour variable: yellowish to olive-green with darker bars; midsides with cluster of dark to black spots; indistinct ocellus on shoulder with pale surround; purplish bar through eye and across cheek. Juveniles with irregular white and black bars. Preserved specimens lose all colours. Attains 13 cm SL.

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic (common), to South Africa (East London) in WIO.

REMARKS Inhabits upper intertidal rock-strewn pools on the west coast (common), and the subtidal zone on south and southeast coasts.

Clinus arborescens (Gilchrist & Thompson 1908)

PLATES 146 & 147

Clinus superciliosus var. *arborescens* Gilchrist & Thompson 1908: 115 (False Bay, South Africa).

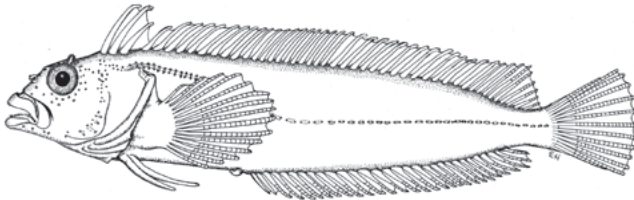
Clinus superciliosus: Smith 1946, 1949*; Penrith 1969; SSF No. 237.22*.

Clinus arborescens: Holleman *et al.* 2012*.

Dorsal fin 36–41 spines, 4–7 rays; anal fin 2 spines, 25–28 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 2 rays. Dorsal fin with first 3 spines forming anterior crest followed by deep notch; crest of males tall and triangular (length of 1st spine 1.7–2.5 fin height in males, 1.1–1.6 fin height in females); most spines with clusters of cirri at tip; fin base scaly. Body slightly compressed; HL 3.2–4.1 in SL; eye diameter 2.7–5.6 in HL. Orbital cirrus a flattened tree-like stalk. Anterior LL scales 38–43, with pores opening alternately dorsally and ventrally. Male intromittent organ tapering, triangular in cross-section, curled upwards at tip, with pair of small dorsal lips. Vertebrae 17–19 + 32–34.

Body mottled shades of red, with irregular hourglass-shaped blotches above midline, and pinkish red with paler markings below midline; belly cream; cheeks, orbital cirrus and

nasal cirri red; lips banded red and cream; dorsal and anal fins dark red with pale markings; pectoral-fin rays banded dark and pale red; pelvic fins with red and pale bands; caudal-fin rays red, membranes paler red, with pale markings including oval spot at base of central ray. Preserved specimens pale yellow. Attains 25 cm SL.



Clinus arborescens, 10 cm SL, male (South Africa).

DISTRIBUTION WIO: South Africa (south coast, from False Bay to Schoenmakerskop).

REMARKS A species of the *Clinus superciliosus* complex; unlike some other species of the complex it does not exhibit different colour forms. Found in subtidal zone, at 5–11 m; an apparent obligate inhabitant among *Rhodophyta* red algae.

Clinus berrisfordi Penrith 1967

Onrust klipfish

PLATE 147

Clinus berrisfordi Penrith 1967: 48, Figs. 3a–b (Onrus River mouth, South Africa); Penrith 1969*; SSF No. 237.12*.

Dorsal fin 33–36 spines, most with cirri at tips, 5 or 6 rays, fin without crest or notch; anal fin 2 spines, 23–25 rays; pectoral fins 11 or 12 rays; pelvic fins 1 spine, 3 rays, inner ray minute. Body slightly compressed, depth 4.5–5 in SL; head acutely wedge-shaped, HL 3.4–4 in SL; eye diameter 3–4.2 in HL. Orbital cirrus a flattened stalk with long, slender filaments. Anterior LL scales 27–29, with pores mostly in vertical pairs. Male intromittent organ cylindrical, with long base and slender upturned tip between 2 lateral lips. Vertebrae 16 or 17 + 28–31.

Body reddish orange, with 7 faint, darker broad bars, and dark ocellus on shoulder; head with 2 dark lines radiating from eye across cheek; fins reddish orange, faintly mottled and barred. Preserved specimens pale yellow. Attains 11 cm SL.

DISTRIBUTION WIO: South Africa (south coast, from False Bay to Schoenmakerskop, Eastern Cape).

REMARKS Uncommon; inhabits weedy pools and lower intertidal zone.

Clinus brevicristatus Gilchrist & Thompson 1908

Cape klipfish

PLATES 146 & 147

Clinus brevicristatus Gilchrist & Thompson 1908: 118 (Kalk Bay, False Bay, South Africa); Barnard 1927; Penrith 1969*; SSF No. 237.13*.

Petraites brevicristatus: Smith 1946; SFSA No. 985*.

Dorsal fin 33–36 spines, most with cirri at tips, and first 3 spines form low crest with deep notch after 3rd spine, 4–7 rays; anal fin 2 spines, 21–24 rays; pectoral fins 12–14 rays; pelvic fins 1 spine, 3 rays, inner ray ~½ length of middle ray. GR 1 or 2/3 or 4. Body slightly compressed, depth 4.5–5 in SL; HL 3.8–4.8 in SL; eye diameter 2.8–3.3 in HL. Orbital cirrus subcylindrical, tip flattened and rounded, with several simple branches. Anterior LL scales ~25, with pores in vertical pairs; dorsal-fin base scaly. Male intromittent organ small, oval, with upturned tip and single dorsal lip. Vertebrae 17 or 18 + 27–31.

Body pale grey or yellow to dark red, with narrow bars, alternating dark and pale shades of green, brown or dark red, belly white to grey; head same colour as body but often with white mottling; body colour continues onto fins; broad dark line from branchiostegal membrane to base of pectoral-fin rays. Attains 11 cm SL.

DISTRIBUTION South Africa: Lambert's Bay (west coast) to False Bay (south coast).

REMARKS Intertidal; uncommon.

Clinus cottoides Valenciennes 1836

Bluntnose klipfish

PLATES 145 & 148

Clinus cottoides Valenciennes in Cuv. & Val. 1836: 367 (Cape Town, Cape of Good Hope, South Africa); Swainson 1839; Gilchrist & Thompson 1908; Barnard 1927; Penrith 1969*; SSF No. 237.14*.

Blenniomimus cottoides: Smith 1946, 1949*.

Dorsal fin 31–36 spines, most with single flap of skin at tip, 4–6 rays, and fin without crest or notch; anal fin 2 spines, 21–25 rays; pectoral fins 12–14 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray minute or absent. GR 2/5 or 6. Body slightly compressed, tapering posteriorly, depth 4.5–5.5 in SL; head large and heavy, HL 3.3–4.3 in SL; maxilla extends to hind margin of eye; eyes large, diameter 2.3–3.5 in HL. Interorbital region concave, with bony ridge over eyes and deep groove across occiput. Orbital cirrus positioned on ridge as flat stalk with many long cirri at end. Anterior LL scales ~30, with alternating or vertical pairs of pores. Male intromittent organ subcylindrical, with upturned tip and pair of dorsolateral lips. Vertebrae 15 + 29–31.

Body slate grey or pale dull green, with mottling in purples and dark greys, often in lacy patterns, and with vague bars of dark grey or red with white, extending onto dorsal and anal fins; head with 5 alternating dark and pale bars diagonally below eye and across cheek; opercle with large black or purple ocellus. Colour pattern remains for years after preservation. Attains 12 cm SL.

DISTRIBUTION South Africa: Olifants River (west coast) in southeastern Atlantic, to Kei River mouth (Eastern Cape) in WIO.

REMARKS Common; inhabits intertidal areas and tidepools with pebbles and boulders, particularly abundant east of False Bay.

Clinus exasperatus

Holleman, Von der Heyden & Zsilavec 2012

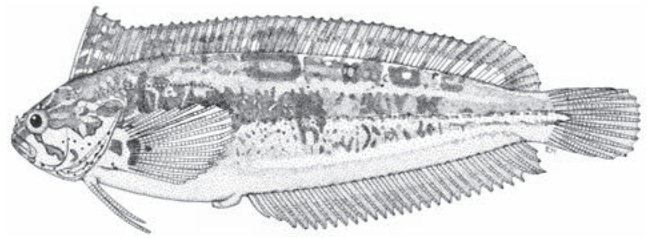
PLATE 148

Clinus exasperatus Holleman, Von der Heyden & Zsilavec 2012: 834, Figs. 1, 2, 5, 7 (Betty's Bay, Western Cape, South Africa).

Dorsal fin 38 spines, 8 rays; anal fin 2 spines, 28 rays; pectoral fins 16 rays; pelvic fins 1 spine, 2 rays. Dorsal-fin crest tall, 1st spine longest (about twice length of 4th spine), 2nd and 3rd spines decreasing in height, shallow notch after 3rd spine; first 6 spines with single filament at tips, those on crest prominent. Body deep and compressed, depth 4.1 in SL; HL 4 in SL; eye diameter 2.6 in HL. Orbital cirrus a small flattened stalk, with indentations at end, its length less than pupil diameter; maxilla extending to anterior margin of orbit. Anterior LL scales ~30, with double pores per scale. Male intromittent organ tapering, triangular in cross-section, curled upwards at tip, with pair of small dorsal lips. Vertebrae 18 + 33.

Preserved specimen with 5 longitudinal stripes, uppermost stripe with series of alternating dark and pale blocks, some dark blocks with pale centres; 2nd stripe pale cream; 3rd stripe immediately above rear section of lateral line grey with paler areas; 4th stripe below lateral line, from behind eye to caudal-fin base, pale with darker edges and some grey cross-hatching; lowest stripe pale, to anal-fin base; head above mid-eye dark grey-brown, with paler areas behind eye; head below mid-eye pale, with dark grey-brown stripe from eye to lower corner of opercle; lips and chin with distinctive pattern of grey-brown marks; branchiostegal membranes pale, with tiny dark brown spots; dorsal-fin crest dark grey to black, remainder of fin grey with darker strip along middle; anal fin pale grey distally; pectoral fins mostly pale grey, but cream at base, with dark

grey mark in centre, and dark grey mark at base of rays; caudal fin pale. Attains at least 12.7 cm SL.



Clinus exasperatus, 13 cm SL, holotype (South Africa).

Source: Holleman *et al.* 2012

DISTRIBUTION Known only from the holotype collected at Betty's Bay (Western Cape, South Africa).

REMARKS Taken at ~2 m. A member of the *Clinus superciliosus* complex.

Clinus helenae (Smith 1946)

Helen's klipfish

PLATE 146

Ophthalmolophus helenae Smith 1946: 542, Fig. 3 (East London to Mbashe River, South Africa); SFSA No. 992*.

Clinus helenae: Smith 1966; Penrith 1969*; SSF No. 237.15*.

Dorsal fin 34–37 spines, 5 or 6 rays, fin without crest or notch; anal fin 2 spines, 24 or 25 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 3 rays, inner ray minute. Body slightly compressed, depth 4.5–5 in SL; head small, HL 3.8–4.8 in SL; eye diameter 3–5 in HL. Interorbital region concave, with low bony ridges over eyes, and occipital groove moderately deep. Orbital cirrus a flat stalk with fringe of many fine cirri. Anterior LL scales 34–40, with vertical pairs of pores. Male intromittent organ flattened, the tip covered by pair of small dorsal lips and pair of large ventral lips. Vertebrae 16 + 30.

Body pale brown with dark mottling and irregular bars which continue onto fins, and head and body speckled with white; reticulated pattern on cheeks; caudal-fin base with dark bar, middle of fin with transparent oval window. Attains 10 cm SL.

DISTRIBUTION WIO: South Africa (south coast, from Schoenmakerskop to Mbashe River mouth).

REMARKS Rare, but may be more widely distributed than currently known. Found in rock pools and subtidal zone.

Clinus heterodon Valenciennes 1836

Westcoast klipfish

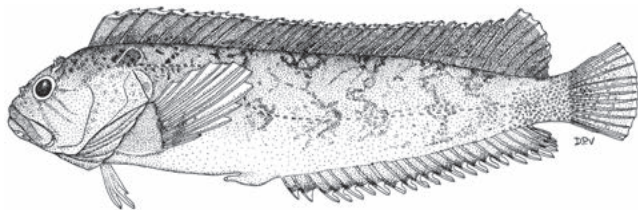
PLATES 146 & 148

Clinus heterodon Valenciennes in Cuv. & Val. 1836: 394 (Cape of Good Hope, South Africa); Barnard 1927; Penrith 1967*, 1969*; SSF No. 237.16*.

Clinus obtusifrons Penrith 1967: 46, Figs. 2a–b (Hondeklip Bay, Northern Cape, South Africa).

Dorsal fin 30–32 spines, each with single cirrus at tip, 6 or 7 rays, rays longer than spines but fin without crest or notch; anal fin 2 spines, 20–22 rays; pectoral fins 13 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray minute if present. Body slightly compressed, depth 4–5 in SL; HL 3.2–4.5 in SL; eye diameter 3–4.5 in HL. Interorbital region concave, and large fish with low ridges over eyes. Orbital cirrus a short, flat stalk, with several simple branches. Anterior LL scales 22–24, with single pores opening dorsally or ventrally; dorsal- and caudal-fin bases scaly. Male intromittent organ subcylindrical, with upturned hook, moderate lateral lips and small dorsal lips. Vertebrae 16 + 27–30.

Body pale green, grey or ochre with irregular dark grey, red-brown or dark blue bars and lacy markings, speckled with white; dark markings continuing on dorsal fin; head with 5 alternating dark and pale bars diagonally below eye and across cheek; oval, pale-margined ocellus on shoulder; anal fin and caudal fin with dark lacy patterns. Attains 12 cm SL.



Clinus heterodon, 12 cm TL (South Africa). Source: SSF

DISTRIBUTION Southern Africa: Namibia (Swakopmund) in southeastern Atlantic, to South Africa (northern KwaZulu-Natal) in WIO.

REMARKS Common in tidepools and intertidal zone on the west coast, rarer eastwards.

Clinus latipennis Valenciennes 1836

False Bay klipfish

PLATES 146 & 148

Clinus latipennis Valenciennes in Cuv. & Val. 1836: 394 (Cape of Good Hope, South Africa); Gilchrist & Thompson 1908 [as *latipinnis*]; Barnard 1927; Hubbs 1952; Smith 1966; Penrith 1969*; SSF No. 237.17*.

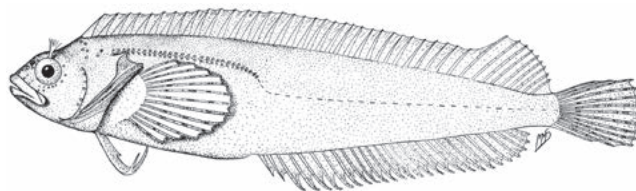
Labrisomus latipennis: Swainson 1839.

Ophthalmolophus latipinnis: Gill 1860; Smith 1946.

Ophthalmolophus latipennis: SFSA No. 993*.

Dorsal fin 33–36 spines, 8 or 9 rays, rays up to 1½ times length of spines, and fin without crest or notch; anal fin 2 spines, 23–26 rays; pectoral fins 13 or 14 rays; pelvic fins spine, 2 or 3 rays, inner ray minute if present. Body slightly compressed, depth 4.9–5.2 in SL; HL 3.5–5.5 in SL; eye diameter 3.2–4.7 in HL. Orbital cirrus a broad, flat stalk, with fringe of long, fine filaments; many head pores open on papillae, giving head a rough appearance. Anterior LL scales ~28, with vertical pairs of pores; dorsal-fin base scaly. Male intromittent organ prominent, with 2 rounded ventrolateral lobes and 1 flattened dorsal lobe. Vertebrae 17 + 30–33.

Body and head pink or yellow-brown with irregular dark mottling and speckling; often with series of dark blotches along dorsum, which extend onto dorsal fin; belly cream or white; fins whitish. Attains 10 cm SL.



Clinus latipennis, 11 cm TL (South Africa). Source: SSF

DISTRIBUTION South Africa: Langebaan (west coast) in southeastern Atlantic to Cape Agulhas (south coast) in WIO.

REMARKS Rare; found subtidally on sandy bottom. Closely resembles another as yet undescribed species.

Clinus cf. latipennis

PLATE 148

Dorsal fin 33 or 34 spines (no anterior crest), 9 or 10 rays; anal fin 2 spines, 26 rays; pectoral fins 12 rays. HL 3.6–3.8 in SL; eye diameter 3.2–3.5 in HL. Orbital cirrus a short stalk with short filaments. Preserved specimens pale yellow. Attains 30 mm SL.

DISTRIBUTION Known from only two specimens collected from Langebaan Lagoon on west coast of South Africa.

REMARKS Very similar to *C. latipennis*, and probably a sibling species; included here as the species may be more widespread.

Clinus marmoratus Castelnau 1861

PLATE 148

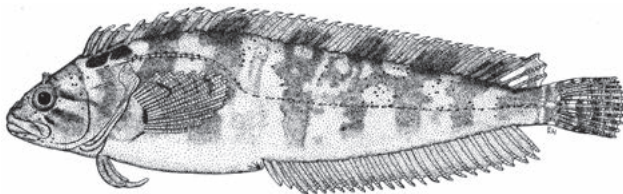
Clinus marmoratus Castelnau 1861: 52 (Table Bay, South Africa).*Clinus agilis* Smith 1931: 154, Pl. 16 (Knysna estuary, South Africa);

Penrith 1969*; SSF No. 237.11*.

Ophthalmolophus agilis: Smith 1946; SFSA No. 988*.*Ophthalmolophus anne* Smith 1948: 733, Fig. 2 (Lambert's Bay, South Africa); SFSA No. 989*.*Clinus anne*: Smith 1966.

Dorsal fin 32–37 spines, 2–4 rays, fin without crest but with shallow notch after 3rd spine; anal fin 2 spines, 20–25 rays; pectoral fins 13–15 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray minute if present. Body slightly compressed, depth 4.5–5.3 in SL; head small, snout rounded, HL 3.5–4.5 in SL; eye diameter 3–4.3 in HL. Orbital cirrus a flat stalk with several short, simple branches at end. Anterior LL scales 26–28, with pores opening alternately dorsally and ventrally; fin bases naked. Male intromittent organ long and cylindrical, with tip enclosed between 2 pairs of lips. Vertebrae 16 or 17 + 27–30.

Body dark grey or green, with ~7 dark red and green irregular bars; usually with pale-edged oval ocellus or pale diagonal stripe on shoulder; belly white to grey; head dark grey or laced with body colours; fins dark and irregularly barred, with translucent window in membrane of dorsal-fin rays. Juveniles white, with distinct red bars. Preserved specimens retain their colour pattern for several years. Attains 9.5 cm SL.

*Clinus marmoratus*, ~80 mm SL (South Africa).

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (Knysna) in WIO.

REMARKS Common in tidepools and subtidal zone on west coast, uncommon on south coast.

Clinus musaicus

Holleman, Von der Heyden & Zsilavec 2012

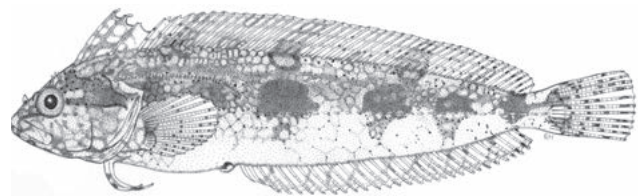
Mosaic klipfish

PLATE 149

Clinus musaicus Holleman, Von der Heyden & Zsilavec 2012: 835, Figs. 1, 3a–f (near Simonstown, South Africa).

Dorsal fin 38–40 spines, 7 or 8 rays, first 3 spines forming low anterior crest with shallow notch after 3rd spine; anal fin 2 spines, 27 or 28 rays; pectoral fins 15 rays; pelvic fins 1 spine, 3 rays, inner ray thin and closely applied to 2nd ray. Body slightly compressed, depth 4.2–4.6 in SL; HL 4–4.5 in SL; eye diameter 3–4.4 in HL. Orbital cirrus a flat stalk, with several short simple branches. Anterior LL scales 35–39, each with double pores; fin bases naked. Male intromittent organ tapering, triangular in cross-section, with pair of small dorsal lips. Vertebrae 18 or 19 + 33 or 34.

Body above midline ranging from olive-green, pale grey, pink to brown, the colour in lozenge-shaped marks, and 4–6 darker lozenges across midline (entire effect being one of a mosaic); body below midline often white; head mostly whitish below eyes, and variously spotted and reticulated with darker markings dorsally; fin membranes translucent to transparent, with pastel colours on elements only, except anal fin usually white and with other body colours. Attains 18 cm SL.

*Clinus musaicus*, 11 cm SL, male holotype (South Africa).Source: Holleman *et al.* 2012

DISTRIBUTION South Africa: west coast of Cape Peninsula (Oudekraal Beach) to False Bay and Betty's Bay (south coast).

REMARKS The only species of the *Clinus superciliosus* complex known to live on hard substrate (pebbles and shell grit); found to ~10 m deep. Observed lying against the base of rocks with its dorsal fin and caudal fin folded flat, its colour matching the substrate.

Clinus nematopterus Günther 1861

Chinese klipfish

PLATES 145 & 149

Clinus nematopterus Günther 1861: 270 (Sea of China [probably in error]); Winterbottom 1976*; Shen 1971*; SSF No. 237.18*.

Dorsal fin 31–34 spines, anterior spines with incised membranes and fringe of cirri at tips, 5–7 rays; anal fin 2 spines, 20–23 rays; pectoral fins 13 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray minute if present. Body compressed. Orbital cirrus a prominent flat stalk (~1 eye diameter in length) with fringe of many long cirri. Anterior LL scales 25–30, mostly with vertical pairs of pores; caudal- and pectoral-fin bases scaly.

Male intromittent organ oval, with small curved tip hidden by large ventral lip. Vertebrae 16 + 26–28.

Body buff, with 4 dark bars interspersed with 3 pale orange brown to brownish red bars that extend onto dorsal and anal fins; head buff and brown, sometimes with purplish area from behind eyes to nape, and pale brown and buff lines radiating below eye; dorsal-fin cirri buff; pelvic fins barred orange or brown and buff; caudal-fin base with narrow orange brown bar. Attains at least 95 mm SL.

DISTRIBUTION WIO: South Africa (south coast, from False Bay to Cape Recife).

REMARKS Rare; found in subtidal zone to ~50 m deep, among seaweeds, bryozoans and soft corals. The original description from the South China Sea was certainly in error; possibly a specimen from False Bay, South Africa, was mixed into a collection from the East (Winterbottom 1976). The generic placement of this species needs investigation.

Clinus ornatus Gilchrist & Thompson 1908

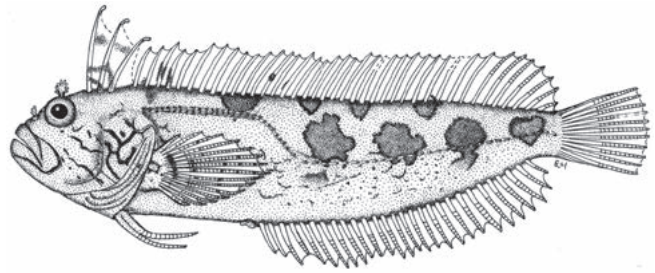
PLATE 149

Clinus ornatus Gilchrist & Thompson 1908: 116 (False Bay, South Africa); Holleman *et al.* 2012*.

Clinus superciliosus: Smith 1946; SFSa No. 986*; Penrith 1969*; SSF No. 237.22*.

Dorsal fin 33–36 spines, all with single cirri at tips, 7 or 8 rays, fin origin just behind rear margin of eye, and anterior crest ~1.2 height of remainder of fin which has subequal spines and slightly undulating margin; anal fin 2 spines, 25–27 rays; pectoral fins 14 or 15 rays; pelvic fins 1 spine, 3 rays, inner ray minute. Body slightly compressed, 3.7–4 in SL; head blunt, HL 3.7–4 in SL; mouth downturned, maxilla reaching vertical at hind margin of eye; eye diameter 3–3.9 in HL. Orbital cirrus a flat stalk, with long side branches, about equal to pupil diameter; nasal cirrus similar but smaller with shorter branches. Anterior LL scales 35–40, most with double pores; dorsal-, anal- and caudal-fin bases scaly. Male intromittent organ tapering, triangular in cross-section, with pair of small dorsal lips. Vertebrae 16 or 17 + 31 or 32.

Colour variable with substrate. Preserved specimens pale yellow with faint pattern on body, and dark brown reticulations on opercle. Attains at least 17 cm TL.



Clinus ornatus, 16 cm SL, syntype (South Africa). Source: Holleman *et al.* 2012

DISTRIBUTION WIO: South Africa (False Bay).

REMARKS Known only from 10 male specimens trawled from 23 m in False Bay, South Africa, prior to 1908, and from several recent photographs, also from False Bay. A species of the *Clinus superciliosus* complex.

Clinus robustus Gilchrist & Thompson 1908

Robust klipfish

PLATE 145

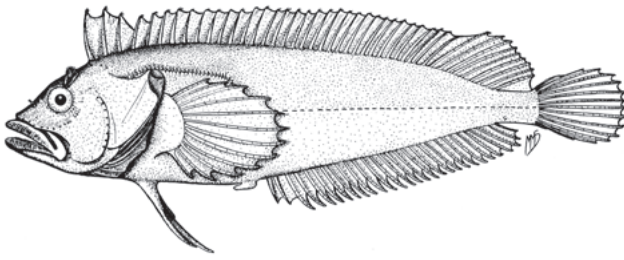
Clinus robustus Gilchrist & Thompson 1908: 128 (Kalk Bay, False Bay, South Africa); Barnard 1927; Smith 1946; SFSa No. 987*; Penrith 1969*; SSF No. 237.19*; Heemstra & Heemstra 2004.

Clinetrachus robustus: Hubbs 1952.

Caboclinus robustus: Smith 1966.

Dorsal fin 32–34 spines (2nd spine longer than 1st, with shallow notch after 3rd spine to form slight anterior crest), 9–14 rays (longer than spines); anal fin 2 spines, 26–28 rays; pectoral fins 12 rays; pelvic fins 1 spine, 3 rays (inner ray well-developed, ~½ length of middle ray). Body slightly compressed, depth 4.5–5.5 in SL; head large and heavy, HL 3.3–4 in SL; eye diameter 5–7.5 in HL. Lips thick, with vertical corrugations. Orbital cirrus a prominent flattened stalk with broad tip and short, flat branches. Anterior LL scales 30 or 31, with vertical pairs of pores; dorsal- and caudal-fin bases scaly. Male intromittent organ with long oval base, and tip covered by pair of large ventral lips and small dorsal lips. Vertebrae 17 + 33.

Body colour variable, from olive-yellow to reddish, with mottling in olive, red, black, green, purple or white, forming obscure bars that extend onto dorsal and anal fins; head speckled, sometimes with bars radiating from eyes; pectoral, pelvic and caudal fins with narrow wavy lines. Preserved specimens lose all colour pattern. Attains at least 37 cm SL.



Clinus robustus, 15 cm TL (South Africa). Source: SFSA

DISTRIBUTION South Africa: west coast of Cape Peninsula in southeastern Atlantic, to Eastern Cape in WIO.

REMARKS Rare; adults found among seaweeds in subtidal zone, juveniles in tidepools.

Clinus rotundifrons Barnard 1937

Kelp klipfish

PLATES 146 & 149

Clinus rotundifrons Barnard 1937: 63* (Lambert's Bay, South Africa); SSF No. 237.20*.

Gymutoclinus rotundifrons: Smith 1946; SFSA 1949*; Penrith 1965*, 1969*.

Dorsal fins 30–32 spines, 8 or 9 rays; anal fin 2 spines, 22–24 rays; pectoral fins 12–15 rays; pelvic fins 1 spine, 3 rays, inner ray minute; vertebrae 16 + 28 or 29. Body highly compressed, depth increasing with age, 3.5–5.2 in SL; HL 3.7–4.2 in SL; eye 3.5–5 in HL; head rounded, mouth downturned; maxilla to vertical through hind margin of eye; dorsal-fin origin above upper junction of opercle; anterior dorsal-fin spines slightly longer than remainder forming a low, rounded crest, spines without cirri at tips, remainder of fin with slightly undulating margin, and with anterior rays longer than past spines; scales onto dorsal-, anal- and caudal-fin bases; orbital cirrus a short nubbin; nasal cirrus longer with shorter branches; anterior LL scales ~20, with single pores; male intromittent organ long and tapering, tip club-shaped with pair of lateral lips and pair of minute dorsal lips.

Live colour variable but generally brown to reddish with paler crossbars; dorsal fin with 4–7 large mottled, yellow-brown blotches, continuing onto dorsum, anal fin with 2 or 3 similar blotches; caudal fin same colour as blotches on dorsal fin; pectoral fins translucent with dark spots on rays; head similar to body or paler, with radial markings around eye. In preservative pale yellow to pale brown, large individuals with faint body pattern and dark brown reticulations on opercle; membranes of anal fin with single melanophore at base between rays. Attains at least 10 cm SL.

DISTRIBUTION Endemic to southern Africa: Lüderitz Bay (Namibia) in southeastern Atlantic, to False Bay (south coast of South Africa).

REMARKS An uncommon species, usually found amongst kelp and other algae.

Clinus spatulatus Bennett 1983

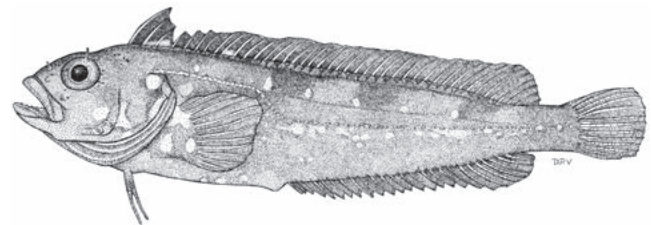
Estuarine klipfish

PLATES 146 & 149

Clinus spatulatus Bennett 1983: 2, Figs. 1–2 (Bot River estuary, South Africa); SSF No. 237.21*; Holleman *et al.* 2012.

Dorsal fin 32–35 spines, about half the spines with single filament at tips, 6–8 rays; anal fin 2 spines, 23–26 rays; pectoral fins 13–15 (usually 14) rays; pelvic fins 1 spine, 2 or 3 rays. Dorsal-fin crest of males triangular, ~2.3 height of remainder of fin in males, ~1.3 its height in females. Body depth 3.8–5 in SL; head moderately blunt and rounded in individuals >5 cm SL, HL 3.5–4.4 in SL; mouth downturned, maxilla reaching vertical at rear margin of pupil; eye diameter 2.5–3.7 in HL. Interorbital region convex. Orbital cirrus variably a small flat nubbin to a flattened stalk with rounded or bifurcate end, its length subequal to pupil diameter. Anterior LL scales 26–31, with pores opening alternately dorsally and ventrally. Vertebrae 17 or 18 + 28 or 29.

Sexually dichromatic: males dark olive-green with bright, white spots at the base of crest, on opercle and pectoral-fin base and at base of each orbital cirrus, pattern of spots differs for individual males. Females from greyish to various shades of pale green, with indistinct mottling. Individual living on sandy bottom photographed in the Bot River estuary shows a typical 'superciliosus' pattern of dark and pale areas, which would render them cryptic amongst the sparse vegetation on the sandy substrate. Attains at least 90 mm SL.



Clinus spatulatus, 70 mm SL (South Africa). Source: Whitfield 1998

DISTRIBUTION WIO: Bot River and Klein River estuaries (south coast of Western Cape) in South Africa.

REMARKS An obligate estuarine species with a high tolerance for low salinities, and listed as a Category-1a invasive species (Whitfield 1994). Bennett (1983) records mass mortality of fishes in the Bot River estuary during an extended period of salinities as low as 2–3‰, wherein apparently all fish species except *C. spatulatus* died. A member of the *Clinus superciliosus* complex.

Clinus superciliosus (Linnaeus 1758)

Super klipfish

PLATES 145 & 150

Blennius superciliosus Linnaeus 1758: 257 (India [locality uncertain]).

Blennius mustelaris Linnaeus 1758: 257 [locality uncertain]; Gronow in Gray 1854 [as *mustellaris*].

Blennius punctulatus Lacepède 1800: 460, 506, Pl. 12, Fig. 3 [no locality given].

Blennius capensis Forster in Bloch & Schneider 1801: 175 (Cape of Good Hope, South Africa).

Blennius spadiceus Bloch & Schneider 1801: 172 (Bot River estuary, South Africa).

Clinus superciliosus: Cuvier 1817; Valenciennes in Cuv. & Val. 1836; Castelnau 1861; Gilchrist & Thompson 1908; Thompson 1918; Barnard 1927; Smith 1946, 1949*; Penrith 1969*; SSF No. 237.22*; Heemstra & Heemstra 2004*; Holleman *et al.* 2012*.

Clinitrachus superciliosus: Swainson 1839; Hubbs 1952 [as *Clinetrachus*].

Blennius versicolor Pappé 1853: 27 (Robben I., South Africa).

Blennius mycterizans Gronow in Gray 1854: 97 (Cape of Good Hope, South Africa).

Blennius ignobilis Gronow in Gray 1854: 98 (Cape of Good Hope, South Africa).

Blennius dubius Bleeker (ex Castelnau) 1859: 71 (Table Bay, South Africa); Castelnau 1861.

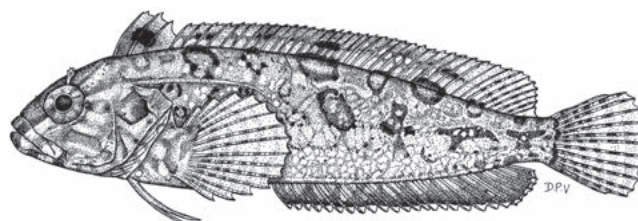
Blennius pantherinus Castelnau 1861: 52 (Table Bay, South Africa).

Caboclinus superciliosus: Smith 1966.

Dorsal fin 32–38 spines, 6–9 rays, first 3 spines form triangular crest up to 2½ height of remainder of fin in adult males, with many fine branches at spine tips and variable notch after 3rd spine; anal fin 2 spines, 24–28 rays; pectoral fins 14–17 rays; pelvic fins 1 spine, 2 rays. GR 2 or 3/7 or 8. Body robust and slightly compressed, depth 4–5 in SL; HL 3.3–4 in SL, snout of large fish conical to rounded; eye diameter 2.5–3.8 in HL. Orbital cirrus a small subcylindrical stalk, with spatulate end and few simple branches. Anterior LL scales 27–35, mostly with single pores; dorsal- and caudal-fin bases scaly. Male intromittent organ tapering, triangular in cross-section, curled upwards at tip with pair of small dorsal lips. Vertebrae 18 + 30–33.

Colour variable and determined by substrate larvae settle on: body mottled reddish and brown to ochre, green, purple, blue and white, and in combinations. Mottled forms generally with several dark semi-bars on dorsum, extending onto dorsal fin; head usually same colour as body but with vermiculations,

and often with radiating lines from eye across cheek; dorsal-fin crest often with dark to black round spot near base of 2nd spine; opercle often with dark comma-shaped mark. Intertidal fish generally purplish. Preserved specimens retain their colour pattern for many years. Attains 25 cm SL.



Clinus superciliosus, 80 mm SL (South Africa). Source: Whitfield 1998

DISTRIBUTION Southern Africa: Namibia (Rocky Point) in southeastern Atlantic, to South Africa (Kei River mouth) in WIO.

REMARKS Abundant and common, from intertidal zone to ~50 m deep. Fish from colder water generally have higher dorsal- and anal-fin spine and ray counts. The many colours of the species has caused much confusion in the past; now recognised as a complex of six closely related species: *Clinus arborescens*, *C. exasperatus*, *C. ornatus*, *C. musaicus*, *C. spatulatus* and *C. superciliosus*.

Clinus taurus Gilchrist & Thompson 1908

Bull klipfish

PLATES 145 & 150

Clinus taurus Gilchrist & Thompson 1908: 126 (False Bay, South Africa);

Barnard 1927; Penrith 1969*; SSF No. 237.23*.

Blenniomimus taurus: Smith 1946, 1949*.

Dorsal fin 30–36 spines, first 3 spines forming low crest followed by shallow notch, 5 or 6 rays; anal fin 2 spines, 20–24 rays; pectoral fins 12 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray minute if present. GR 3 or 4/7 or 8. Body slightly compressed, depth 4–5 in SL; head heavy with large lips, HL 3.5–4.3 in SL; eye diameter 3–4.5 in HL. Interorbital region deeply concave, with thick bony ridges over eyes, and occipital groove deep. Orbital cirrus flat and broad with many filaments at end. Head pores mostly multiple; anterior LL scales ~33, with multiple pores dorsally and in pairs ventrally; dorsal- and caudal-fin bases scaly. Male intromittent organ subcylindrical, tapering, with small tip and pair of ventral lips. Vertebrae 16 + 28–30.

Body pale yellow-green, with 7 dark brown bars that extend onto dorsal and anal fins, and pale areas with many dark brown speckles, some with large dark centres; head speckled in same colours as body; pink ocellus on shoulder; juveniles with

dark brown head, and 7 distinct dark brown bars, interspersed with yellow, on body and extending onto median fins. Attains 19 cm TL.

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (Port Alfred) in WIO.

REMARKS Rare; found in lower intertidal zone (especially on west coast) and subtidal zone.

Clinus venustris Gilchrist & Thompson 1908

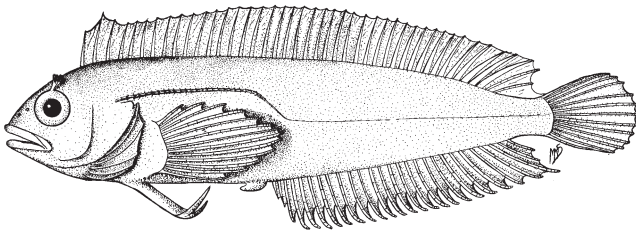
Speckled klipfish

PLATE 150

Clinus venustris Gilchrist & Thompson 1908: 130 (Fish Hoek, False Bay, South Africa); Barnard 1927; Smith 1966; Penrith 1969*; SSF No. 237.24*.
Ophthalmolophus venustris: Smith 1946, 1949*.

Dorsal fin 35–41 spines, anterior spines with cirri at tips, 2 or 3 rays, fin without crest or notch (although 2nd spine may be longer than others); anal fin 2 spines, 23–28 rays; pectoral fins 14 rays; pelvic fins 1 spine, 2 rays. GR 3/6–8. Body slightly compressed, ~3.3 in SL; head rounded, HL ~4.1 in SL; eye diameter ~2.6 in HL. Orbital cirrus prominent and spoon-shaped, with several simple branches. Anterior LL scales ~37, with vertical pairs of pores; fin bases naked. Male intromittent organ short and oval, with small tip hidden between 2 lateral lips.

Body colour extremely variable, from pale ochre to orange, red or dark brown, usually with irregular pale and dark bars across body and dorsal and anal fins; head with dark spots on cheeks, often with pale dark-edged diagonal bar from eye to cheek; dorsal fin with indistinct (sometimes green) mark on membrane of first 3 spines, with 2nd larger round mark (with yellow or red above) on dorsal fin above pectoral fin, and a 3rd less distinct mark at middle of dorsal fin; many individuals with orange-red fins; eyes green and orange. Attains 11 cm SL.



Clinus venustris, 10 cm TL (South Africa). Source: SFSA

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (Port Alfred) in WIO.

REMARKS Uncommon; found in lower intertidal pools and subtidal zone.

Clinus woodi (Smith 1946)

Oldman klipfish

PLATE 145

Petraites woodi Smith 1946: 540, Fig. 2 (Mbhashe River to Mthatha River, South Africa); SFSA No. 984*.

Clinus woodi: Penrith 1969*; SSF No. 237.25*; Heemstra & Heemstra 2004.

Dorsal fin 27–31 spines, first 3 spines with cirri at tips and forming low triangular crest followed by deep notch, 5 rays; anal fin 2 spines, 21–24 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 2 rays. GR 2/7 or 8. Body slightly compressed, depth 3.5–4 in SL; HL 3.5–4 in SL, snout rounded; eye diameter 3–4 in HL. Orbital cirrus a round stalk with several lateral filaments. Pores on head and lateral line small; anterior LL scales ~27, with pores either single or in vertical pairs; dorsal- and anal-fin bases scaly. Male intromittent organ cylindrical, tapering, with upwardly curved tip between 2 pairs of lips. Vertebrae 15 + 27.

Body colour variable: shades of olive, brown and red, with obscure bars that continue onto dorsal fin; irregular ocelli on dorsum at dorsal-fin base, middle ocellus most prominent; large dark spot on shoulder, with narrow pale surround; lips and throat striped. Attains 15 cm SL.

DISTRIBUTION WIO: South Africa (Kei River mouth) to Mozambique (Inhambane).

REMARKS Relatively common, in intertidal and subtidal zones.

GENUS *Fucomimus* Smith 1946

Body highly compressed, peduncle long and narrow; caudal fin 11 rays; dorsal- and anal-fin membranes with transparent windows. One species.

Fucomimus mus (Gilchrist & Thompson 1908)

Mousey klipfish

PLATE 150

Clinus mus Gilchrist & Thompson 1908: 119 (False Bay, South Africa); Barnard 1927.

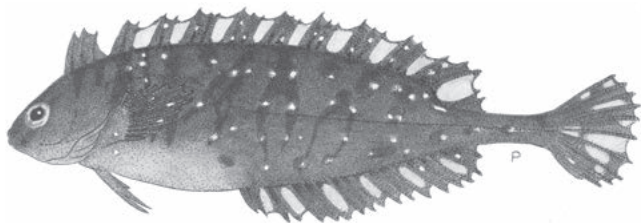
Fucomimus mus: Smith 1946; SFSA No. 997*; SSF No. 237.26*; Heemstra & Heemstra 2004*.

Pavoclinus (Fucomimus) mus: Penrith 1969*.

Diagnosis as for genus. Dorsal fin 25–28 spines, first 3 spines forming separate low crest, 3 or 4 rays; anal fin 2 spines, 14–18 rays; pectoral fins 10 rays; pelvic fins 1 spine, 3 rays.

Body depth 3.5–4.5 in SL; HL 3.8–5 in SL, snout upturned; eye diameter 2.5–4 in HL. No orbital cirrus. No teeth on vomer. Body scales minute, scattered and embedded; fin bases naked; anterior LL scales 17–20, with pores opening dorsally or ventrally. Male intromittent organ small, conical, with long tip. Vertebrae 14 + 27 or 28.

Body colour variable and possibly cued to substrate: shades of green or brown, mottled and streaked with intricate patterns of yellow, purple, black, olive, dark green, dark brown and silvery; median fins with transparent patches. Attains 90 mm SL.



Fucomimus mus, 90 mm TL (South Africa). Source: SSF

DISTRIBUTION South Africa: western coast of Cape Peninsula in southeastern Atlantic, to Transkei region in WIO.

REMARKS A highly modified, intertidal species, commonly found among dense seaweeds.

GENUS *Muraenoclinus* Smith 1946

Body eel-like and slightly compressed. One species.

Muraenoclinus dorsalis (Bleeker 1859)

Nosestripe klipfish

PLATE 151

Clinus dorsalis Bleeker (ex Castelnau) 1859: 72 (Cape of Good Hope, South Africa); Castelnau 1861; Gilchrist & Thompson 1908; Barnard 1927.

Clinus (Muraenoclinus) dorsalis: Penrith 1969*.

Muraenoclinus dorsalis: Smith 1946; SFSA No. 979*; SSF No. 237.27*.

Dorsal fin 41–48 spines, 1 ray, no crest or notch; anal fin 2 spines, 25–31 rays; pectoral fins 11–13 rays; pelvic fins 1 spine, 2 or 3 rays, inner ray minute if present. Body depth 5.5–7 in SL; HL 3.5–5 in SL, head wedge-shaped and snout pointed; eye diameter 3–4.5 in HL. Orbital cirrus a flat stalk with fringe of cirri. Anterior LL scales 21–25, with pores opening alternately dorsally and ventrally; fin bases naked. Male intromittent organ subcylindrical, with small tip and pair of large dorsal lips. Vertebrae 19 + 32–35.

Body and head usually dark green or red, or pale greenish or brownish and mottled with darker greens, browns or reds; mottled specimens with ocellus on shoulder, and always with white to cream stripe, sometimes with pale blue markings, from snout tip to dorsal-fin origin and sometimes extending along dorsal fin. Attains 75 mm SL.

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (KwaZulu-Natal) in WIO.

REMARKS Found in rock-strewn intertidal pools; most common west of False Bay, South Africa.

GENUS *Pavoclinus* Smith 1946

Body compressed, with small cycloid scales, imbricate or not; anterior lateral line with single (usually) or double pores; no orbital cirrus; dorsal fin with or without elevated anterior spines and crest, no cirri at spine tips; peduncle usually long and narrow; caudal fin 13 rays; pelvic fins with 3rd ray present (except minute in *P. pavo* if present); teeth present on vomer, none on palatines. Weed-dwellers; several species adopt the colour of the substrate that the larvae settle on. Nine species, all in southern Africa.

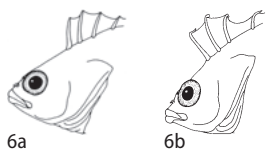
KEY TO SPECIES

- | | | |
|----|---|------------------------|
| 1a | Anal fin ≥ 27 rays; first 3 dorsal-fin spines forming tall crest, distance between 3rd and 4th spines greater than distance between first 3 spines; lips thick, with flap on middle of lower lip | <i>P. mentalis</i> |
| 1b | Anal fin ≤ 24 rays; first 3 dorsal-fin spines not separated from 4th, and may or may not form a crest; no flap on middle of lower lip | 2 |
| 2a | Dorsal-fin spines short, fin margin even, without crest or notches | 3 |
| 2b | First 3 dorsal-fin spines elevated into crest, but membrane with or without notch between 3rd and 4th spines | 4 |
| 3a | Body compressed, depth ~ 4.8 in SL; dorsal fin 30 spines, 4 rays, rays longer than spines | <i>P. profundus</i> |
| 3b | Body elongate, depth 7.4–7.6 in SL; dorsal fin 36–38 spines, 2 or 3 rays, rays not longer than spines | <i>P. smalei</i> |
| 4a | Dorsal fin with 7 or 8 rays; first 3 spines forming tall crest, but no notch in membrane between 3rd and 4th spines | <i>P. litorafontis</i> |
| 4b | Dorsal fin with < 7 rays | 5 |

Continued ...

KEY TO SPECIES

- 5a Dorsal-fin crest low, with or without notch between 3rd and 4th spines 6
- 5b Dorsal-fin crest high, at least 1½ times height of remainder of fin 7
- 6a Dorsal-fin origin over rear margin of preopercle; upper jaw <31.5% HL *P. graminis*
- 6b Dorsal-fin origin between rear margin of eye and rear margin of preopercle; upper jaw >31.6% HL *P. laurentii*



- 7a Dorsal fin with deep notch between 3rd and 4th spines, spines 4 and 5 about half height of remaining spines, and fin margin undulating *P. myae*
- 7b Dorsal fin with shallow notch or no notch between 3rd and 4th spines, remaining spines gradually increasing in length, and fin margin straight 8
- 8a Dorsal fin with shallow notch between 3rd and 4th spines; head profile rounded; cheeks with blue spots in life *P. caeruleopunctatus*
- 8b Dorsal fin not notched; head profile flat to slightly concave; cheeks with wavy turquoise lines in life *P. pavo*

Pavoclinus caeruleopunctatus Zsilavec 2001

Bluespot klipfish

PLATE 145 & 151

Pavoclinus caeruleopunctatus Zsilavec 2001: 2, Figs. 1–2, Pl. 1 (Oudekraal, Cape Peninsula, South Africa); Heemstra & Heemstra 2004.

Dorsal fin 29–33 (usually 31) spines, first 3 spines forming crest up to twice height of fin followed by slight notch, 1–3 (usually 2) rays; anal fin 2 spines, 19–21 (usually 20) rays; pectoral fins 12 rays; pelvic fins 1 spine, 3 rays, inner ray minute. Body moderately compressed, depth 3.7–4.7 in SL; HL 3.8–4.3 in SL; eye diameter 3.3–4.3 in HL. Anterior LL pored scales 26–28, with single median pores; dorsal-fin base scaly. Male intromittent organ cylindrical, with large tip and pair of lateral lips.

Body colour variable, matching substrate: buff, white, red, green or brown, with 6 variously coloured (yellow, pink, red, brown or dark blue) irregular bars, not extending onto fins, but with 6 dark round marks along dorsum, half on dorsal-fin

base; dorsal and anal fins with 6 bars each of dominant body colour, with translucent areas between, and last 2 dorsal-fin rays curved towards each other with the membrane forming clear, oval window; head darker above eyes than below, with blue spots behind eyes, on top of head, snout and often on dark areas of body. Attains at least 75 mm SL.

DISTRIBUTION South Africa: Robben I. in southeastern Atlantic, to Tsitsikamma region in WIO.

REMARKS Known from offshore reefs, in 6–25 m, among a variety of seaweeds, hydroids and soft corals. Sibling species of *P. pavo*.

Pavoclinus graminis (Gilchrist & Thompson 1908)

Grass klipfish

PLATE 151

Clinus graminis Gilchrist & Thompson 1908: 136 (St James, False Bay, South Africa).

Clinus heterodon (*non* Valenciennes 1836): Valenciennes *in* Cuv. & Val. 1836; Barnard 1927; Smith 1935.

Pavoclinus heterodon: Smith 1946; SFS No. 1001*.

Pavoclinus (*Pavoclinus*) *graminis*: Penrith 1966*.

Pavoclinus graminis: Christensen 1978*; SSF No. 237.28*; Heemstra & Heemstra 2004.

Dorsal fin 30–35 spines, first 3 spines forming low crest followed by variable depth notch (or no notch), 4–6 rays, and fin origin over preopercle margin; anal fin 2 spines, 21–24 rays; pectoral fins 12 rays; pelvic fins 1 spine, 3 rays. Body moderately compressed, depth 4–5 in SL; HL 3.5–4.8 in SL; eye diameter 2.5–3.8 in HL; upper jaw length <31.5% HL. Head pores mostly single; anterior LL scales ~30, broad, with pores opening dorsally or ventrally; dorsal- and anal-fin bases scaly. Male intromittent organ short, subtriangular, with single lip forming a cowl around the large tip. Vertebrae 15 + 29–31.

Body colour variable: green, brown or red, and mottled, streaked or with bars of yellow, silvery or deeper shades of the ground colour; fins plain or barred with many transparent areas on dorsal fin and caudal fin; juveniles red with pearly spots along sides. Attains 14 cm SL.

DISTRIBUTION WIO: South Africa (False Bay) to Mozambique (Inhambane).

REMARKS Found in intertidal areas, often among seaweeds, and more common eastwards.

Pavoclinus laurentii (Gilchrist & Thompson 1908)

Rippled klipfish

PLATE 151

Clinus laurentii Gilchrist & Thompson 1908: 120 (Winkelspruit, KwaZulu-Natal, South Africa); Smith 1935*.

Petraites laurentii: Barnard 1927.

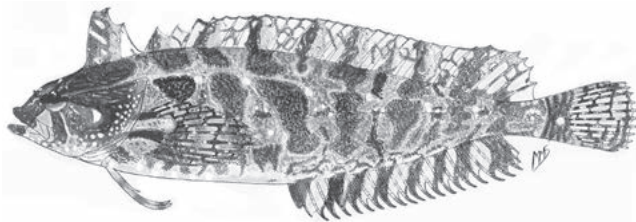
Labroclinus laurentii: Smith 1946, 1949*.

Pavoclinus (Pavoclinus) laurentii: Penrith 1969*.

Pavoclinus laurentii: SSF No. 237.30*.

Dorsal fin 29–33 spines, first 3 spines forming low crest followed by variable depth notch, 4 or 5 rays, and fin origin over midpoint between posterior margins of preopercle and eye; anal fin 2 spines, 20–22 rays; pectoral fins 12 rays; pelvic fins 1 spine, 3 rays. Body moderately compressed, depth 4–5.5 in SL; HL 4.3–4.8 in SL; eye diameter 2.8–3.8 in HL; upper jaw length >31.6% HL. Head pores mostly double; anterior LL scales 28–32, broad, with pores mostly in vertical pairs; dorsal- and anal-fin bases scaly. Male intromittent organ short, oval, with long recurved tip. Vertebrae 15 + 27–29.

Resembles *P. graminis*. Attains 12 cm SL.



Pavoclinus laurentii, 15 cm TL (South Africa). Source: SSF

DISTRIBUTION WIO: South Africa (Eastern Cape) to Mozambique (Inhambane) and southern Madagascar.

REMARKS Fairly common in weedy intertidal pools. The only southern African species recorded at a locality away from the continent. Closely resembles *P. graminis*, but most readily distinguished by its longer upper jaw length.

Pavoclinus litorafontis Penrith 1965

Slinky klipfish

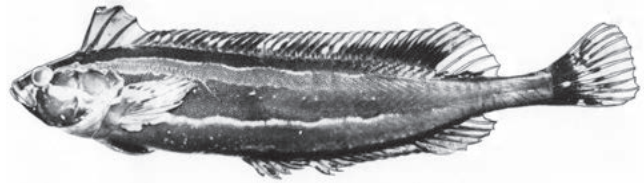
Pavoclinus litorafontis Penrith 1965: 212, Pl. 5 (Strandfontein, False Bay, South Africa); SSF No. 237.31*; Heemstra & Heemstra 2004.

Pavoclinus (Pavoclinus) litorafontis: Penrith 1969*.

Dorsal fin 29–32 spines, first 3 spines forming tall crest but without notch after 3rd spine, 7 or 8 rays; anal fin 2 spines, 20–23 rays; pectoral fins 11 or 12 rays; pelvic fins 1 spine,

3 subequal rays. Body depth 4.5–5.8 in SL; HL 3.8–5 in SL; eye diameter 3.5–5.3 in HL. Anterior LL scales 21, broad, with pores opening dorsally or ventrally; dorsal- and anal-fin bases scaly. Male intromittent organ short, rounded triangular, with single lip forming a cowl around base of large tip. Vertebrae 17 + 32 or 33.

Body green with longitudinal stripes of darker shades of green, yellow and silvery; fins mostly green, usually with transparent patches; cheeks with yellow or silvery line; juveniles green or brown, with broad silvery midlateral stripe. Attains 19 cm SL.



Pavoclinus litorafontis, 17 cm TL (South Africa). Source: Penrith 1969

DISTRIBUTION WIO: South Africa (south coast, from False Bay to Cape Agulhas).

REMARKS Uncommon; found in lower intertidal zone, often in *Caulerpa filiformis* seaweed beds.

Pavoclinus mentalis (Gilchrist & Thompson 1908)

Bearded klipfish

PLATES 146 & 151

Cristiceps mentalis Gilchrist & Thompson 1908: 139 (East London, South Africa).

Labroclinus mentalis: Smith 1946; SFSA No. 998*.

Pavoclinus (Labroclinus) mentalis: Penrith 1969*.

Pavoclinus mentalis: SSF No. 237.32*.

Dorsal fin 35–39 spines, first 3 spines forming tall crest, 6–8 rays; anal fin 2 spines, 27–32 rays; pectoral fins 11 or 12 rays; pelvic fins 1 spine, 3 rays, inner ray well-developed. Body highly compressed, depth 4.5–5.5 in SL; snout pointed, HL 4–4.8 in SL; eye diameter 4.3–5.8 in HL. Lips thick, with flap of skin at lower jaw symphysis. Anterior LL scales 28 or 29, mostly with single pores opening dorsally; dorsal- and caudal-fin bases scaly. Male intromittent organ with short basal portion, and large conical tip, ensheathed at base by pair of crescentic dorsolateral lips. Vertebrae 16 + 37.

Body brilliantly coloured and cryptic (depending on the seaweed it inhabits), from brownish red to green; juveniles with silvery patches along sides. Attains 30 cm SL.

DISTRIBUTION WIO: South Africa (Algoa Bay to St Lucia).

REMARKS Rare; found mainly in subtidal zone.

Pavoclinus myae Christensen 1978

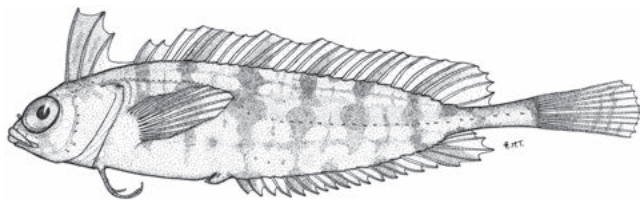
Mya's klipfish

PLATES 146 & 151

Pavoclinus myae Christensen 1978: 3, Fig. 2 (inner reef south of Gonubie River mouth, Eastern Cape, South Africa); SSF No. 237.33*; Heemstra & Heemstra 2004.

Dorsal fin 27–30 spines, first 3 spines separated forming tall crest separated from 4th spine, 3–5 rays, and fin margin undulating; anal fin 2 spines, 18 or 19 rays; pectoral fins 11 or 12 rays; pelvic fins 1 spine, 3 rays, inner ray $\sim\frac{1}{2}$ length of longest ray. Body depth 4.2–5.1 in SL; snout rounded, HL 4–4.5 in SL; eye diameter 2.4–3.2 in HL; peduncle narrow, depth >5 in HL, length $<\frac{1}{2}$ HL. Anterior LL scales ~ 25 , with single pores opening dorsally or ventrally; fin bases naked. Male intromittent organ short, subcylindrical to conical, with tip curved and semi-enclosed in single dorsal lip. Vertebrae 12–14 + 26–28.

Body rusty red, with dark brownish red bars that continue onto dorsal and anal fins, the fins transparent between bars; belly orange-red; 4 red bars radiating from eyes; large silvery spot behind eye and at pectoral-fin base, partly covered by gill membranes; several smaller spots on opercle and abdomen. Preserved specimens yellowish, the bars slow to fade. Attains at least 5 cm SL.



Pavoclinus myae, 50 mm SL (South Africa). Source: Christensen 1978

DISTRIBUTION WIO: South Africa (Tsitsikamma region to northern Eastern Cape).

REMARKS Found offshore, to ~ 28 m deep, among dense algae and corallines. Resembles the mousey klipfish *Fucomimus mus* more than other *Pavoclinus* species.

Pavoclinus pavo (Gilchrist & Thompson 1908)

Peacock klipfish

PLATE 152

Clinus pavo Gilchrist & Thompson 1908: 123 (St James/Kalk Bay, False Bay, South Africa); Barnard 1927.

Pavoclinus pavo: Smith 1946; SFSA No. 1000*; SSF No. 237.34*; Zsilavec 2001*; Heemstra & Heemstra 2004*.

Pavoclinus (Pavoclinus) pavo: Penrith 1969*.

Dorsal fin 30–36 spines, first 3 spines forming tall crest (twice height of remainder of fin) but without notch after 3rd spine, 2–4 rays; anal fin 2 spines, 20–23 rays; pectoral fins 11 or 12 rays; pelvic fins 1 spine, 2 or 3 rays, inner (3rd) ray minute if present. Body depth 3.8–5 in SL; head pointed, profile straight to slightly convex, HL 3.5–4.8 in SL; eye diameter 3–4 in HL. Anterior LL scales 29–31, broad, with pores opening dorsally or ventrally; dorsal-fin base scaly. Male intromittent organ short, subcylindrical to conical, the tip with 2 lateral lips. Vertebrae 15 + 28–31.

Body colour variable: green, brown or red, or mottled and longitudinally striped with silver, yellow or main body colour; often with 1–5 ocelli with blue centre surrounded by black and orange on body beneath dorsal fin; head same colour as body, and with wavy blue-green lines, and orange-brown area behind eye to opercle. Attains 11 cm SL.

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (Kei River mouth) in WIO.

REMARKS Found from intertidal seaweed beds to ~ 6 m deep. Sibling species of *P. caeruleopunctatus*.

Pavoclinus profundus Smith 1961

Deepwater klipfish

PLATES 146 & 152

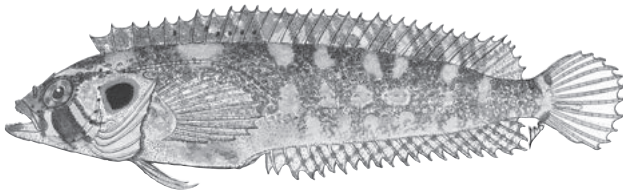
Pavoclinus profundus Smith 1961: 689, Fig. 1 (Knysna, South Africa); SSF No. 237.35*.

Pavoclinus (Pavoclinus) profundus: Penrith 1969*.

Dorsal fin 30 spines, 4 rays, fin without crest or notch; anal fin 2 spines, 21 rays; pectoral fins 12 rays; pelvic fins 1 spine, 3 rays, inner ray minute; caudal-fin rays subequal. Body highly compressed and evenly tapering to peduncle, depth

at anal-fin origin 4.8 in SL; eye diameter 3 in HL. Anterior LL scales ~24, with single pores opening dorsally or ventrally. Male intromittent organ with long tapering tip between 2 large lateral lips. Vertebrae 14 + 27.

Body pale grey with pink and white markings, to pale orange with series of dark blotches below dorsal fin; head darker and with dark streak below eyes, and pale line either side of streak; almost diamond-shaped ocellus on opercle, black in centre, with narrow pale edges and then narrower dark surround. Attains at least 50 mm TL.



Pavoclinus profundus, 50 mm TL, holotype (South Africa). Source: SSF

DISTRIBUTION WIO: South Africa (False Bay to Algoa Bay).

REMARKS Known from 20–40 m.

Pavoclinus smalei Heemstra & Wright 1986

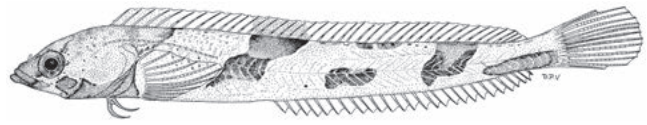
Deep-reef klipfish

PLATES 146 & 152

Pavoclinus smalei Heemstra & Wright 1986: 6, Figs. 5–7, Pl. 1 (off Storms River mouth, South Africa); Prochazka & Griffiths 1992.

Dorsal fin 36–38 spines, 2 or 3 rays, fin without crest or notch; anal fin 2 spines, 25–27 rays; pectoral fins 12 rays; pelvic fins 1 spine, 2 rays. Body elongate, compressed posteriorly, depth 7.4–7.6 in SL; head slightly conical and slightly depressed, HL 3.9–4.2 in SL; eye diameter 3.2–3.3 in HL. Lips thick. GR 1/6. Anterior LL scales ~21, with single pores; head and body otherwise naked. Male intromittent organ small and stout, with bluntly rounded tip set in oval depression, and with slender, hard, curved hook at anteroventral edge of terminal orifice. Vertebrae 15 + 29–31.

Body cream with irregular orange-brown blotches; head with fine orange speckles; snout and lips orangish; brown-edged orange blotch below eyes; fin membranes hyaline. Maximum size unknown.



Pavoclinus smalei, 25 mm SL, female holotype (South Africa). Source: SSF

DISTRIBUTION WIO: South Africa (south coast [type locality] and Cape Peninsula).

REMARKS Occurs on gravel. Described from three type specimens (largest ~50 mm SL), collected at 18–20 m. The generic placement of this species may be incorrect and requires further investigation.

GENUS *Smithichthys* Hubbs 1952

Body highly compressed; first 4 or 5 dorsal-fin spines forming large, rounded crest; single row of teeth in each jaw. One species.

Smithichthys fucorum (Gilchrist & Thompson 1908)

Leafy klipfish

PLATES 146 & 152

Clinus fucorum Gilchrist & Thompson 1908: 121 (St James, False Bay, South Africa); Barnard 1927.

Myxodes fucorum: Smith 1946, 1949*.

Smithichthys fucorum: Hubbs 1952; Smith 1953*; SSF No. 237.36*.

Pavoclinus (Smithichthys) fucorum: Penrith 1969*.

Diagnosis as for genus. Dorsal fin 28–31 spines with heavy bases, 4–6 rays, fin origin over rear margin of eye, fin not notched and margin undulating; anal fin 2 spines, 19–21 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 3 rays. Body highly compressed, depth 3.5–4 in SL; head profile steep, HL 4–4.8 in SL; eye diameter 3–5 in HL. Anterior LL scales ~27, broad, with single median pores. Male intromittent organ conical, with small tip and 2 small lateral lips. Vertebrae 15 + 28 or 29.

Body dark brown or olive, fin edges paler or transparent; round, iridescent, silvery spot beneath end of pectoral fin; juveniles mostly black, with white spot beneath end of pectoral fin, and white to translucent patches along dorsal- and anal-fin margins, forming undulating effect. Attains 20 cm SL.

DISTRIBUTION WIO: South Africa (south coast, from False Bay to Mbhashe River mouth).

REMARKS Rare; found in lower intertidal and subtidal zones among seaweeds.

GENUS *Springeratus* Shen 1971

Body compressed; dorsal fin with low crest with notch after 3rd spine; pelvic fins 3 rays, innermost ray $\sim\frac{1}{2}$ length of middle ray; orbital cirrus present; teeth present on vomer and palatines; lateral line with anterior series of adjacent scales with pores opening dorsally and ventrally or a pair of pores per scale, and a posterior series of tubed scales with a pore at each end; genital opening with prominent fleshy flaps or valves. At least 2 species in western Pacific, and 2 species in WIO. This genus requires revision: resembles *Clinus* in general appearance and the species are morphologically very similar and difficult to separate, although they are geographically widely separated.

KEY TO SPECIES

- | | | |
|----|--|-----------------------|
| 1a | Body golden yellow; anterior LL pored scales with pores opening dorsally [SW India and Sri Lanka] | <i>S. halei</i> |
| 1b | Body mottled purples; anterior LL pored scales with pores opening dorsally and ventrally [Mauritius and Réunion] | <i>S. polyporatus</i> |

Springeratus halei (Day 1888)

PLATE 152

Cristiceps halei Day 1888: 799, Fig. (Colombo, Sri Lanka).
Springeratus xanthosoma: Shen 1971*; Fraser 1972.

Dorsal fin 29–31 spines, anterior spines with single small cirrus at tips, 4 or 5 rays; anal fin 2 spines, 20 or 21 rays; pectoral fins 13 rays; pelvic fins 1 spine, 3 rays. Body depth 4.2–4.8 in SL; HL 4–4.6 in SL; eye diameter 3–3.5 in HL. Orbital cirrus a flattened stalk with fringe of long cirri. Anterior LL pored scales 20–22, with pores opening dorsally; narrow band of scales along dorsal-fin base. Male intromittent organ a rounded cone, with slender forward-pointing tip, set within a semicircular valve anteriorly. Vertebrae 14 + 25 or 26.

Head and body golden yellow, darker dorsally; irregular

whitish patches on opercle, below dorsal fin and along midline; dorsal-fin crest brown, membrane between 3rd and 4th spines whitish, remainder of fin golden brown with regular whitish patches along margin; anal fin alternating yellow and brown on rays and membranes forming saw-tooth pattern; pectoral fins with clusters of whitish spots at base, rays brown, membranes hyaline; pelvic fins golden; caudal fin brown with small white spots. Attains \sim 60 mm SL.

DISTRIBUTION Indian Ocean: southwestern India and Gulf of Mannar.

REMARKS Collected from a rocky subtidal area in <7 m.

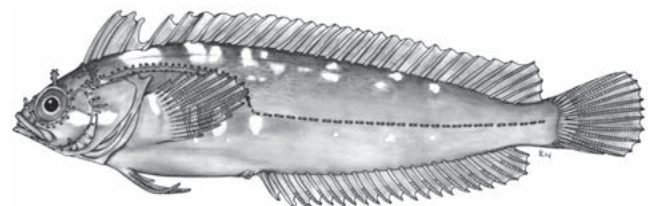
Springeratus polyporatus Fraser 1972

PLATE 152

Springeratus polyporatus Fraser 1972: 4, Figs. 1–2 (rock tidepool at Mauritius, Mascarenes); Fricke *et al.* 2009.

Dorsal fin 29 or 30 spines, a few cirri at tips of crest spines (difficult to see), 3–5 rays; anal fin 2 spines, 19–21 (usually 20) rays; pectoral fins 13 rays; pelvic fins 1 spine, 3 rays. Body depth 4.2–4.6 in SL; HL 4–4.5 in SL; eye diameter 3.6–4.5 in HL. Anterior LL pored scales 17–21, pair of pores per scale; dorsal-fin base scaly. Male intromittent organ conical, set within a semicircular valve anteriorly. Vertebrae 39–42.

Head and body mottled shades of purple, continuing as irregular darker bars onto dorsal and anal fins, with transparent areas in between; series of silvery round spots on midsides; pelvic fins barred purple and white. Attains 50 mm SL.



Springeratus polyporatus, 40 mm SL, paratype (Mauritius).

DISTRIBUTION WIO: endemic to Réunion and Mauritius.

REMARKS Found from lower intertidal to subtidal zones, among algae-covered rocks.

GENUS *Xenopoclinus* Smith 1948

Body elongate, head depressed; eyes dorsal; dorsal fin low and even; pelvic fins jugular, with 3 subequal upcurled rays, joined by membrane for most of their length (giving webbed-foot appearance); orbital cirrus present; teeth present on vomer, none on palatines. Two species, both in southern Africa, only 1 ranging to WIO.

KEY TO SPECIES

- 1a Opercular membrane covers pectoral-fin base; hook on cleithrum well-developed; maxilla nearly reaches hind margin of eye *X. kochi*
- 1b Opercular membrane not covering pectoral-fin base; hook on cleithrum reduced or absent; maxilla reaching only to mid-eye *X. leprosus* [west coast only]

Xenopoclinus kochi Smith 1948

Platanna klipfish

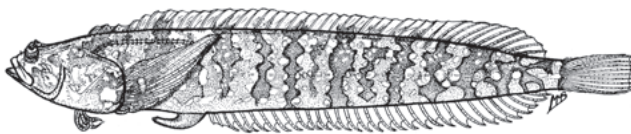
PLATES 146 & 152

Xenopoclinus kochi Smith 1948: 732, Fig. 1 (low-tide mark in Lambert's Bay, South Africa); Smith 1949*; Penrith 1969*; SSF No. 237.37*; Prochazka & Griffiths 1992.

Xenopoclinus (Xenopoclinus) kochi: Smith 1961*.

Dorsal fin 33–37 spines (evenly spaced), 7–11 rays, fin low and margin even; anal fin 2 spines, 29 or 30 rays; pectoral fins 12 or 13 rays; pelvic fins 1 spine, 3 rays. Body compressed, depth 6–7.5 in SL; HL 3.8–5 in SL, snout short, lower jaw longer than upper jaw; eyes dorsal and placed well forward, diameter 4–6.5 in HL. Opercular membranes expanded to cover pectoral-fin bases and overlapping below. Orbital cirrus small, flat and rounded. Anterior LL pored scales ~30, mostly with vertical pairs of pores. Male intromittent organ cylindrical, tapering, with rounded tip between 2 lateral lips. Vertebrae 15 + 34 or 35.

Body ground colour pinkish, with ~6 irregular olive-brown bars with narrow purple edges, becoming vaguely mottled posteriorly, with many white spots; fins transparent. Attains 10 cm SL.



Xenopoclinus kochi, 80 mm TL, male (South Africa). Source: SSF

DISTRIBUTION South Africa, from Lambert's Bay (west coast) in southeastern Atlantic, to Algoa Bay (south coast) in WIO.

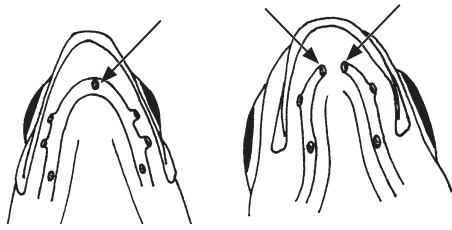
REMARKS Uncommon; burrows in sand and coarse grit with only the eyes and top of the head exposed, or lies on coarse sediment in rockpools and gullies with kelp. Found in lower intertidal zone on the west coast, and to ~15 m deep on the south coast.

FAMILY TRIPTERYGIIDAE

Triplefin blennies

Wouter Holleman

Body elongate, subcylindrical anteriorly and slightly compressed posteriorly in most species (depth generally 4–5.5 in SL), and 3 separate dorsal fins: 1st dorsal fin with 3 or 4 spines, 2nd dorsal fin with 11–15 spines, and 3rd dorsal fin with 8–11 rays, last ray divided to base but counted as single ray; anal fin usually with 1 or 2 small spines, 16–21 rays, all rays simple except last divided to base; pelvic fins jugular, with 1 short hidden spine, 2 undivided rays usually united by membrane for part of length; pectoral fins 13–17 total rays: 0–4 upper rays undivided + central rays divided (except some *Enneapterygius* species with no divided rays) + 6–8 lower rays thickened and undivided; caudal fin 7 + 6 principal rays: 1 or 2 outer rays undivided, central rays divided. Orbital cirrus present or absent; no cirri on nape. Anterior nostrils a short tube, with cirrus on rear rim. Mandibular pore patterns often diagnostic of species, with 2–9 pores on each side and 1–5 pores at symphysis. Some species with labial folds (crescentic folds of skin extending from each mandible to mandibular sensory canal). Teeth in jaws conical and often slightly recurved, vomer with similar teeth, and palatines with or without teeth. Branchiostegal rays 6; gill membranes united and free from isthmus. Lateral line either a row of pored scales ending from below 2nd dorsal fin to peduncle, or divided into an anterior series of pored scales ending below 2nd dorsal fin, plus a posterior series of notched scales beginning ½–3 scale rows beneath the pored series and extending to caudal-fin base. Body scales ctenoid, except belly often with cycloid scales (or naked), and head with or without scales. LSS counted from pectoral-fin axil to caudal-fin base, plus many species with 1–3 scale rows on caudal-fin base (not included in LSS count); transverse scale rows counted from base of anterior half of 2nd dorsal fin to the LL pored scales, and below that to the anal-fin base.



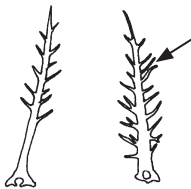
Lower jaw mandibular symphyseal pores: one pore (left) and 2 pores (right) at the jaw symphysis.

Small-sized, generally <8 cm SL in WIO (but to ~18 cm SL in New Zealand); cryptically coloured, with the live colour often diagnostic, and males frequently more brightly coloured and often with areas of black, unlike females. Benthic, mainly on hard and rough substrates, including tidepools and rocky and coral reefs, but also on compacted sand and among seagrasses, from intertidal zone to usually <30 m deep. Occur worldwide in tropical to temperate and sub-Antarctic seas. About 30 genera and ~150 species, several undescribed; 5 genera and possibly 38 species in WIO.

KEY TO GENERA

- 1a First dorsal fin 4 spines; anal fin 1 or 2 short spines 2
 1b First dorsal fin 3 spines; anal fin 1 short spine 4

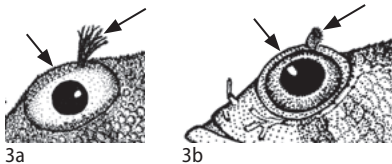
- 2a Anal fin 1 spine; dorsal-fin spines with many small, laterally branching spinelets *Acanthanectes*



- 2b Anal fin 2 spines; dorsal-fin spines not as above 3

- 3a Orbital cirrus branched; ring of scales or scale-like spines around eyes; teeth present on palatines *Cremanocharites*

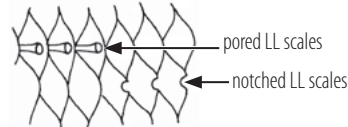
- 3b Orbital cirrus simple or serrate; no ring of scales around eyes; no teeth on palatines *Norfolkia*



Continued...

KEY TO GENERA

- 4a Lateral line divided into anterior series of pored scales, and posterior series of notched scales *Enneapterygius*



- 4b Lateral line a single row of pored scales, ending from below 2nd dorsal fin to peduncle *Helcogramma*

GENUS *Acanthanectes*

Holleman & Buxton 1993

First dorsal fin 4 spines; all dorsal-fin spines with several small laterally projecting spinelets; anal fin 1 short spine. Ctenoid scales on body, including bases of pectoral fins and/or caudal fin, except cycloid scales on belly; cheeks and top of head papillose, papillae with embedded spines which are attached to skull. Lateral line with pored scales anteriorly, notched scales posteriorly. Tiny and robust-bodied; 2 species, both known only from WIO coast of South Africa.

KEY TO SPECIES

- 1a Anal fin 17–19 rays; pectoral fins 16 rays; body with irregular bars *A. hystrix*
 1b Anal fin 21 or 22 rays; pectoral fins 17 rays; no bars on body *A. rufus*

Acanthanectes hystrix Holleman & Buxton 1993

Prickly triplefin

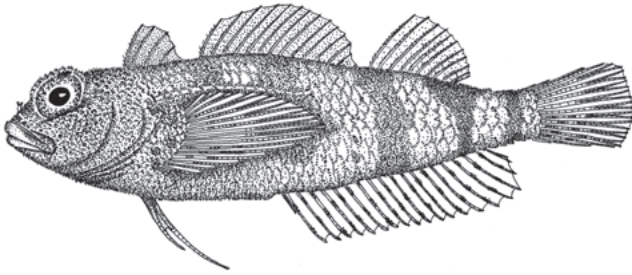
PLATE 154

Acanthanectes hystrix Holleman & Buxton 1993: 332, Figs. 5, 6b
 (Tsitsikamma National Park, south coast, South Africa).

Dorsal fins 4 spines + 12–14 spines + 9 or 10 rays; anal fin 1 spine, 17–19 rays; pectoral fins 16 rays (1 + 8 + 7). Dorsal-fin spines and rays with lateral spinelets; 1st dorsal fin ~ $\frac{2}{3}$ height of 2nd dorsal fin. Interorbital region wide and deeply concave, forming prominent brow ridges in adults. Orbital and nasal cirri multifid. Top of head, snout and perimeter of eyes papillose, the papillae with embedded spines with protruding tips, and spines on top of head attached to skull. Mandibular pores 3 + 2 + 3. Jaws with band of conical teeth, largest in row on outer margin of premaxilla and slightly recurved; row of 7 or 8 stout teeth on vomer; 2 or 3 stout teeth on palatines. Body, upper part of opercle, and bases of pectoral fins and caudal

fin with ctenoid scales with stout ctenii, scales not lying flat, giving a coarse pineapple-like appearance; scale arrangement irregular, with small scales inserted particularly between scales in upper 2 rows on body; LL scales 15–18 + 19–22, notched series starting 2 scale rows below end of pored series; LSS 34; transverse scale rows 3/7.

Body pale cream, with 5 deep orange and black bars (first 3 bars extending to anal-fin base; darkest bar across peduncle); head with orange markings; dorsal and pectoral fins of males with orange bars, and anal fin with narrow black bars interspersed with orange-yellow; caudal fin with narrow orange bars. Attains 35 mm SL.



Acanthanectes hystrix, 31 mm SL, male holotype (South Africa).
Source: Holleman & Buxton 1993

DISTRIBUTION WIO: endemic to South Africa (Tsitsikamma National Park to Cape Recife).

REMARKS Found from subtidal zone to 30 m deep.

Acanthanectes rufus Holleman & Buxton 1993

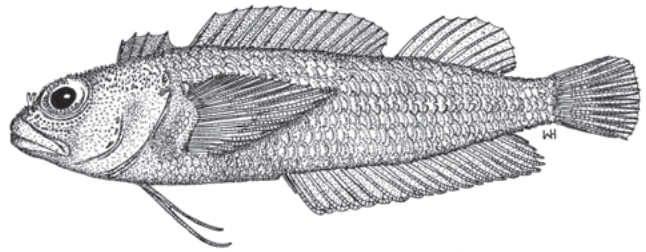
Redhead triplefin

PLATE 154

Acanthanectes rufus Holleman & Buxton 1993: 336, Figs. 6a, 8
(Tsitsikamma National Park, south coast, South Africa).

Dorsal fins 4 spines + 14 or 15 spines + 10 or 11 rays; anal fin 1 spine, 21 or 22 rays; pectoral fins 17 rays (1 + 8 + 8). First dorsal fin $\sim\frac{1}{2}$ height of 2nd; 2nd dorsal fin low, $\sim\frac{1}{2}$ body depth. Interorbital region wide, $\sim\frac{1}{2}$ eye diameter. Head, snout and interorbital area papillose, each papilla with soft spine, those on head attached to skull. Nasal cirri long and multifid; no orbital cirrus. Mandibular pores 4 or 5 + 2 + 4 or 5; complex arrangement of sensory canals branching from infraorbital canal over preopercle, each with 2 rows of small pores. Jaws with band of conical, depressible teeth, largest in row on outer margin; row of teeth on vomer; no teeth on palatines. Body scales ctenoid with long ctenii, scales extending onto caudal-fin base; cycloid scales on belly, from vent to pelvic-fin bases, and a few cycloid scales on upper parts of opercle and pectoral-fin bases; LL scales 15–17 + 22 or 23; LSS 34 or 35; transverse scale rows 4/8.

Body pale reddish brown, with 5 or 6 paler narrow bars from dorsum to lateral midline; top of head, snout and area below eyes yellow; opercle and anterior portion of belly pinkish; large males with evenly scattered melanophores on median-fin membranes. Attains 36 mm SL.



Acanthanectes rufus, 36 mm SL, male holotype (South Africa).
Source: Holleman & Buxton 1993

DISTRIBUTION WIO: endemic to South Africa (Tsitsikamma National Park to Port Alfred, Eastern Cape).

REMARKS Found from subtidal zone to 25 m deep.

GENUS *Cremnochorites* Holleman 1982

Diagnosis as for the single species.

Cremnochorites capensis

(Gilchrist & Thompson 1908)

Cape triplefin

PLATES 153 & 154

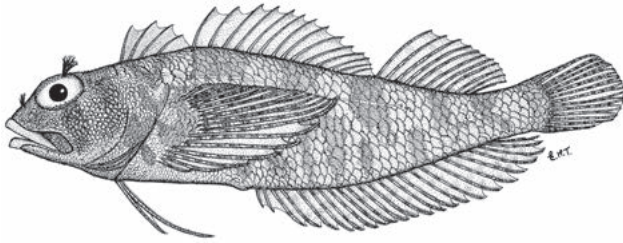
Tripterygium capense Gilchrist & Thompson 1908: 140 (False Bay, Western Cape, South Africa).

Gillias capensis: Barnard 1927; SFSa No. 1005*.

Cremnochorites capensis: Holleman 1982*; SSF No. 236.1*; Heemstra & Heemstra 2004*; Fricke 2009.

Dorsal fins 4 spines + 14 or 15 spines + 10 or 11 rays; anal fin 2 spines, 21 or 22 rays; pectoral fins 16 rays (0 + 8 + 8). Head covered with small denticle-like scales, each on a 'pedestal,' those on top of head attached to skull; ring of ctenii around eyes and at rear end of maxillae; isthmus papillose, each papilla containing a soft spine. Orbital cirrus large and multifid; nasal cirrus similar but smaller. Mandibular pores 5 + 2 + 5. Jaws with slightly recurved, conical teeth, largest on outer margin; vomer with single row of recurved teeth, extending onto palatines. Body covered with ctenoid scales, ctenii irregular in length, and scale rows somewhat irregular; pectoral-fin bases and rear margin of opercle with scales $\sim\frac{1}{2}$ size of body scales; belly scales ctenoid with few ctenii, but cycloid scales around vent; LL scales 21–24 + 17–20; LSS 36 or 37; transverse scale rows 5/11.

Body pale grey, belly paler; head with brown bars and spots, body irregularly barred and blotched in shades of russet and brown; males in breeding colours with bright yellow to orange head, 1st dorsal fin, and bars anteriorly along dorsum. Attains 80 mm SL.



Cremonchorites capensis, 80 mm SL, male (South Africa). Source: SSF

DISTRIBUTION WIO: endemic to South Africa (False Bay to Aliwal Shoal).

REMARKS Found on rocky reefs, in 5–20 m; type specimens taken by trawl in 30 m.

GENUS *Enneapterygius* Rüppell 1835

Dorsal fins 3 spines + 10–14 spines + 8–11 rays; anal fin 1 short spine, 15–22 rays. Head naked, except nape sometimes scaly or partially scaly; belly naked or with cycloid scales. Lateral line divided into anterior series of pored scales ending below 2nd dorsal fin, and posterior series of notched scales beginning ½–2 scale rows below end of anterior series and continuing to caudal-fin base. Inhabit coral reefs in tropical and subtropical Indo-Pacific. About 70 species, possibly 19 in WIO.

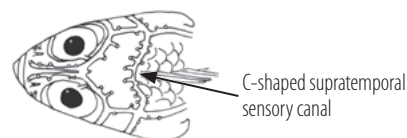
KEY TO SPECIES

- | | | |
|----|---|----------------------|
| 1a | Pectoral fins 13 or 14 rays, all unbranched | 2 |
| 1b | Pectoral fins 13–16 rays, at least some branched | 3 |
| 2a | Pectoral fins 14 rays; belly naked; 1st dorsal fin of males taller than 2nd dorsal fin; black spot on margin of 2nd dorsal fin, and anal fin with black bars and subcutaneous black spots at base | <i>E. altipinnis</i> |
| 2b | Pectoral fins 13 rays; belly with thin cycloid scales; 1st dorsal fin of males subequal in height or lower than 2nd dorsal fin; cluster of melanophores on midsides beneath pectoral fins | <i>E. kosiensis</i> |
| 3a | Peduncle with distinct dark bar or marking; body with well-defined vertical or oblique dark bars (except <i>E. elegans</i>); anal fin with or without dark barring | 4 |

Continued ...

KEY TO SPECIES

- | | | |
|----|--|------------------------|
| 3b | Body and peduncle without distinctive dark bars or markings | 9 |
| 4a | Dark bar or marking on peduncle not continuous | 5 |
| 4b | Dark bar on peduncle encircling it | 7 |
| 5a | LL pored scales 14–18; anal fin 16–19 (rarely 16) rays | 6 |
| 5b | LL pored scales 8–12 (usually 10 or 11); anal fin 15–17 rays; peduncle with 2 round black spots, one above the other; body with oblique black bars, and body anteriorly pink in life | <i>E. destai</i> |
| 6a | Total LL scales 16–18 + 16–18; anal fin 16 or 17 rays; peduncle with 2 squarish black spots, one above the other; body with indistinct red bars (darker in preservative); males with lower half of head black | <i>E. elegans</i> |
| 6b | Total LL scales 14–16 + 19–23; anal fin 17–19 rays; peduncle mark generally darker dorsally, often with small clear 'window' at centre; small dark saddle mark at base of last dorsal-fin rays; body cream-coloured, with dark brown bars which may divide ventrally | <i>E. gruschkai</i> |
| 7a | LL pored scales usually 15 or 16 (rarely 13 or 14); anal fin 17 or 18 rays | 8 |
| 7b | LL pored scales 11 or (usually) 12; anal fin 16 or 17 (usually 16) rays; body with vertical dark bars, often dividing ventrally; black bar encircling peduncle; belly with thin cycloid scales; pectoral-fin bases with row of cycloid scales | <i>E. clarkae</i> |
| 8a | Body with 6 distinct vertical dark bars; 2nd dorsal fin with black spot basally, capped by bright orange arc in life; broad dark bar on peduncle with white band at caudal-fin base | <i>E. melanospilus</i> |
| 8b | Body with 6 or 7 oblique bars; 2nd dorsal fin without black spot, but anal fin with 6 or 7 dark blue basal spots; narrow dark bar on peduncle positioned at caudal-fin base | <i>E. fasciatus</i> |
| 9a | Supratemporal sensory canal U-shaped, curving around first 1 or 2 dorsal-fin spines | 10 |
| 9b | Supratemporal sensory canal an open C-shape in front of 1st dorsal-fin spine | 14 |



Continued ...

KEY TO SPECIES

- 10a Anal fin with 5–7 oblique black bars, and basal spots present or absent; mandibular pores 3 + 1 or 2 + 3 12



- 10b No dark bars or spots on anal fin; mandibular pores 2 + 2 + 2 11

- 11a Third dorsal fin 10 or 11 rays; anal fin 20 or 21 rays; body without distinguishing marks, probably bright green in life *E. pallidus*

- 11b Third dorsal fin 9 rays; anal fin 17 or 18 rays; body dark red in life, 1st dorsal fin white and dark red with yellow patches *E. qirmiz*

- 12a Anal fin with spots at base; midsides of body with broad, diffuse dark bars containing 3 or 4 pale (white in life) blotches; black preanal spot present or absent; white line at caudal-fin base 13

- 12b No spots along anal fin and no dark bars on body; black preanal spot present; 1st dorsal fin of males higher than 2nd dorsal fin, and multi-coloured in life *E. pusillus*

- 13a Pectoral fins 15 rays; 2nd dorsal fin 13 spines; 1st dorsal fin of males not higher than 2nd dorsal fin, and white in life; peduncle with quadrangular dusky mark *E. hollemani*

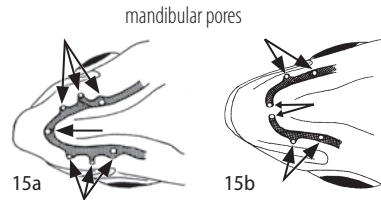
- 13b Pectoral fins 14 rays; 2nd dorsal fin 11–13 spines; 1st dorsal fin of males higher than 2nd dorsal fin, and cream or pale yellow in life; peduncle with triangular dusky mark (the apex anteriormost) *E. ventermaculatus*

- 14a First dorsal fin of males taller than 2nd dorsal fin; pectoral fins 14 rays; anal fin with black bars, and subcutaneous black spots at base *E. cf. tutuilae*

- 14b First dorsal fin of males equal in height or lower than 2nd dorsal fin; pectoral fins 14–16 rays 15

- 15a Mandibular pores 2–9 + 1 + 2–9; pectoral fins 15 or 16 rays; no labial folds 16

- 15b Mandibular pores 2 + 2 + 2; pectoral fins 14 or 15; 3 or 4 uppermost pectoral-fin rays undivided; labial folds prominent; no distinguishing marks except for oblique bands on anal fin (dark red in life), and 1st dorsal fin yellow and white *E. obscurus*



- 16a Body with or without scattered melanophores; head of males black or with cluster of melanophores on each cheek 17

- 16b Body, head and fins of males densely and evenly covered with melanophores, lower half of head generally darker than upper; immature males and females less densely covered with melanophores, but sometimes showing as indistinct oblique bars on body and anal fin *E. philippinus*

- 17a Males with black head and throat, and body orange-yellow to yellow-green in life; in life, females with line from eye onto upper lip; LL pored scales 12–15 (usually 13 or 14) 18

- 17b Males with cluster of melanophores on cheeks; both sexes with small black spot at upper and lower ends of pectoral-fin base; LL pored scales 13–15 (usually 15) *E. genamaculatus*

- 18a Black on head of males extends to nape and pectoral- and pelvic-fin bases, and, in life, entire body yellow to yellow-green; in life, females with line of dark melanophores forward from eye onto upper lip; anal fin 17 or 18 (usually 18) rays *E. abeli*

- 18b Black on head of males reaches only to rear edges of eyes and preopercle, and yellow on body confined to anterior third; in life, females with 2 brown streaks from eye to upper lip; anal fin usually 19 (17–19) rays *E. elaine*

Enneapterygius abeli (Klausewitz 1960)

Yellow triplefin PLATES 153 & 154

Tripterygion abeli Klausewitz 1960: 11, Figs. 1–2 (Hurghada, Egypt, Red Sea).

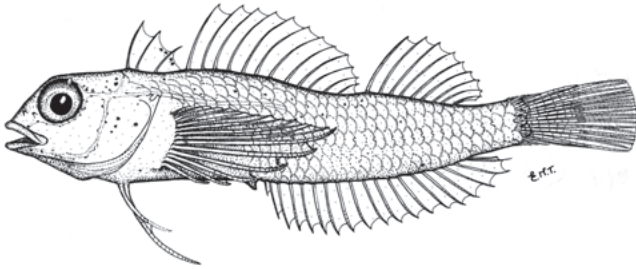
Helcogramma abeli: Lal Mohan 1971.

Enneapterygius abeli: Clark 1980*; SSF No. 236.2*; Winterbottom *et al.* 1989*; Goren & Dor 1994; Fricke 1999, 2009; Golani & Bogorodsky 2010; Holleman & Bogorodsky 2012*; Fricke *et al.* 2013.

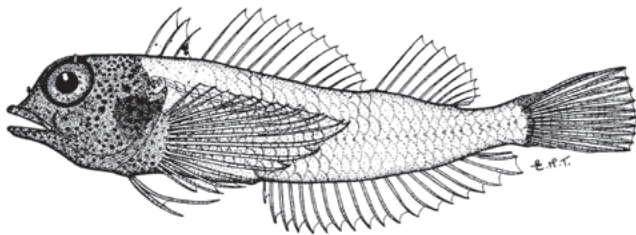
Dorsal fins 3 spines + 11–13 spines + 8–10 rays; anal fin 1 spine, 17 or 18 rays; pectoral fins 15 rays (3 + 5 + 7). First dorsal fin subequal to 2nd in males, lower in females; 2nd dorsal fin ~ $\frac{2}{3}$ body depth; pelvic-fin rays united by membrane for ~ $\frac{1}{2}$ length of shorter ray, and longer ray reaches mid-vent. Orbital cirrus small and pointed. Mandibular pores 3 + 1 + 3; supratemporal sensory canal crescent-shaped. Nape partially scaly; head, 1st dorsal-fin base and belly naked; LL scales

12–14 + 20–22, notched series beginning 1st scale row below end of pored series; LSS 31; transverse scale rows 3/6.

Males with yellow to yellow-green body with irregular black markings; head, nape, pre-pectoral area and throat to pelvic-fin bases black; caudal fin and dorsal fins pinkish, with black spots on 1st dorsal fin. Females with yellowish head and body, white belly, and oblique line of melanophores from upper lip to front margin of eye. Attains 30 mm SL.



Enneapterygius abeli, 24 mm SL, female (South Africa). Source: SSF



Enneapterygius abeli, 21 mm SL, male (South Africa). Source: SSF

DISTRIBUTION WIO (widespread): Red Sea, Kenya to South Africa (Aliwal Shoal), Mozambique Channel, Comoros, Seychelles, Mauritius, St Brandon Shoals and Chagos; not known from Gulf of Oman.

REMARKS Found in coral-rich areas, in lagoons and on seaward reefs, in 1–20 m. Similar to *Enneapterygius elaine* from Rodrigues, which is yellow only anteriorly.

Enneapterygius altipinnis Clark 1980

Highfin triplefin

PLATES 153 & 154

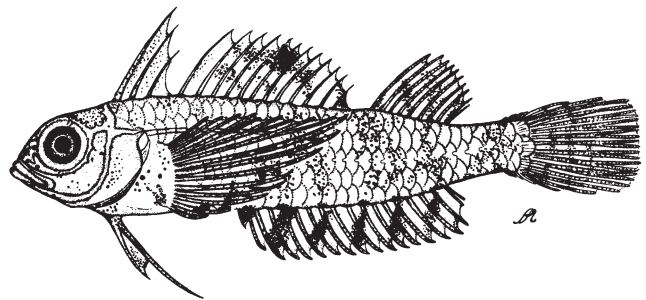
Enneapterygius altipinnis Clark 1980: 99, Figs. 3b, 6c, 11 (north of Ras Burqa, Egypt, Gulf of Aqaba, Red Sea); Dor 1984; Goren & Dor 1994; Holleman & Bogorodsky 2012*.

Enneapterygius tutuilae (non Jordan & Seale 1906): Fricke 1994*, 1999; Holleman 2005*; Fricke 2009.

Enneapterygius pusillus (non Rüppell 1835): SSF No. 236.5*.

Dorsal fins 3 spines + 11 or 12 spines + 9 or 10 rays; anal fin 1 spine, 16–18 rays; pectoral fins 14 rays (all simple). First dorsal fin higher than 2nd in males, fin heights subequal in females; 2nd dorsal fin ~70% body depth; pelvic-fin rays united by membrane for ~½ length of shorter ray, longer ray reaches to vent; longest pectoral-fin ray reaches end of 2nd dorsal fin; maxilla reaches vertical at front edge of pupil. Orbital cirrus moderate and lobate. Mandibular pores 2 + 1 or 2 + 2; supratemporal sensory canal crescent-shaped. Nape scaly; belly naked; LL scales 11 or 12 + 20–23, notched series beginning 2nd scale row below end of pored series; LSS 29; transverse scale rows 2/4.

Males mostly tan, with orange-edged scales, and white ventrally; head cream with diffuse pale green or olive markings, eyes greenish with small white spots; body with 5 irregular olive-brown patches with melanophores, last across peduncle; 1st dorsal fin mottled cream and green, with red patch at base of last membrane, and 1st spine with alternating dark brown and white bands; 2nd dorsal fin with red patches anteriorly, and 2 white bands posteriorly, and middle of fin with broad band of dark melanophores on otherwise hyaline membrane; 3rd dorsal fin similar but paler in life (lacking red and black blotches); anal fin with alternating white, hyaline and black bands; pelvic fins whitish distally; pectoral-fin rays with irregular bands of brown, white and green, and several subcutaneous spots at fin base; black preanal spot; caudal fin hyaline with white flecks on rays. Attains ~40 mm SL.



Enneapterygius altipinnis, 21 mm SL, paratype (Gulf of Aqaba). Source: Clark 1980

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Occurs on rocks and dead corals, often at the base of reefs, in 2–5 m. Member of a species-complex that includes species from the western Pacific; see *Enneapterygius* cf. *tutuilae*.

Enneapterygius clarkae Holleman 1982

Clark's triplefin

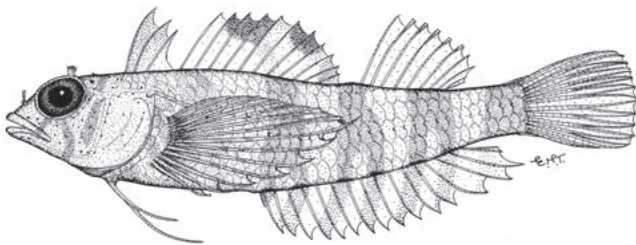
PLATES 153 & 154

Enneapterygius n. sp. 2: Clark 1980*.

Enneapterygius clarkae Holleman 1982: 121, Fig. 6 (off Barreira, Inhaca I., Mozambique); SSF No. 236.3*; Goren & Dor 1994; Holleman 2005*; Golani & Bogorodsky 2010; Holleman & Bogorodsky 2012*.

Dorsal fins 3 spines + 11 or 12 spines + 8–10 rays; anal fin 1 spine, 16 or 17 rays; pectoral fins 15 rays (2 + 6 + 7). First and 2nd dorsal fins of equal height. Orbital cirrus length $\sim\frac{1}{2}$ pupil diameter, with serrate end; upper and rear margins of orbits with fine serrations. Mandibular pores 3 + 2 + 3; supratemporal sensory canal crescent-shaped. Nape scaly; thin cycloid scales on belly, and row of cycloid scales on pectoral-fin bases parallel to margin of branchiostegal membranes; LL scales 11 or 12 + 20–22, notched series beginning 1st scale row below end of pored series; LSS 29 or 30; transverse scale rows 3/6.

Body of males and females cream, with 4 or 5 dark brown transverse bars: darkest bar at peduncle, bars fainter under pectoral fins, and bars continuing onto anal-fin base as subcutaneous black spots; prominent preanal spot present; front half of body dusted with melanophores, sometimes forming irregular bars on lower portion of head; 1st dorsal fin reddish; 2nd dorsal fin with 2 reddish areas, posteriormost black basally; 3rd dorsal fin and pectoral fins with irregular dusky markings. Displays little sexual dichromatism, except males generally more darkly marked than females and with red on 1st and 2nd dorsal fins. Attains 27 mm SL.



Enneapterygius clarkae, 24 mm SL, male holotype (S Mozambique).
Source: SSF

DISTRIBUTION WIO: Red Sea, Kenya to South Africa (Sodwana Bay), Madagascar, Comoros and St Brandon Shoals; not known from Mauritius and Gulf of Oman.

REMARKS Found on rocky reefs and sandy areas between corals, in 2–20 m.

Enneapterygius destai Clark 1980

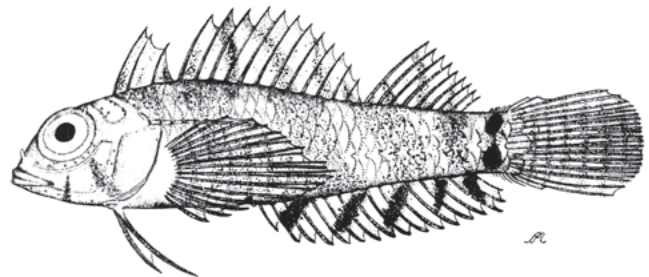
Destá's triplefin

PLATE 153

Enneapterygius destai Clark 1980: 102, Figs. 4b, 13 (Delemone I., Ethiopia, Red Sea); Goren & Dor 1994; Holleman 2005*; Golani & Bogorodsky 2010; Holleman & Bogorodsky 2012*.

Dorsal fins 3 spines + 11–13 spines + 8 or 9 rays; anal fin 1 spine, 15–17 rays; pectoral fins 15 rays (5 + 6 + 4). First dorsal fin $\sim\frac{2}{3}$ height of 2nd; 2nd dorsal fin $\sim 70\%$ body depth; pelvic-fin rays not united by membrane; pectoral fins of males long, longest ray extending to 2nd or 3rd dorsal-fin ray; maxilla extends to vertical at front margin of pupil. Orbital cirrus a rounded flap, its length $\sim\frac{1}{2}$ pupil diameter. Mandibular pores 3 + 2 + 3; supratemporal sensory canal crescent-shaped. Scales large; nape scaly, scales extend onto dorsal- and anal-fin bases, and caudal-fin base with 2 scale rows; LL scales 8–12 + 21–23, notched series beginning 2nd scale row below end of pored series; LSS 28; transverse scale rows 2/5.

Head, body and 1st dorsal fin bright pink; tints of pink on other fins except pelvic fins; 5 broad, oblique, dusky bands across body present to some degree in adults, absent in juveniles; 2 or 3 dusky bars radiating downwards from rear quarter of eye; 2nd and 3rd dorsal fins with irregular dusky bars; anal fin with 5 or 6 oblique black bars; preanal black spot prominent; 2 prominent black spots forming hourglass-shape on peduncle. No sexual dichromatism evident. Attains 21 mm SL.



Enneapterygius destai, 20 mm SL, female paratype (Red Sea).
Source: Clark 1980

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Found in coral-rich areas of bays and lagoons, often in association with *Porites* corals, in 2–12 m. Replaces *E. abeli* as the most abundant species in the southern Red Sea.

Enneapterygius elaine Holleman 2005

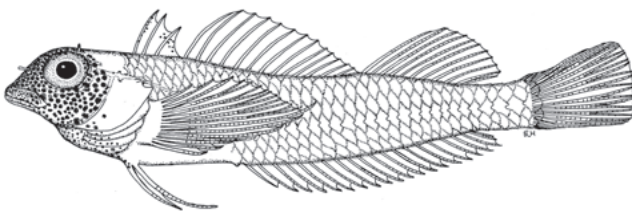
Yellowscarf triplefin

PLATES 154 & 155

Enneapterygius elaine Holleman 2005: 7, Fig. 6, Pl. 1a–b (Baladirou, Rodrigues, Mascarenes); Fricke 2009.

Slender-bodied; mouth oblique, small and pointed. Dorsal fins 3 spines + 12 or 13 spines + 10 rays; anal fin 1 spine, 17–19 rays; pectoral fins 15 rays (3 + 5 + 7). First dorsal fin $\sim\frac{1}{2}$ height of 2nd dorsal fin; pelvic-fin rays slender, united by membrane for $\sim\frac{1}{2}$ length of longer ray; pectoral fins large, longest ray reaches to penultimate spine of 2nd dorsal fin; maxilla reaches vertical at front margin of orbit. Orbital cirrus small and pointed. Mandibular pores 3 + 1 + 3; supratemporal sensory canal crescent-shaped. Scales large, nape scaly; belly naked; LL scales 14 or 15 + 21 or 22, notched series beginning 2nd scale row below end of pored series; LSS 33; transverse scale rows 2/5.

Males head densely covered with large melanophores (dorsally to just behind eyes, laterally to preopercle margin, and ventrally to pelvic-fin bases), spotting on lips and throat less dense than elsewhere; some fish with brown on lower portion of opercle; body bright yellow from behind pectoral-fin bases to junction between 1st and 2nd dorsal fins; rear part of body with pale brown reticulations (generally created by colour on the scale margins); narrow brown bar on peduncle; 1st dorsal fin pale yellow, with few melanophores on 2nd and 3rd membranes; all other median fins with pale reddish brown elements and hyaline membranes; caudal fin with narrow pale yellow bar at base of rays; pectoral-fin base with 2 pale brown spots (one above the other), rays pale brown, membranes unmarked. Females head white to rear margin of eyes, and 2 brown streaks from each eye to upper lip; head brown behind eyes to nape and opercle margin; body with same pale brown reticulation as males; pectoral fins and median fins as in males, except caudal-fin base without pale yellow bar. Attains 23 mm SL.



Enneapterygius elaine, 19 mm SL, male holotype (Rodrigues).

Source: Holleman 2005

DISTRIBUTION Known only from the type specimens from Rodrigues.

REMARKS Collected among boulders and corals with sand, in 17–22 m.

Enneapterygius elegans (Peters 1876)

Hourglass triplefin

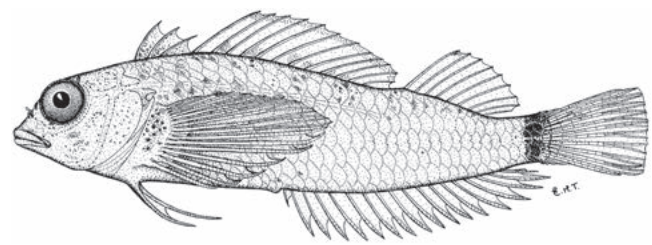
PLATE 154

Tripterygium elegans Peters 1876: 441 (Mauritius, Mascarenes).

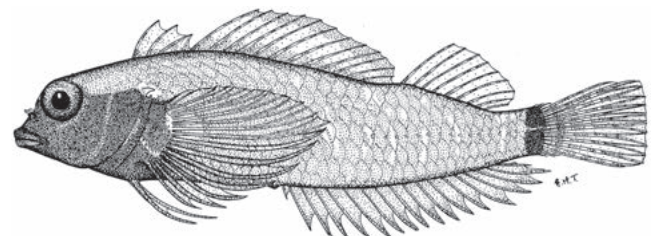
Enneapterygius elegans: SSF No. 236.4*; Fricke & Randall 1992; Fricke 1999, 2009; Heemstra *et al.* 2004; Holleman 2005*; Fricke *et al.* 2009.

Body robust, depth 3.8–4.6 in SL. Dorsal fins 3 spines + 11–13 spines + 8–10 rays; anal fin 1 spine, 16 or 17 rays; pectoral fins 16 rays (2 + 7 + 7). First dorsal fin $\sim\frac{2}{3}$ height of 2nd; 2nd dorsal fin $\frac{1}{2}$ – $\frac{2}{3}$ body depth. Nasal and orbital cirri small and simple. Mandibular pores 6–9 + 1 + 6–9; supratemporal sensory canal crescent-shaped. Nape scaly; belly with thin cycloid scales, entirely scaly in males, only rear half scaly in females; LL scales 16–18 + 16–18, notched series beginning 1st scale row below end of pored series, overlapping by 2 or 3 scales; LSS 30 or 31; transverse scale rows 3/5. Exposed rear margins of median and lateral extrascapulars finely serrate.

Males russet with paler irregular narrow bars; head, excluding snout, densely spotted with melanophores (from below middle of eyes to upper lip and onto underside), the spotting extending to pectoral-fin bases and front of belly; peduncle with 2 squarish black marks separated by midlateral unpigmented space (resembling a dumbbell or hourglass shape); bright yellow spot on peduncle behind last dorsal-fin ray; 1st and 2nd dorsal fins stippled with red and black, 2nd dorsal fin darkest along margin and base; 3rd dorsal fin with broken orange bars and black stipples; narrow red stripe at caudal-fin base; anal fin red; pectoral fins red with creamy blotch at base of middle rays; pelvic fins with red stipples. Females less intensely marked: body with indistinct bands with pale spots between; no black on lower part of head and throat, and fewer melanophores on head and fins; belly and pelvic fins white; indistinct stipples along base and margin of 2nd dorsal fin. Attains 35 mm SL.



Enneapterygius elegans, 35 mm SL, female (St Brandon Shoals). Source: SSF



Enneapterygius elegans, 30 mm SL, male (St Brandon Shoals). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Kenya to Mozambique (Bazaruto I.), Comoros, Mauritius, Rodrigues, Seychelles, Réunion, St Brandon Shoals, Maldives and Sri Lanka; elsewhere to Cocos (Keeling) Is., Taiwan, southern Japan, New Guinea, Solomon Is., New Caledonia and Samoa.

REMARKS Collected from sand patches between corals, in 6–10 m.

Enneapterygius fasciatus (Weber 1909)

Banded triplefin

PLATE 155

Tripterygium fasciatum Weber 1909: 148 (Savu I. and Karakelang I., Indonesia).

Tripterygion (Enneapterygius) fasciatum: Mukerji 1935.

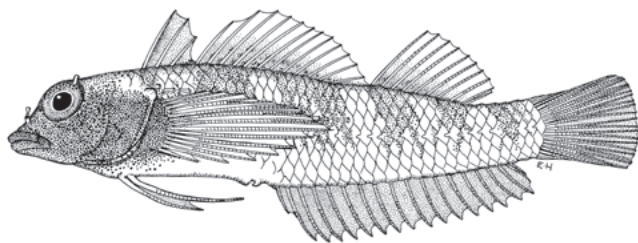
Tripterygion fasciatum: Herre 1939.

Tripterygion fasciatus: Lal Mohan 1968*.

Enneapterygius fasciatus: Fricke 1997, 2009; Holleman 2005*.

Body robust. Dorsal fins 3 spines + 11–13 spines + 9–11 rays; anal fin 1 spine, 17 rays; pectoral fins 15 or 16 rays (3 or 4 + 4 or 5 + 7 or 8). First dorsal fin lower than 2nd; 2nd dorsal fin ~70% body depth. Orbital and nasal cirri small and lobate. Mandibular pores 3 + 1 + 3; supratemporal sensory canal crescent-shaped. Nape scaly; belly naked; LL scales 13–16 + 18–21, notched series beginning 1st scale row below end of pored series and overlapping it by 2 or 3 scales; LSS 30–32; transverse scale rows 3/6.

Distinguished by 6–8 black or blue spots at anal-fin base in both sexes; body with oblique bars. Weber's original description gives live colours as: body yellowish, with 7 brown crossbars; head with brown flecks and bands; 1st and 2nd dorsal fins with dark bases. Lal Mohan (1968; based on one specimen) noted: snout, cheeks and anterior part of belly mottled with blue chromatophores; brown blotch on lower part of opercle; 5 greenish irregular vertical bars on body; dark blotch on 1st membrane of dorsal fin; reddish blotch on pectoral- and pelvic-fin bases; 6 deep blue spots on anal-fin base. Herre (1939) noted a dark band at caudal-fin base. Attains 30 mm SL.



Enneapterygius fasciatus, 26 mm SL, male (N Mozambique). Source: Holleman 2005

DISTRIBUTION Indo-Pacific. WIO: Kenya to northern Mozambique, Comoros, Seychelles, southern India and Sri Lanka; elsewhere to Andaman Is., Thailand, Indonesia, Philippines, Taiwan, New Guinea and Solomon Is.

REMARKS Found in various coral habitats, usually seen resting on rocks and corals, to ~15 m deep.

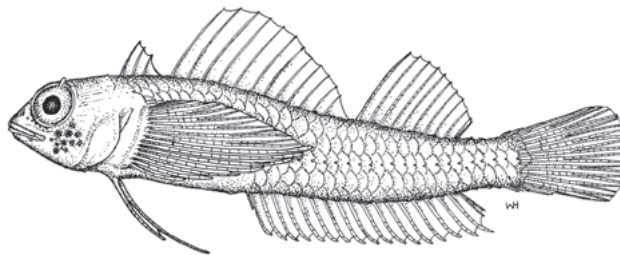
Enneapterygius genamaculatus Holleman 2005

Cheekspot triplefin

Enneapterygius genamaculatus Holleman 2005: 11, Fig. 10 (Grande Passe, St Brandon Shoals); Fricke 2009.

Slender-bodied, depth 4.6–5.4 in SL; HL 3.5–3.9 in SL. Dorsal fins 3 spines + 12 or 13 spines + 9–11 rays; anal fin 1 spine, 18 or 19 rays; pectoral fins 15 or 16 rays (3 or 4 + 5 or 6 + 7 or 8). First dorsal fin lower than 2nd; 2nd dorsal fin ~70% body depth; pelvic-fin rays united by membrane for entire length of shorter ray, longer ray reaches anal-fin spine; maxilla reaches vertical at front edge of pupil. Teeth present on palatines; tip of tongue narrow and rounded. Orbital and nasal cirri small and rounded. Mandibular pores 3 + 1 + 3; supratemporal sensory canal crescent-shaped. Nape scaly; belly naked; LL scales 13–15 + 21–23, notched series beginning 1st scale row below end of pored series; LSS 32 or 33; transverse scale rows 2/4.

Preserved specimens: males with large cluster of melanophores below and slightly behind eyes; large specimens may have some pigment on snout, in interorbital area, on top of head, and on branchiostegal membranes; 2 small clusters of melanophores at upper and lower ends of pectoral-fin base, and small black spots on last membrane of 1st dorsal fin. Females with 2 clusters of melanophores on pectoral-fin bases only, and a few melanophores on 1st dorsal-fin membrane. Attains 23 mm SL.



Enneapterygius genamaculatus, 21 mm SL, male paratype (St Brandon Shoals). Source: Holleman 2005

DISTRIBUTION Known only from the type specimens from St Brandon Shoals.

REMARKS Collected at 6 m.

Enneapterygius gruschkai Holleman 2005

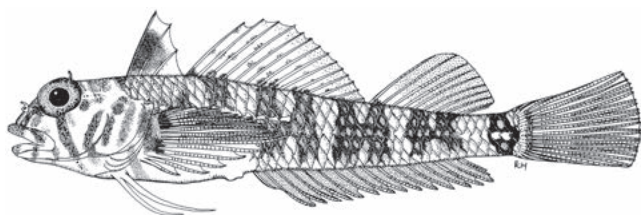
Springer's triplefin

PLATE 154

Enneapterygius sp.: Winterbottom *et al.* 1989*.*Enneapterygius gruschkai* Holleman 2005: 11, Fig. 11, Pl. 1e(Passe d'Ambulante, Mauritius, Mascarenes); Fricke *et al.* 2009.

Dorsal fins 3 spines + 12 or 13 spines + 8–11 rays; anal fin 1 spine, 17–19 rays; pectoral fins 15 rays (2 + 7 + 6). First dorsal-fin spines with small, laterally projecting spinelets; 1st and 2nd dorsal fins ~70% body depth; pelvic-fin rays not united by membrane; maxilla reaches vertical at front edge of pupil. Teeth in broad band in upper jaw and at front of lower jaw; no teeth on palatines. Orbital and nasal cirri simple and lobate. Mandibular pores 3 + 2 + 3; supratemporal sensory canal slightly curved. Body scales continuing onto bases of dorsal and anal fins; nape scaly; belly naked; LL scales 14–16 + 20–23, notched series beginning 1st scale row below end of pored series and below middle of 2nd dorsal fin; LSS 33; transverse scale rows 3/5.

Males variable: body creamy yellow, with 5 dark brown bars (sometimes divided below midline), or body rich brown, with 5 narrow creamy white bars (last bar at caudal-fin base; darkest bar across peduncle and with small clear 'window' midlaterally, and peduncle creamy or yellow either side of bar; penultimate 2 bars darkest dorsally, forming small dark saddles at base of last 2 dorsal-fin rays and on peduncle); scale margins with brown and orange spots; head markings dark brown to black, face almost tiger-striped; top of head deep orange with black stipples; 1st dorsal fin with black and red stipples; 2nd dorsal fin with orange bands on spines and black stipples on membranes; 3rd dorsal fin paler than 2nd; anal fin stippled black, but ray tips colourless; pectoral-fin base with black spot near upper and lower ends, white blotch behind the lower black spot, followed by another black spot and larger white blotch at centre of fin; pectoral-fin rays orange distally; caudal fin deep orange to red proximally, with narrow band of black stipples at base, and dusky distally. Females and juveniles less heavily pigmented: facial markings and bars on body pale brown; dorsal fins with yellow-orange pigment only (no black stipples); anal fin pale yellow, with some black stipples; caudal fin with orange and black stipples at base of rays. Attains 30 mm SL.

*Enneapterygius gruschkai*, 27 mm SL, male paratype (Mauritius).

Source: Holleman 2005

DISTRIBUTION WIO: Comoros, Seychelles, Mascarenes, St Brandon Shoals and Chagos.

REMARKS Known from lagoons, on reef tops and on drop-offs, in 3–18 m.

Enneapterygius hollemanii Randall 1995

Holleman's triplefin

PLATE 154

Enneapterygius hollemanii Randall 1995: 27, Fig. 1 (Ras Madrakah, Oman);

Manilo & Bogorodsky 2003; Holleman 2005*.

Body moderately elongate. Dorsal fins 3 spines + 13 spines + 10 rays; anal fin 1 spine, 19 rays; pectoral fins 15 rays (2 or 3 + 6 + 6 or 7). First and 2nd dorsal fins ~65% body depth; pelvic-fin rays united by membrane for ~½ length of shorter ray, longer ray reaches vent; maxilla reaches vertical at front edge of orbit. Orbital cirrus tiny and lobate. Mandibular pores 3 + 1 + 3; supratemporal sensory canal U-shaped. Nape scaly except near front of 1st dorsal fin; belly naked; LL scales 16 + 23 or 24, notched series beginning 2nd scale row below end of pored series and overlapping it by one scale.

Males: body mostly pale green, belly white; scale edges with red and dark brown spots forming 3 broad dusky bars which divide ventrally (2 below 2nd dorsal fin, and 1 below 3rd dorsal fin), bars darkest ventrally and separated by clusters of white flecks; dark mark on peduncle, its rear margin a narrow dark brown bar at caudal-fin base; head pale green, red and brown, becoming pale green ventrally; upper lip dusky; orbital cirrus white; 1st dorsal fin creamy white with red tip to first spine; 2nd dorsal fin with red cross-bands, 3 oblique white bands and dusky band at base; 3rd dorsal fin similar but paler; pelvic fins white; pectoral-fin rays white with red tips, and 6 dark brown spots forming irregular transverse bars, lower rays orange-yellow distally, membranes pale; anal fin with 7 black spots basally, which continue internally and diagonally across fin, interspersed with white, and rays with white and dark red spots; anus edged in black; caudal fin with narrow white band at base, membranes hyaline, and rays bright green. Attains 33 mm SL.

DISTRIBUTION Known only from three type specimens from Oman.

REMARKS Collected in <0.5 m.

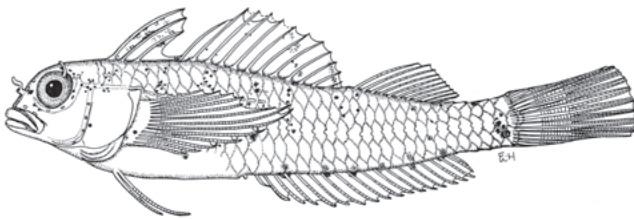
Enneapterygius kosiensis Holleman 2005

Kosi Bay triplefin

Enneapterygius kosiensis Holleman 2005: 13, Fig. 12 (Sodwana Bay, KwaZulu-Natal, South Africa); Fricke 2009.

Slender-bodied; mouth oblique. Dorsal fins 3 spines + 12 spines + 9 rays; anal fin 1 spine, 16 or 17 rays; pectoral fins 13 rays (all simple). First dorsal fin slightly higher than 2nd; 2nd dorsal fin 75–90% body depth; pelvic-fin rays slender, united by thin, fragile membrane for $\sim\frac{1}{2}$ length of shorter ray; longest pectoral-fin ray almost reaching 3rd dorsal-fin origin; maxilla reaches vertical at front margin of pupil. Interorbital region concave and broad, width about equal to pupil diameter. Orbital cirrus a simple rounded flap, length $\sim\frac{1}{2}$ pupil diameter. Mandibular pores 2 + 1 or 2 + 2; supratemporal sensory canal crescent-shaped. Scales large, nape scaly; belly with smaller, thin, cycloid scales; LL scales 12 + 21 or 22, notched series beginning 2nd scale row below end of pored series, overlapping it by one scale; LSS 32; transverse scale rows 1/4.

Preserved specimens: males with a few melanophores scattered on body, a cluster of large melanophores on midsides beneath pectoral fins, and cluster of melanophores on peduncle below midline; 1st dorsal-fin margin with cluster of large melanophores; band of melanophores parallel to 2nd dorsal-fin margin; anal fin with 6 irregular black bars, and basal spots may be present subcutaneously; preanal spot may be present. Females without markings on fins, and with fewer melanophores on body. Attains at least 20 mm SL.



Enneapterygius kosiensis, 20 mm SL, male holotype (South Africa).
Source: Holleman 2005

DISTRIBUTION Known only from 11 type specimens from South Africa.

REMARKS Collected on flat sponge reef, in 29–31 m.

Enneapterygius melanospilus Randall 1995

Spotfin triplefin

PLATE 154

Enneapterygius melanospilus Randall 1995: 29, Fig. 2 (Masirah I., Oman); Holleman 2005* [as *melanospilos*]; Fricke 2009.

Body moderately elongate; mouth not large. Dorsal fins 3 spines + 12 spines + 10 rays; anal fin 1 spine, 18 rays; pectoral fins 15 or 16 rays (2 + 5 or 6 + 8); pelvic-fin rays scarcely united by membrane. First dorsal fin $\sim 20\%$ higher than 2nd dorsal fin in males, fins subequal in females; 2nd dorsal fin $\sim 75\%$ body depth; maxilla reaches vertical at front of orbit. Orbital cirrus bilobed or trilobed, subequal to pupil diameter. Mandibular pores 3 + 2 + 3; supratemporal sensory canal crescent-shaped; numerous small spinules along hind edge of supratemporal sensory canal and on upper hind edge of orbit. Nape scaly; belly naked; LL scales 14 or 15 + 21 or 22, notched series beginning 1st scale row below end of pored series; LSS 34.

Body whitish, with 6 orange-brown bars (darker posteriorly and darkest across peduncle), width of last 4 bars about equal to white interspaces; front of head and nape brown, mottled with orange; lower half of head pale with brown-edged orange stripe below eyes; opercle dark orange-brown shading to yellowish posteriorly; 1st dorsal fin pinkish; 2nd dorsal fin with distinctive eye-sized black spot basally (at 7th–11th spines), fin white above spot with bright orange arc on margin, remainder of fin hyaline with irregular oblique dusky bars formed by orange on spines; 3rd dorsal fin with 2 brown-orange bands, continuous with 4th and 5th body bars; pelvic fins white; pectoral-fin membranes hyaline, rays yellowish; anal fin whitish with 4 broad dusky zones; caudal fin with white band at base, membranes hyaline, and rays pink, becoming whitish at tips. Attains 27 mm SL.

DISTRIBUTION Known only from three type specimens from Oman.

REMARKS Collected at ~ 3 m.

Enneapterygius obscurus Clark 1980

Crimson triplefin

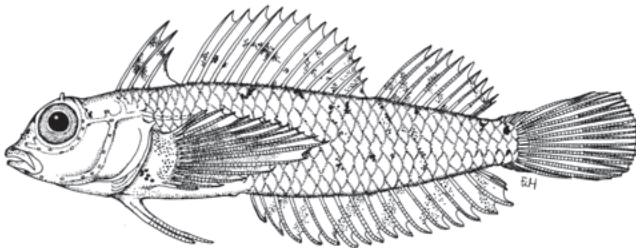
PLATE 155

Enneapterygius obscurus Clark 1980: 105, Figs. 4d, 15 (El Himeira, Sinai, Egypt, Gulf of Aqaba, Red Sea); Fricke & Randall 1992; Goren & Dor 1994; Holleman 2005*; Fricke 2009; Golani & Bogorodsky 2009; Holleman & Bogorodsky 2012*.

Body moderately slender; head profile rounded; mouth low on head, cleft nearly horizontal. Dorsal fins 3 spines + 12–14 spines + 9 or 10 rays; anal fin 1 spine, 16–18 rays; pectoral fins 14 or 15 rays (3 or 4 + 5 + 6). First dorsal fin equal to or slightly lower than 2nd; 2nd dorsal fin subequal to body depth; pelvic-fin rays united by membrane for $\sim\frac{1}{2}$ length of shorter ray; maxilla reaches vertical at front edge of pupil. Orbital cirrus bilobed, $\sim\frac{1}{2}$ pupil diameter. Prominent labial folds present.

Mandibular pores 2 + 2 + 2; supratemporal sensory canal crescent-shaped. Nape scaly; belly naked; LL scales 10–12 + 21 or 22, notched series beginning 2nd scale row below end of pored series (some Red Sea specimens with only 7 or 8 pored scales, followed by 2 notched scales); transverse scale rows 1/4.

Males: body translucent with irregular dark red markings, and scale margins dark red; large red blotch below pectoral fins, and 2 small red spots at top and bottom of peduncle; vertical line of scales above lateral line, between 2nd and 3rd dorsal fins, edged blackish; opercle dark red; upper portion of head dark red with some white marks; eyes dark red, with fine yellow line around black pupil; orbital cirri yellow; 1st dorsal fin dark red anteriorly with yellow markings, white posteriorly with tiny black spots; elements of 2nd and 3rd dorsal fins dark red with irregular bands of melanophores on membranes; anal-, caudal- and pectoral-fin rays pale red, membranes hyaline (preserved specimens show melanophores on membranes of anal fin, banded in females). Females paler, with pale red irregular bands on body, and without intense red on head or brightly coloured 1st dorsal fin. Attains 25 mm SL.



Enneapterygius obscurus, 19 mm SL, male (WIO).
Source: Holleman 2005, composite

DISTRIBUTION WIO: Red Sea and Maldives.

REMARKS Found on vertical walls of seaward coral and rocky reefs, in 2–22 m. Originally known only from Red Sea; one specimen collected at Maldives (Fricke & Randall 1992) suggests the species may be more widely distributed.

Enneapterygius pallidus Clark 1980

Pale triplefin

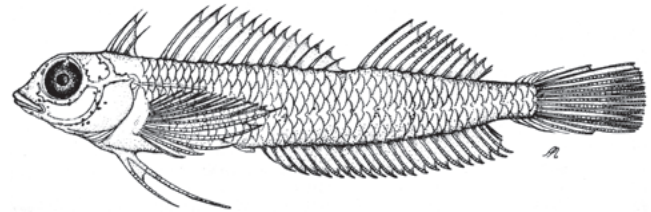
PLATE 155

Enneapterygius pallidus Clark 1980: 107, Figs. 4e, 16 (El Himeira, Sinai, Egypt, Gulf of Aqaba, Red Sea); Holleman 2005*; Golani & Bogorodsky 2009; Holleman & Bogorodsky 2012*.

Slender-bodied, depth ~6.3 in SL. Dorsal fins 3 spines + 13 or 14 spines + 10 or 11 rays; anal fin 1 spine, 21 or 22 rays; pectoral fins 13 or 14 rays (3 + 5 or 6 + 5); pelvic-fin rays united by membrane for ~½ length of shorter ray. First dorsal

fin equal in height or lower than 2nd dorsal fin; 2nd dorsal fin subequal to body depth. Orbital cirrus small and lobate. Prominent labial folds present. Mandibular pores 2 + 2 + 2; supratemporal sensory canal deeply U-shaped. Nape and belly naked; LL scales 10 or 11 + ~28, notched series beginning 2nd scale row below end of pored series.

[Based on photographs by R Field.] Body translucent, with faint red bars, most prominent across peduncle; top of head, opercles and anterior part of body bright green; iris green and brown; fins translucent, but a few tiny dark spots on first membrane of dorsal fin. Attains 30 mm SL.



Enneapterygius pallidus, 21 mm SL, male holotype (Red Sea).
Source: Clark 1980

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Usually seen on outer-reef flats; known to ~21 m.

Enneapterygius philippinus (Peters 1868)

Minute triplefin

PLATES 154 & 155

Tripterygium philippinum Peters 1868: 269 (coral reef at Camarines Norte Province, Luzon, Philippines).

Enneapterygius minutum Günther 1877: 211, Pl. 118d (Apia, Upolu I., Samoa).

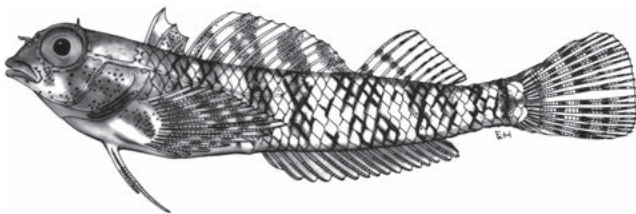
Enneapterygius tusitalae Jordan & Seale 1906: 416, Fig. 97 (Pago Pago, American Samoa).

Enneapterygius philippinus: Fricke 1997*, 1999, 2004; Heemstra *et al.* 2004; Holleman 2005*; Fricke *et al.* 2009; Fricke *et al.* 2013.

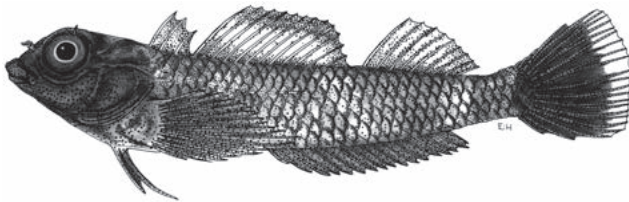
Slender-bodied, depth 5–5.6 in SL; mouth slightly oblique. Dorsal fins 3 spines + 10–13 spines + 8 or 9 rays; anal fin 1 spine, 15–17 rays; pectoral fins 15 rays (3 or 4 + 4 or 5 + 7); pelvic-fin rays slender, united by membrane for ~¾ length of shorter ray. First dorsal fin lower than 2nd dorsal fin; maxilla reaches vertical at front of orbit. Orbital cirrus small and lobate. Mandibular pores 2 or 3 + 1 + 2 or 3; supratemporal sensory canal crescent-shaped. Nape, belly and pectoral-fin bases naked; LL scales 10–15 + 20–22, notched series beginning 2nd scale row below end of pored series; LSS 29–31; transverse scale rows 2/5.

Fricke (1994: 245) citing Hutchins (1994): upper sides of body green-yellow, lower sides red-yellow; all scales on sides

profusely spotted in black, also red spots on dorsal surface; lower half of head with larger black spots extending onto pectoral-fin base; breast and throat pale with black spots; eyes red; median fins spotted with black. Jordan & Seale's (1906) description of *E. tusitalae* is in reasonable agreement with Hutchins. Underwater photographs in Masuda & Kobayashi (1994: 310) show males with head, body and fins with dense melanophores, plus white flecks on head, body, and 1st and 2nd dorsal fins; females with less black, showing clearer banding on body and fins. Photographs of fresh male and female specimens (by R Winterbottom) from Lizard I. (Great Barrier Reef) agree with Hutchins' description, and a photograph (by PC Heemstra) of a single male from Rodrigues (Mascarenes) shows the top of head and anterior dorsum as dark yellowish green. Attains 30 mm SL.



Enneapterygius philippinus, 21 mm SL, female (N Mozambique).
Source: Holleman 2005, composite



Enneapterygius philippinus, 19 mm SL, male (Mauritius).
Source: Holleman 2005, composite

DISTRIBUTION Tropical Indo-Pacific (widespread). WIO: Kenya to northern Mozambique, Mozambique Channel, Comoros, Seychelles, Mascarenes and St Brandon Shoals; elsewhere to Philippines, southern Japan, Marshall Is., Australia, New Caledonia and Samoa.

Enneapterygius pusillus Rüppell 1835

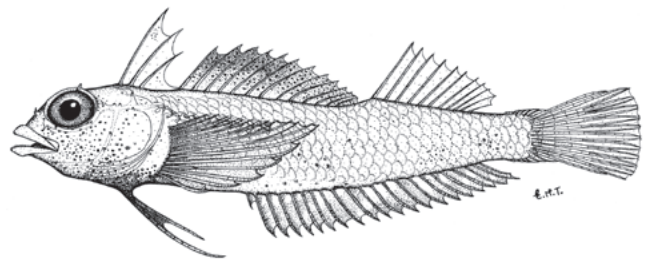
Pixie triplefin

PLATES 154 & 155

Enneapterygius pusillus Rüppell 1835: 2, Pl. 1, Fig. 2 (Massawa, Eritrea, Red Sea); Clark 1980*; Goren & Dor 1994; SSF No. 236.5* [not Pl. 116, which is *E. tutuilae*]; Randall 1995*; Manilo & Bogorodsky 2003; Holleman 2005*; Fricke 2009; Golani & Bogorodsky 2009; Holleman & Bogorodsky 2012*.

Slender-bodied, depth 5.3–6 in SL. Dorsal fins 3 spines + 12–14 spines + 10 or 11 rays; anal fin 1 spine, 20 or 21 rays; pectoral fins usually 13 or 14 rays (usually 4 + 3 + 6); pelvic-fin rays united by membrane for ~½ length of shorter ray. First dorsal fin of males distinctly higher than 2nd dorsal fin, fins of females subequal; 2nd dorsal fin 70% body depth; maxilla reaches vertical at front edge of eye. Orbital cirrus small and lobate. Mandibular pores 3 + 2 + 3; supratemporal sensory canal deeply U-shaped. Nape, belly and bases of dorsal and anal fins naked; LL scales 9–12 + 25–28, notched series beginning 2nd scale row below end of pored series; LSS 29 or 30; transverse scale rows 2/4.

Live fish multi-coloured. Males with pale cream body, with 4 irregular dark bars; scales on upper half of body with scattered orange and yellow-green spots, and edged with thin orange line; lower half of body with up to 10 orange blotches, interspersed with irregular dark silvery grey spots; abdomen with dark brown rosettes anteriorly and pale red blotches posteriorly; dark brown or black preanal spot (often V-shaped) usually present; top of head with red spots and subcutaneous green and cream markings; upper margin of eyes and orbital cirrus speckled with dark red; snout and lips pale yellow with orange spots; cheeks with yellow, red and black spots; pectoral fins yellow distally, orange proximally, and fin base with large circular orange-red mark with green centre; pelvic-fin bases and surrounding skin heavily mottled with dark red and black, proximal half of rays black, distally with red stipples, membranes black; 1st dorsal fin with pale red spots and some melanophores; 2nd dorsal fin heavily marked with dark brown to black melanophores, interspersed with red spots and with 3 silvery hyaline vertical bands; 3rd dorsal fin pale orange to hyaline; anal fin with red and black spots, the melanophores tending to form ≥6 indistinct bars; upper half of caudal fin pale orange, lower half pale yellowish green. Females less intensely pigmented than males. Attains 30 mm SL.



Enneapterygius pusillus, 22 mm SL, male (South Africa). Source: SSF

DISTRIBUTION WIO: Gulf of Oman to southern India, Red Sea, Mozambique and South Africa (Sodwana Bay).

REMARKS Found in bays and lagoons and near the base of reefs, often on stones and dead corals, usually in <10 m.

Enneapterygius qirmiz Holleman & Bogorodsky 2012

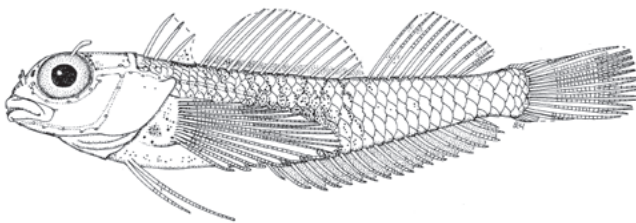
Scarlet triplefin

PLATES 154 & 156

Enneapterygius sp. 1: Clark 1980*.*Enneapterygius* sp.: Debelius 1998; Lieske & Meyers 2004.*Enneapterygius qirmiz* Holleman & Bogorodsky 2012: 509, Figs. 2h, 6–7 (Uqban, Kamaran I., Yemen, Red Sea).

Dorsal fins 3 spines + 12 or 13 spines + 9 rays; anal fin 1 spine, 17 or 18 rays; pectoral fins 14 or rays (2 + 6 + 6), fins long, longest ray reaching 1st ray of 3rd dorsal fin; pelvic-fin rays not united by membrane, longest ray reaching 1st anal-fin ray. First dorsal fin of males subequal to 2nd dorsal fin, slightly lower in females. Mouth small and pointed, maxilla reaching vertical at anterior margin of pupil. Eyes relatively large. Orbital cirrus a rounded flap, its length equal to orbit diameter. Mandibular pores 2 + 2 + 2; supratemporal canal a broad, flat U-shape (not a shallow crescent). Nape scaly; belly naked; LL scales 8–10 + 22, notched series beginning 2nd scale row below pored series; LSS ~33, plus 1 scale row on caudal-fin base; transverse scale rows 2/5.

Males: body translucent, scale margins with double lines of dark red, except scale margins black immediately below end of 2nd dorsal fin, forming indistinct narrow oblique bar, and large rectangular patch of melanophores from below 2nd dorsal fin almost to anal-fin base; dark red blotches along vertebral column and anal-fin base; preanal triangular cluster of melanophores present in large specimens; head (including nape and opercles) red, underside pale; iris dark red with whitish ring; white patches behind and between eyes; orbital cirri yellow, nasal cirri red; red on lips; 1st dorsal fin with broad inverted dark red triangle (apex at base of 1st spine) with golden yellow marks, remainder of fin white, with narrow white saddle from base of first 4 spines extending onto dorsum; membranes of 2nd dorsal fin hyaline, with red on spines, and black and white spots along fin margin and base; 3rd dorsal fin similar; anal-fin rays dark red, membranes with patches of black and red spots; dark red spots in front of pectoral-fin bases, and white spots below, pectoral-fin rays red with white spots; caudal fin with dark red lines on edges of rays. Female live colour unknown, but probably also dark red, but without blotch of melanophores on sides or conspicuously coloured 1st dorsal fin. Longest specimen examined 19 mm SL.

*Enneapterygius qirmiz*, 17 mm SL, holotype (Red Sea).

Source: Holleman & Bogorodsky 2012

DISTRIBUTION WIO: endemic to Red Sea.**REMARKS** Found on vertical walls of seaward coral and rocky reefs, to ~14 m deep, and also occurs on isolated reefs far from coast.*Enneapterygius ventermaculus* Holleman 1982

Spotbelly triplefin

PLATE 156

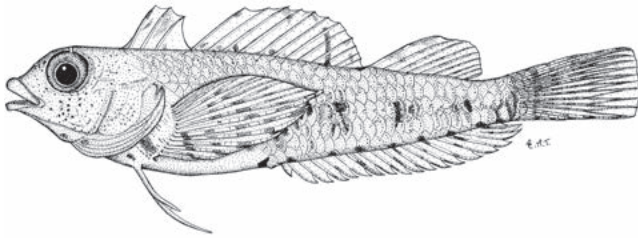
Enneapterygius ventermaculus Holleman 1982: 123, Fig. 7 (rock pool south of Sodwana Bay, KwaZulu-Natal, South Africa); SSF No. 236.6*; Randall 1995*; Manilo & Bogorodsky 2003; Holleman 2005*; Fricke 2009; Golani & Bogorodsky 2009; Holleman & Bogorodsky 2012*; Fricke *et al.* 2013.

Enneapterygius nasimae Hoda 1983: 116, Figs. 1a–d, 2a–d, 3a–c (Buleji, Karachi coast, Pakistan).

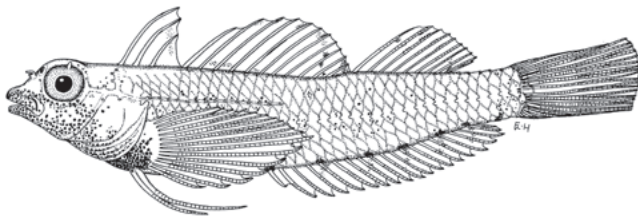
Dorsal fins 3 spines + 11–13 spines + 8–10 rays; anal fin 1 spine, 17–20 rays; pectoral fins 14 rays (usually 2 + 5 + 7). Body moderately robust, depth 4.8–5.2 in SL; mouth small and nearly horizontal, maxilla reaches vertical at front edge of orbit; 1st dorsal fin slightly higher than 2nd dorsal fin in males, slightly lower in females; 2nd dorsal fin ~70% body depth; pelvic-fin rays united by membrane for ~½ length of shorter ray, longer ray reaches preanal mark. Orbital cirrus moderate and lobate. Mandibular pores 3 + 1 + 3; supratemporal sensory canal U-shaped, embracing 1st dorsal-fin spine. Nape, 1st dorsal-fin base and belly naked; LL scales 13–16 + 21–25, notched series beginning 2nd scale row below end of pored series; LSS 31–36 (usually 32–33, but 35–36 for Oman specimens); transverse scale rows 2/6.

Males: head and body greenish, with orange-brown markings below eyes, on abdomen, and to pelvic- and pectoral-fin bases; scales with brown stipples and orange margin, except ventrally; black preanal mark (either a small spot or boomerang shape in front of vent); 3 white blotches along midsides (under tip of pectoral fins, below junction of 2nd and 3rd dorsal fins, and below end of 3rd dorsal fin); caudal-fin base with dark triangular area (apex anterior, base darkest), followed by narrow white band at caudal-fin base; 1st dorsal fin with brown and orange speckles, but no pigment on last membrane; 2nd dorsal fin with orange spines, alternating areas of orange and dense dark brown stipples along fin margin and band of stipples along base; 3rd dorsal fin banded dark brown on rays and orange stipples on anterior membranes; pelvic fins yellow; pectoral fins with white and dark brown marks, lower rays yellow; 2 white spots between pectoral- and pelvic-fin bases, sometimes obscured in darkly marked specimens; anal fin with 5–7 black broken bars and white and hyaline areas in between, and 5–7 black basal spots which continue subcutaneously; caudal-fin rays greenish, upper rays with

brownish semi-bands, lower rays with black marks. Females: body translucent pale green dorsally, scale margins orange; no black or brown on underside of head and abdomen, but small clusters of melanophores below midline (more prominent than in males); dark streak in front of pelvic fins, another on sides of abdomen, and a third from lower part of pectoral-fin bases, and the latter 2 streaks continuing slightly below branchiostegal membranes. Attains 32 mm SL.



Enneapterygius ventermaculus, 25 mm SL, female type (South Africa).
Source: SSF



Enneapterygius ventermaculus, 27 mm SL, male (South Africa).
Source: Holleman 2005

DISTRIBUTION WIO: Pakistan, Oman, southern Red Sea and Gulf of Aden to South Africa (Transkei region) and Mozambique Channel (Europa I.).

Enneapterygius cf. *tutuila*

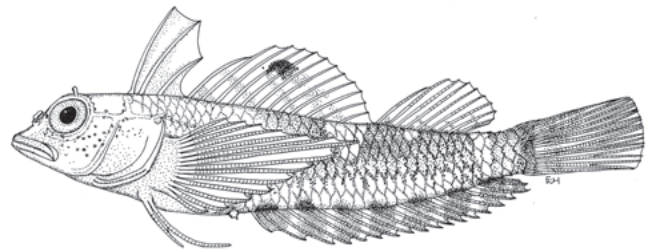
Enneapterygius tutuila (non Jordan & Seale 1906): Fricke 1994; Randall *et al.* 1997.

Enneapterygius altipinnis (non Clark 1980): Goren & Dor 1994; Fricke 2009; Fricke *et al.* 2009; Golani & Bogorodsky 2009; Holleman & Bogorodsky 2012*.

Dorsal fins 3 spines + 11 or 12 spines + 9 or 10 rays; anal fin 1 spine, 16–18 rays; pectoral fins 14 rays (some divided), longest ray reaching to end of 2nd dorsal fin. First dorsal fin higher than 2nd in males, fin heights subequal in females; 2nd dorsal fin ~70% body depth; pelvic-fin rays united by membrane for ~½ length of shorter ray, longer ray reaches vent; maxilla reaches vertical at front edge of pupil. Orbital

cirrus moderate and lobate. Mandibular pores 2 + 1 or 2 + 2; supratemporal sensory canal crescent-shaped. Nape scaly; belly naked; LL scales 11 or 12 + 20–23, notched series beginning 2nd scale row below end of pored series; LSS 29; transverse scale rows 2/4.

Two colour forms, with females of both forms less brightly coloured than males. Green form (more common): top of head and body green, with white blotches on midsides, a white saddle below rear half of 2nd dorsal fin, and a white bar across body at end of 3rd dorsal fin; anal-fin base with 6–8 black spots, and black preanal spot present (except anal-fin spots and preanal mark absent in most specimens from St Brandon Shoals); scale-pocket margins on upper half of body with red dots; snout, lower half of head, chest and pectoral-fin bases with many red spots; 1st dorsal fin whitish green; 2nd dorsal fin with many red spots anteriorly, black spots on membranes from 4th–9th spines, and white band posteriorly continuing onto body; 3rd dorsal fin hyaline, with some red basally and white band on margin posteriorly; pelvic fins spotted with red; pectoral-fin rays lined in red but with 3 white bands, membranes hyaline; anal fin with alternating dark red and white bars; caudal-fin rays red, membranes hyaline. Brown form (less common): head and body with brown and orange spots; narrow dark bar across peduncle; 1st dorsal fin orange and cream; 2nd dorsal fin as in green form, but with orange and brown replacing red; cream-coloured bands replacing white bands of the green form; lower half of pectoral fins red. Attains 22 mm SL.



Enneapterygius cf. *tutuila*, 14 mm SL, male (WIO).
Source: Holleman 2005, composite

DISTRIBUTION WIO: East Africa, Madagascar, Comoros, Seychelles, Réunion, Mauritius and St Brandon Shoals.

REMARKS A member of the *Enneapterygius tutuila* species-complex, which has 3 species in the Indian Ocean and an unknown number of species in the western Pacific; the group needs much work, and the collection of additional fresh specimens for tissue samples is crucial.

GENUS *Helcogramma* McCulloch & Waite 1918

Dorsal fins 3 spines + 11–14 spines + 8–12 rays; anal fin 1 short spine, 16–21 rays; head, pectoral-fin bases and belly naked; LL pored scales 10–37, ending from below 1st dorsal fin to caudal-fin base; orbital cirrus minute or absent. Most species >4 cm SL. Cryptic and inhabit tidepools and coral reefs in tropical and subtropical Indo-Pacific. About 37 species, 15 in WIO.

KEY TO SPECIES

[Where possible, characters are applicable to both males and females. However, colour characters are those of mature males. The live colour of 4 of 14 species is unknown; colour pattern in preservative is noted here before live colour.]

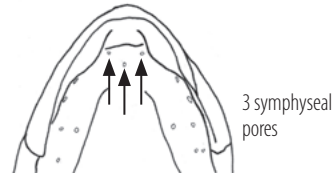
- 1a Body with longitudinal lines or rows of dots and dashes 2
 1b Body without lines or rows of dots or dashes 3
- 2a Pectoral fins 15 rays; nape naked; body with 3 pale, broken, longitudinal stripes (from top of head to below 2nd dorsal fin; from rear margin of eye to upper part of caudal-fin base; and just below lateral midline); in life, both sexes reddish with white stripes and spots *H. maldivensis*
 2b Pectoral fins 16 rays; nape scaly; body with 3 longitudinal stripes (from top of head to upper part of caudal-fin base; from rear margin of eye to middle of caudal-fin base; and broad stripe below lateral line), with 6 or 7 spots between lowermost 2 stripes; in life, both sexes reddish with bluish stripes and spots *H. striata*
- 3a First dorsal-fin spines 1 and 2 closely spaced, fin triangular, its height subequal to or taller than 2nd dorsal fin; 1st interspinous membrane with numerous melanophores; males red in life 4
 3b First dorsal fin not as above: height usually lower than 2nd dorsal fin, and all spines evenly spaced 6
- 4a Anal fin with micromelanophores on entire fin; HL >3.2 in SL; angle of head profile >59°; maxilla ~2.2 in HL 5
 4b Anal fin with micromelanophores along margin only; HL ~3.2 in SL; angle of head profile 56–59°; maxilla ~2 in HL *H. steinitzi*
- 5a Orbital cirrus pointed, ~½ pupil diameter; head profile ~70°; 1st dorsal-fin spine of males longer than 2nd dorsal-fin spines; pale (yellow in life) saddles without micromelanophores at ends of 2nd and 3rd dorsal fins *H. microstigma*
 5b Orbital cirrus short and triangular; head profile ~60°; 1st dorsal-fin spine of males shorter than 2nd dorsal-fin spines; pale (red in life) saddles with micromelanophores at end of 2nd and 3rd dorsal fins *H. rosea*
- 6a Pectoral fins 15 or 16 rays; 2nd dorsal fin usually <14 spines, 3rd dorsal fin usually <11 rays; no micromelanophores below eyes in males 7

Continued ...

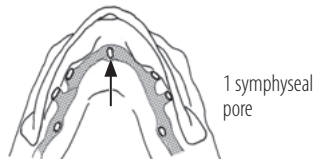
KEY TO SPECIES

- 6b Pectoral fins 17 rays; 2nd dorsal fin usually 14 spines, 3rd dorsal fin 11 rays; large males with line of micromelanophores from upper lip, below eye to opercle; in life, males orange-pink with dark to black median fins, and blue-white line below eyes *H. fuscopinna*

- 7a Mandibular symphyseal pores 3 or more 8

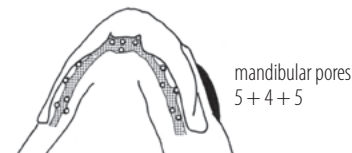


- 7b Mandibular symphyseal pores 1 or 2 10



- 8a LL scales <25, ending below 2nd dorsal fin 9

- 8b LL scales 33–37, running to caudal-fin base; mandibular pores 5–7 + 3–5 + 5–7; nape naked; in life, males with red and blue-black head, body reddish to orange, dark blue ocellus on pectoral-fin bases, dorsal fin reddish, and anal fin blue or dark *H. ellioti*



- 9a Body of males dark to black, with 4 pale narrow streaks from dorsum to midlaterally below 2nd and 3rd dorsal fins; dorsal and anal fins evenly and densely covered with melanophores; in life, body dark greenish to black, interorbital region and eyes bright red, and blue line from upper lip to below eye and onto opercle *H. shinglensis*

- 9b Body without dark pigment, only scattered melanophores; many melanophores below eyes and on pelvic fins and pectoral-fin bases; dorsal and anal fins without pigment, except black spots on membrane between 1st and 2nd dorsal-fin spines; in life, body brown with 3 narrow white slanted bands from dorsum to midsides *H. ememes*

- 10a Mandibular pores 2 or 3 + 1 or 2 + 2 or 3 11

- 10b Mandibular pores 4–6 + 1 + 4–6 12

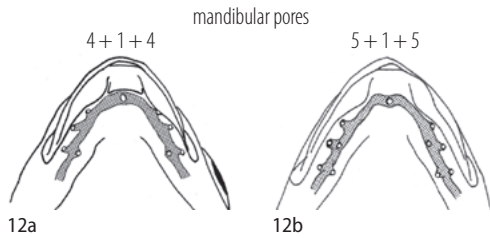
- 11a Nape naked; LL scales 21 or 22; 2nd dorsal fin 11 or (usually) 12 spines; anal fin 16–18 rays *H. larvata*

- 11b Nape scaly; LL scales 27–33; 2nd dorsal fin 13 or 14 spines; anal fin 17–20 rays *H. billi*

Continued ...

KEY TO SPECIES

- 12a Mandibular pores 4 + 1 + 4 13
- 12b Mandibular pores 5 or 6 + 1 + 5 or 6 14



- 13a Body of males nearly all black, with 2 or 3 narrow pale streaks from dorsum to lateral midline; dorsal and anal fins dark to black; in life, bases of 1st and 2nd dorsal fins yellowish green, eyes red, snout green, dorsum reddish anteriorly, and blue line from corner of mouth to preopercle margin *H. obtusirostris*
- 13b Body of males pale, with 7 or 8 clusters of melanophores along lateral midline, head below eyes black, colour stopping abruptly between isthmus and pelvic-fin bases; fine cirri behind eyes *H. serendip*
- 14a Body of males nearly black, with 3 or 4 narrow pale streaks from dorsum to lateral midline, dorsal-fin margins dark, anal fin densely covered with melanophores, and upper lip dark in centre and with clear half-moon patches on either side; in life, with 6 or 7 silvery white spots along midsides, blue line from corner of mouth to opercle margin, and bright red on sides of upper lip *H. rharhabe*
- 14b Body of males pale, with scattered melanophores and 7 or 8 clusters of melanophores along midsides, head below eyes black, the colour continuing onto pectoral- and pelvic-fin bases *H. alkamr*

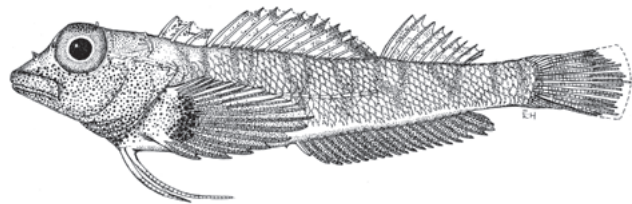
Helcogramma alkamr Holleman 2007

Comoros triplefin PLATE 156
Helcogramma alkamr Holleman 2007: 56, Fig. 2, Pl. 1 (Mayotte, Comoros).

Dorsal fins 3 spines + 13 or 14 spines + 10 or 11 rays; anal fin 1 spine, 19 or 20 rays; pectoral fins 16 rays (1 + 8 + 7). First dorsal fin < ½ height of 2nd dorsal fin; pelvic-fin rays united by membrane for entire length of shorter ray, longest ray reaches ~80% distance to vent; maxilla reaches vertical at front of orbit. Labial folds moderate. Teeth in broad patch at front of both jaws, in single row at sides, and with row of enlarged teeth inside of tooth patch of upper jaw, and both outside and inside of tooth patch of lower jaw. Orbital cirrus small and pointed; edge of frontal bones at rear margin of eyes with small cirri. Mandibular pores 5 or 6 + 1 + 5 or 6. Nape mostly naked, but with patches of scales above first few LL scales; scales not extending to anal-fin base, and no scales on underside of

peduncle; LL scales 20–23, ending below junction of 2nd and 3rd dorsal fins; LSS 36–39, plus 2 rows of scales on caudal-fin base; transverse scale rows 6/4.

Males pale brown, with pairs of reddish brown semi-bars from dorsum to midline, interspersed with many small white spots, and dark brown band at peduncle; series of dark brown blotches along midsides interspersed with small bluish white spots; body below midline pinkish; head spotted with red-brown and black, darker below eyes; eyes red and gold; pale bluish line from corner of mouth onto preopercle; pectoral-fin bases and base of lower rays darkly spotted with black, interspersed with pale blue and brown; pelvic fins pinkish; 1st dorsal fin with pink and black spots; 2nd dorsal fin with 4 narrow bands of pink and black spots; 3rd dorsal fin similar but paler; anal fin grey; caudal fin without colour. Females similar body barring, but with reddish spots on head to pectoral-fin bases. Attains 32 mm SL.



Helcogramma alkamr, 28 mm SL, male holotype (Comoros).
 Source: Holleman 2007

DISTRIBUTION WIO: Tanzania, Madagascar, Comoros, Seychelles, Mauritius, Rodrigues and St Brandon Shoals.

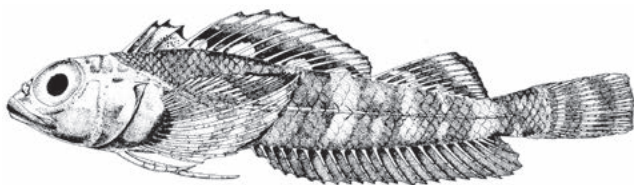
Helcogramma billi Hansen 1986

Helcogramma billi Hansen 1986: 329, Fig. 10 (rocky area outside harbour, Trincomalee, Sri Lanka); Manilo & Bogorodsky 2003; Holleman 2007*.

Dorsal fins 3 spines + 13 or 14 spines + 9–11 rays; anal fin 1 spine, 17–20 rays; pectoral fins 16 rays (2 + 7 + 7). First dorsal fin ~½ height of 2nd dorsal fin (except males from Comoros with 1st dorsal fin higher); pelvic fins united by membrane for ~¾ length of shorter ray, longest ray reaches vent; maxilla reaches vertical at middle of pupil. Orbital cirrus a small rounded flap. Mandibular pores 3 + 1 + 3. Nape scaly; scales not reaching anal-fin base; LL scales 27–33, ending below middle of 3rd dorsal fin; LSS 38–39, no scales at caudal-fin base; transverse scale rows 11/7.

Preserved specimens: males with 5 darkish H-shaped bars forming series of darker spots along midline; occiput, head below eyes, and body to pectoral and pelvic fins evenly covered with small melanophores; 1st membrane of dorsal fin dark; 2nd dorsal fin with thin black margin, clear stripe beneath, and irregular black markings along middle, forming 4 distinct clear areas basally on the corresponding fin elements;

3rd dorsal fin irregularly banded; pelvic-fin rays dark; pectoral fins darker posteriorly; anal-fin membranes dark and uniformly spotted; caudal fin with 2 or 3 dark vertical bands. Females and juveniles less heavily pigmented, and with little or no pigment on head below eyes. Attains 32 mm SL.



Helcogramma billi, 31 mm SL, male paratype (Sri Lanka). Source: Hansen 1986

DISTRIBUTION Indian Ocean: southern India and Sri Lanka.

Helcogramma ellioti (Herre 1944)

PLATE 156

Tripterygion ellioti Herre 1944: 49 (Maharanepeta Beach, Visakhapatnam, India).

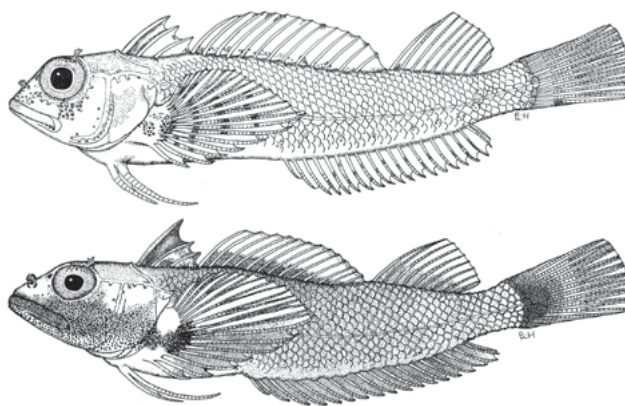
Helcogramma ellioti: Lal Mohan 1968; Hoda 1983; Hansen 1986 [in part]; Fricke 1997, 2009; Manilo & Bogorodsky 2003; Holleman 2007*.

Helcogramma indicus Talwar & Sen 1971: 248, Fig. 1 (Cape Comorin [Kanyakumari], India).

Dorsal fins 3 spines + 13 spines + 9 or 10 rays; anal fin 1 spine, 18 or 19 rays; pectoral fins 16 rays (1 + 8 + 7). First dorsal fin lower than 2nd dorsal fin; pelvic-fin rays united by membrane for $\sim\frac{1}{2}$ length of shorter ray, longest ray reaches $\sim\frac{2}{3}$ distance to vent; maxilla reaches vertical at middle of pupil. Orbital cirrus flat and palmate. Mandibular pores 5–7 + 3–5 + 5–7. Nape, belly and anal-fin base naked; LL scales 33–37, ending near caudal-fin base; LSS 36–38, plus 1 scale row on caudal-fin base; transverse scale rows 8/6.

[Based on colour slide of JE Randall, of male and female specimen from Sri Lanka.] Males grey-brown, with 3 pale saddle-like areas (1st below middle of and 2nd below end of 2nd dorsal fin, 3rd below end of 3rd dorsal fin); belly pinkish; head below level of eyes black and blue, colour not extending to pelvic-fin bases; nape with dark red and white area above pectoral-fin bases; branchiostegal membranes blue and black; narrow blue line from rear end of maxilla onto preopercle; snout, eyes, interorbital region and area behind eyes dark red; 1st dorsal fin pale yellow, with red spots on membrane behind 3rd spine; 2nd dorsal fin mostly hyaline, pale blue basally; 3rd dorsal fin mostly pale blue, with white distally on anterior rays; anal fin pale blue-grey; pectoral fins with deep blue ocellus surrounded by black at base of middle rays, with dark red above and below, and blue and black on fin base, rays with

irregular darker and paler bars; pelvic-fin bases and rays dark red; caudal fin pale blue-grey. Females whitish, with brown marks forming oblique semi-bars and blotches from dorsum to below lateral midline; head below eyes white with brown and red spots, darker dorsally, with brown blotches and brown line from corner of eye onto upper lip; eyes pale golden; 1st dorsal fin pale with brown marks anteriorly, translucent posteriorly; 2nd and 3rd dorsal fins translucent with pale golden and white marks; pelvic fins white; upper pectoral-fin rays banded pale brown and golden, lower rays golden with dark brown marks; anal fin white, with narrow brown marks on rays forming oblique bars; caudal fin translucent, with white at base of rays, and white line at margins of hypural plates. Attains 54 mm SL.



Helcogramma ellioti, 28 mm SL, female (top); 29 mm SL, male (bottom) (both Sri Lanka). Source: Holleman 2007

DISTRIBUTION Indian Ocean. WIO: Pakistan and west coast of India (Karachi and Gujarat coasts either side of Indus delta, and Kerala), Sri Lanka; elsewhere to east coast of India.

REMARKS Found in tidepools.

Helcogramma ememes Holleman 2007

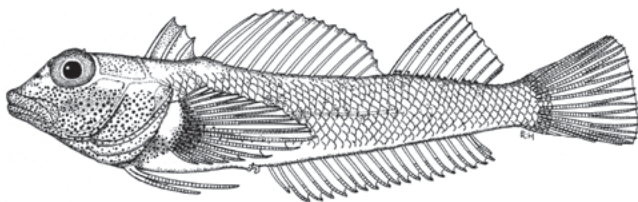
PLATE 156

Helcogramma ememes Holleman 2007: 61, Fig. 5, Pl. 1 (Ibo I., Mozambique); Fricke 2009.

Dorsal fins 3 spines + 13 or 14 spines + 10 or 11 rays; anal fin 1 spine, 18 or 19 rays; pectoral fins usually 15 rays (1 + 7 + 7 in East African specimens, or 1 + 8 + 6 or 2 + 7 + 6 in Seychelles specimens). First dorsal fin $<\frac{1}{2}$ height of 2nd dorsal fin; pelvic-fin rays united by membrane for $\sim\frac{1}{2}$ length of shorter ray, longest ray reaches vent in males, $\sim 20\%$ shorter in females; maxilla reaches vertical at front edge of pupil. Orbital cirrus small and pointed, often with micromelanophores. Mandibular pores 4–6 + 3 + 4–6. Nape and bases of 2nd dorsal

fin and anal fin naked; ventral surface of peduncle with thin scales; LL scales 10–23; LSS 36–38, plus 2 scale rows on caudal-fin base; transverse scale rows 9/7.

[Based on colour slide of JE Randall, of male and female specimen from Seychelles.] Males: head below eyes with densely packed melanophores, extending to opercle margin and pelvic-fin base, and reddish dorsally with scattered melanophores; eyes orange-red; lower lip partially white; body brown, with 3 narrow white and pink saddle marks extending to midline (below middle of 2nd dorsal fin, below end of 2nd dorsal fin, and below end of 3rd dorsal fin); ≥ 6 variously sized round white blotches below midline, interspersed with diffuse dark brown areas with melanophores; belly white; 1st dorsal fin hyaline, with white mark on 1st membrane, and some brown on spines; 2nd and 3rd dorsal fins hyaline, with brown and white marks on spines; pelvic fins pink; pectoral-fin bases with yellow blotch, and with white pigment above and black and blue pigments below, large oval area of dense melanophores at base of middle rays; pectoral-fin rays pink above and with red spots below the black oval area, fin hyaline distally; anal-fin membranes hyaline, rays pink with fine melanophores; caudal fin white at base, with 3 tiny red-brown marks. Females: body dull olive-green, with brown and white marks dorsally, and ≥ 6 variously sized round white blotches below midline, interspersed with brown blotches; head below eyes white with brown marks, and dark olive-green with brown marks dorsally; eyes yellowish; all fins hyaline with white marks, except pelvic fins proximally with both brown and white marks. Attains 39 mm SL.



Helcogramma ememes, 29 mm SL, male holotype (N Mozambique).
Source: Holleman 2007

DISTRIBUTION WIO: Kenya (Malindi) to Mozambique (Bazaruto I.) and Seychelles.

Helcogramma fuscopinna Holleman 1982

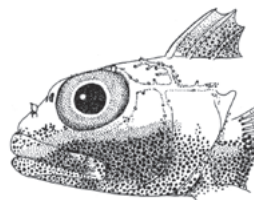
Dusky-finned triplefin

PLATES 156 & 157

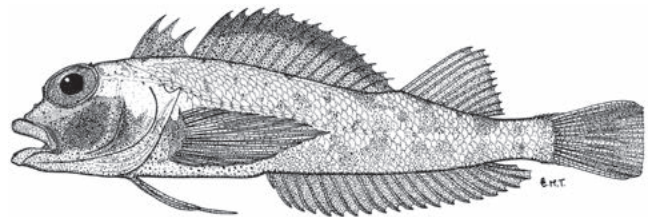
Helcogramma fuscopinna Holleman 1982: 115, Fig. 4 (offshore reef, Sodwana Bay, KwaZulu-Natal, South Africa); Hansen 1986; SSF No. 236.7*; Winterbottom *et al.* 1989*; Williams & McCormick 1990*; Manilo & Bogorodsky 2003; Williams & Howe 2003*; Heemstra *et al.* 2004; Heemstra & Heemstra 2004*; Holleman 2007*; Fricke *et al.* 2009.

Dorsal fins 3 spines + 14 spines + 10 or 11 rays; anal fin 1 spine, 20 or 21 rays; pectoral fins 17 rays (usually 1 + 9 + 7). First dorsal fin $\sim 80\%$ height of 2nd dorsal fin, the latter slightly higher in males than in females; pelvic-fin rays united by membrane for $\sim \frac{1}{2}$ length of shorter ray, longest ray reaches $\sim 85\%$ distance to vent; maxilla reaches vertical at middle of pupil. Orbital cirrus simple. Mandibular pores 4–6 + 1 or 2 + 4–6. Nape and bases of 1st and 2nd dorsal fins and anal fin scaly; LL scales 23–27, ending below front half of 3rd dorsal fin; LSS 38–40, plus 1 row of scales on caudal-fin base; transverse scale rows 6/11.

Males orange-pink, scale margins with row of melanophores, and small dusky rosettes scattered over body, generally more dense below midline; darkly pigmented specimens (mature males) with 5 or 6 grey-white blotches stippled with melanophores above and below midline, which may produce faint vertical banding or narrow dusky triangular marks (apex pointing up) along lower half of body; head with broad black band from upper lip, below eye, onto opercle and pectoral-fin base, bordered above by distinct blue-white line; throat with densely packed melanophores extending to belly; 1st and 2nd dorsal fins and anal fin darkly speckled to nearly black; 3rd dorsal fin with dark margin; upper pectoral-fin rays dark; caudal fin with uneven dark markings, mostly on membranes. Females and immature specimens: body varying from pale pink-orange with few melanophores to paler versions of large males, but without black on lower half of head or blue-white stripe below eyes; large females may have patch of micromelanophores on upper lip. Attains 43 mm SL.



Helcogramma fuscopinna, 35 mm SL, male head (S Mozambique).



Helcogramma fuscopinna, 50 mm TL, male holotype (South Africa).
Source: SSF

DISTRIBUTION WIO: Kenya to South Africa (KwaZulu-Natal), Comoros, Seychelles, Mauritius, Rodrigues, Chagos and Maldives.

REMARKS Member of a species-complex of nine species that extend into the western Pacific. Found in association with coral reefs, often on coral grit and sand, in subtidal zone, to ~22 m deep.

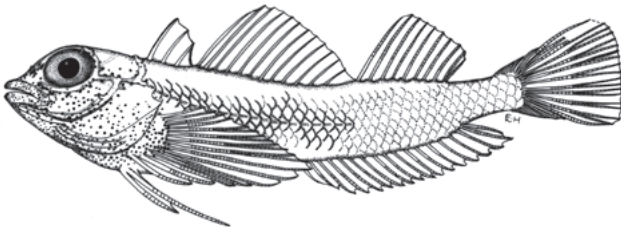
Helcogramma larvata Fricke & Randall 1992

Masked triplefin

Helcogramma larvata Fricke & Randall 1992: 6, Figs. 5–6 (Malé Atoll, Maldives); Holleman 2007*; Fricke 2009.

Dorsal fins 3 spines + 11 or 12 spines + 8 or 9 rays; anal fin 1 spine, 16–18 rays; pectoral fins 15 rays (1 + 7 + 7). First dorsal fin 50–60% height of 2nd dorsal fin; pelvic-fin rays united by membrane for ~½ length of shorter ray, longest ray nearly reaches end of 1st dorsal fin; maxilla reaches vertical at front margin of pupil. No orbital cirrus. Mandibular pores 2 or 3 + 1 + 2 or 3. Nape and belly naked; scales not reaching bases of 1st and 2nd dorsal fins and anal fin; LL scales 20–22, ending below first rays of 3rd dorsal fin; LSS 33–34.

[Based on original description.] Preserved specimens: head, body and fins pale; males with lower sides of head dark, with pale blotch below eyes, 3rd interspinous membrane of dorsal fin dusky distally, and 2 pale blotches on pectoral-fin bases; females with a few dark spots on sides of head. Attains 22 mm SL.



Helcogramma larvata, 19 mm SL, paratype (Maldives).
Source: Holleman 2007

DISTRIBUTION Known only from four type specimens from Maldives.

REMARKS Collected in 1–1.5 m.

Helcogramma maldivensis Fricke & Randall 1992

Maldives triplefin

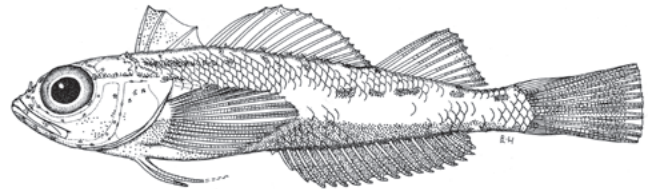
PLATE 157

Helcogramma maldivensis Fricke & Randall 1992: 9, Pl. 1, Figs. 7–8 (Kandooma Is., South Malé Atoll, Maldives); Holleman 2007*.

Helcogramma striata Hansen 1986 [in part]: Holleman 2007; Fricke 2009.

Dorsal fins 3 spines + 12–14 spines + 9–11 rays; anal fin 1 spine, 17–21 rays; pectoral fins 15 rays (usually 3 + 6 + 6). First dorsal fin ~½ height of 2nd dorsal fin; pelvic-fin rays united by membrane for ~½ length of shorter ray; maxilla reaches vertical at front margin of pupil. No labial folds. No orbital cirrus. Mandibular pores 3 + 1 + 3. Nape scaly; belly naked; scales not reaching bases of 1st and 2nd dorsal fins and anal fin; LL scales 13–21, ending below first rays of 3rd dorsal fin; LSS 36 or 37, plus 2 scale rows on caudal-fin base; transverse scale rows 5/6.

[Based on photograph by JE Randall and original description.] Males with reddish brown body, lower third pale grey; sides with 3 lines of bluish white dots or streaks, forming stripes anteriorly (1st stripe from 1st dorsal-fin spine to below centre of 3rd dorsal fin, 2nd from rear margin of eye to upper part of caudal-fin base, and 3rd from top of pectoral-fin base to underside of peduncle), dividing red upper body from grey lower body; head reddish, with small blue-white spots on snout and cheeks, lips orange-red, throat and isthmus white; median-fin elements dark red, and 1st dorsal fin with white on 1st membrane; pectoral and pelvic fins white. Females paler than males, white ventrally, without spots and stripes, and fins entirely translucent. Attains 26 mm SL.



Helcogramma maldivensis, 20 mm SL, male paratype (Maldives).
Source: Holleman 2007

DISTRIBUTION WIO: Maldives.

REMARKS Found in small groups, on sponges or smooth corals along steep slopes and on drop-offs, in 0.5–35 m. Closely related to *Helcogramma striata* from Sri Lanka and eastwards.

Helcogramma microstigma Holleman 2006

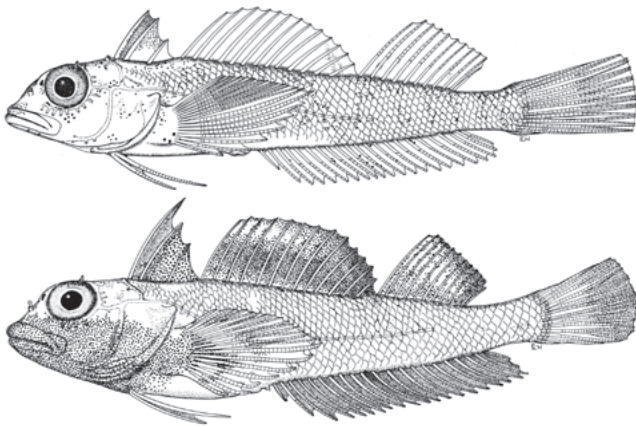
PLATE 157

Helcogramma microstigma Holleman 2006: 92, Figs. 1–2 (off lighthouse at Bazaruto I., Mozambique); Holleman 2007*; Fricke 2009.

Dorsal fins 3 spines + 18–20 spines + 10 or 11 rays; anal fin 1 spine, 18–20 rays; pectoral fins 15 or 16 rays (2 + 6 or 7 + 7). First dorsal fin of males triangular, with 1st spine slightly taller than 2nd dorsal fin, fin heights subequal in females; pelvic-fin rays united by membrane for ~¾ length of shorter ray, longer ray reaches ~90% distance to vent in males, ~80% in females;

maxilla reaches vertical at front edge of pupil. Inner margin of upper lip crenulate; labial folds narrow. Teeth in broad patch at front of jaws, outer margin with single row of enlarged teeth. Orbital cirrus simple and pointed, its length $\sim\frac{1}{2}$ pupil diameter. Mandibular pores 4 + 1 + 4. Nape partially scaly; scales not reaching bases of 1st dorsal fin and anal fin; scales on underside of peduncle; LL scales 24–30, ending below middle of 3rd dorsal fin; LSS 37 or 38, plus 2 or 3 scale rows on caudal-fin base; transverse scale rows 9/7.

Males: body of freshly preserved specimens dark pink, with 3 orange blotches along 2nd dorsal-fin base and 3 blotches along 3rd dorsal-fin base; dark pink blotches along midsides, and \sim 8 dark pink spots along anal-fin base; belly white; head black below eyes, with orange spots above; 1st dorsal fin with dense melanophores, especially on 1st membrane; 2nd dorsal fin black and orange basally; 3rd dorsal fin similar but paler; pelvic fins without colour; pectoral fins with orange on middle and upper rays; anal fin black, with orange along rays corresponding to colour on body; caudal fin pinkish with orange at base of rays. Females similar to males but without black on head and median fins, except for micromelanophores on 1st membrane of dorsal fin, and narrow dark bar at caudal-fin base. Attains 29 mm SL.



Helcogramma microstigma, 28 mm SL, female paratype (top); 29 mm SL, male holotype (bottom) (both central Mozambique). Source: Holleman 2007

DISTRIBUTION WIO: Mozambique, northern Madagascar and Comoros.

Helcogramma obtusirostris (Klunzinger 1871)

Klunzinger's triplefin

PLATE 157

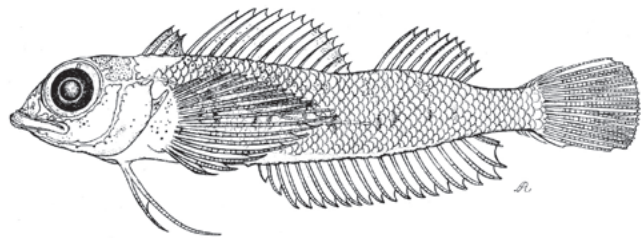
Tripterygium obtusirostre Klunzinger 1871: 498 (Al-Qusayr, Egypt, Red Sea).

Helcogramma obtusirostre: Clark 1980; Goren & Dor 1994; Holleman 2007*; Fricke 2009; Fricke *et al.* 2009; Golani & Bogorodsky 2010; Holleman & Bogorodsky 2012*.

Helcogramma obtusirostris: Hansen 1986 [in part]; Randall 1995*.

Dorsal fin 3 spines + 13 spines + 10 rays; anal fin 1 spine, 18 or 19 rays; pectoral fins 16 rays (usually 2 + 7 + 7). First dorsal fin $\sim\frac{1}{2}$ height of 2nd dorsal fin; pelvic-fin rays united by membrane for $\sim\frac{1}{2}$ length of shorter ray, longer ray reaches vent; maxilla reaches vertical at centre of pupil. Orbital cirrus small and simple. Mandibular pores 4 + 1 + 4. Nape and belly naked; scales not reaching to bases of 1st dorsal fin and anal fin; LL scales 20–23, ending below junction of 2nd and 3rd dorsal fins; LSS 36–38, plus 2 scales rows on caudal-fin base; transverse scale rows 7/5.

Males mottled greenish with darker interconnecting areas; 4 pale narrow streaks from dorsal-fin base to lateral midline, below 2nd and 3rd dorsal fins; series of pale spots along midsides; belly pink; head dark: black below eyes and to branchiostegal membranes, and nape black with dull red; bright blue stripe from lower lip across cheek, broadly edged with black above and below; 1st dorsal fin dusky with some orange, darkest on margin, and small black spot at base of membrane connecting 1st and 2nd dorsal fins; 2nd dorsal fin dusky with dull orange band basally; 3rd dorsal fin dusky; pelvic fins dark pink proximally; pectoral-fin bases with red spot above and below, lower spot with blue in front and above; anal fin dark, with even cover of melanophores; caudal fin dusky. Females dull green, with dark areas forming zigzag pattern, and pale ventrally; head dark green dorsally, underside pale; median fins with sparse melanophores, and 1st dorsal fin with small black spots as in males; 3rd dorsal-fin base and entire anal fin white. Attains 38 mm SL.



Helcogramma obtusirostris, 22 mm SL, female (Red Sea). Source: Clark 1980

DISTRIBUTION WIO: Red Sea and Gulf of Oman.

REMARKS Usually seen in pairs, in coral and rocky areas of lagoons, to \sim 8 m.

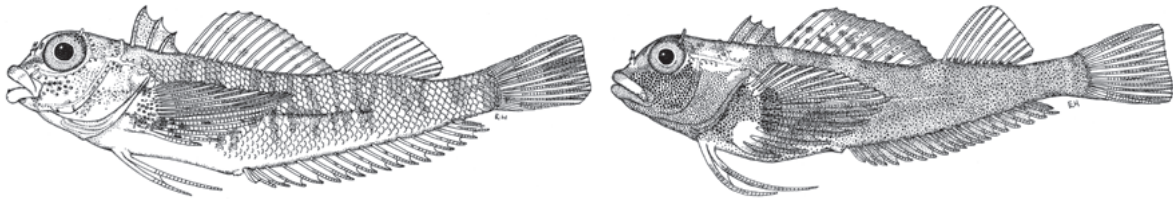
Helcogramma rharhabe Holleman 2007

Hotlips

PLATES 157 & 158

Helcogramma sp.: Heemstra & Heemstra 2004*.

Helcogramma rharhabe Holleman 2007: 69, Fig. 11, Pl. 2 (Sheffield Beach, KwaZulu-Natal, South Africa); Fricke 2009.



Helcogramma rharhabe, 26 mm SL, female paratype (left); 37 mm SL, male holotype (right) (both South Africa). Source: Holleman 2007

Dorsal fins 3 spines + 12–14 spines + 10 or 11 rays; anal fin 1 spine, 19 rays; pectoral fins 15 or 16 rays (usually 1 + 8 + 7). First dorsal fin $\sim\frac{1}{2}$ height of 2nd dorsal fin; pelvic-fin rays united by membrane for $\frac{1}{3}$ – $\frac{1}{2}$ length of shorter ray, longer ray reaching vent; maxilla reaches vertical at front edge of pupil. Orbital cirrus small and simple. Mandibular pores 5 + 1 + 5. Nape and belly naked; scales not reaching bases of 1st dorsal fin and anal fin; LL scales 21–31 (differs with locality), ending below junction of 2nd and 3rd dorsal fins; LSS 37–38, plus 2 scale rows on caudal-fin base; transverse scale rows 9/5.

Males heavily and evenly spotted with black and some dark red, except for 4 pale streaks from dorsal-fin bases to lateral midline (below middle of 2nd and 3rd dorsal fins), and 6 or 7 silvery white spots just below lateral midline (saddle marks and spots below midline may be entirely obscured in heavily pigmented specimens); belly pale, with some melanophores; head below eyes black, with bright blue-white streak from corner of mouth onto preopercle; upper lip with dark red patch on sides, black in middle, and blue at corners of mouth; area above upper lip and interorbital region green; top of head reddish to black, with many small melanophores; throat blue and black; 1st dorsal fin with gold and black spots on 1st membrane and along margin of other membranes; 2nd dorsal fin hyaline, with brown or black margin, and irregularly scattered dark red, black and white marks on membranes and spines; 3rd dorsal fin with red along edges of rays and grey margin; caudal fin mostly without pigment, but some red and black on 2 or 3 lowermost rays; anal fin evenly covered with red and black spots; pelvic-fin bases dark red; pectoral-fin bases with red spots above and below, and with bright blue above and behind lower spot, and black half-moon to triangular shape (apex pointed back) at bases of middle rays, bases of 3 or 4 uppermost rays red, 2 lowermost rays with dark red spot, and other rays dusky. Females pale green above lateral midline, some scales edged in brown, forming pairs of semi-bars which extend onto dorsal fins; body below lateral midline translucent, with black semi-bars interspersed with white spots; head brown-green dorsally, underside whitish with scattered melanophores; dorsal-fin elements with alternating irregular pale and dark bars; pelvic fins whitish; pectoral fins with irregular bands of dark brown, white and greenish; anal fin with some melanophores along rays; caudal fin hyaline, with whitish band at base of rays. Attains 38 mm SL.

DISTRIBUTION WIO: Kenya (Malindi) to South Africa (Eastern Cape).

REMARKS Found in tidepools and shallow subtidal waters; often in large numbers in large intertidal pools. A member of the *Helcogramma obtusirostris* species-complex, which comprises 6 or 7 species, including 1 species from Ascension I. in the southeastern Atlantic.

Helcogramma rosea Holleman 2006

Yellow-saddle triplefin

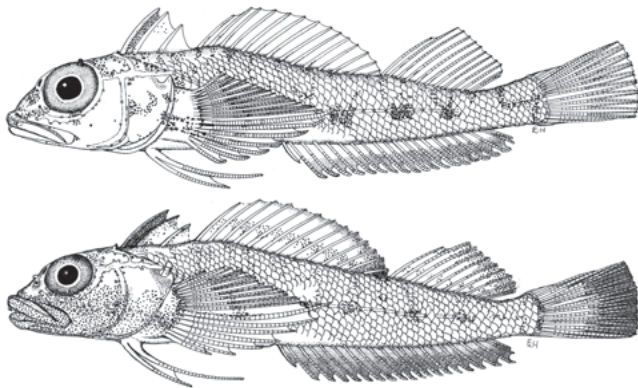
PLATES 157 & 158

Helcogramma rosea Holleman 2006: 95, Figs. 3–4 (Ko Hi, Phuket, Thailand); Holleman 2007*; Fricke 2009.

Dorsal fins 3 spines + 13 spines + 10 or 11 rays; anal fin 1 spine, 18–20 rays; pectoral fins 16 rays (usually 2 + 7 + 7). First dorsal fin of males triangular, with 1st spine equal to or slightly taller than 2nd dorsal fin, 1st dorsal fin of females slightly shorter than 2nd; pelvic-fin rays united by membrane for $\sim\frac{1}{2}$ length of longer ray, longer ray reaches to vent in males, $\sim 80\%$ the distance in females; maxilla reaches vertical at centre of pupil. Orbital cirrus small, triangular and rounded, slightly longer than wide. Mandibular pores 3 or 4 + 1 + 3 or 4. Nape scaly; scales not reaching 2nd dorsal-fin base and anal-fin origin; scales present on underside of peduncle; LL scales 23–29; LSS 36–38, plus 2 or 3 scale rows on caudal-fin base. Vertebrae 11 + 25 or 26.

Males red, with 3 small yellow saddles (below anterior and posterior ends of 2nd dorsal fin, and below end of 3rd dorsal fin); line of yellow dots and dark brown dashes along lateral line; narrow dark bar across peduncle; belly spotted red; head reddish dorsally, dark brown behind eyes and to opercle margin, pale with dark spots below eyes and to pelvic-fin bases; oblique dark brown bar from lower margin of eye, and pale blue in front of and below eye, and yellow spot immediately behind eye; iris red with yellow spots; nostrils and centre of upper lip brown; 1st dorsal fin pale, with brown and red spots; 2nd dorsal fin with red spots basally and brownish margin; 3rd dorsal fin with red spots basally, and red and black along margin; caudal fin mostly deep pink with small black spots

anteroventrally; anal fin spotted with red and black, darkest along margin; pectoral-fin bases brown with 2 pale blue spots, fin mostly red, with 3 pale bars; pelvic fins red basally. Females cream and greenish above lateral line, with series of brown blotches along lateral line, and ~6 pairs of brown saddle marks (2 below 2nd dorsal fin; 2 below 3rd dorsal fin; 1 on peduncle; and last half-pair forming narrow bar across peduncle); head, nostrils, upper lip, preopercle and opercle mottled brown and cream, area below eyes mostly cream with few brown marks; 1st dorsal fin with brown marks; 2nd and 3rd dorsal fins with brown on spines and rays roughly corresponding to saddles on dorsum; anal fin with ~7 subcutaneous brown blotches along base, margin with spots, rays with colour; caudal fin pale, with some colour along rays. Attains 35 mm SL.



Helcogramma rosea, 28 mm SL, female (top); 34 mm SL, male holotype (bottom) (both Thailand). Source: Holleman 2007

DISTRIBUTION Indian Ocean: Sri Lanka and Andaman Sea (Thailand).

Helcogramma serendip Holleman 2007

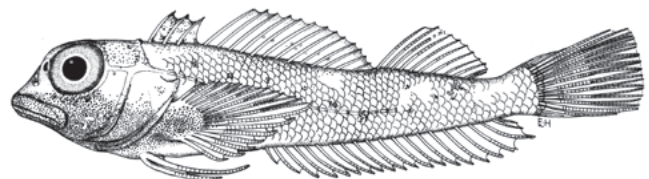
Ceylon triplefin

Helcogramma serendip Holleman 2007: 73, Fig. 13 (Trincomalee, Sri Lanka); Fricke 2009.

Dorsal fins 3 spines + 14 spines + 10 rays; anal fin 1 spine, 18 or 19 rays; pectoral fins 16 rays (2 + 7 + 7). First dorsal fin <math>< \frac{1}{2}</math> height of 2nd dorsal fin; pelvic-fin rays united by membrane for length of shorter ray, longest ray reaches ~80% distance to vent; maxilla reaches vertical at front of pupil. Hind margin of eye with small cirri on edge of frontal bones; edges of sensory canals immediately behind the eye with fringe of minute cirri. Interorbital width about equal to pupil diameter. Orbital cirrus small and pointed. Broad patch of teeth in front of jaws, single row at sides, with row of enlarged teeth inside middle of upper jaw, both outside and inside middle of lower jaw. Labial folds

relatively large. Mandibular pores 4 + 1 + 4. Nape naked, except patches of scales above first few LL scales; belly naked to anal-fin origin and above anterior part of anal-fin base; no scales on underside of peduncle; LL scales 20–22, ending below junction of 2nd and 3rd dorsal fins; LSS 36–39, plus 2 rows of scales on caudal-fin base; transverse scale rows 6/4.

Preserved specimens: Males with evenly spaced melanophores from level of upper lip and below eyes, onto opercle and pectoral-fin base (forming a triangle on middle rays, with apex posterior), pigment ending abruptly between isthmus and pelvic-fin base); interorbital region and top of head and with melanophores; body with scattered melanophores above midline and with 7 or 8 clusters along midline, darkest anteriorly; 1st and 2nd dorsal fins with black spots along margin; 3rd dorsal fin unpigmented; anal fin with band of melanophores on membranes along middle of fin; pelvic fins and caudal fin unpigmented. Females with ~7 H-shaped bars on midsides (4 below 2nd dorsal fin; 2 below 3rd dorsal fin; last across peduncle); head, opercles and pectoral-fin bases with scattered melanophores; cluster of melanophores below eyes and stripe from corner of mouth onto upper lip; 1st dorsal fin with dark margin, other fins without pigment. Attains 23 mm SL.



Helcogramma serendip, 22 mm SL, male holotype (Sri Lanka). Source: Holleman 2007

DISTRIBUTION Known from type specimens from Sri Lanka.

Helcogramma shinglensis Lal Mohan 1971

Indian triplefin

PLATE 158

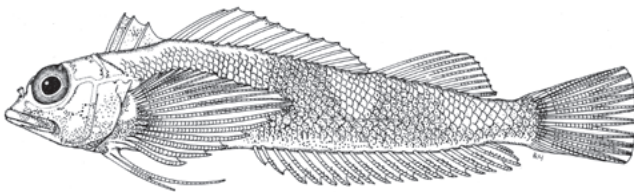
Helcogramma shinglensis Lal Mohan 1971: 219, Fig. 1 (Shingle I., Gulf of Mannar, India and Sri Lanka); Holleman 2007*; Fricke 2009.

Helcogramma obtusirostris (non Klunzinger 1871): Hansen 1986 [in part].

Dorsal fins 3 spines + 9 or 10 spines + 9 or 10 rays; anal fin 1 spine, 19 or 20 rays; pectoral fins 15 or 16 rays (usually 1 + 8 + 7). First dorsal fin ~ $\frac{1}{2}$ height of 2nd dorsal fin; pelvic-fin rays united by membrane for ~ $\frac{1}{2}$ length of shorter ray, longest ray reaches vent; maxilla reaches vertical at centre of pupil. Orbital cirrus small and simple. Mandibular pores 4 + 3 + 4. Nape and belly naked; scales do not extend to 1st dorsal-fin base and anal-fin origin; LL scales 21–24, ending below junction of 2nd and

3rd dorsal fins; LSS 37 or 38, plus 2 scale rows on caudal-fin base; transverse scale rows 10/5.

Males pinkish red, with 4 or 5 white saddles (1st immediately behind eyes, 2nd small and below end of 1st dorsal fin, 3rd small and below middle of 2nd dorsal fin, 4th at end of 2nd dorsal fin, and 5th at end of 3rd dorsal fin), and with series of rectangular brown blotches along lateral midline; eyes, orbital cirrus, top of head and front of head red, and heavily marked with melanophores to bases of pectoral- and pelvic fins; bright blue line from corner of mouth to preopercle margin; opercle margin partially blue; dorsal- and anal-fin rays red, some pale red marks on membranes of 1st dorsal fin, and anal-fin margin entirely red; pectoral- and pelvic-fin rays pink; pectoral-fin bases black, with blue mark on lower half and a red streak onto lower rays; caudal fin hyaline. Females paler, without blue on face and pectoral-fin bases. Attains at least 37 mm SL.



Helcogramma shinglensis, 27 mm SL, male (Sri Lanka). Source: Holleman 2007

DISTRIBUTION Indian Ocean: southeastern India, Sri Lanka and Andaman Is.

Helcogramma steinitzi Clark 1980

Red triplefin

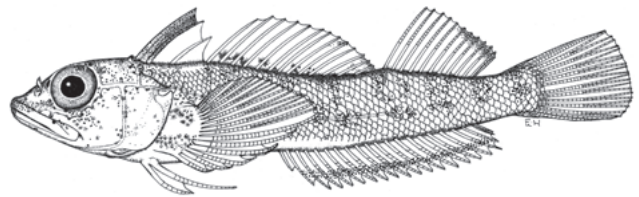
PLATE 158

Helcogramma steinitzi Clark 1980: 88, Figs. 3d, 5a, 6a, 8, Pls. 2–5 (bay near El Himeira, Sinai, Egypt, Gulf of Aqaba, Red Sea); Hansen 1986; Goren & Dor 1994; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Holleman 2006, 2007*; Fricke 2009; Golani & Bogorodsky 2010; Holleman & Bogorodsky 2012*.

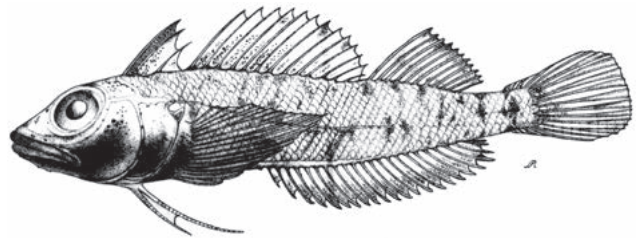
Dorsal fins 3 spines + 12–14 spines + 10–12 rays; anal fin 1 spine, 19–21 rays; pectoral fins usually 16 rays (3 + 7 + 6). First spine of 1st dorsal fin subequal to first spine of 2nd dorsal fin in males, $\sim\frac{3}{4}$ the length in females; pelvic-fin rays united by membrane for $\sim\frac{1}{2}$ length of shorter ray, longer ray reaches vent; mouth large, maxilla reaches vertical at rear edge of pupil. Orbital cirrus minute. Mandibular pores 3 + 1 + 3. Nape scaly; belly naked; scales not reaching bases of 1st dorsal fin and anal fin; LL scales 21–27, ending below first 5 rays of 3rd dorsal fin; LSS 37–41, plus 1 or 2 scale rows on caudal-fin base.

Males dark red above lateral line, with many scales outlined in black, paler red below lateral line, with white flecks and indistinct black markings forming reticulated pattern, and

midlines with 8 dark blotches interspersed with white blotches; belly white; head above eyes dark red, below eyes bluish grey with many small melanophores plus bluish streak; 1st membrane of 1st dorsal fin white, the remainder with red and black spots; 2nd and 3rd dorsal fins with red band at base, with black spots and pale red margin, fin hyaline in between but with white on elements; anal fin pale red, darker along margin; caudal fin pale red; pectoral fins red, bases dark grey with 2 oval, bluish marks, one above the other; pelvic fins pink. Females translucent greenish, irregularly spotted white, with large interconnecting red blotches, and red and black spots on scale margins forming reticulated pattern; head greenish, with numerous dark red spots and short bands, the darkest a diagonal band on side of snout. Attains 47 mm SL.



Helcogramma steinitzi, 30 mm SL, female paratype (Red Sea). Source: Holleman 2007



Helcogramma steinitzi, 36 mm SL, male holotype (Red Sea). Source: Clark 1980

DISTRIBUTION WIO: Red Sea, Oman and Persian/Arabian Gulf.

REMARKS Found on exposed coral reefs in lagoons and on seaward reefs, in 1–25 m.

Helcogramma striata Hansen 1986

Candy-striped triplefin

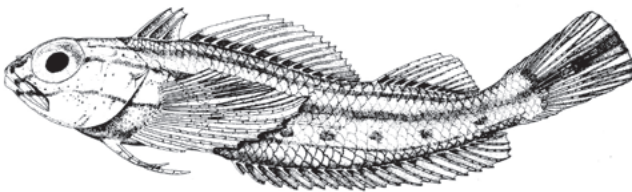
PLATE 158

Helcogramma striata Hansen 1986: 349, Fig. 18 (Miyakejima, Izu Is., Japan) [in part]; Fricke 1994, 2009; Holleman 2007*.
Helcogramma striatum: Fricke 1997.

Dorsal fins 3 spines + 13 spines + 10 or 11 rays; anal fin 1 spine, 19 or 20 rays; pectoral fins 16 rays (usually 2 + 7 + 7). First dorsal fin $\sim\frac{1}{2}$ height of 2nd dorsal fin; snout short, $\sim\frac{1}{2}$ length of maxilla; mouth down-turned and large, maxilla

reaches vertical at mid-pupil. Jaws with band of conical, slightly recurved teeth, and similar but larger evenly spaced teeth along outer and inner margins; vomer with curved band of relatively large teeth; palatines with long tooth plates with large teeth. Eyes large; no orbital cirrus. Mandibular pores 3 + 2 + 3. Lateral line continues straight from lateral extrascapular without curve. Nape scaly; scales extending to dorsal- and anal-fin bases; belly naked; LL scales 16–18, ending below end of 2nd dorsal fin; LSS 38–39, plus 2 or 3 rows of small scales on caudal-fin base; transverse scale rows 11/10.

Males red dorsally, green to dark blue ventrally, with longitudinal bluish stripes on sides (uppermost stripe from head and along first 2 scale rows to top of peduncle; middle stripe from rear margin of eye to sides of peduncle then dipping and continuing to centre of caudal fin; lowermost stripe from lower margin of eye, across opercle and along otherwise darker ventrum); 6 or 7 green-blue spots midway between lower 2 stripes; belly whitish; head above uppermost stripe red with blue-white marks; lips red with stripes continuing onto them; throat white; 1st dorsal fin red with grey-blue spots on membranes; 2nd and 3rd dorsal fins with red elements and blue-green band basally; pelvic-fin rays red, membranes pink; pectoral-fin rays pink; anal fin uniformly dark blue; caudal fin with red rays and central blue stripe. Females paler than males. Attains 43 mm SL.



Helcogramma striata, 25 mm SL, male paratype (Japan).
Source: Hansen 1986

DISTRIBUTION Indo-Pacific. WIO: Maldives and Sri Lanka; elsewhere to Indonesia (Raja Ampat Is.), Dampier Archipelago, Philippines, Japan, Solomon Is., Great Barrier Reef, Fiji and Line Is.

GENUS *Norfolkia* Fowler 1953

First dorsal fin 4 spines; anal fin 2 short spines; nape, pectoral-fin bases, head and opercles with ctenoid scales, belly with cycloid scales; lateral line with anterior series of pored scales ending below 2nd dorsal fin, and posterior series of notched scales, beginning 2 or 3 scale rows below end of pored series and extending to caudal-fin base. Inhabit coral reefs. Three species, 1 in WIO.

Norfolkia brachylepis (Schultz 1960)

Scalyhead triplefin

PLATE 158

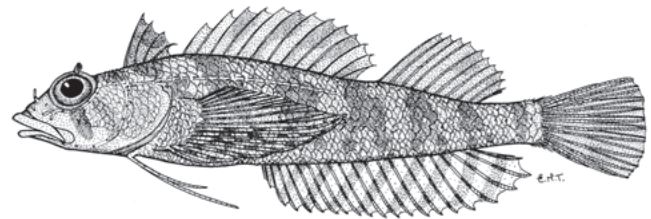
Tripterygion brachylepis Schultz in Schultz *et al.* 1960: 291, Fig. 113
(coral heads in lagoon at Bikini Atoll, Marshall Is.).

Norfolkia springeri Clark 1980: 95, Figs. 4f, 5d, 9 (north of Ras Burqa, Sinai, Egypt, Gulf of Aqaba, Red Sea); SSF No. 236.9*.

Norfolkia brachylepis: Holleman 1991*; Goren & Dor 1994; Randall 1995*; Fricke 1997, 2009; Manilo & Bogorodsky 2003; Heemstra & Heemstra 2004*; Golani & Bogorodsky 2010; Holleman & Bogorodsky 2012*.

Dorsal fins 4 spines + 13 or 14 spines + 9–11 rays; anal fin 2 spines, 18–20 rays; pectoral fins usually 16 rays (2 + 7 + 7); pelvic-fin rays not united by membrane. Head profile rounded; interorbital region concave. Orbital and nasal cirri finely serrate. Mandibular pores 4 + 1 or 2 + 4 (except Randall [1995] records 3 + 2 + 3 for Oman specimens). Head with scales to below lower margin of eyes; LL scales 14–18 + 18–23, notched series beginning 3rd scale row below end of pored series; LSS 32 or 33; transverse scale rows 3/8.

Males greyish, with 6 broad irregular dark brown bars, scales in bars with yellow margins; head mottled whitish and brown, with dark brown bar below eyes; throat and branchiostegal membranes yellow; 1st membrane of 1st dorsal fin pink, other membranes with melanophores; 2nd and 3rd dorsal fins mostly red-orange, with 3 irregular pale brown bars (2 on 2nd dorsal fin; 1 on 3rd dorsal fin); pelvic fins white; pectoral fins with irregular cream and grey bars; anal fin with alternating grey and white bars; caudal-fin rays reddish with white marks. Females paler, without red-orange on median fins or with yellow on throat and branchiostegal rays. Attains at least 50 mm SL.



Norfolkia brachylepis, 50 mm TL, male (South Africa). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: Gulf of Oman, Red Sea, Kenya to South Africa (Aliwal Shoal), Comoros and Sri Lanka; elsewhere to Indonesia, Philippines, southern Japan, Marshall Is., New Caledonia and Samoa.

REMARKS *Norfolkia springeri* was formerly a synonym of *Norfolkia brachylepis* but has recently been recognised as a valid species.

FAMILY AMMODYTIDAE

Sandlances

Hitoshi Ida and John E Randall

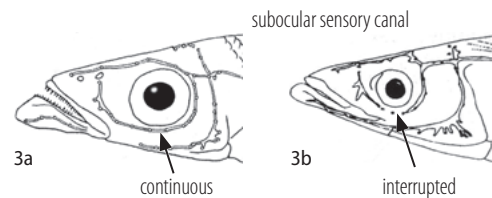
Small-sized (to ~30 cm TL), body elongate, cylindrical or subcylindrical, head pointed; upper jaw protractile (except *Hyperoplus*), lower jaw projecting. Dorsal fin long, with 35–64 rays; anal fin 13–32 rays; pelvic fins present or absent; caudal fin forked. Teeth present or absent in jaws. Branchiostegal rays 7, gill membranes separate; gill rakers long. Lateral line close to dorsal contour of body. Scales minute, adherent; LSS 90–170. No swimbladder. Vertebrae 50–72; unusual in having more abdominal than caudal vertebrae.

Some derived characters can be seen in jaw structure: dentary with wide posterior elevation and narrow anterolateral perforation (Ida *et al.* 1994); margin of lips thickened by ligaments reinforced with labial ossicles in *Ammodytoides* and *Gymnammodytes* (Ida 1973), and the anterolateral perforation receives the labial ligaments when mouth is closed. Specialisations for rapid swimming include the pointed head, adipose eyelids, forked caudal fin, an expansion of the neural and haemal spines in the last several vertebrae to strengthen the tail except *Protammodytes*, *Bleekeria* and *Lepidammodytes*, a low dorsal fin and anal fin without spines and which fold into a groove, and loss or reduced size of pelvic fins. These specialisations, along with the strong, pointed, projecting lower jaw, elongate body and adherent scales, also facilitate rapid entry into sedimentary substrates. The sandlances are named for their ability to dive into sand to escape a predator or to sleep at night. Generally found in shallow water, typically on broad open stretches of sedimentary substrate, and in small evasive aggregations that feed on zooplankton. However, one trawl haul from ~240 m on the Saya de Malha Bank contained two sandlances, which were subsequently described (Randall & Ida 2014).

Occur in tropical to arctic seas of all oceans. Seven genera and ~32 species; at least 4 genera and 8 species in WIO. *Bleekeria murtii* Joshi, Zakaria & Kanthan 2012, described from specimens collected from trawls off southeastern India, may also be expected from the west coast of India in WIO. Furthermore, certain counts (dorsal fin 34–49 rays, anal fin 12–16 rays, LL scales 89–108, and vertebrae 56–75) suggest it may represent more than one species. Ida *et al.* (1994) listed the vertebral counts of the 20 species of ammodytids known at the time; only one species was reported with a vertebral-count range of 4, and the remainder with only a single vertebral count or a range of 2.

KEY TO GENERA

- 1a No scales on most of body and none anteriorly, except those of lateral line; anterior part of lateral line with short dorsal and ventral branches; no predorsal bones; peduncle very short *Gymnammodytes*
- 1b Scales present on most of body anteriorly; lateral line without dorsal and ventral branches; predorsal bones 2; caudal peduncle not very short 2
- 2a Pelvic fins larger, length 5.9–7.8% SL; LL scales 86–95 *Protammodytes*
- 2b Pelvic fins smaller (length <5% SL) or fins absent; LL scales 99–151 3
- 3a Teeth present in jaws; dorsal fin 40–49 rays; anal fin 14–20 rays; pelvic fins small or fins absent; subocular sensory canal continuous; haemal and neural spines of caudal vertebrae not expanded *Bleekeria*
- 3b No teeth in jaws; dorsal fin 45–53 rays; anal fin 21–25 rays; no pelvic fins; subocular sensory canal interrupted; haemal and neural spines of caudal vertebrae expanded *Ammodytoides*

GENUS *Ammodytoides* Duncker & Mohr 1939

Dorsal fin 45–53 rays; anal fin 21–25 rays; pectoral fins 15 or 16 rays; no pelvic fins. Body very elongate, depth 8.6–11.7% in SL. No teeth in jaws; ventrolateral skin fold slightly developed; subocular sensory canal discontinuous below eyes; labial ossicles present; no olfactory rosette. Vertebrae 56–63; predorsal bones present; haemal and neural spines of caudal vertebrae expanded. Ten species, 3 in WIO.

KEY TO SPECIES

- 1a Caudal fin with curved, submarginal, blackish bar across each lobe; numerous black dots on dorsal and anal fins, but no spots along dorsal-fin margin; eye diameter 4.3–4.6% SL; longest dorsal-fin ray 6.9–8.5% SL 2

Continued...

KEY TO SPECIES

- 1b Caudal fin without submarginal blackish bar across each lobe; no black dots on dorsal and anal fins, but dorsal-fin margin with series of ~5 black spots; eye diameter 3.3–3.5% SL; longest dorsal-fin ray 5.5–5.7% SL [Mozambique] ... *A. xanthops*
- 2a Dorsal fin 48 rays; pectoral fins 14 rays; LL scales 103–106; 4 scales dorsally on opercle; GR 5/23 [Chagos] *A. praematura*
- 2b Dorsal fin 50 or 51 rays; pectoral fins 15–17 rays; LL scales 113–115; no scales dorsally on opercle; GR 10/21 or 22 [east coast of South Africa] *A. renniei*

Ammodytoides praematura Randall & Earle 2008

Small sandlance PLATE 159

Bleekeria renniei (non Smith 1957): Winterbottom *et al.* 1989*.

Ammodytoides praematura Randall & Earle 2008: 610, Fig. 4 (Isla du Coin, Peros Banhos Atoll, Chagos Archipelago).

Dorsal fin 48 rays, anal fin 24 rays (dorsal and anal rays branched except 1st ray); pectoral fins 14 rays, central rays branched; caudal fin 15 principal rays, middle 13 rays branched. Body depth 10 in SL; HL 4 in SL, lower jaw strongly projecting; snout length 3.4 in HL; eye diameter 5.5 in HL; dorsal fin nearly uniform in height, fin origin above 11th LL scale, longest ray 3.7 in HL. GR 5/23. Predorsal scales 12; row of 4 scales dorsally on opercle; LL scales 103 on left side, 106 on right side, last 4 not tubed. Vertebrae 58.

Body pale grey, rear half with silvery tan lateral stripe; opercle and pre-pectoral area silvery green, narrowly brown above opercle; dorsal and anal fins with numerous black dots, both on rays and membranes (no spots along margin); caudal fin translucent whitish, with curved blackish bar across each lobe. Attains at least 6.1 cm SL.

DISTRIBUTION Known only from the holotype (a mature female) collected from Chagos.

REMARKS Taken at 7 m, from sand in the lagoon near a head of *Porites* coral. Named *praematura* in reference to the unexpectedly small size for a mature fish of this genus.

Ammodytoides renniei (Smith 1957)

Scaly sandlance

PLATE 159

Bleekeria renniei Smith 1957: 219, Fig. 2 (found on the beach at Mpekweni, Eastern Cape, South Africa); SSF No. 238.1*.

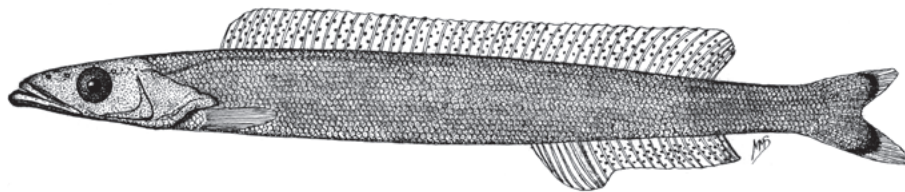
Ammodytoides renniei: Ida *et al.* 1994.

Dorsal fin 50 or 51 rays; anal fin 23 or 24 rays; pectoral fins 15–17 rays; no pelvic fins. Body depth ~9.5 in SL; HL ~4 in SL. In HL: snout length ~3.6, eye diameter ~5.8, interorbital width ~8.9, and peduncle depth ~5 in HL. Dorsal-fin origin over pectoral fin, fin highest posteriorly, 6th from last ray longest (~2.9 in HL); longest anal-fin ray in middle of rounded anterior lobe; caudal-fin lower lobe slightly longer than upper lobe. Nostrils small and widely separated. GR 10/21 or 22. LL scales 113–115; row of 4 small scales dorsally on opercle. Vertebrae 58.

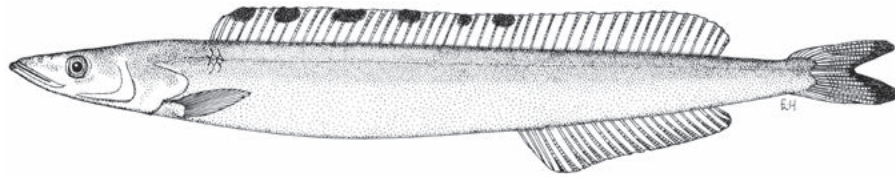
Body pale olive dorsally, silvery white below; dorsal and anal fins with numerous black dots; caudal fin dusky yellowish, with curved black bar across each lobe. Attains at least 7.5 cm TL.

DISTRIBUTION WIO: Mozambique Channel, South Africa (Eastern Cape), Seychelles and Mascarene Plateau.

REMARKS Rare. The three type specimens were found on the beach after the onset of cold water. Specimens from the Mozambique Channel and the Mascarene Plateau were trawled from ~190 m and ~275 m, respectively.



Ammodytoides renniei, 7 cm TL, holotype (South Africa). Source: Smith 1957



Ammodytoides xanthops, 12 cm SL, holotype (Mozambique).

Ammodytoides xanthops Randall & Heemstra 2008

Yellowface sandlance

PLATE 159

Ammodytoides xanthops Randall & Heemstra 2008: 23, Fig. 1 (Mozambique).

Dorsal fin 48 or 49 rays; anal fin 23 or 24 rays; pectoral fins 15 or 16 (usually 15) rays; no pelvic fins. Body depth 8.5–10 in SL; HL 4.2–4.3 in SL. In HL: snout length ~3.6, eye diameter 6.9–7.2, interorbital width 5.7–5.9, and peduncle depth 5–5.4. Dorsal-fin origin over 12th LL scale, fin highest posteriorly, posteriormost 6th ray longest (4–4.4 in HL); 3rd or 4th anal-fin ray longest (3.3–3.7 in HL); caudal-fin concavity 3.7–4 in HL; pectoral fins short and pointed, 2.4–2.6 in HL. GR 5 or 6/22–25. LL scales 106–112; no scales dorsally on opercle. Vertebrae 57–59.

Body dark bluish or purplish grey dorsally; sides broadly and abruptly silvery blue-green, separated by indistinct yellow line from pale blue-green ventral surface of body; snout, interorbital area and occiput brassy yellow; opercle mainly silvery, becoming mixed yellow and blackish dorsally and on nape; dorsal-fin margin with series of ~5 black spots; caudal fin yellow, distal two-thirds blackish. Attains at least 14 cm SL.

DISTRIBUTION WIO: Mozambique Channel (type locality).

REMARKS Known from the holotype, collected in a trawl in 62 m, and from 18 paratypes, taken in one trawl haul in 26–28 m. All specimens were fully ripe males and females. Randall *et al.* (1994) showed that the yellow of the head of *Ammodytoides pylei* from Hawaii is spawning colouration; it seems likely that the same is true for the males of *A. xanthops*.

GENUS *Bleekeria* Günther 1862

Dorsal fin 40–49 rays; anal fin 13–20 rays; pectoral fins 14–16 rays. LL scales 99–151. Body very elongate, depth 8.6–11.7% in SL. Teeth in jaws small; ventrolateral skin fold slightly developed; subocular sensory canal discontinuous below eye; labial ossicles present; olfactory rosette reduced to 4 lamellae. Vertebrae 52–62; 2 predorsal bones; haemal and

neural spines of caudal vertebrae not expanded. Six species, at least 3 in WIO (2 of these are each known in WIO from only one specimen).

KEY TO SPECIES

- | | | |
|----|--|----------------------|
| 1a | No pelvic fins; LL scales 99; head very short, HL ~4.9 in SL [Mozambique] | <i>B. estuaria</i> |
| 1b | Pelvic fins present; LL scales 109–151; head less short, HL ≤4.8 in SL | 2 |
| 2a | Dorsal fin 40–43 rays; anal fin 14–17 rays; LL scales 109–120; vertebrae 52–55 [Red Sea; Singapore to central Japan] | <i>B. mitsukurii</i> |
| 2b | Dorsal fin 49 rays; anal fin 20 rays; LL scales 151; vertebrae 62 [Mascarene Plateau] | <i>B. profunda</i> |

Bleekeria estuaria Randall & Ida 2014

Estuary sandlance

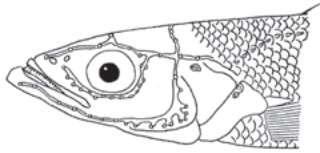
PLATE 159

Bleekeria estuaria Randall & Ida 2014: 7, Figs. 4–7 (Pomene Estuary, Mozambique).

Dorsal fin 42 rays; anal fin 15 rays; pectoral fins 14 rays, fin length 5.7 in SL (longest of genus); no pelvic fins. Body depth 9.5 in SL; head short, HL 4.9 in SL; eyes moderately large, diameter 4.3 in HL; mouth moderately large and oblique, upper jaw 3.4 in HL, lower jaw strongly projecting, the tip narrowly rounded. Teeth in jaws small slender: 22 teeth on sides of upper jaw, and 2 or 3 teeth anteriorly on sides of lower jaw. No gap in subocular sensory canal. Scales weakly ctenoid; LL scales 99; 1 scale dorsally on preopercle, 2 scales on opercle. Vertebrae 53.

Body pale greenish grey, scales above lateral line and row below rimmed with black; abdominal region mainly blue and white with broad middle area of purple and red; snout mainly greenish grey; cheek to chest white, reddish above; caudal fin grey with a thin black posterior margin. Preserved specimen yellowish brown; scales on upper body and on lateral line finely stippled with black, scales below lateral line with progressively less dark pigment; silvery white ventrally; opercle with silvery

patches; fin rays pale yellowish, anterior edge of dorsal rays finely dotted with black; fin membranes translucent. Attains at least 6.3 cm SL.



Bleekeria estuaria, 6 cm SL, holotype (S Mozambique). Source: Randall & Ida 2014

DISTRIBUTION Known only from the holotype from Mozambique.

REMARKS Collected in an estuary, at 5 m, by multi-prong spear from an aggregation of ~50 individuals that were feeding on zooplankton.

Bleekeria mitsukurii Jordan & Evermann 1902

Bleekeria mitsukurii Jordan & Evermann 1902: 233,

Fig. 12 (Giran, Taiwan); Ida *et al.* 1994.

Embolichthys mitsukurii: Robins & Böhlke 1970; Kotthaus 1977;

Pietsch & Zabetian 1990.

Dorsal fin 40–43 rays; anal fin 14–17 rays; dorsal- and anal-fin rays branched; pectoral fins 14–16 rays; pelvic fins 5 rays; caudal-fin lower lobe slightly longer than upper lobe. Body depth 8.3–10.5 in SL; HL 4.4–4.6 in SL. In HL: snout length 3.7–4.2, eye diameter 4.4–5.3, interorbital width 5.9–7.2, and peduncle depth 3.5–3.85. Teeth in jaws small (easily overlooked); no labial ossicles. Subocular sensory canal continuous. GR 6–9 + 18–22. LL scales 109–120; scale rows 4 above lateral-line origin; scale rows 21–23 from lateral line to anal-fin origin; head naked. Vertebrae 52–55.

Specimen from Taiwan pale yellowish green; scales on upper third of body dark-edged, darkest above lateral line; midsides from behind head to above anus with ~25 slightly oblique whitish streaks, and whitish stripe (pupil width) directly below; postorbital area of head and chest with irregular dark orange-yellow markings; dorsal- and anal-fin rays green, fin membranes transparent; caudal fin pale green, lobe tips broadly and obliquely blackish. Attains 17 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Mandeb Strait (between Red Sea and Gulf of Aden: one record); elsewhere, South China Sea to central Japan, northwestern Australia and Chesterfield Is.

REMARKS We follow Ida *et al.* (1994) and Collette (2001) in placement of this species in *Bleekeria*. Kotthaus (1977) reported one specimen, 7.3 cm SL, from Bab-el-Mandeb, collected from 174 m, the greatest depth for the species. The measurements compare well with specimens from the Pacific; however, one meristic difference (LL scales 109, versus 116–120 in Pacific specimens) suggests the need for more specimens from WIO.

Bleekeria profunda Randall & Ida 2014

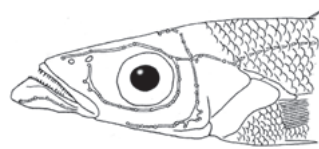
Deepsea sandlance

PLATE 159

Bleekeria profunda Randall & Ida 2014: 5, Figs. 3, 5–7 (Saya de Malha Bank).

Dorsal fin 49 rays; anal fin 20 rays; pectoral fins 16 rays; pelvic fins small, 5 rays. Body depth at dorsal-fin origin 9 in SL; HL 4.2 in SL; pelvic fins 4.2 in HL; eye diameter 4.4 in HL; mouth oblique (at ~40° angle to horizontal axis of body) and moderately large, upper jaw length 3.7 in HL, lower jaw projecting ~½ eye diameter anterior to opening of mouth, its tip narrowly rounded. Teeth in jaws well-spaced, small, slender, conical. No gap in subocular sensory canal. GR 8/21. Scales ctenoid; LL scales 151. Vertebrae 62.

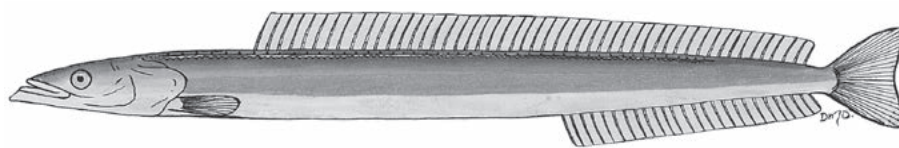
Body greyish blue on upper third of body anteriorly, progressively paler posteriorly, with whitish lateral line; interorbital area blue, becoming grey on nape; opercle and chest white; snout, jaws and underside of head mainly dark red, front of lower jaw blue, except for small grey anterior nodule; dark red oblique band from opercle to pectoral-fin base may be a result of trauma from the trawl. Preserved specimen pale yellowish brown dorsally, scale edges dark brown, except those of lateral line; head and body yellowish white ventrally; large triangular silvery area on opercle, and silvery spot at same level on preopercle; fins pale yellowish. Attains at least 12.1 cm SL.



Bleekeria profunda, 12 cm SL, holotype, male (Saya de Malha Bank). Source: Randall & Ida 2014

DISTRIBUTION Known only from the holotype from Saya de Malha Bank.

REMARKS Taken by bottom trawl in 237–240 m. Collected in the same haul as the holotype of *Protammodytes ventrolineatus*.



Gymnammodytes capensis, 18 cm TL (South Africa). Source: SFSA

GENUS *Gymnammodytes*

Duncker & Mohr 1935

Lateralis system of head not continuous with that of body at posttemporal region; anterior end of lateral line with short dorsal and ventral branches; dorsal- and anal-fin rays not branched; no labial ossicles; no olfactory rosette; scales absent from most of body and none anteriorly, except those of lateral line; no predorsal bones; peduncle very short; haemal and neural spines of caudal vertebrae expanded. Three species: 2 in eastern Atlantic and Mediterranean Sea, 1 from southern Africa.

Gymnammodytes capensis (Barnard 1927)

Cape sandlance

PLATE 159

Ammodytes capensis Barnard 1927: 66 (Table Bay and False Bay, Western Cape, South Africa); SSF No. 238.2.

Gymnammodytes capensis: Ida *et al.* 1994.

Dorsal fin 49–54 rays; anal fin 24–27 rays; pectoral fins 13–15 rays; pelvic fins 5 rays. Body slender, depth 13.5–14 in SL; HL ~4.5 in SL; snout length ~3.7 in HL; eye diameter ~7.5 in HL, equal to interorbital width; pectoral-fin length ~9.8% SL, subequal to lower jaw length; peduncle depth ~3.5% SL. Dorsal and anal fins low and nearly uniform in height, rays not branched; no pelvic fins; caudal fin moderately forked, nearly half HL. No teeth in jaws; no labial ossicles; no olfactory rosette; nostrils close-set; ventrolateral skin fold present. GR 3/22. Scales rudimentary, isolated, beginning above middle of anal fin (only about rear fifth of body scaly); LL scales with branches above and below, ~50 pores above and twice as many below; subocular sensory canal broadly interrupted below eye; lateralis system on head not continuous with lateral line on body. No predorsal bones. Vertebrae 60.

The colour was given by Barnard (1927) as “bluish or greenish above, more or less silvery, a brilliant silver lateral stripe.” However, a colour photograph taken of a freshly collected specimen just south of Algoa Bay by C. McCarthy was violet-grey dorsally, with deep blue mid-dorsal stripe beginning in interorbital area, lavender-grey ventrally with midlateral stripe consisting of numerous series of rectangular

pale blue segments, bordered above by narrow dark blue band; snout violet, with deep blue spot before eyes and spot on snout tip. Attains 18 cm TL.

DISTRIBUTION Southern Africa: Angola and South Africa (Lamberts Bay to False Bay) in southeastern Atlantic, to Mozambique (Maputo Bay) in WIO.

REMARKS Barnard (1927) described this species from specimens from Table Bay and False Bay, South Africa, without giving the number of specimens, date of collection, depth of capture, or designating a holotype. Michael Bougaardt of the South African Museum (SAM) informed us that specimens were collected in False Bay by P Faure in 1907; the largest of two specimens of SAM 12756, 15.6 cm SL, is clearly in best condition and is here designated the lectotype.

GENUS *Protammodytes*

Ida, Sirimontaporn & Monkolprasit 1994

Regarded as the most primitive genus of the family as indicated by a stocky body with relatively few vertebrae, fewer dorsal- and anal-fin rays, pelvic fins present, a complete set of olfactory lobes with 10 lamellae filling the nasal cavity, and ctenoid scales. Other features are scales not embedded in oblique dermal plicae; lateral line simple, without branches or accessory sensory villi; LL pored scales <92; infraorbitals complete; no labial ossicles; no ventrolateral skinfold and plicae; and neural and haemal spines of caudal vertebrae not expanded. At least 3 species, 1 in WIO.

Protammodytes ventrolineatus

Randall & Ida 2014

Linedbelly sandlance

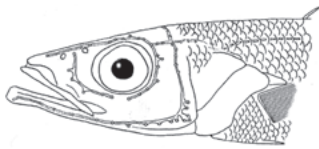
PLATE 159

Protammodytes ventrolineatus Randall & Ida 2014: 2, Figs. 1–2, 5–7 (Saya de Malha Bank).

Dorsal fin 36 rays; anal fin 16 rays; pectoral fin 17 rays; pelvic fin 5 rays. Body depth at dorsal-fin origin 10.9 in SL; HL 3.8 in SL; pelvic fins 3.8 in HL; eyes large, diameter 4.2 in HL; mouth

large and slightly oblique, upper jaw 3.1 in HL, and lower jaw projecting, its tip narrowly rounded. No teeth in jaws. No gap in subocular sensory canal. GR 3/21. LL scales 86; row of 10 scales dorsally on opercle. Vertebrae 53.

Head and upper quarter of body bluish grey, scale edges black; lateral line enclosed as pale blue line; rest of body pale blue-green, streaked with white at margins of somites; snout and lips dark greyish red; caudal fin reddish basally, whitish distally. Preserved specimen yellowish brown dorsally, scales narrowly rimmed in black; broad pale purplish grey zone on sides, abruptly pale tan ventrally below pectoral-fin bases, with series of ~22 oblique black lines on each side of abdomen, and 3 longitudinal black lines midventrally; fins pale yellowish. Attains at least 13.8 cm SL.



Protammodytes ventrolineatus, 14 cm SL, holotype (Saya de Malha Bank).
Source: Randall & Ida 2014



Protammodytes ventrolineatus, 14 cm SL, ventral view showing dark abdominal lines (Saya de Malha Bank). © HA Randall, Bishop Museum

DISTRIBUTION Known only from the holotype from Saya de Malha Bank.

REMARKS Taken by bottom trawl at ~240 m. Collected in the same haul with the holotype of *Bleekeria profunda*.

GLOSSARY

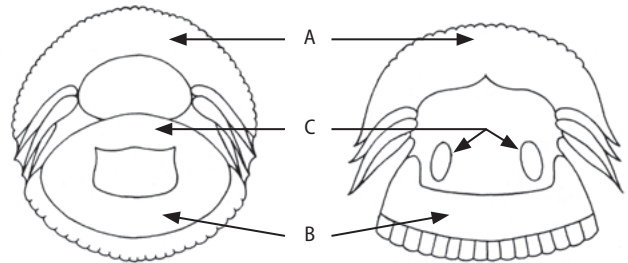
- dermal plicae** – folds in the skin.
- labial ossicles** – small bones associated with the upper 'lips' of certain species of *Bleekeria*.
- somites** – body muscle segments.

FAMILY GOBIESOCIDAE

Clingfishes

John C Briggs

Tiny to small-sized (generally <7 cm SL; one species reaches ~30 cm TL), body shape various, but head almost always depressed. Anterior nostrils always tubular, posterior nostrils usually tubular. Dorsal fin and anal fin small, close to peduncle; no fin spines. Pelvic fins incorporated into a prominent suction disc; parts of ventral surface of disc with small flattened papillae that contribute to its adhesive function, with the number and pattern of papillae varying among genera. Surface of disc denoted as three different regions: anterior portion as region A, posterior portion as region B, and central portion as region C; pelvic disc either 'double,' with small rear disc separated from front portion by free front edge, or disc 'single,' with the two parts fused into one structure. Lateral-line pores well-developed on head but often missing posteriorly. No scales, but body protected by heavy coat of mucus.



Disc regions of a typical double type disc (left), and single type disc (right). A, B and C regions as in text.

Cosmopolitan in tropical to temperate waters; many species in the tropics are commensal with sea urchins and crinoids, and some are known to eat the pinnules (tube feet) of their host. Forty-seven genera and 161 species; all species marine except for ~7 species of *Gobiesox* which inhabit New World freshwater streams. Eleven genera and 17 species in WIO.

KEY TO GENERA

- 1a Gill arches $3\frac{1}{2}$, membranes attached to isthmus 2
 1b Gill arches 3 4
- 2a Pelvic disc double 3
 2b Pelvic disc single *Chorisochismus*



- 3a Anus surrounded by papillae, and nearer anal-fin origin than to pelvic disc; small incisors at front of jaws followed by well-developed canines *Apletodon*
 3b No papillae around anus, and anus nearer rear margin of pelvic disc than to anal-fin origin; jaws with patches of small canines at front, and no incisors *Diplecogaster*
- 4a Gill membranes free from isthmus 5
 4b Gill membranes attached to isthmus 6

- 5a Pelvic disc double *Pherallodus*
 5b Pelvic disc single *Eckloniaichthys*



5a



5b

- 6a Pelvic disc double 7
 6b Pelvic disc single 9

- 7a Dorsal fin and anal fin each with 4 rays *Briggsia*
 7b Dorsal fin 5–7 rays; anal fin 5 or 6 rays 8

- 8a Pectoral fins 16 rays *Lissonanchus*



- 8b Pectoral fins 23 rays *Aspasmodes*

Continued ...

KEY TO GENERA

- 9a Pelvic disc with ventral cavity posteriorly, and with cluster of large papillae in centre *Discotrema*
 9b Pelvic disc entire, with small papillae 10



9a



9b

- 10a Snout short, 3.1–4.2 in HL *Lepadichthys*
 10b Snout long, 1.9–2.3 in HL *Diademichthys*

GENUS *Apletodon* Briggs 1955

Pelvic disc double; anus surrounded by papillae, and nearer anal-fin origin than to pelvic disc; small incisors at front of jaws followed by well-developed canines; gill arches $3\frac{1}{2}$, membranes attached to isthmus. Six species, 1 in WIO.

Apletodon pellegrini (Chabanaud 1925)

Chubby clingfish

PLATE 160

Lepadogaster (Mirbelia) pellegrini Chabanaud 1925: 283 (Senegal, and Cap Blanc, Mauritania, northwestern Africa).

Apletodon pellegrini: Briggs 1955*; Penrith 1969*; Penrith & Penrith 1970; SSF No. 110.1*; Heemstra & Heemstra 2004.

Apletodon knysnaensis Smith 1964: 590, Pls. 93, 96, 97 (Knysna, South Africa); Smith & Smith 1966*.

Dorsal fin 5 or 6 rays; anal fin 5 rays; pectoral fins 22–25 rays; caudal fin 10–12 rays. HL 2.2–2.3 in SL; body depth 4.9–5.2 in SL; pelvic-disc length 3.2–3.5 in SL. Pelvic disc region A with 5 or 6 rows of flattened papillae across width, region B with 7 or 8 rows, and region C with 5 or 6 rows. GR 6/8; upper attachment of gill membrane opposite pectoral-fin rays 3–4.

Colour variable, from whitish to dark red-brown, but usually pinkish. Attains 50 mm TL.



Apletodon pellegrini, 25 mm TL, female ventral view (left); 30 mm TL, dorsal view (right; both South Africa). Source: SSF

DISTRIBUTION Eastern Atlantic (Madeira and Canary Is. to Cape of Good Hope) to southwestern Indian Ocean (Aliwal Shoal, South Africa).

REMARKS Found on reefs; individuals commonly sit under shells. Eggs deposited under shells and guarded by an adult.

GENUS *Aspasmodes* Smith 1957

Pelvic disc double; head not depressed, snout blunt, and lips narrow; both jaws with single series of pointed incisors; gill membranes attached to isthmus. One species.

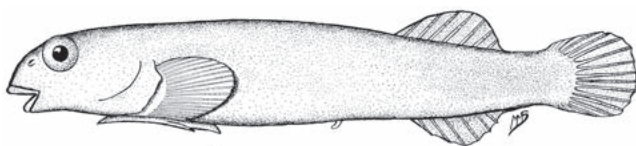
Aspasmodes briggsi Smith 1957

Olive clingfish

Aspasmodes briggsi Smith 1957: 398, Fig. 1 (La Digue, Seychelles); Smith & Smith 1963*.

Diagnosis as for genus. Dorsal fin 7 rays; anal fin 6 rays; pectoral fins 23 rays. Pelvic-disc length 4.4 in SL, surface of disc smooth; anus much closer to rear edge of disc than to anal-fin origin; eye diameter equal to interorbital space, 4 in HL. GR 7 on 2nd arch, minute; upper attachment of gill membrane opposite pectoral-fin ray 3. Skin with minute grooves forming crisscross pattern.

Body olive-brown. Attains at least 25 mm SL.



Aspasmodes briggsi, 20 mm TL (Seychelles). Source: Smith 1957

DISTRIBUTION Known only from the holotype from the Seychelles.

GENUS *Briggsia* Craig & Randall 2009

Pelvic disc double; dorsal fin and anal fin each with 4 rays; both jaws with sandpaper-like teeth in pads at front. One species.

Briggsia hastingsi Craig & Randall 2009

Orange-eye clingfish

PLATE 160

Briggsia hastingsi Craig & Randall 2009: 65, Figs. 1–3 (Rahah Bay, southeastern coast of Oman).

Diagnosis as for genus. Dorsal fin 4 rays; anal fin 4 rays; pectoral fins 23 rays. Pelvic-disc length 3.9 in SL; disc region A with several rows of flattened papillae, region B with 3 rows, and region C with 4 rows; anus about halfway between anal-fin origin and rear edge of disc. No fleshy pad at lower part of pectoral-fin bases. GR 9 on 2nd gill arch.

Body and dorsal part of head reddish grey; numerous blue dots on sides of body except posteriorly; dark purplish brown stripe from upper lip to eyes; eye colour same as adjacent head colour except for bright orange ring around pupil; dorsal and anal fins translucent with indistinct pale spots; paired fins pale; caudal fin with reddish rays and clear membranes, upper and lower rays each with row of pale spots. Attains at least 22 mm SL.



Briggsia hastingsi, 22 mm SL, disc of holotype (Oman). Source: Craig & Randall 2009

DISTRIBUTION Known from the holotype from Oman.

REMARKS Collected at 2 m.

GENUS *Chorisochismus*

Brisout de Barneville 1846

Pelvic disc single; gill arches $3\frac{1}{2}$, membranes attached to isthmus. One species.

Chorisochismus dentex (Pallas 1769)

Rocksucker

PLATE 160

Cyclopterus dentex Pallas 1769: 6, Pl. 1, Figs. 1–4 [no locality given].

Gobiesox gyrinus Valenciennes 1841: Pl. 108, Fig. 1 (South Africa).

Gobiesox fimbriatus Castelnau 1861: 72 (Camps Bay, Cape Town, South Africa).

Athaena fasciata Castelnau 1861: 72 (Green Point, Cape Town, South Africa).

Chorisochismus dentex: Günther 1861; Smith 1949*; Briggs 1955*; SSF No. 110.2*; Heemstra & Heemstra 2004*.

Diagnosis as for genus. Dorsal fin 6–9 rays; anal fin 6 or 7 rays; pectoral fins 23 or 24 rays. Pelvic-disc length 2.8–3.2 in SL; disc region A with 18–25 rows of flattened papillae across its width, region B with 10 or 11 rows, and region C with 19–24 rows. Head relatively large, HL ~2.2 in SL, width 2.3–2.6 in SL; eye diameter 1–1.3 in bony interorbital space, 4.3–5.2 in HL. Upper attachment of gill membrane opposite pectoral-fin rays 8–10.

Body greenish, with brown and pink blotches; pale ventrally. Attains 30 cm TL.



Chorisochismus dentex, 18 cm TL (South Africa). Source: SSF

DISTRIBUTION Southern Africa: Namibia in southeastern Atlantic, to South Africa (northern KwaZulu-Natal) in WIO.

REMARKS Found in tidepools and on rocky reefs, to ~25 m deep. Juveniles feed on crustaceans, and adults on limpets, chitons, sea urchins and gastropods; it levers limpets from rocks by inserting its huge upper teeth under the shell when lifted, and pivoting its body through 180° (Stobbs 1980).

GENUS *Diademichthys* Pfaff 1942

Pelvic disc single, with small papillae; head narrow, with long spatulate snout; mouth small and inferior; both jaws with single row of incisors. One species.

Diademichthys lineatus (Sauvage 1883)

Urchin clingfish

PLATE 161

Crepidogaster lineatum Sauvage 1883: 158 [15] (New Caledonia).

Diademichthys lineatus: Whitley 1950; Briggs 1955*; Randall 1995*.

Diagnosis as for genus. Dorsal fin 13–15 rays; anal fin 12–14 rays; pectoral fins 25 or 26 rays. Pelvic disc region A with 4 rows of papillae across its width, and region B with 5 rows; anus much closer to anal-fin origin than to rear margin of pelvic disc. Head narrow and well depressed; males HL 2.8–3.1 in SL, females HL 2.4–2.5 in SL; snout of males long, 2.2–2.3 in HL; snout of females longer, 1.9–2 in HL; eye diameter of males 0.4–0.7 in bony interorbital space, that of females ~0.3. Upper attachment of gill membrane opposite pectoral-fin rays 8–10.

Body reddish to dark brown, with 4 longitudinal white or pale yellow stripes: one mid-dorsally, one on each side, and one ventrally from pelvic disc to anal-fin base. Attains 56 mm SL.



Diademichthys lineatus, 43 mm SL (New Caledonia).

© JE Randall, Bishop Museum

DISTRIBUTION Indo-Pacific (widespread). WIO: Gulf of Oman and Mascarenes; elsewhere to Indonesia, Ryukyu Is., New Guinea, northeastern Australia, New Caledonia, Fiji and Tonga.

REMARKS Found at 3–20 m. Commensal with *Diadema* long-spined sea urchins and branching corals.

GENUS *Diplecogaster* Fraser-Brunner 1938

Pelvic disc double; no papillae around anus, and anus nearer rear margin of pelvic disc than to anal-fin origin; jaws with patches of small canines at front, but no incisors; gill arches $3\frac{1}{2}$, membranes attached to isthmus. Four species, 1 in WIO.

Diplecogaster megalops Briggs 1955

Bigeye clingfish

PLATE 161

Diplecogaster megalops Briggs 1955: 31, Fig. 84 (Durban, KwaZulu-Natal, South Africa); Smith 1961, 1964*; SFSA No. 1087a; Penrith & Penrith 1970; SSF No. 110.3*.

Dorsal fin 4–6 rays; anal fin 3–5 rays; pectoral fins 23–25 rays. Pelvic-disc length 3.2–3.6 in SL; disc with 3–5 rows of flattened papillae across region A, 5 rows across region B, and 3 or 4 rows across region C. HL 2.6–2.8 in SL; eye diameter 0.5–0.8 in bony interorbital space, 3–3.5 in HL. GR 6 or 7.

Body blotched dark and pale pink; pink ocellus with pale centre behind eyes; pectoral-fin membranes pink; anal-fin pale pink; dorsal, anal and caudal fins with dark pink bar midway on membranes. Attains 34 mm SL.



Diplecogaster megalops, 25 mm SL (South Africa). Source: SSF

DISTRIBUTION Endemic to South Africa, from Saldanha Bay in southeastern Atlantic, to KwaZulu-Natal in WIO.

GENUS *Discotrema* Briggs 1976

Pelvic disc single, with deep ventral cavity posteriorly, and cluster of enlarged papillae in centre; head slender, HL 3–3.5 in SL; snout short, rounded, with steep profile; both jaws with single row of narrow incisors with rounded tips. Three species, 1 likely in WIO.

Discotrema crinophilum Briggs 1976

Crinoid clingfish

PLATE 161

Discotrema crinophila Briggs 1976: 340, Figs. 1–4 (on a crinoid at Benga Lagoon, Fiji).

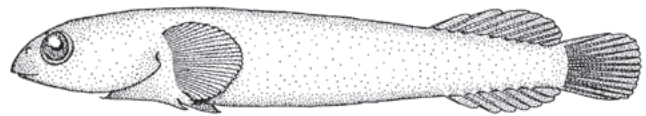
Discotrema echinophila [nomen nudum]: Randall *et al.* 1990*; Debelius 1993*.

Discotrema crinophilum: Craig & Randall 2008.

Dorsal fin 8 or 9 rays; anal fin 7 or 8 rays; pectoral fins 25–27 rays. Pelvic disc relatively large, its length 4.2–4.9 in SL; disc region A with 11 or 12 rows of papillae across its width, and region B with 3–6 rows; anus much closer to anal-fin

origin than to rear margin of pelvic disc. Snout rounded and short, its length 2.8–3.5 in HL; eye diameter 0.8–1 in bony interorbital space, 3.1–3.4 in HL. Upper attachment of gill membrane opposite pectoral-fin rays 8–10.

Two distinct colour morphs: dark brown body with small white spots, and a total of 3 pale longitudinal stripes: one along mid-dorsum, and one along each side from snout to caudal fin; or body black or reddish, with broad white or gold stripe along each side continuous over top of snout, and no mid-dorsal stripe. Attains ~26 mm SL.



Discotrema crinophilum, 22 mm SL, holotype. Source: Briggs 1976

DISTRIBUTION Indo-Pacific: presumed likely to occur in WIO; widespread in eastern Indian Ocean and western Pacific (Indonesia to Ryukyu Is., New Guinea, Australia, New Caledonia and Fiji).

REMARKS Found on protected coastal reefs, from shallow reef flats and along slopes and walls, to ~20 m deep. Lives among arms of crinoids as a commensal, particularly *Anneissia bennettii*.

GENUS *Eckloniaichthys* Smith 1943

Genus diagnosis as for the single species.

Eckloniaichthys scylliorhiniceps Smith 1943

Weedsucker

PLATE 161

Eckloniaichthys scylliorhiniceps Smith 1943: 67, Fig. 1 (tidepool west of East London, Eastern Cape, South Africa); Briggs 1955*; Smith 1964*; SFSA No. 1087*; Smith & Smith 1966*; Penrith 1969*; SSF No. 110.4*.

Dorsal fin 5 or 6 rays; anal fin 5 or 6 rays; pectoral fins 18 or 19 rays; caudal fin 10–12 rays. Pelvic disc single, its length 6.5–6.7 in SL; disc region A with only 1 group of papillae at centre; region B with 4 or 5 rows of flattened papillae across its width; region C with 2 rows of papillae at centre. HL 3.6–4 in SL; head width 5.7–6.2 in SL. GR 4 or 5; gill membranes free from isthmus, upper attachment opposite pectoral-fin ray 2.

Body usually green or dark maroon-brown to match habitat. Attains 35 mm TL.



Eckloniaichthys scylliorhinceps, 20 mm TL (South Africa). Source: SSF

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to South Africa (Kei River mouth) in WIO.

REMARKS Lives on *Ecklonia* kelp but may swim to other seaweeds when disturbed.

GENUS *Lepadichthys* Waite 1904

Pelvic disc single, with small papillae; head slender, HL 2.6–3.2 in SL; snout short and rounded; upper jaw with row of compressed incisors with reverse points, but no teeth at tip where the premaxillaries fail to meet; lower jaw teeth variable, some conical and some incisor-like; dorsal fin 9–17 rays; anal fin 8–15 rays; pectoral fins 25–31 rays. Twelve species, at least 7 in WIO.

KEY TO SPECIES

[Note: Add 1 to count of dorsal-fin rays if the fin is not dissected.]

- | | | |
|----|--|-------------------------|
| 1a | Dorsal fin 14–17 rays; anal fin 11–15 rays | 2 |
| 1b | Dorsal fin 9–13 rays; anal fin 8–11 rays | 3 |
| 2a | Only dorsal fin joined to caudal fin; dorsal fin 14 rays;
GR 6 on 2nd arch | <i>L. ctenion</i> |
| 2b | Both dorsal fin and anal fin joined to caudal fin; dorsal fin
15–17 rays; GR 8–14 on 2nd arch | <i>L. erythraeus</i> |
| 3a | Upper attachment of gill membrane opposite
pectoral-fin rays 8–9 | 4 |
| 3b | Upper attachment of gill membrane opposite
pectoral-fin rays 12–15 | 5 |
| 4a | Postdorsal–caudal distance 2.7–2.8 in dorsal-fin length;
GR 16 on 2nd arch | <i>L. coccinotaenia</i> |
| 4b | Postdorsal–caudal distance ~1.3 in dorsal-fin length;
GR 8 on 2nd arch | <i>L. caritus</i> |
| 5a | Dorsal fin 12 rays; anal fin 10 rays; pelvic-disc length
~8.2 in SL | <i>L. bolini</i> |
| 5b | Dorsal fin 9–11 rays; anal fin 8 or 9 rays; pelvic-disc length
5.1–5.7 in SL | 6 |

Continued ...

KEY TO SPECIES

- | | | |
|----|--|--------------------|
| 6a | Anus much closer to anal-fin origin than to rear margin of
pelvic disc; pelvic-disc length ~5.7 in SL; GR 8 on 2nd arch,
sharp | <i>L. lineatus</i> |
| 6b | Anus about halfway between anal-fin origin and rear margin
of pelvic disc; pelvic-disc length 5.1–5.3 in SL; GR 5 on
2nd arch, shallow | <i>L. minor</i> |

Lepadichthys bolini Briggs 1962

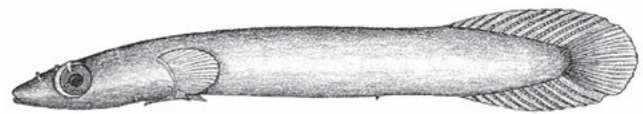
Gracile clingfish

PLATE 162

Lepadichthys bolini Briggs 1962: 424, Fig. 1 (Palikulo Bay, Espiritu Santo I., Vanuatu); Briggs 1969; Winterbottom *et al.* 1989*.

Dorsal fin 12 rays; anal fin 10 rays; pectoral fins 30 rays. Both dorsal fin and anal fin continuous with caudal fin; anus much closer to anal-fin origin than to rear margin of pelvic disc; upper attachment of axial dermal flap opposite pectoral-fin ray 18. Pelvic disc with apparently 1 or 2 rows of papillae across region A, and 3 rows across region B. Body elongate and depressed anteriorly, depth 9.2 in SL; head narrow and depressed, HL ~3.8 in SL; snout profile rounded and short, ~3.6 in HL; eye diameter ~0.8 in bony interorbital space, ~4 in HL; peduncle short, its depth ~0.7 in its length. Anterior nostrils long, tubular, without dermal flap. Both jaws with single row of teeth, but teeth in upper jaw lacking prominent reverse tips as found in other members of the genus; incisors on lower jaw without reverse tips. GR 5 on 2nd arch, shallow and blunt; upper attachment of gill membrane opposite pectoral-fin ray 15.

Specimen illustrated by Winterbottom *et al.* (1989: Fig. 63) appears to have a total of at least 3 pale longitudinal stripes: one mid-dorsally and one on each side. Attains 30 mm SL.



Lepadichthys bolini, 30 mm TL, holotype (Vanuatu). Source: Briggs 1962

DISTRIBUTION Indo-Pacific (widespread). WIO: Seychelles and Chagos; elsewhere to Indonesia, Philippines, Vietnam, New Guinea, Vanuatu and Fiji.

REMARKS Collected at Chagos from coral heads on sand in shallow protected bays, in 1–4 m.

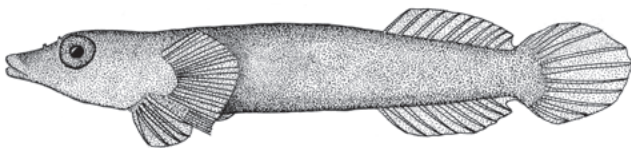
Lepadichthys caritus Briggs 1969

Pale clingfish

Lepadichthys caritus Briggs 1969: 464, Fig. 1 (north tip of Mahé, Seychelles); SSF No. 110.5*.

Dorsal fin 10 or 11 rays; anal fin 8 or 9 rays; pectoral fins 25–27 rays. Dorsal and anal fins of medium length; anus much closer to anal-fin origin than to rear margin of pelvic disc; upper attachment of axial dermal flap opposite pectoral-fin ray 13. Body depth 5.7–6.8 in SL; head narrow and depressed, HL 3.2 in ~SL; snout rounded and short, 3–3.2 in HL; eye diameter 0.6–0.7 in bony interorbital space, 3.5–3.7 in HL; peduncle short, its depth 0.8–1 in its length. Anterior nostrils long and tubular, without dermal flap. Some incisors in lower jaw with slightly reversed tips. Pelvic disc medium, its length 5.8–6 in SL; disc region A with 3 or 4 rows of papillae across its width, and region B with 5 rows. GR 8 on 2nd arch, sharp; upper attachment of gill membrane opposite pectoral-fin rays 8–9.

Preserved specimens pale and translucent, with no evident pigment. Attains 29 mm SL.



Lepadichthys caritus, 27 mm SL (South Africa). Source: SSF

DISTRIBUTION Indo-Pacific. WIO: Mozambique, South Africa (Sodwana Bay) and Seychelles; elsewhere to New Guinea and Lord Howe I.

Lepadichthys coccinotaenia Regan 1921

Eyestripe clingfish

PLATE 162

Lepadichthys coccinotaenia Regan 1921: 2 (Durban, KwaZulu-Natal, South Africa); Barnard 1927; Briggs 1955; SFSA No. 1088*; SSF No. 110.6*; Manilo & Bogorodsky 2003.

Dorsal fin 12 or 13 rays; anal fin 10 rays; pectoral fins 28 rays. Dorsal and anal fins of medium length; anus closer to rear margin of pelvic disc than to anal-fin origin; upper attachment of axial dermal flap opposite pectoral-fin rays 12–14. Body depth 5.8–6.3 in SL; head narrow and moderately depressed, HL 2.7–2.9 in SL; snout rounded and of medium length, 3–3.4 in HL; eye diameter 0.8 in bony interorbital space,

4.4–4.5 in HL; peduncle short, its depth 0.7–0.8 in its length. Anterior nostrils with minute dermal flap on rear margin. Pelvic disc small, its length 5.4–5.5 in SL; disc region A with 4 rows of papillae across its width, and region B with 6 rows. GR 16 on 2nd arch, narrow and pointed; upper attachment of gill membrane opposite pectoral-fin rays 8–9.

Body brown or greenish, with prominent dark stripe from snout through eyes and to back of head. Attains ~45 mm SL.



Lepadichthys coccinotaenia, 30 mm SL (South Africa). Source: SSF

DISTRIBUTION WIO: Pakistan, Tanzania to South Africa (Aliwal Shoal) and Madagascar.

Lepadichthys ctenion Briggs & Link 1963

Orange clingfish

Lepadichthys ctenion Briggs & Link 1963: 101, Fig. 1 (west of Karachi, Pakistan); Manilo & Bogorodsky 2003.

Dorsal fin 14 rays; anal fin 11 or 12 rays; pectoral fins 28 or 29 rays. Only dorsal fin joined to caudal fin (anal fin free); anus closer to anal-fin origin than to rear margin of pelvic disc; upper attachment of axial dermal flap opposite pectoral-fin rays 11–12. Body depth 7.3–7.9 in SL; peduncle short, its depth ~0.8 in its length; head narrow and depressed, HL 2.8–3 in SL; snout short but slightly protruding, its length 3.2–3.3 in HL; eye diameter 0.9–1 in bony interorbital space, 5–5.8 in HL. Pelvic-disc length 5.3–5.5 in SL; disc region A with 1–3 rows of papillae across its width, and region B with 6 or 7 rows. GR 6 on 2nd arch, shallow and pointed; upper attachment of gill membrane opposite pectoral-fin rays 6–7.

Body bright orange, with dark red cheeks and snout. Attains 40 mm SL.



Lepadichthys ctenion, 35 mm SL, holotype (Pakistan). Source: Briggs & Link 1963

DISTRIBUTION WIO: Arabian Sea (Pakistan).

Lepadichthys erythraeus Briggs & Link 1963

Papillate clingfish

PLATE 162

Lepadichthys erythraeus Briggs & Link 1963: 102, Fig. 2 (Hurghada, Egypt, Red Sea); Craig *et al.* 2015.

Dorsal fin 14 rays; anal fin 13 rays; pectoral fins 28 rays. Both dorsal fin and anal fin joined to caudal fin; anus much closer to anal-fin origin than to rear margin of pelvic disc; upper attachment of axial dermal flap opposite pectoral-fin ray 12. Body depth 7.6 in SL; head narrow and depressed, HL 2.9 in SL; snout short but produced, 3.2 in HL; eye diameter 0.8 in bony interorbital space, 4.7 in HL; peduncle short, its depth 0.7 in its length. Pelvic disc small, its length 6.3 in SL; disc region A with 1 or 2 rows of papillae across its width, and region B with 8 rows. GR 8 on 2nd arch, slender and pointed; upper attachment of gill membrane opposite pectoral-fin ray 9.

Brown with broad, dark stripe through eye. Attains 42 mm SL.

*Lepadichthys erythraeus*, 37 mm SL, holotype (Egypt).

Source: Briggs & Link 1963

DISTRIBUTION WIO: endemic to the Red Sea.*Lepadichthys lineatus* Briggs 1966

Striped clingfish

PLATE 162

Lepadichthys lineatus Briggs 1966: 37, Fig. 1 (Eilat, Israel, Gulf of Aqaba, Red Sea); SSF No. 110.7*; Goren & Dor 1994; Randall 1995*; Craig *et al.* 2015.

Dorsal fin 11 rays; anal fin 8 or 9 rays; pectoral fins 27 rays. Dorsal fin and anal fin both separate from caudal fin; anus much closer to anal-fin origin than to rear margin of pelvic disc; upper attachment of axial dermal flap opposite pectoral-fin ray 14. Body rounded but depressed anteriorly, depth ~5.8 in SL; head narrow and depressed, HL ~2.8 in SL; snout short and rounded, ~3.2 in HL; eye diameter ~0.8 in bony interorbital space, ~4 in HL; peduncle short, its depth ~0.8 in its length. Anterior nostrils without dermal flap. Pelvic disc medium, its length ~5.7 in SL; disc region A with 4 rows of papillae across its width, and region B with 5 rows. GR 8 on 2nd arch, sharp; upper attachment of gill membrane opposite pectoral-fin ray 12.

Body reddish brown, with scattered small white or pale spots between several white or yellowish orange stripes: mid-dorsally from snout tip to dorsal-fin origin; on upper sides, through upper part of eye to upper part of caudal-fin base; on lower sides, from snout through lower part of eye to just in front of peduncle; on each side ventrally, from underside of chin to anterior part of pelvic disc. Attains ~33 mm SL.

*Lepadichthys lineatus*, 35 mm TL (South Africa). Source: SSF

DISTRIBUTION Indo-Pacific (widespread). WIO: Red Sea, Oman, Mozambique, South Africa (Aliwal Shoal) and Seychelles; elsewhere to Myanmar, Indonesia, Ryukyu Is., New Guinea and Fiji.

REMARKS Found at 5–25 m. Lives on crinoids, particularly *Lamprometra palmate* and *Capillaster multiradiatus*, and feeds on the pinnules of its host. Its head-pore structure is similar to that of *Discotrema crinophilum*, but other important characters support its retention in *Lepadichthys*.

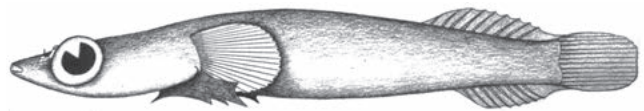
Lepadichthys minor Briggs 1955

Minor clingfish

Lepadichthys minor Briggs 1955: 137, Fig. 113 (Muaras Reef, Sulawesi, Indonesia); Fricke *et al.* 2009.

Dorsal fin 9 or 10 rays; anal fin 8 rays; pectoral fins 27 or 28 rays. Pelvic-disc length 5.1–5.3 in SL. GR 5 on 2nd arch, blunt and knob-like; upper attachment of gill membrane opposite pectoral-fin rays 12–15.

Live colour unknown. Attains 22 mm SL.

*Lepadichthys minor*. Source: Briggs 1955

DISTRIBUTION Indo-Pacific. WIO: Réunion; elsewhere to Indonesia, New Caledonia, Tonga and Cook Is.

REMARKS Found in tidepools and on outer-reef flats.

GENUS *Lissonanchus* Smith 1966

Head broad and depressed, snout pointed; both jaws with cluster of stout conical teeth at front. One species.

Lissonanchus lusherii Smith 1966

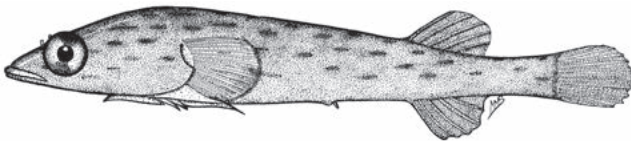
Streaky clingfish

PLATE 162

Lissonanchus lusherii Smith 1966: 642, Fig. 1, Pl. 19 (reef at Ponte Zavora, southern Mozambique); SSF No. 110.8*.

Diagnosis as for genus. Dorsal fin 5 rays; anal fin 5 rays; pectoral fins 16 rays. Pectoral-fin base with small fleshy pad. Pelvic-disc length 3.8 in SL; anus located slightly closer to anal-fin origin than to rear margin of pelvic disc; eye diameter subequal to interorbital space, 4.4 in HL. Pelvic disc region A with 4 or 5 rows of papillae across its width, and region C with 4 rows. Gill rakers rudimentary; upper attachment of gill membrane opposite pectoral-fin ray 2 or 3.

Body bright green, with several dark parallel streaks along length. Attains 21 mm SL.



Lissonanchus lusherii, 25 mm TL, holotype (S Mozambique). Source: Smith 1966

DISTRIBUTION Known only from two type specimens from Mozambique.

GENUS *Pherallodus* Briggs 1955

Pelvic disc double; gill arches 3, membranes united and free from isthmus. Two species, 1 in WIO.

Pherallodus smithi Briggs 1955

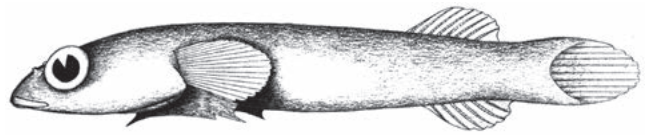
Mini clingfish

Pherallodus smithi Briggs 1955: 44, Figs. 24, 86 (Durban, KwaZulu-Natal, South Africa); Smith 1964*; SSF No. 110.9*.

Dorsal fin 8 rays; anal fin 6 rays; pectoral fins 23 rays. Pelvic-disc length 3.7 in SL; disc region A with 4 rows of papillae across its width, region B with 4 rows, and region C with 2 rows. Upper attachment of axial dermal flap opposite

pectoral-fin ray 5. Eye diameter 0.8 in interorbital space, 3.9 in HL. Posterior nostrils located directly above front edge of eyes. Incisors at sides of jaws with rounded tips. Upper attachment of gill membrane opposite pectoral-fin ray 5.

Live colour unknown. Attains at least 19 mm SL.



Pherallodus smithi, 20 mm TL, holotype (South Africa). Source: Briggs 1955

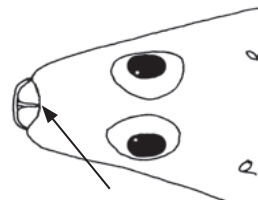
DISTRIBUTION Known only from the holotype from South Africa.

FAMILY CALLIONYMIDAE

Dragonets

Ronald Fricke and M Eric Anderson

Small-sized (to <35 cm TL), body elongate and moderately depressed; head usually broad and depressed, typically triangular when viewed from above; upper jaw protrusile. Two separate dorsal fins: 1st with spines, 2nd with soft rays; anal fin with rays only; last dorsal- and anal-fin rays divided to base but counted as single ray. Pelvic fins large, jugular, widely separated, with 1 spine, 5 rays. Jaws with villiform teeth; no teeth on palate. Preopercle with stout spine; no spines on opercle and subopercle. Single nostril on each side of snout. Gill opening restricted to small dorsal or sub-lateral pore. Gill rakers few or absent. Lateral line present. No scales. Vertebrae 20–23.



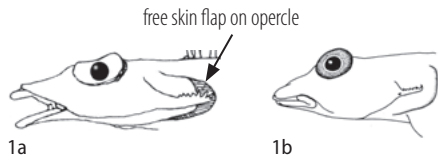
Rear symphysis of upper lip as starting point for measuring SL, TL, HL, and other callionymid lengths (e.g., predorsal, preanal and preorbital).

Adults benthic, from near shore to ~550 m in WIO, elsewhere to ~900 m deep; eggs, larvae and transforming larvae are planktonic. Found on sandy and muddy substrates, among seagrasses, in tidepools and surf zone, and on coral reefs. Typically colourful and commonly sexually dimorphic. Some species are sold in the aquarium trade, but usually not of commercial importance, although may be used for fishmeal in some areas.

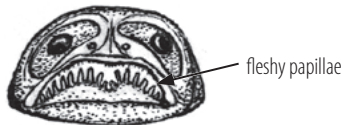
Occur in warm-temperate to temperate waters of all oceans. Eleven genera and at least 190 species; 5 genera and 39 species in WIO. Indo-Pacific species revised by Fricke (1983).

KEY TO GENERA

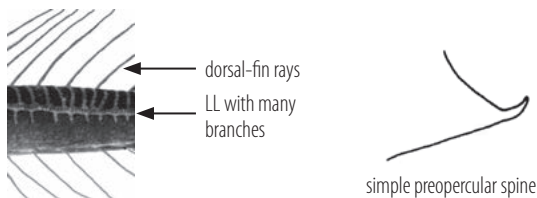
- 1a Opercle with free flap of skin 2
 1b Opercle without free flap of skin 3



- 2a Body with lateral fold of skin below lateral line; lower lip without fleshy papillae; anal-fin rays unbranched *Diplogrammus*
 2b Body without lateral fold of skin below lateral line; dorsal margin of lower lip with row of erect fleshy papillae; anal-fin rays branched *Draculo*



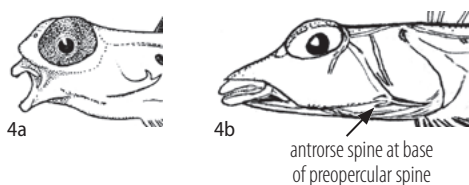
- 3a Lateral line with numerous long branches above and below; preopercular spine simple, without accessory spines *Paracallionymus*
 3b Lateral line unbranched in most species; preopercular spine with 1 or more accessory spines 4



- 3a Lateral line with numerous long branches above and below; preopercular spine simple, without accessory spines *Paracallionymus*
 3b Lateral line unbranched in most species; preopercular spine with 1 or more accessory spines 4



- 4a Snout shorter than eye diameter; dorsal-fin rays branched (in fish >3 cm TL); gill openings sub-lateral; no antrorse spine at base of preopercular spine *Synchiropus*
 4b Snout subequal to or longer than eye diameter; dorsal-fin rays unbranched; gill openings dorsal; antrorse spine present at base of preopercular spine *Callionymus*

GENUS *Callionymus* Linnaeus 1758

Body elongate, depressed; snout subequal to or longer than eye diameter; no free flap of skin on opercle; preopercular spine with antrorse spine at base; dorsal- and anal-fin rays unbranched. Genus reviewed by Fricke (1983). About 119 species, most in tropical Indo-Pacific, but 7 species in temperate North Atlantic; 24 species in WIO.

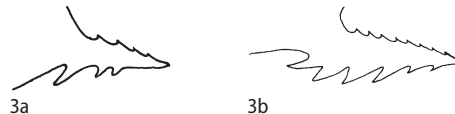
KEY TO SPECIES

- 1a Both upper and lower edges of preopercular spine with antrorse spine or serrae 2
 1b Only upper edge of preopercular spine with large curved point or small antrorse serrae (1 or 2 antrorse spines may also be present at base of spine) 4



- 2a Snout densely covered with spines *C. spiniceps*
 2b Snout without spines (except small preorbital spine present in some species) 3

- 3a Supraorbital tentacle present; preopercular spine with 1–3 curved points on lower edge, plus antrorse spine at base *C. muscatensis*
 3b No supraorbital tentacle; preopercular spine with 4–9 curved points on lower edge, plus antrorse spine at base *C. oxycephalus*



- 4a Preopercular spine with small antrorse serrae on upper edge 5
 4b Preopercular spine with large curved points on upper edge (and rarely with 1 additional antrorse serra) 14



- 5a Second dorsal fin 8 rays, last divided to base 6
 5b Second dorsal fin 9 rays, last divided to base 9

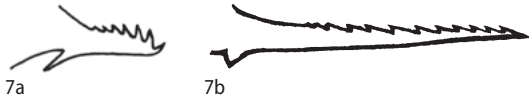
- 6a Anal fin 7 rays, last divided to base 7
 6b Anal fin 8 or 9 rays, last divided to base 8

- 7a Tip of preopercular spine curved upwards, and upper edge of spine with 5 or 6 small antrorse serrae *C. flavus*

Continued ...

KEY TO SPECIES

- 7b Tip of preopercular spine straight, and upper edge of spine with 8–15 small antrorse serrae *C. delicatulus*



- 8a First spine of dorsal fin distinctly elongate, filamentous; anal fin black distally *C. margaretae*

- 8b First spine of dorsal fin not distinctly elongate; anal fin pale *C. tenuis*

- 9a Anal fin 8 rays, last divided to base; males with 1st spine of dorsal fin connected to 2nd spine 10

- 9b Anal fin 9 rays, last divided to base; males with 1st spine of dorsal fin separate from 2nd spine *C. filamentosus*

- 10a First dorsal-fin spine with long filament 11

- 10b First dorsal-fin spine without filament 13

- 11a Lower margin of caudal fin black 12

- 11b Lower margin of caudal fin pale *C. aagilis*

- 12a Dorsal fin with black blotch near tip of 3rd spine; preopercular spine with 6–12 small antrorse serrae on upper edge *C. gardineri* [males]

- 12b No black blotch on 3rd spine of dorsal fin; preopercular spine with 3–6 small antrorse serrae on upper edge *C. margaretae*



- 13a Anal fin with black bar distally *C. persicus*

- 13b No black bar on anal fin *C. gardineri* [females]

- 14a Dorsal fin 3 spines; jaws extremely protrusile, forming broad tube when protruded *C. hindsii*

- 14b Dorsal fin 4 spines; jaws moderately protrusile, narrow when protruded 15

- 15a Anal fin 7 rays, last divided to base *C. stigmatopareius*

- 15b Anal fin 8 or 9 rays, last divided to base 16

- 16a Preopercular spine with small antrorse barb near tip, plus 1 or 2 large curved points 17

- 16b Preopercular spine with ≥1 large curved points but no antrorse barb near tip 23



- 17a Caudal-fin margin convex or slightly pointed, middle 1 or 2 rays with filaments 18

- 17b Caudal-fin margin convex, without filaments 20

- 18a Preopercular spine with 2 curved points on upper edge in addition to small antrorse barb *C. bentuviai*

- 18b Preopercular spine with 1 curved point on upper edge in addition to small antrorse barb 19



- 19a Pectoral fins 17 rays; preopercular spine slender, distance between the two dorsal points greater than length of the longest point; pelvic fins dark, with black blotch at base of 2nd ray; 1st dorsal fin of males with black blotch at base of 1st to 4th membranes; 4 dark oblique streaks on upper half of caudal fin *C. omanensis* [deep water]

- 19b Pectoral fins 18–20 rays; preopercular spine stout, distance between the two dorsal points less than length of the longest point; pelvic fins pale with a few dark spots; 1st dorsal fin of males with black blotch at base of 2nd and 3rd membranes; upper half of caudal fin pale with a few dark spots *C. profundus* [deep water]

- 20a Second dorsal fin with vertical black streaks 21

- 20b Second dorsal fin with horizontal rows of white and dark blotches *C. africanus* [males]

- 21a First dorsal fin with black blotch on 1st or 2nd–3rd membranes; cheeks pale *C. kotthausi*

- 21b First dorsal fin with black blotch only on 3rd membrane; cheeks with spots or suborbital dark streak 22

- 22a Suborbital dark streak present; anal fin black distally *C. africanus* [females]

- 22b Suborbital region without dark streak, but with many brown blotches encircled with darker brown *C. regani*

- 23a Preopercular spine with 1 or 2 curved points on upper edge 24

- 23b Preopercular spine with 3–7 curved points on upper edge 25



- 24a Tip of preopercular spine long, curved, and spine not curved upwards at base *C. carebares*

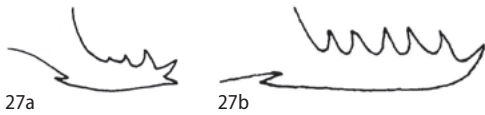


- 24b Tip of preopercular spine short, straight, and spine curved upwards from base *C. mascarenius*

Continued...

KEY TO SPECIES

- 25a Caudal fin elongate, middle 2 rays with filaments *C. cooperi*
 25b Caudal-fin margin convex, without filaments 26
- 26a Second spine of dorsal fin longer than 1st spine (both spines may be filamentous in males) *C. erythraeus*
 26b Second spine of dorsal fin shorter than 1st spine 27
- 27a Preopercular spine strongly curved upwards at base; males with white-edged black blotch on rear of 1st dorsal fin *C. mascarenus*
 27b Preopercular spine only slightly curved upwards at base; no black blotch on rear of 1st dorsal fin *C. marleyi*

*Callionymus aagilis* Fricke 1999

Slow dragonet

PLATE 163

Callionymus aagilis Fricke 1999: 491, Fig. 9 (Réunion, Mascarenes);
 Fricke 2002; Fricke *et al.* 2009; Pinault *et al.* 2014.

Dorsal fins 4 spines (1st spine filamentous in males), 9 rays; anal fin 8 rays; pectoral fins 21 rays; caudal fin 10 rays, middle 2 rays of males elongate but not filamentous. Lateral line with 3 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 26%, body depth 10%, predorsal length 30%, and preanal length 52%. Percentage HL: eye diameter 34%, snout length 42%. Preopercular spine with 5 or 6 points (serrae) on upper edge and antrorse spine at base.

Body pale brown dorsally, cream ventrally, with midlateral row of dark brown blotches; dorsum and head with dark

brown saddles and numerous small white spots; cheeks and rear of head with small dusky spots; 1st dorsal fin of males dark grey, with several narrow wavy white lines; caudal fin with vertical rows of dark spots at centre. Attains at least 22.5 cm SL.

DISTRIBUTION WIO: Réunion and Mauritius.

Callionymus africanus (Kotthaus 1977)

African deepwater dragonet

Diplogrammus africanus Kotthaus 1977: 38, Figs. 421–424 (northeast of Mombasa, Kenya) [in part].

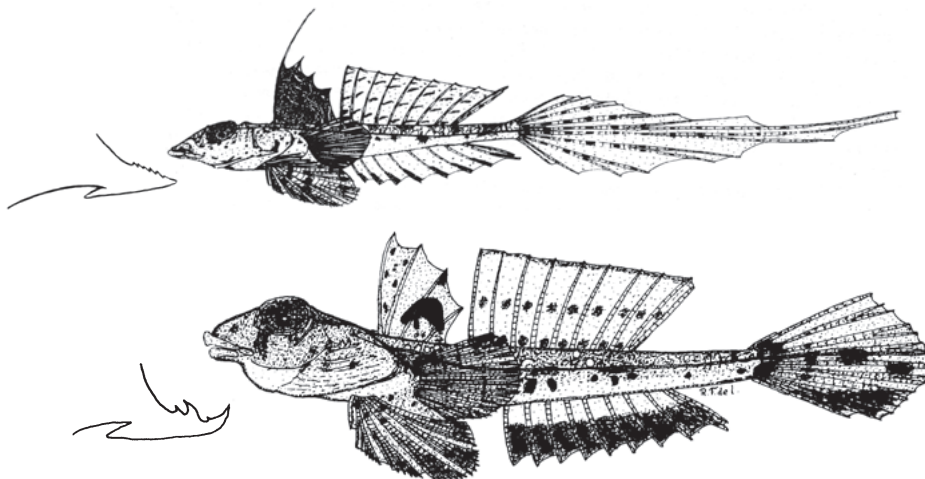
Callionymus africanus: Fricke 1981*, 1983*, 1988*, 2002; Manilo & Bogorodsky 2003; Fricke *et al.* 2014.

Dorsal fins 4 spines (none filamentous), 9 rays; anal fin 9 rays; pectoral fins 20–22 rays; caudal fin 10 rays, middle 2 rays of males with short filaments. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 24–26%, body depth 8–13%, predorsal length 31–38%, and preanal length 45–47%. Percentage HL: eye diameter 45–48%, snout length 30–32%. Preopercular spine with 2 curved points and 1 serra on upper edge, and antrorse spine at base.

Body yellow or brown dorsally, cream ventrally, with midlateral row of paired dark brown blotches; dorsum and head with pale spots bordered with dark brown; cheeks and rear of head with dusky spots; 1st dorsal fin translucent, base of 3rd membrane with large black blotch surrounded by white; upper part of caudal fin with dusky blotches, lower part with oblique dark bar. Attains 13 cm TL.

DISTRIBUTION WIO: Somalia, Kenya, Tanzania, and a seamount of Chain Ridge (06°58' N, 52°05' E).

REMARKS Found on soft bottom, at 124–220 m.



Callionymus aagilis, 11 cm SL, preopercular spine inset (Réunion).
 Source: Fricke 1999

Callionymus africanus, 83 mm SL, female, preopercular spine inset (Somalia). Source: Fricke 1983

Callionymus bentuviai Fricke 1981

Ben-Tuvia's deepwater dragonet

Diplogrammus africanus Kotthaus 1977: 38, Figs. 421–424 (southern Red Sea) [in part].

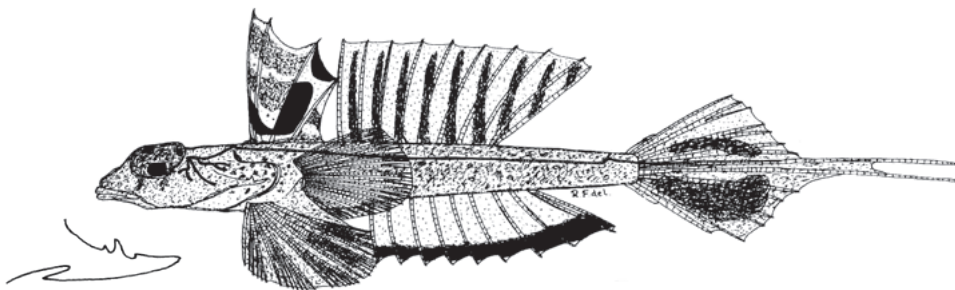
Callionymus bentuviai Fricke 1981: 366, Fig. 12 (Eritrea, Red Sea); Fricke 1983*, 1988*, 2002; Baranes & Golani 1993*; Fricke *et al.* 2014.

Dorsal fins 4 spines (none filamentous), 9 rays; anal fin 9 rays; pectoral fins 19–22 rays; caudal fin 8–10 rays, middle 2 rays with long filaments in males, with short filaments in females. Lateral line with 4 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 25–28%, body depth 8–11%, predorsal length 28–33%, and preanal length 51–55%. Percentage HL: eye diameter 35–47%, snout length 20–25%. Preopercular spine with 3 points (2 curved, 1 serra) on upper edge and antrorse spine at base.

Body dark brown dorsally, cream ventrally, with a few dark spots dorsally and on sides; cheeks and pectoral-fin bases with numerous dark blotches; 1st dorsal fin translucent, with large black blotch surrounded by white on 3rd membrane, with ventral branch of blotch reaching to 1st membrane; 2nd dorsal fin of males with vertical dusky streaks; upper part of caudal fin with narrow oblique band, lower part with broad oblique dark bar. Attains 13 cm TL.

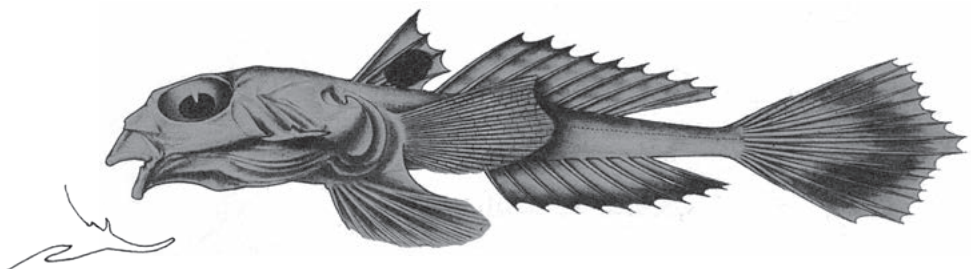
DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Collected from soft bottom, in 70–85 m.



Callionymus bentuviai, 85 mm SL, preopercular spine inset (Eritrea). Source: Fricke 1983

Callionymus carebares, ~13 cm TL, female holotype, preopercular spine inset (SE India). Source: Alcock 1892



Callionymus carebares Alcock 1890

Indian deepwater dragonet

PLATE 163

Callionymus carebares Alcock 1890: 209, Pl. 8, Fig. 8 (off Chennai, India); Alcock 1899*; Fricke 1981*, 1983*, 1988*, 2000; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003.

Bathycallionymus carebares: Nakabo 1982.

Dorsal fins 4 spines (none filamentous), 9 rays; anal fin 9 rays; pectoral fins 19–23 rays; caudal fin 10 rays, and middle rays of males with short filaments. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 28–37%, body depth 12–15%, predorsal length 31–38%, and preanal length 50–59%. Percentage HL: eye diameter 29–38%, snout length 21–24%. Preopercular spine with 1 or 2 curved points on upper edge, main tip long and curved, and antrorse spine at base.

Body dark grey or brown above, cream ventrally, with midlateral row of paired or triple dark brown blotches; males with dusky spots on cheeks; 1st dorsal fin of males plain dark grey, fin of females with large black blotch at base of 2nd and 3rd membranes; caudal fin of males dusky distally, fin of females with few dusky spots and streaks on upper part and oblique dark bar on lower part. Attains 16 cm TL.

DISTRIBUTION WIO: Mozambique, Gulf of Aden, Gulf of Oman to India; elsewhere to Bay of Bengal (Andhra Pradesh coast of India).

REMARKS Found on soft bottom, at 98–330 m.

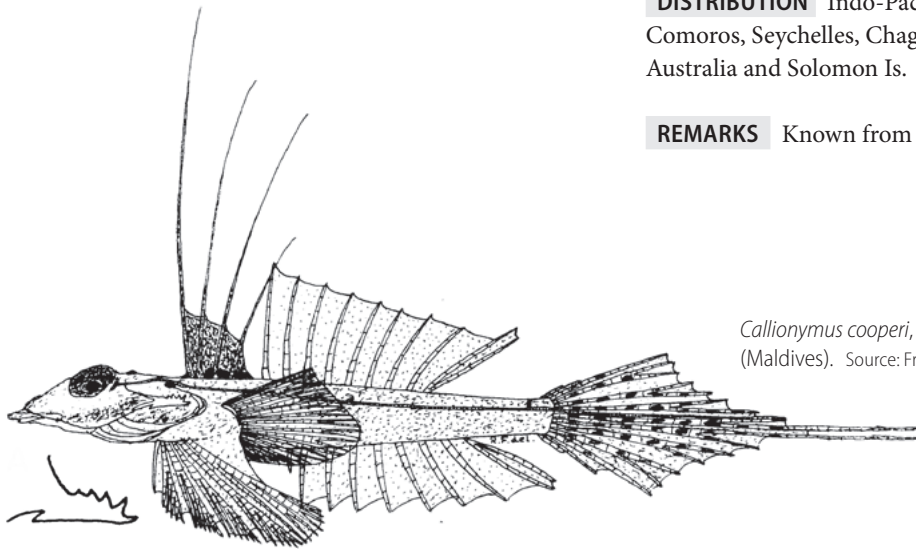
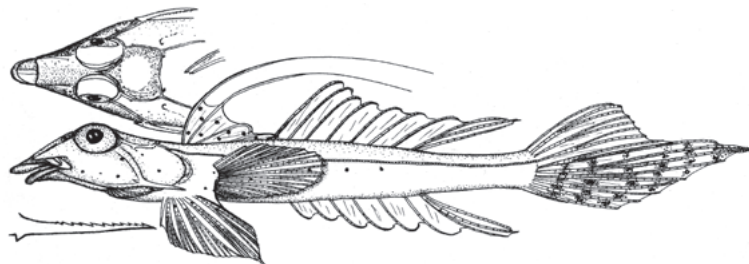
Callionymus cooperi Regan 1908

Cooper's dragonet

Callionymus cooperi Regan 1908: 247 (Suvadiva and Haddumati Atolls, Maldives); Fricke 1983*, 1988*, 2002.*Repomucenus cooperi*: Nakabo 1982.

Dorsal fins 4 spines (filamentous in males), 9 rays; anal fin 8 or 9 rays; pectoral fins 19–22 rays; caudal fin 10 or 11 rays, middle 2 rays of males with long filaments. Lateral line with 1 branch in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 26–29%, body depth 12–15%, predorsal length 30–34%, and preanal length 45–53%. Percentage HL: eye diameter 32–45%, snout length 26–33%. Preopercular spine with 3–5 curved points on upper edge and antrorse spine at base.

Body yellow or whitish above, cream ventrally; 1st dorsal fin dusky, bases of 2nd–4th membranes each with black blotch; central part of caudal fin with vertical rows of brown blotches. Attains 7 cm TL.

DISTRIBUTION WIO: Maldives.**REMARKS** Type specimens collected on soft bottom, at 73–81 m.*Callionymus cooperi*, 44 mm SL, male, preopercular spine inset (Maldives). Source: Fricke 1983*Callionymus delicatulus*, 46 mm TL, holotype, preopercular spine and dorsal view of head inset (Seychelles). Source: Smith 1963*Callionymus delicatulus* Smith 1963

Delicate ruddertail dragonet

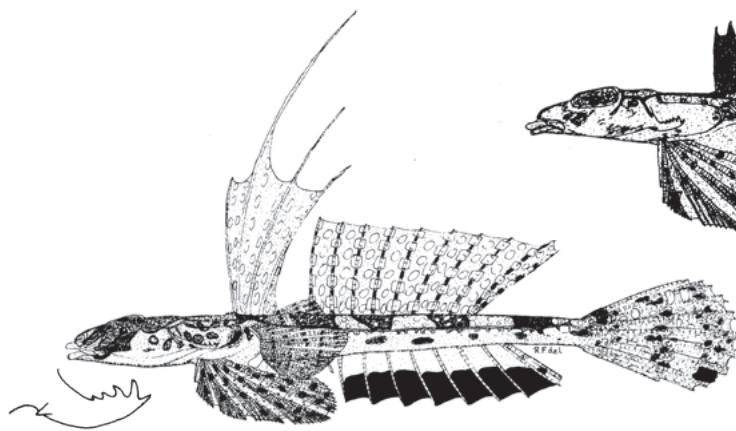
PLATE 163

Callionymus delicatulus Smith 1963: 557, Fig. 6 (Connan Reef, Mahé, Seychelles); Fricke 1982, 1983*, 1988*, 1989, 2002; Dor 1984; Myers 1989*; Winterbottom *et al.* 1989*; Eichler & Lieske 1994 [in part]; Lieske & Myers 1994 [in part]; Myers 1999*.*Pseudocalliurichthys delicatulus*: Nakabo 1982.

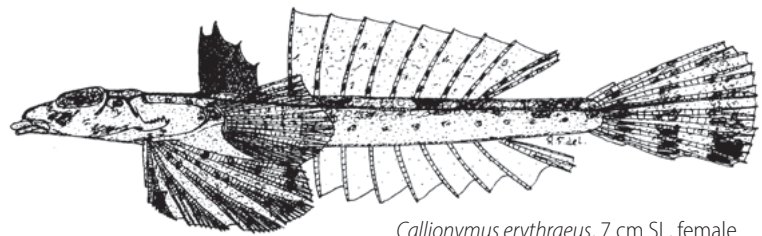
Dorsal fins 4 spines (1st and 2nd spines filamentous in males; 1st spine shorter than 2nd spine in females), 8 rays; anal fin 7 rays; pectoral fins 15–17 rays; caudal fin 10 or 11 rays, middle rays of males elongate and uppermost 5 rays truncated. Lateral lines with branches on postorbital region and cheeks, and lateral lines joined across nape only (not across top of peduncle). Percentage SL: HL 23–29%, body depth 10–16%, predorsal length 29–35%, and preanal length 50–59%. Percentage HL: eye diameter 29–37%, snout length 33–48%. Preopercular spine with 8–15 serrae on upper edge, main tip straight, and antrorse spine at base.

Head and body cream to yellow, with dark spots on head and sides; 1st dorsal fin of males with wavy lines and black spots on 1st and 2nd membranes, fin of females with black blotch on 3rd membrane. Attains 5 cm SL.

DISTRIBUTION Indo-Pacific. WIO: Red Sea, Madagascar, Comoros, Seychelles, Chagos and Maldives; elsewhere, Palau, Australia and Solomon Is.**REMARKS** Known from the littoral zone to ~22 m deep.



Callionymus erythraeus, 7 cm SL, male, preopercular spine inset (India). Source: Fricke 1983



Callionymus erythraeus, 7 cm SL, female (Persian/Arabian Gulf). Source: Fricke 1983

Callionymus erythraeus Ninni 1934

Smallhead dragonet

PLATE 163

Callionymus erythraeus Ninni 1934: 55, Pl. 13 (Isratu I., Dahlak Archipelago, Eritrea, Red Sea); Fricke 1980*, 1983*, 1988*; Randall 1997*. *Repomucenus erythraeus*: Nakabo 1982.

Dorsal fins 4 spines (2nd–4th spines filamentous in males; none filamentous in females), 9 rays; anal fin 8 rays; pectoral fins 17–21 rays; caudal fin 10 rays, without filaments, fin margin convex. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 20–25%, body depth 8–13%, predorsal length 30–35%, and preanal length 50–52%. Percentage HL: eye diameter 33–40%, snout length 31–38%. Preopercular spine with 3–5 curved points on upper edge, antrorse spine at base, and ventral margin convex.

Body yellow, brown or grey dorsally, cream ventrally; dorsum and head with 5 dark brown saddles and numerous small pale blotches; cheeks of males with ocelli; 1st dorsal fin of males translucent with numerous white blotches, fin of females black; caudal fin with 3 bands of brown blotches, distalmost band ending in lower black blotch. Attains 9 cm TL.

DISTRIBUTION WIO: Red Sea (Eritrea) to Oman, and Persian/Arabian Gulf to southern India.

REMARKS Found on soft bottom, to ~10 m deep.

Callionymus filamentosus Valenciennes 1837

Blotchfin dragonet

PLATE 163

Callionymus filamentosus Valenciennes in Cuv. & Val. 1837: 303, Pl. 359 (Manado, Sulawesi, Indonesia); Pfeffer 1893; Regan 1906; Norman 1929, 1939; Ninni 1934*; Smith 1963*, 1966; Fricke 1983*; Kuronuma & Abe 1986*; SSF No. 239.1*; Randall 1995*; Fishelson 1996*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Khalaf & Zajonz 2007*; Golani & Bernardi 2012.

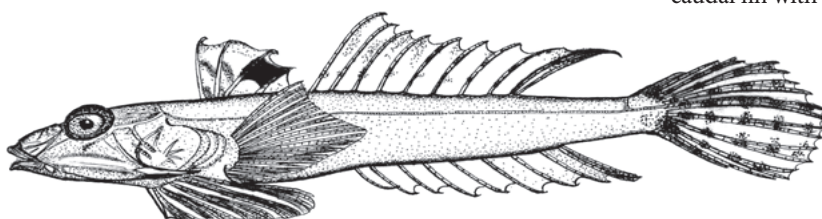
Calliurichthys filamentosus: Chabanaud 1932.

Callionymus stigmatopteron Smith 1963: 555, Fig. 4 (Zanzibar, Tanzania).

Repomucenus filamentosus: Nakabo 1982.

Dorsal fins 4 spines (1st spine of males separate and elongate; 1st spine of females connected to 2nd by membrane and not elongate), 8 or 9 rays; anal fin 9 rays; pectoral fins 17–21 rays; caudal fin 10 rays, middle 2 rays filamentous in males. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 20–28%, body depth 9–14%, predorsal length 27–32%, and preanal length 45–53%. Percentage HL: eye diameter 35–45%, snout length 23–32%. Preopercular spine with 4–9 points (serrae) on upper edge, antrorse spine at base, and ventral margin convex.

Body brown or pale bluish dorsally, covered with small brown or yellowish brown blotches, cream ventrally; midlateral row of larger darker brown blotches; rear of head, cheeks and dorsum with small grey-edged yellow spots; 1st dorsal fin of males with black stripes or solid black blotch and pale stripes on 3rd and 4th membranes, membranes of females with large black blotch; caudal fin with large black spots in centre. Attains 15 cm TL.



Callionymus filamentosus, 106 mm TL, female holotype of *C. stigmatopteron* (Zanzibar). Source: Smith 1963

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Red Sea to Mozambique (Inhaca I.), Madagascar, Seychelles and southwestern India; Lessepsian migrant to eastern Mediterranean Sea; elsewhere to Indonesia, Philippines, Taiwan, New Guinea, Australia and Vanuatu.

REMARKS Found on soft bottom, from nearshore to ~350 m deep.

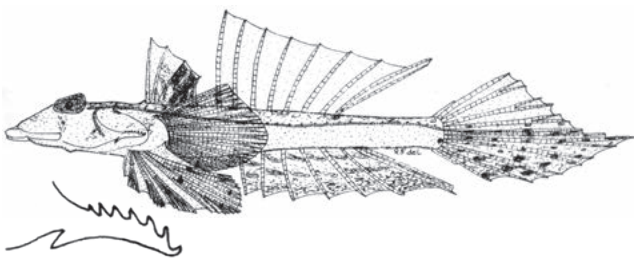
Callionymus flavus Fricke 1983

Yellow ruddertail dragonet

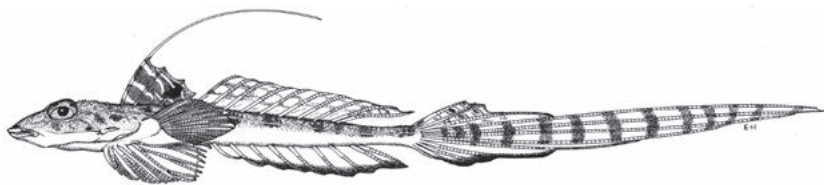
Callionymus (Calliurichthys) flavus Fricke 1983: 360, Fig. 110 (reef at Jeddah harbour, Saudi Arabia, Red Sea); Fricke 1988*, 1990, 2002.

Dorsal fins 4 spines, 8 rays; anal fin 7 rays; pectoral fins 17–20 rays; caudal fin 10 rays, middle rays of males elongate and upper 5 rays truncated. Lateral line with single branch in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 23–25%, body depth 13–14%, predorsal length 28–35%, and preanal length 51–55% SL. Percentage HL: eye diameter 34–40%, snout length 23–32%. Preopercular spine with 5 or 6 points (serrae) on upper edge, antrorse spine at base, ventral margin concave, and main tip curved upwards.

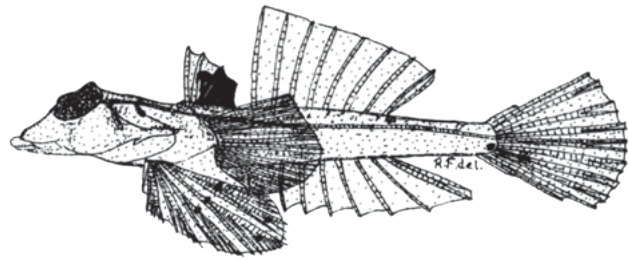
Body yellow dorsally, cream ventrally; dorsum and head with small brown and white spots; cheeks pale; caudal fin of males with bands of brown blotches in lower half; 1st dorsal fin of males anteriorly pale, posteriorly dark grey; in females 3rd and 4th dorsal-fin membranes black, with an anterior black branch running onto 2nd membrane. Attains 5 cm TL.



Callionymus flavus, 32 mm SL, male holotype, preopercular spine inset (Red Sea). Source: Fricke 1983



Callionymus gardineri, 96 mm SL, male (N Mozambique).



Callionymus flavus, 22 mm SL, female paratype (Red Sea). Source: Fricke 1983

DISTRIBUTION WIO: endemic to Red Sea.

REMARKS Found on silty sand bottom, at 2–46 m.

Callionymus gardineri Regan 1908

Longtail dragonet

PLATE 164

Callionymus longicaudatus (non Temminck & Schlegel 1845): Playfair & Günther 1867; Sauvage 1875.

Callionymus maldivensis Regan 1908: 247, Pl. 30, Fig. 3 (South Nilandu Atoll, Maldives); Norman 1939.

Callionymus gardineri Regan 1908: 248, Pl. 30, Fig. 5 (St Brandon Shoals); Nakabo 1979*; Fricke 1983*, 1984, 1988*, 2000, 2002; SSF No. 239.2*; Manilo & Bogorodsky 2003.

Calliurichthys gardineri: Barnard 1927; Smith 1949; Nakabo 1982.

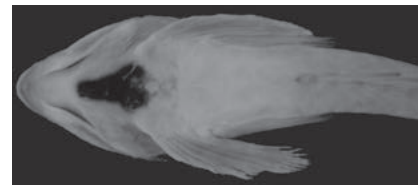
Callionymus japonicus (non Houttuyn 1782): Smith 1963*; Kotthaus 1977* [in part].

Callionymus persicus (non Regan 1906): Bayoumi 1972.

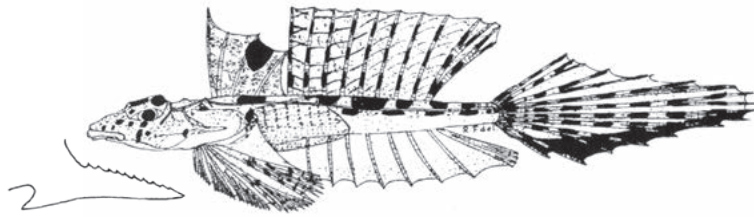
Calliurichthys maldivensis: Nakabo 1982.

Dorsal fins 4 spines (1st spine filamentous in males), 9 rays; anal fin 8 rays; pectoral fins 14–20 rays; caudal fin 9–11 rays, none filamentous, but fin extremely long, subequal to body length less HL. Lateral line with 2 or 3 branches in postorbital region of cheek, and lateral lines joined across nape by single canal and across top of peduncle by 2 canals. Percentage SL: HL 24–28%, body depth 9–14%, predorsal length 28–31%, and preanal length 49–54%. Percentage HL: eye diameter 32–44%, snout length 24–43%. Preopercular spine with 6–12 points (serrae) on upper edge, antrorse spine at base, and ventral margin slightly concave.

Body dark brown dorsally, cream ventrally; black or dark brown blotches on head, dorsum and caudal fin; anal-fin margin of males black. Attains 28 cm TL.



Callionymus gardineri, 130 mm SL, male, ventral view of head (Mozambique). PC Heemstra © NRF-SAIAB



Callionymus gardineri, 92 mm SL, female, preopercular spine inset (Red Sea). Source: Fricke 1983

DISTRIBUTION WIO: Red Sea, Gulf of Aden to South Africa (KwaZulu-Natal), Seychelles, St Brandon Shoals and Maldives.

REMARKS Found on sandy and muddy bottom, at 30–180 m.

Callionymus hindsi Richardson 1844

Megamouth dragonet

PLATE 164

Callionymus hindsi Richardson 1844: 64, Pl. 37, Figs. 3–4 (Pacific [probably China or Singapore]); Fricke 1980*, 1983*, 1988* [all as *hindsi*]; Randall 1995*; Carpenter *et al.* 1997*; Fricke 2002; Manilo & Bogorodsky 2003; Psomadakis *et al.* 2015.

Callionymus jonesii Lal Mohan 1970: 357, Fig. 1, Pl. 1, Figs. A–B (Palk Bay, India).

Callionymus sagitta (*non* Pallas 1770): Kuronuma & Abe 1972*, 1986*.

Dorsal fins 3 spines (1st spine filamentous in males), 9 or 10 rays; anal fin 9 rays; pectoral fins 16–19 rays; caudal fin 9–11 rays (none elongate), fin margin convex. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 24–29%, body depth 8–10%, predorsal length 32–38%, and preanal length 52–56%. Percentage HL: eye diameter 29–38%, snout length 29–45%. Jaws extremely protrusile, forming broad tube when expanded. Preopercular spine with 2–4 curved points on upper edge, antrorse spine at base, and ventral margin convex.

Body pale brown or yellow dorsally, cream ventrally; head and dorsum with small dark brown spots, and caudal fin with small brown spots in centre; 1st dorsal fin of males with black stripes, fin of females translucent. Attains 9 cm TL.

DISTRIBUTION Indo-Pacific. WIO: Persian/Arabian Gulf, Oman, Pakistan and southern India; elsewhere to South China Sea.

REMARKS Found on soft bottom, from near shore to ~100 m deep.

Callionymus kotthausi Fricke 1981

Kotthaus' deepwater dragonet

Callionymus kaianus (*non* Günther 1880): Alcock 1899.

Diplogrammus indicus Kotthaus 1977: 40, Figs. 423–425 (near Kochi, India) [secondary homonym of *Callionymus indicus* Linnaeus 1758 when placed in *Callionymus*].

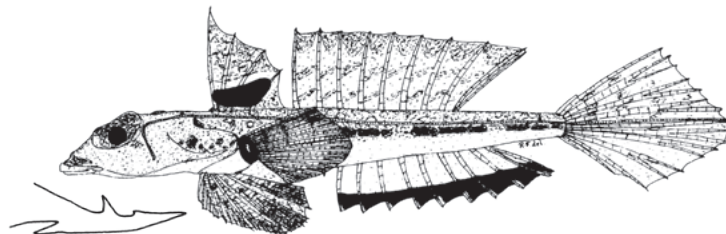
Callionymus kotthausi Fricke 1981: 363, Fig. 10 (southwest of Kochi, India) [replacement name for *Diplogrammus indicus* Kotthaus 1977, secondarily preoccupied]; Fricke 1983*, 1988*; Manilo & Bogorodsky 2003.

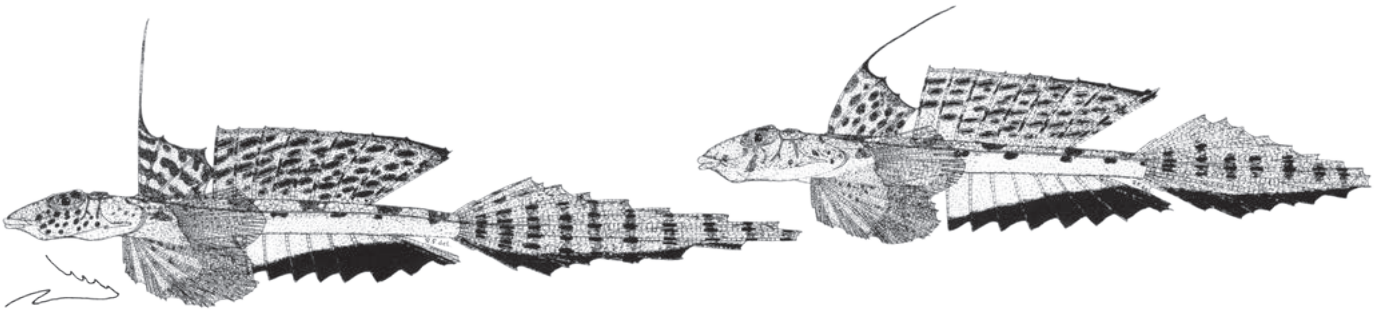
Bathycallionymus kotthausi: Nakabo 1982.

Dorsal fins 4 spines (none filamentous, but 1st spine longest), 9 rays; anal fin 9 rays; pectoral fins 20 or 21 rays; caudal fin 10 rays (none filamentous), fin margin convex. Lateral line with single branch in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL ~26%, body depth ~12%, predorsal length 28–30%, and preanal length 47–53%. Percentage HL: eye diameter ~42%, snout length ~28%. Preopercular spine with 2 or 3 points on upper edge (1 or 2 curved, 1 serra), antrorse spine at base, and main tip long.

Head and body yellowish brown dorsally, cream ventrally, with midlateral row of triple dark brown blotches; head and dorsum with dark-edged whitish blotches; cheeks and rear of head with grey spots; 1st dorsal fin of males with large black blotch surrounded by white on 2nd and 3rd membranes, fin of females with large black band bordered above and below by white bands and extending over first 2 membranes; caudal fin with 3 or 4 bands of pale brown spots in upper half. Attains 15 cm TL.

Callionymus kotthausi, 114 mm SL, female holotype, preopercular spine inset (SW India). Source: Fricke 1983





Callionymus margaretae, 69 mm SL, male, preopercular spine inset (left); 74 mm SL, female (right) (both Bay of Bengal). Source: Fricke 1983

DISTRIBUTION WIO: southwestern India (Malabar coast).

REMARKS Types collected from soft bottom, at 138–211 m.

Callionymus margaretae Regan 1905

Blackfin dragonet

Callionymus margaretae Regan 1905: 326, Pl. 3, Fig. C (Muscat, Oman, Gulf of Oman); Fricke 1980*, 2000, 2002; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Psomadakis *et al.* 2015.

Callionymus japonicus (*non* Houttuyn 1782): Kotthaus 1977 [in part].

Callionymus margaretae margaretae: Fricke 1983*, 1988*.

Calliurichthys margaretae: Nakabo 1982.

Dorsal fins 4 spines (1st spine filamentous in both sexes), 8 or 9 rays; anal fin 8 rays; pectoral fins 16–21 rays; caudal fin 9 or 10 rays (none filamentous). Lateral line with 2 or 3 branches in postorbital region of cheek, and lateral lines joined across nape by single canal and across top of peduncle by 2 canals. Percentage SL: HL 23–29%, body depth 8–14%, predorsal length 25–33%, and preanal length 48–56%. Percentage HL: eye diameter 26–44%, snout length 32–50%. Caudal fin very long, two-fifths (females) to four-fifths (male) of TL. Preopercular spine with 3–6 points (serrae) on upper edge, antrorse spine at base, and ventral margin straight or slightly concave.

Head and body dark brown dorsally, cream below, with dark saddles and small white spots on head and dorsum, and series of double or single black blotches along lateral line; cheeks of males with brown spots; 1st dorsal fin with brown spots or lines; distal half of anal fin black; caudal fin with bands of brown spots in centre, lower margin of fin black. Attains 18 cm TL.

DISTRIBUTION WIO: Somalia, Oman, Persian/Arabian Gulf, Pakistan and India; elsewhere, Bay of Bengal.

REMARKS Found on soft bottom, at 22–107 m.

Callionymus marleyi Regan 1919

Darter dragonet

PLATE 164

Callionymus marleyi Regan 1919: 201, Fig. 4 (Durban, KwaZulu-Natal, South Africa); Barnard 1927; Smith 1949*, 1963*; Day 1974; Fricke 1983*, 1988*, 2002; SSF No. 239.3*; Fischer *et al.* 1990*; Randall 1995; Sommer *et al.* 1996*; Carpenter *et al.* 1997* [spelt *Callionymous*]; Manilo & Bogorodsky 2003; Psomadakis *et al.* 2015.

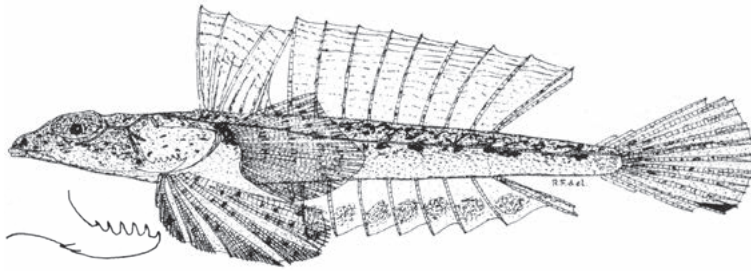
Repomucenus marleyi: Nakabo 1982.

Dorsal fins 4 spines (1st and 4th spines of males longest; 1st spine of females longest and 4th spine shortest), 9 or 10 rays; anal fin 8 or 9 rays; pectoral fins 17–21 rays; caudal fin 10–12 rays, fin moderate and rounded. Lateral line with 2 branches in postorbital region of cheek, preopercular branch bifurcate, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 20–28%, body depth 9–14%, predorsal length 31–33%, and preanal length 48–53%. Percentage HL: eye diameter 33–40%, snout length 25–33%. Preopercular spine with 3–7 inwardly curved antrorse points on upper edge, antrorse point at base, and ventral margin slightly convex.

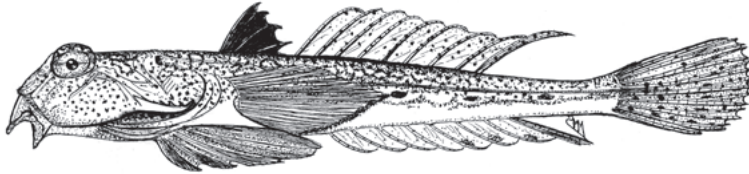
Juveniles sandy yellow with blue or brown spots and 2 large red spots on each side of 1st dorsal fin that disappear with age. Adults yellowish to brown, cream ventrally, with small dark-edged pale blue spots and smaller brown spots; orange patches often present on head; males with alternating black and yellow stripes on 1st and 4th dorsal-fin spines, and lower edge of caudal fin black; 1st dorsal fin of females entirely black or with anterior membranes orange and white. Attains 13 cm TL.

DISTRIBUTION Antitropical in Indian Ocean. WIO: Persian/Arabian Gulf, southern Red Sea and Gulf of Aden to northern Mozambique, South Africa (to False Bay), Madagascar and southwestern India; elsewhere to east coast of India.

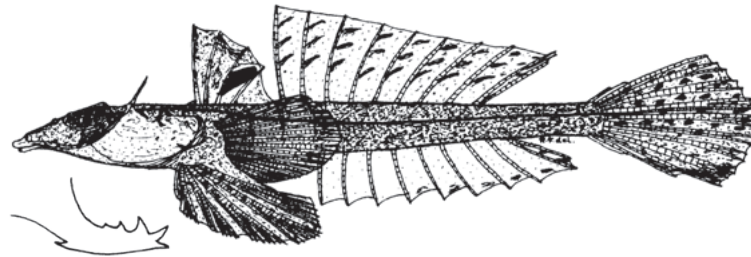
REMARKS Found in muddy bays and on sandy bottom, to ~36 m deep.



Callionymus marleyi, 78 mm SL, male, preopercular spine inset (Mozambique). Source: Fricke 1983



Callionymus marleyi, 80 mm TL, female (South Africa). Source: Smith 1963



Callionymus mascarenus, 49 mm SL, male holotype (Mauritius). Source: Fricke 1983

Callionymus mascarenus Fricke 1983

Mauritius dragonet

?*Callionymus marleyi* (non Regan 1919): Ninni 1934 [in part].
Callionymus mascarenus Fricke 1983: 206, Fig. 60 (Mauritius, Mascarenes); Fricke 1988*, 2002.

Dorsal fins 4 spines (none filamentous), 9 rays; anal fin 9 rays; pectoral fins 19–21 rays; caudal fin 10 rays (none filamentous), fin moderate. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 23–25%, body depth 9–11%, predorsal length 29–31%, and preanal length 50–51%. Percentage HL: eye diameter 35%, snout length 28–30%. Preopercular spine with 2–4 curved points on upper edge, antrorse spine at base, and ventral margin convex.

Body brown dorsally, suborbital region darker, and cream ventrally; 1st dorsal fin of males with black blotch on white background on 3rd membrane, fin of females with plain black blotch; upper half of caudal fin spotted, lower margin black. Attains at least 6.5 cm TL.

DISTRIBUTION Known only from type specimens from Mauritius.

REMARKS Collected on soft bottom near shore.

Callionymus muscatensis Regan 1905

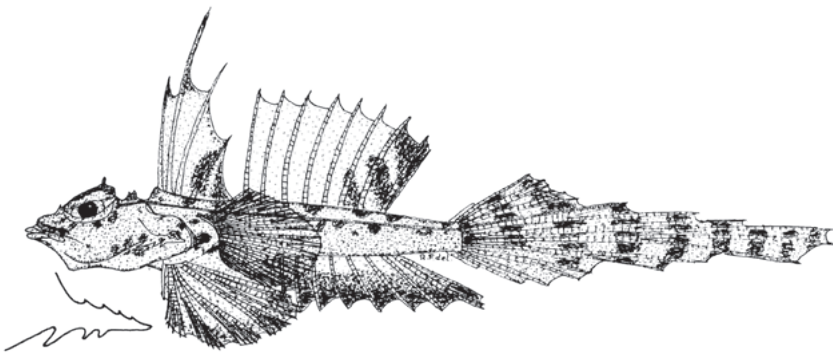
Muscat spiny dragonet

PLATE 164

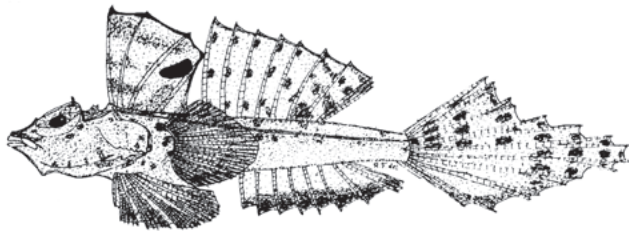
Callionymus muscatensis Regan 1905: 326, Pl. 3c, Fig. 2 (Muscat, Oman, Gulf of Oman); Fricke 1983*, 1988*, 2002; Randall 1995*; Manilo & Bogorodsky 2003.
Callionymus spiniceps (non Regan 1908): Kotthaus 1977*.
Spinicapitichthys muscatensis: Nakabo 1982.

Dorsal fins 4 spines (2nd and 3rd spines of males longest, with filaments; spines of females subequal, without filaments), 8 rays; anal fin 8 rays; pectoral fins 19–23 rays; caudal fin 10 rays (none filamentous), and fin very long, from half body length (including HL) in females, to body length in males. Lateral line with single branch in postorbital region, and lateral lines joined across nape only (not across top of peduncle). Percentage SL: HL 25–29%, body depth 14–17%, predorsal length 24–30%, and preanal length 53–58%. Percentage HL: eye diameter 40–50%, snout length 23–30% HL. Head with preorbital spine and strong occipital protuberance; supraorbital tentacle present. Preopercular spine with 2–6 serrae on upper edge, 1–3 curved points on lower edge, and antrorse spine at base.

Head and body brown dorsally, cream ventrally, with irregular midlateral row of dark brown blotches; head and dorsum with dark brown saddle-like blotches; cheeks and rear of head with small brown spots; 1st dorsal fin of males pale with irregular dark areas, fin of females with large black blotch on 3rd membrane; anal-fin margin brown; caudal fin with bands of brown blotches on upper two-thirds. Attains 10 cm TL.



Callionymus muscatensis, 40 mm SL, male, preopercular spine inset (Red Sea). Source: Fricke 1983



Callionymus muscatensis, 40 mm SL, female (Red Sea). Source: Fricke 1983

DISTRIBUTION WIO: southern Red Sea and Gulf of Oman.

REMARKS Type specimens collected from soft bottom, at 40–70 m.

Callionymus oxycephalus Fricke 1980

Red Sea spiny dragonet

PLATE 164

Callionymus oxycephalus Fricke 1980: 95, Figs. 13–14 (Gulf of Suez, Egypt, Red Sea); Fricke 1983*, 1988*, 2002.

Spinicapitichthys oxycephalus: Nakabo 1982.

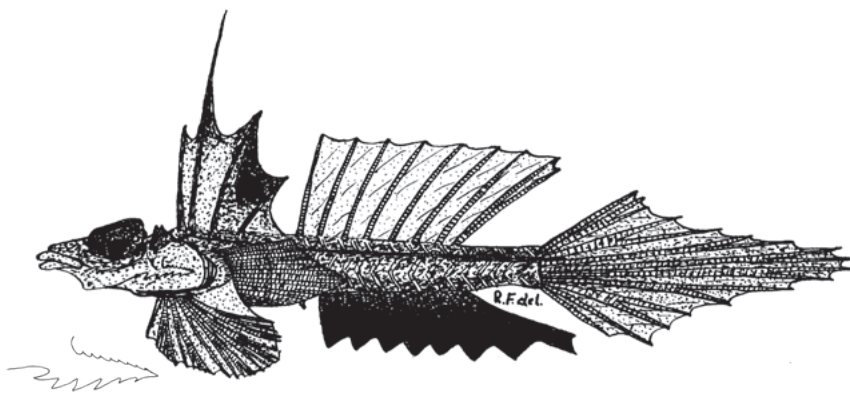
Dorsal fins 4 spines (2nd spine of males longest and filamentous; 2nd spine of females longest but not filamentous),

8 rays; anal fin 7 or 8 rays; pectoral fins 18–21 rays; caudal fin 10 rays (none filamentous), and fin very long, from half body length (including HL) in females, to two-thirds body length in males. Lateral line with single branch in postorbital region, and lateral lines joined across nape only (not across top of peduncle). Percentage SL: HL 25–28%, body depth 19–23%, predorsal length 25–29%, and preanal length 50–56%. Percentage HL: eye diameter 33–45%, snout length 28–38%. No supraorbital tentacle. Preopercular spine with 5–10 points (serrae) on upper edge, 4–9 curved points on lower edge, and antrorse spine at base.

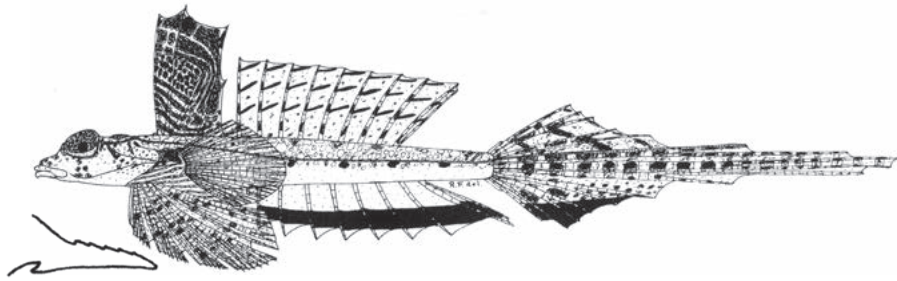
Head and body grey to lilac dorsally, cream ventrally, with midlateral row of dark brown blotches on some fish, and females with clusters of small brown spots; cheeks occasionally with small grey spots; 1st dorsal fin of males pale with dark margin and black blotch on 3rd membrane, fin of females pale with black blotches on 1st and 3rd membranes; caudal fin sometimes with bands of brown spots on upper half, lower margin black. Attains 15 cm TL.

DISTRIBUTION WIO: northern Red Sea.

REMARKS Found on soft bottom, probably in ~15–80 m [no depths given with type series].



Callionymus oxycephalus, 85 mm SL, male paratype, preopercular spine inset (Gulf of Suez). Source: Fricke 1983



Callionymus persicus, 69 mm SL, male, preopercular spine inset (Comoros). Source: Fricke 1983

Callionymus persicus Regan 1905

Persian dragonet

PLATE 165

Callionymus persicus Regan 1905: 325, Pl. 3c, Fig. 1 (syntypes:

Makran coast, Persian/Arabian Gulf; Muscat, Oman, Gulf of Oman);

Fricke 1980*, 1983*, 1988*, 2002; Randall & Van Egmond 1994*;

Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003.

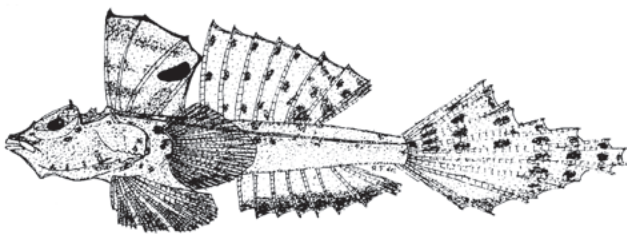
Callionymus affinis Regan 1908: 248 (South Nilandu Atoll, Maldives).

Calliurichthys persicus: Nakabo 1982.

Calliurichthys affinis: Nakabo 1982.

Dorsal fins 4 spines (none filamentous; first 3 spines of males long, and 2nd longest; 1st spine of females longest), 9 rays; anal fin 8 rays; pectoral fins 18–21 rays; caudal fin 9 or 10 rays (none filamentous), fin elongated in males, subequal to body length less HL, about half body length in females. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape by single canal and across top of peduncle by 2 canals. Percentage SL: HL 21–30%, body depth 10–16%, predorsal length 24–33%, and preanal length 48–56%. Percentage HL: eye diameter 33–44%, snout length 32–37%. Preopercular spine with 3–7 points (serrae) on upper edge, antorse spine at base, and ventral margin slightly concave.

Head and body pale brown dorsally, cream ventrally, with midlateral row of dark brown blotches; head and dorsum with dark brown and white spots; cheeks and rear of head with groups of small brown spots; anal fin with distal black band but tips of rays white; 1st dorsal fin of males brown with oblique white lines and black blotch distally on 2nd membrane, fin of females with large black blotch distally on 3rd membrane; caudal fin with bands of brown spots in centre, oblique brown lines above, and lower margin black. Attains 26 cm TL.



Callionymus persicus, 35 mm SL, female (Comoros). Source: Fricke 1983

DISTRIBUTION WIO: Persian/Arabian Gulf, Gulf of Oman, Gulf of Aden, Comoros, Seychelles and Maldives.

REMARKS Found on soft bottom, at 15–55 m.

Callionymus regani Nakabo 1979

Regan's deepwater dragonet

PLATE 165

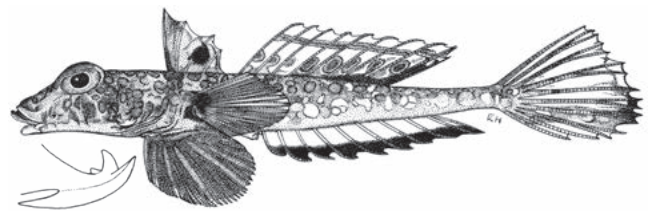
Callionymus regani Nakabo 1979: 231, Fig. 1a–f (Saya de Malha Bank);

Fricke 1981*, 1983*, 1988*, 2002.

Bathycallionymus regani: Nakabo 1982.

Dorsal fins 4 spines, 9 rays; anal fin 9 rays; pectoral fins 19–21 rays; caudal fin 9 or 10 rays (none filamentous), fin moderate and rounded. Lateral line with bifurcate infraorbital branch in postorbital region; lateral lines joined across nape and top of peduncle. Percentage SL: HL 24–27%, body depth 11–13%, predorsal length 27–29%, and preanal length 48–51%. Percentage HL: eye diameter 36–39%, snout length 29–36%. Preopercular spine with 2 or 3 points (2 curved, 0 or 1 serra) on upper edge, anteriormost smallest and directed inwards.

Head with numerous brown blotches encircled with darker brown, dorsum brownish grey to sepia, and abdomen pale; pectoral-fin bases with large black blotch (in both sexes); 1st dorsal fin with black blotch mainly on 3rd membrane, anterior membranes dusky in adults but with yellowish stripes in juveniles; 2nd dorsal fin of adults with purplish ocelli and yellow patches; anal-fin margin of adult males black; juveniles with yellow stripes or spots on body. Attains 23 cm TL.



Callionymus regani, 178 mm SL, preopercular spine inset (South Africa).

DISTRIBUTION WIO: Mozambique, South Africa (KwaZulu-Natal) and Saya de Malha Bank.

REMARKS Rare; found on soft bottom, at 126–260 m.

Callionymus spiniceps Regan 1908

Seychelles spiny dragonet

PLATE 165

Callionymus spiniceps Regan 1908: 249, Pl. 30, Fig. 4 (Amirante Is., Seychelles); Smith 1963*; Smith & Smith 1963*; Nakabo 1979*;
Fricke 1983*, 1988*, 2002.

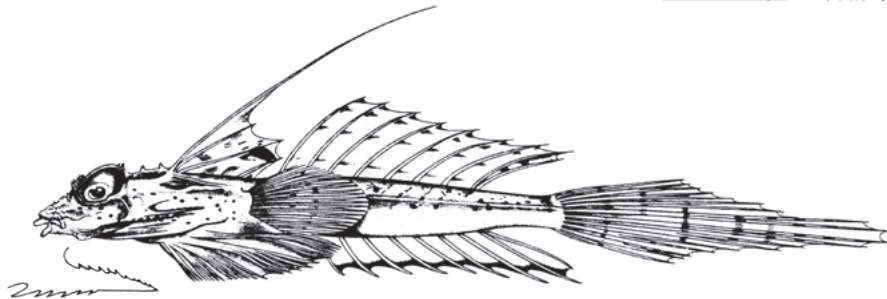
Spinicapitichthys spiniceps: Nakabo 1982.

Dorsal fins 4 spines (1st spine filamentous), 8 or 9 rays; anal fin 8 rays; pectoral fins 20–23 rays; caudal fin 10 rays, middle 4 rays filamentous in males. Lateral line with 2 short branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 26–28%, body depth 14%, predorsal length 26–27%, and preanal length 50–53%. Percentage HL: eye diameter 29–42%, snout length 25–31%. Head with numerous spines along upper jaw and in preorbital and postorbital regions; supraorbital tentacle present. Preopercular spine with 8–15 points (serrae) on upper edge, 5–9 points (serrae) on lower edge, and antrorse spine at base.

Head and body brown dorsally, pale cream ventrally, with midlateral row of dark brown blotches; cheeks, rear of head and sides of body with numerous small brown spots; 1st dorsal fin with black blotch on 3rd membrane; anal fin of males with distal black band; caudal fin with bands of dark brown spots, most distinct on upper half. Attains 19 cm TL.

DISTRIBUTION WIO: Seychelles (Amirante Is.) to Saya de Malha Bank.

REMARKS Found on soft bottom, in ~60–100 m.



Callionymus spiniceps, 154 mm TL, holotype, preopercular spine inset (Seychelles). Source: Regan 1908

Callionymus stigmatopareius Fricke 1981

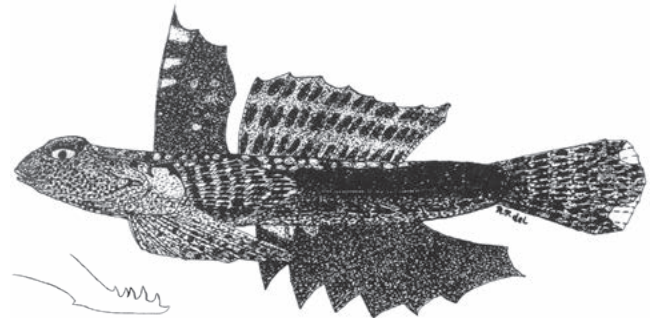
Mozambique dragonet

Callionymus stigmatopareius Fricke 1981: 161, Pl., Figs. 1–2 (Lumbo, Mozambique); Fricke 1983*, 1988*, 2002.

Paradiplogrammus stigmatopareius: Nakabo 1982.

Dorsal fins 4 spines (none filamentous; 1st spine of male longest), 8 rays, spinous dorsal fin high; anal fin 7 rays, distal margin of fin convex; pectoral fins 17 rays; caudal fin 9 rays (none filamentous), fin moderate. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 24%, body depth 14%, predorsal length 29%, and preanal length 50%. Percentage HL: eye diameter 33%, snout length 29%. Preopercular spine with 5 curved points on upper edge and antrorse spine at base.

Male: head and body dark brown dorsally, cream ventrally, with short black streaks below lateral line; cheeks and rear of head with small black spots; 1st dorsal fin black, with white spots distally on 1st membrane; anal fin black; caudal fin with bars of dark brown blotches. Attains at least 8 cm TL.



Callionymus stigmatopareius, 62 mm SL, male holotype, preopercular spine inset (Mozambique). Source: Fricke 1983

DISTRIBUTION Known only from the holotype from Mozambique.

REMARKS Probably collected in shallow water.

Callionymus tenuis Fricke 1981

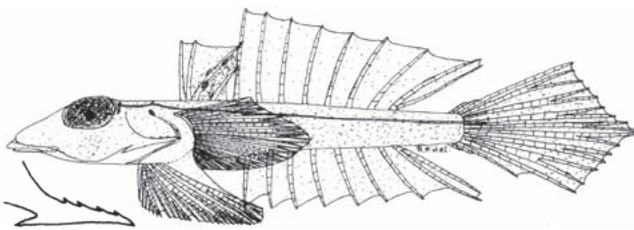
Tiny dragonet

Callionymus (Calliurichthys) tenuis Fricke 1981: 387, Fig. 1 (South Niland Atoll, Maldives); Fricke 1983*, 1988*, 2002.

Pseudocalliurichthys tenuis: Nakabo 1982.

Dorsal fins 4 spines (none filamentous), 8 rays; anal fin 8 rays; pectoral fins 18–20 rays; caudal fin 11 rays, fin moderate. Lateral line with single branch in postorbital region, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 30%, body depth 14%, predorsal length 37%, and preanal length 50%. Percentage HL: eye diameter 44%, snout length 36%. Preopercular spine with 4 points (serrae) on upper edge, antrorse spine at base, and ventral margin slightly concave.

Head and body yellowish dorsally, cream ventrally; 1st dorsal fin translucent, 3rd membrane dusky with dark spots; caudal fin pale. Attains at least 25 mm TL.



Callionymus tenuis, 18 mm SL, holotype, preopercular spine inset (Maldives). Source: Fricke 1983

DISTRIBUTION Known only from the holotype from Maldives.

REMARKS Collected on sandy bottom, in <60 m.

GENUS *Diplogrammus* Gill 1865

Body with lateral skin fold below lateral line; anal-fin rays unbranched. Occur in Indo-Pacific; 7 species, 5 in WIO. Genus reviewed by Fricke (1983), and Red Sea species by Fricke *et al.* (2014).

KEY TO SPECIES

- 1a Opercle with free flap of skin 2
- 1b Opercle without free flap of skin [Gulf of Suez and Suez Canal] *D. gruveli*
- 2a Preopercular spine with 3 or 4 curved spinules on upper edge in addition to main tip 3

Continued ...

KEY TO SPECIES

- 2b Preopercular spine with 5–9 curved spinules on upper edge in addition to main tip 5
- 3a Main tip of preopercular spine nearly straight; 1st spine of dorsal fin of males barely filamentous, subequal to 1st ray [northern Red Sea] *D. randalli* [males]
- 3b Main tip of preopercular spine curved upwards; 1st spine of dorsal fin of males longer than 1st ray 4
- 4a Length of 2nd spine of dorsal fin of males subequal to 1st and 3rd spines, or longer than 1st spine; anal fin of males pale with black spots distally, fin of females entirely black; caudal fin rounded [Persian/Arabian Gulf and southern coast Arabian Peninsula] *D. pygmaeus*
- 4b Length of 1st spine of dorsal fin of males longer than 2nd and 3rd spines; anal fin of males with outer third black, fin of females pale with black margin; caudal fin pointed [central and southern Red Sea] *D. paucispinis*
- 5a First spine of dorsal fin strongly filamentous in males, and significantly longer than 1st ray; main tip of preopercular spine curved upwards; anal fin of females pale; head and body of males with numerous blue spots and streaks [Gulf of Sinai to southern Red Sea, East Africa, and throughout islands of WIO] *D. infulatus*
- 5b First spine of dorsal fin barely filamentous in males, and not much longer than 1st ray; main tip of preopercular point straight; anal fin of females with narrow black streak near margin; head and body of males with irregular brown and white spots, no blue spots and streaks [northern Red Sea] *D. randalli* [IN PART]



Diplogrammus gruveli Smith 1963

Slender dragonet

PLATE 165

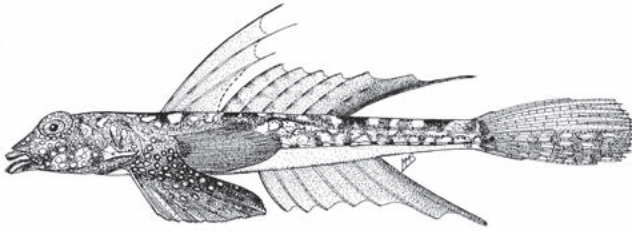
Diplogrammus goramensis (non Bleeker 1858): Chabanaud 1932*; Gruvel & Chabanaud 1937.

Diplogrammus (Diplogrammoides) gruveli Smith 1963: 551, Fig. 2 (Great Bitter Lake, Suez Canal, Red Sea); Fricke 1983*, 1988*; Fricke *et al.* 2014*.

Dorsal fins 3 or 4 spines (elongate in males), 7–9 rays; anal fin 6 or 7 rays; pectoral fins 16 or 17 rays; caudal fin 10 or 11 rays, fin rounded. Lateral line with 2 branches in postorbital region, and lateral lines joined across nape only (not across top of peduncle). Percentage SL: HL 23–25%, body depth 12–13%, predorsal length 31–33%, and preanal length 50–56%.

Percentage HL: eye diameter 29–45%, snout length 25–33%. Preopercular spine straight, with 4–6 small inwardly curved points on upper edge, and antrorse spine at base.

Head and body dark brown dorsally, cream ventrally; ventrolateral fold marked alternately black and white; dorsum with pale blotches; cheeks, rear of head, pelvic fins and caudal fin with numerous blue ocelli; 1st dorsal fin of males pale, with dusky spots; anal fin distally dusky. Attains 62 mm TL.



Diplogrammus gruveli, 62 mm TL, holotype (Suez Canal). Source: Smith 1963

DISTRIBUTION WIO: Suez Canal and Gulf of Suez.

Diplogrammus infulatus Smith 1963

Sawspine dragonet

PLATE 166

Diplogrammus (Climacogrammus) infulatus Smith 1963: 550, Pl. 83, Figs. E–I (Inhaca I., Mozambique); Fricke 1983*; Heemstra *et al.* 2004. *Diplogrammus infulatus*: Fourmanoir & Crosnier 1964*; SSF No. 239.4*; Fricke 1988*; Debelius 1993*, 1999*; Fricke *et al.* 2013; Fricke *et al.* 2014*; Fricke *et al.* 2016*.

Dorsal fins 4 spines (1st spine filamentous in males), 8 rays; anal fin 7 rays; pectoral fins 18–20 rays; caudal fin 10 or 11 rays, fin rounded. Lateral line with 2 branches in postorbital region, anteriormost bifurcate, and lateral lines joined across nape and in front of eyes but not across top of peduncle; lateral line on body with numerous short dorsal and ventral branches. Percentage SL: HL 23–27%, body depth 12–16%, predorsal length 28–31%, and preanal length 48–56%. Percentage HL: eye diameter 30–42%, snout length 25–28%. Preopercular spine straight or gently bowed, with main tip curved upwards, and with 3–9 inwardly curved points on upper edge and small antrorse spine at base.

Females with sandy yellow to golden blotches dorsally; pale silvery blue spots midlaterally, interspersed with a few reddish blotches, and series of squarish brown blotches on sides; pelvic fins bluish distally. Males with golden and brown blotches dorsally; head also with blue and green streaks and spots; fins hyaline golden green, with deep blue spots and wavy lines, except pectoral fins pinkish with brown or bluish spots. Attains 12 cm TL.



Diplogrammus infulatus, 80 mm TL, male (Red Sea); preopercular spine (inset) from 90-mm-TL male holotype (Mauritius).

© JE Randall, Bishop Museum. Inset source: Smith 1963

DISTRIBUTION WIO: Red Sea to Mozambique (Maputo Bay), Europa I. (Mozambique Channel), Madagascar, Aldabra, Seychelles, Réunion and Mauritius.

REMARKS Found from tidepools and subtidal zone to ~20 m deep.

Diplogrammus paucispinis

Fricke & Bogorodsky 2014

Saudi Arabian dragonet

PLATE 166

Diplogrammus paucispinis Fricke & Bogorodsky in Fricke *et al.* 2014: 15, Figs. 1, 6, 7, 11 (south of Al Wajh, Saudi Arabia, Red Sea).

Dorsal fins 4 spines, 8 rays; anal fin 7 rays; pectoral fins 18 or 19 rays; caudal fin 10 rays, fin moderate and slightly pointed. Lateral line with 2 branches in postorbital region, and lateral lines joined across nape and in front of eyes but not across top of peduncle; lateral line on body with numerous short dorsal and ventral branches. Percentage SL: HL 26–29%, body depth 11–13%, predorsal length 29–32%, and preanal length 50–53%. Percentage HL: eye diameter 31–40%, snout length 28–33%. Preopercular spine with 3 or 4 curved points on upper edge and small antrorse spine at base.

Head and body cream, belly white; sides with row of dark spots; 1st dorsal fin of males cream, with irregular rows of yellow mottling, brownish yellow distally; 1st dorsal fin of females with 1st membrane cream, 2nd–4th membranes dark grey; anal fin of males with outer third black, fin of females with black margin; caudal fin cream, with brown and white spots at base, and yellow spots and blotches distally. Attains at least 45 mm TL.

DISTRIBUTION Known only from type specimens collected in Red Sea

REMARKS Taken from sand bottom close to fringing reef, at ~4 m.

Diplogrammus pygmaeus Fricke 1981

Pygmy dragonet

PLATE 166

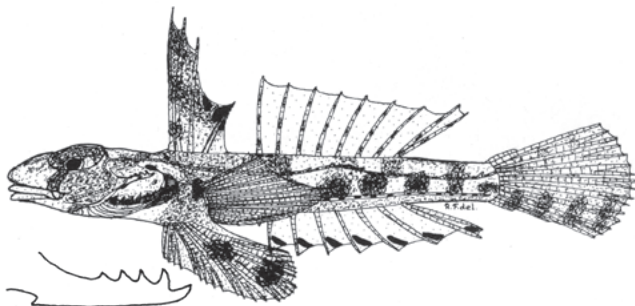
Callionymus sp.: Norman 1939.

Diplogrammus (*Climacogrammus*) *pygmaeus* Fricke 1981: 685, Figs. 1–2 (southern Arabian coast [Oman]); Fricke 1983.

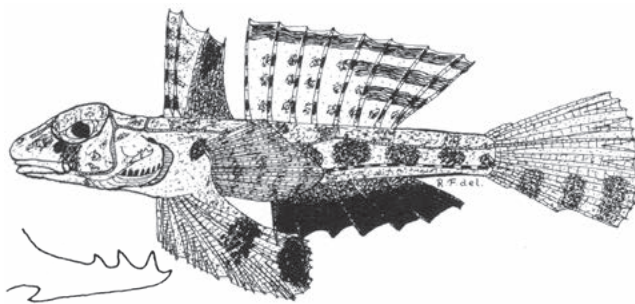
Diplogrammus pygmaeus: Fricke 1988*, 2002; Randall 1995*; Carpenter *et al.* 1997*; Manilo & Bogorodsky 2003; Fricke *et al.* 2014*.

Dorsal fins 4 spines, 8 rays; anal fin 7 rays; pectoral fins 20 rays; caudal fin 10 rays, fin moderate and rounded. Lateral line with 2 branches in postorbital region, and lateral lines joined across nape and in front of eyes but not across top of peduncle; lateral line on body with numerous short dorsal and ventral branches. Percentage SL: HL 27–29%, body depth 17–18%, predorsal length 31–33%, and preanal length 50–53%. Percentage HL: eye diameter 38–42%, snout length 30–32%. Preopercular spine with 3 or 4 curved points on upper edge and small antrorse spine at base.

Head and body pale brown dorsally, darker brown below, belly creamy white; head with dark suborbital streak; midlateral row of dark brown blotches; pectoral-fin bases with dark blotch; 1st dorsal fin of males grey distally, with black spots on 3rd membrane; 1st dorsal fin of females pale on 1st and 2nd membranes, grey on 3rd and 4th membranes, but with black blotch distally on 3rd membrane; anal fin with distal black spots in males, fin entirely black in females; caudal fin with 3 or 4 dark bars on lower part. Attains ~40 mm TL.



Diplogrammus pygmaeus, 20 mm SL, male paratype, preopercular spine inset (Oman). Source: Fricke 1983



Diplogrammus pygmaeus, 20 mm SL, female holotype (Oman). Source: Fricke 1983

DISTRIBUTION WIO: Oman to Persian/Arabian Gulf.

REMARKS Found on shallow, soft bottom; type specimens collected at ~13.5 m.

Diplogrammus randalli Fricke 1983

Randall's fold dragonet

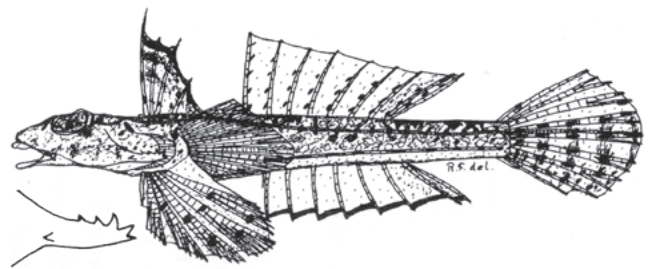
PLATE 166

Diplogrammus (*Climacogrammus*) *randalli* Fricke 1983: 518, Fig. 155 (Eilat, Israel, Gulf of Aqaba, Red Sea).

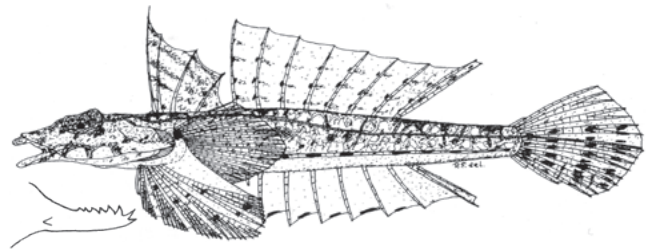
Diplogrammus randalli: Fricke 1988, 2002; Fricke *et al.* 2014*.

Dorsal fins 4 spines, 7 or 8 rays; anal fin 6 or 7 rays; pectoral fins 17–22 rays; caudal fin 9 or 10 rays, fin moderate and rounded. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and in front of eyes but not across top of peduncle; lateral line on body with numerous short dorsal and ventral branches. Percentage SL: HL 21–29%, body depth 10–14%, predorsal length 23–34%, and preanal length 49–54%. Percentage HL: eye diameter 28–36%, snout length 33–38%. Preopercular spine with 3–7 curved points on upper edge, small antrorse spine at base, and main tip straight.

Head and body pale brown to yellowish dorsally, cream ventrally, with midlateral row of small dark brown blotches; head and dorsum with dark brown and whitish blotches; cheeks and rear of head with irregular brown streaks; 1st dorsal fin pale with brown lines; anal fin pale with black margin; lower part of caudal fin with dark bars formed by brown spots. Attains 75 mm TL.



Diplogrammus randalli, 40 mm SL, male holotype, preopercular spine inset (Red Sea). Source: Fricke 1983



Diplogrammus randalli, 57 mm SL, female paratype, preopercular spine inset (Red Sea). Source: Fricke 1983

DISTRIBUTION WIO: northern Red Sea.

REMARKS Found on shallow, sand bottom.

GENUS *Draculo* Snyder 1911

Upper margin of lower lip with row of erect fleshy papillae. Occur in Indo-Pacific; 5 species, 2 in WIO. Reviewed by Fricke (1983).

KEY TO SPECIES

- 1a First dorsal fin comprised of 1 spine (= 2 slender spines bound together by skin); 2nd dorsal fin with 11 rays; anal fin 12 branched rays *D. celetus*
- 1b First dorsal fin with 4 spines; 2nd dorsal fin with 9 or 10 rays; anal fin 10 branched rays *D. maugei*

Draculo celetus (Smith 1963)

Dainty dragonet

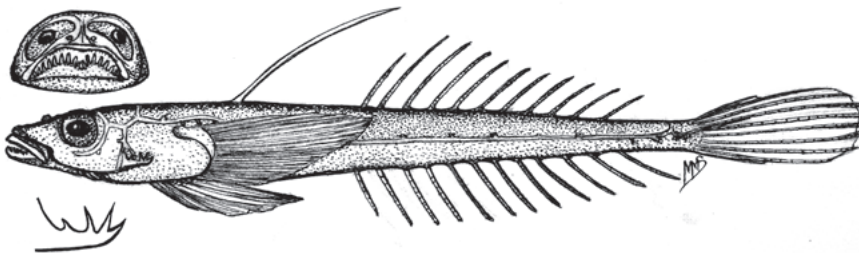
PLATE 166

Charibarbitus celetus Smith 1963: 562, Fig. 8 (Inhaca I., Mozambique); Christensen 1977*.

Eleutherochir celetus: Nakabo 1982.

Draculo celetus: Fricke 1983*, 1988*, 2002; SSF No. 239.5*.

Dorsal fins 1 spine (longer in males than in females), 11 unbranched rays; anal fin 12 rays; pectoral fins 19–22 rays; caudal fin 10 rays, fin slightly rounded. Lateral line with 2 branches in postorbital region, posteriormost branch extending to lower jaw, and lateral lines joined across nape and top of peduncle. Lower lip with row of 16–20 simple papillae. Percentage SL: HL 23–28%, body depth 11–15%, predorsal length 31–33%, and preanal length 48–53%. Percentage HL: eye diameter 31–36%, snout length 24–29%. Preopercular spine with 2 or 3 points on upper edge before main tip, and no antrorse spine at base.



Draculo celetus, 34 mm TL, holotype of *Charibarbitus celetus*, preopercular spine and anterior head inset (S Mozambique).

Source: Smith 1963

Body uniformly buff or pale pinkish, with diffuse orange blotches and rosettes dorsally, and abdomen silvery; head with rosettes of melanophores dorsally; 2nd dorsal fin and anal fin cream, with orange spot at base of each ray; eyes silvery with orange tinge on upper part. Attains at least 4.5 cm TL.

DISTRIBUTION WIO: Mozambique (Inhaca I.) to South Africa (False Bay).

REMARKS Rare; known from tidepools, and rocky or sandy subtidal areas.

Draculo maugei (Smith 1966)

Clathropus maugei Smith 1966: 323, Fig. 1 (northwest of Toliara, Madagascar).

Draculo maugei: Fricke 1983*, 1988*, 2002.

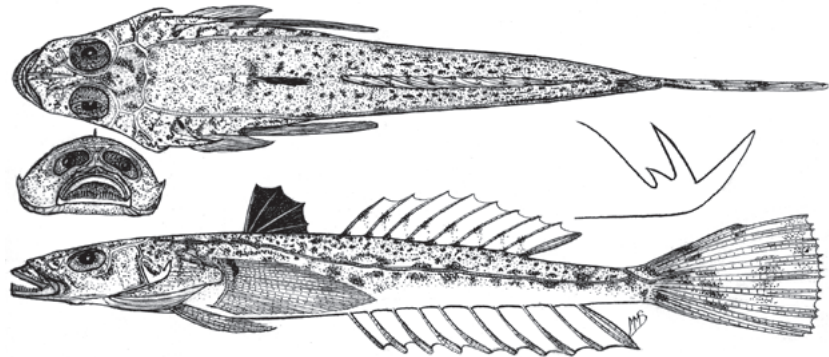
Dorsal fins 4 spines, 9 or 10 rays; anal fin 10 rays; pectoral fins 20 or 21 rays; caudal fin 11 rays, fin rounded. All dorsal- and anal-fin rays unbranched. Lateral line with 2 branches in postorbital region, posteriormost branch extending to lower jaw, and lateral lines joined across nape and top of peduncle. Lower lip with ~22 papillae. Percentage SL: HL 21–22%, body depth 10–13%, predorsal length 28–33%, and preanal length 44–48%. Percentage HL: eye diameter 28–36%, snout length 25–30%. Preopercular spine with 2 points on upper edge (anteriormost smaller) and main tip strongly curved upwards; no antrorse spine at base.

Preserved specimens with dense patches of melanophores on sides of body and top of head, and 1st dorsal fin black. Attains 55 mm TL.

DISTRIBUTION Known only from five type specimens from Madagascar.

REMARKS Collected along sandy beach in ~1 m.

Draculo maugei, 55 mm TL, female holotype, lateral and dorsal views, anterior head and preopercular spine inset (Madagascar).
Source: Smith 1966



GENUS *Paracallionymus* Barnard 1927

Diagnosis as for the single species. Reviewed by Fricke (1983).

Paracallionymus costatus (Boulenger 1898)

Ladder dragonet PLATE 166

Callionymus costatus Boulenger 1898: 4 [9] (off Cape St Blaize, South Africa).

Paracallionymus costatus: Barnard 1927*; SFSA No. 392*; Smith 1963*; Day *et al.* 1970; Fricke 1983, 1988*, 2002; SSF No. 239.6*.

Paracallionymus fowleri Poll 1949: 240, Fig. 15 (Africa [Namibia]); Fricke 1982.

Dorsal fins 4 spines (elongate and filamentous in males, and 2nd spine subequal to body length in large males; females without filamentous spines, and 1st spine longest and subequal to eye diameter), 9 or 10 rays; anal fin 9 rays; pectoral fins 19–23 rays; caudal fin 10 rays, middle ray elongate in males, and fin longer than head. All dorsal- and anal-fin rays unbranched. Lateral line with 2 branches in postorbital region of cheek; lateral lines joined across nape by single canal and across top of peduncle by 2 canals; lateral line on body with numerous long dorsal and ventral branches. Percentage SL: HL 22–27%, body depth 11–14%, predorsal length 28–33%, and preanal length 46–52%. Percentage HL: eye diameter 33–45%, snout length 26–33%. Preopercular spine simple and tip curved upwards (no points on upper edge and no antrorse spine at base).

Adults uniformly dusky brown dorsally, cream ventrally; 1st dorsal fin membranes black (except frequently not first membrane). Juveniles with yellow blotches and swathes on sides and fins, except anal-fin margin black. Attains 19 cm TL.

DISTRIBUTION Southern Africa: Namibia (Lüderitz) in southeastern Atlantic, to Mozambique (Maputo Bay) in WIO.

REMARKS Found at 37–457 m. The colour painting in Smith (1949, 1965; duplicated in SSF No. 239.6, Pl. 121), showing the body and fins as mostly yellow in a large male, was based on notes and is erroneous, as is the count of 13 caudal-fin rays.

GENUS *Synchiropus* Gill 1859

Snout shorter than eye diameter; dorsal-fin rays branched (in fish >3 cm TL); preopercular spine without antrorse spine at base. Review and checklists in Fricke (1981, 2002). Occur in temperate to tropical regions of all three major oceans; about 55 species, 7 in WIO.

KEY TO SPECIES

1a	Anal-fin rays unbranched (last divided at base)	2
1b	Anal-fin rays branched (last divided at base)	5
2a	Caudal-fin length 25–32% SL	3
2b	Caudal-fin length 33–40% SL	<i>S. monacanthus</i>
3a	Pectoral-fin base with large black blotch; 2nd dorsal fin with oblique rows of ocellated black spots	<i>S. tudorjonesi</i>
3b	Pectoral-fin base without large black blotch; 2nd dorsal fin pale or with narrow streaks	4
4a	Dorsal-fin spines of males filamentous; no black spots on lower part of pectoral-fin base	<i>S. postulus</i>
4b	Dorsal-fin spines of males not filamentous; black spot present on lower part of pectoral-fin base	<i>S. minutulus</i>

Continued ...

KEY TO SPECIES

- 5a Preopercular spine with 1 point on upper edge in addition to main tip *S. stellatus*
- 5b Preopercular spine with 2 points on upper edge in addition to main tip 6
- 6a Main tip of preopercular spine straight, no small antrorse spines at base; 1st dorsal fin dark and striped *S. marmoratus*
- 6b Main tip of preopercular spine curved upwards, and spine usually with 1 or 2 small antrorse points at base; 1st dorsal fin pale with dark blotches *S. sechellensis*

Synchiropus marmoratus (Peters 1855)

Marbled dragonet

PLATE 167

Callionymus marmoratus Peters 1855: 446 (Mozambique); Barnard 1927; Smith 1949*.

Callionymus elegans Bianconi 1858: 52 (Mozambique) [primary homonym of *Callionymus elegans* Lesueur 1814; subsequently redescribed as *Callionymus perelegans* Bianconi 1858].

Callionymus perelegans Bianconi 1858: 437, Fig. (Mozambique).

Callionymus caeruleomaculatus Jatzow & Lenz 1898: 510, Pl. 35, Fig. 6 (Zanzibar, Tanzania).

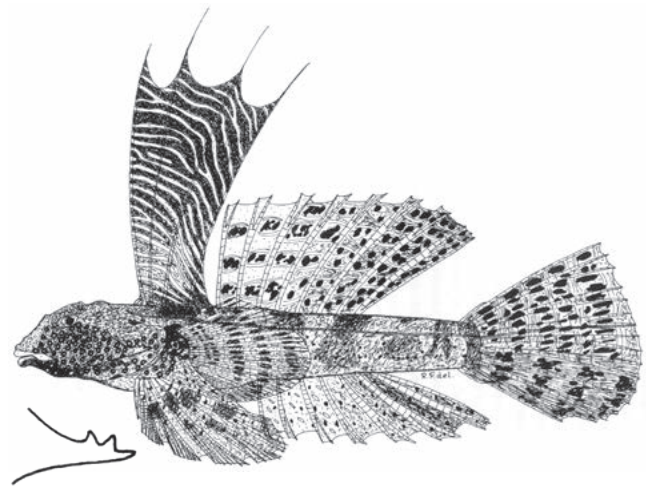
Synchiropus marmoratus: Smith 1963*; Fricke 1981*, 1983*, 1988*, 2002; SSF No. 239.7*.

Neosynchiropus bacescui Nalbant 1979: 349, Figs. 1–5 (Dar es Salaam, Tanzania).

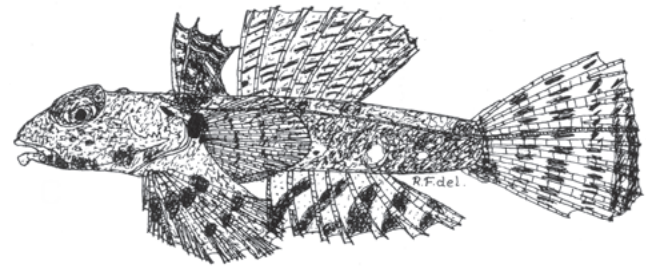
Neosynchiropus marmoratus: Nakabo 1982; Heemstra & Heemstra 2004.

Dorsal fins 4 spines (spines filamentous in males, almost twice HL; 1st dorsal fin of females lower than 2nd), 7 or 8 rays; anal fin 6–8 rays; pectoral fins 18–22 rays; caudal fin 10 or 11 rays, fin large, longer and deeper in males than in females. All dorsal- and anal-fin rays branched. Lateral line on body bifurcate and joined across nape, with 1 branch running to behind eye, but lateral lines not joined across top of peduncle. Percentage SL: HL 24–33%, body depth 15–22%, predorsal length 25–30%, and preanal length 50–59%. Percentage HL: eye diameter 31–44%, snout length 22–35%. Preopercular spine with main tip curved upwards and with 2 additional points on upper edge; no antrorse spine at base.

Both sexes vividly coloured and variably marbled: males mostly greenish black with blue and orange spots and mottling, to reddish with white and orange mottling; 1st dorsal fin of females dark, striped; pectoral fins and pelvic-fin margins orange to red, with white or black spots. Attains 13 cm TL.



Synchiropus marmoratus, 94 mm SL, male, preopercular spine inset (Zanzibar). Source: Fricke 1983



Synchiropus marmoratus, 52 mm SL, female (Zanzibar). Source: Fricke 1983

DISTRIBUTION WIO: Tanzania, including Zanzibar, to Mozambique (Maputo Bay).

REMARKS Found in estuaries and littoral areas, in seagrass beds, and on coral reefs.

Synchiropus minutulus Fricke 1981

Minute flagfin dragonet

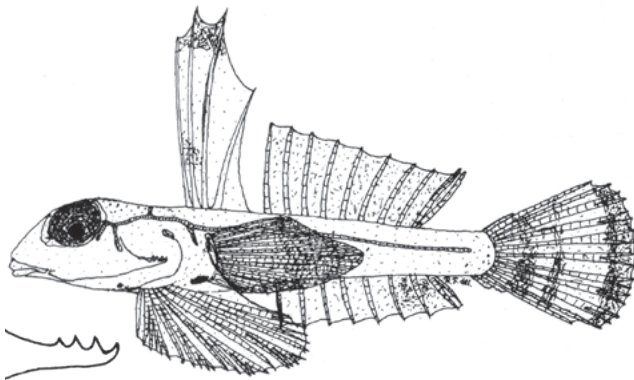
PLATE 167

Synchiropus minutulus Fricke 1981: 119, Fig. 38 (southwest of Mafilifleuri, Maldives); Fricke 1983*, 1988*, 2002; Winterbottom *et al.* 1989*.

Dorsal fins 4 spines (1st dorsal fin of males high, without filaments, and 3rd spine longest), 9 rays; anal fin 8 rays; pectoral fins 19 rays; caudal fin 10 or 11 rays, fin rounded. All dorsal- and anal-fin rays unbranched. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 26–31%,

body depth 17–18%, predorsal length 33–36%, and preanal length 49–53%. Percentage HL: eye diameter 31–40%, snout length 28–29%. Preopercular spine with 3 curved points on upper edge.

Body yellowish brown dorsally, cream ventrally; 1st dorsal fin of males grey distally; black spot at lower part of pectoral-fin base; caudal fin with dark bars. Attains at least 23 mm SL.



Synchiropus minutulus, 14 mm SL, male holotype, preopercular spine inset (Maldives). Source: Fricke 1983

DISTRIBUTION WIO: Chagos and Maldives.

REMARKS Found on sand patches of coral reefs, from nearshore to ~10 m deep.

Synchiropus monacanthus Smith 1935

Deepwater dragonet

PLATE 167

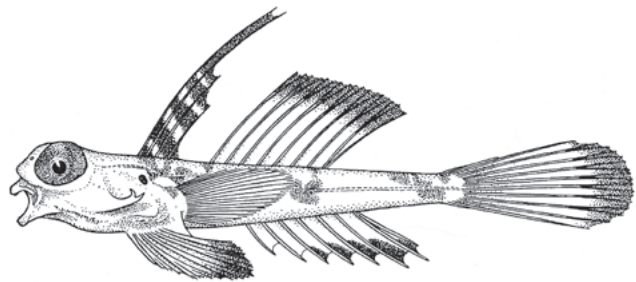
Synchiropus monacanthus Smith 1935: 187 (Port Alfred, Eastern Cape, South Africa); Smith 1949*, 1963*; Kotthaus 1977; Fricke 1981*, 1983*, 1988*, 2002; SSF No. 239.8*; Manilo & Bogorodsky 2003; Anderson *et al.* 2005.

Callionymus bicornis Norman 1939: 74, Fig. 26 (near Zanzibar, Tanzania). *Callionymidae* sp.: Kotthaus 1977*.

Dorsal fins 4 spines (spines 1–2 of males elongate), 8 rays; anal fin 7 rays; pectoral fins 19–21 rays; caudal fin 10–12 rays, fin large and slightly rounded. Lateral line bifurcate on nape, with one branch connected to other side and the other branch running to behind eye; no branches across top of peduncle. Percentage SL: HL 26–32%, body depth 15–18%, predorsal length 28–35%, and preanal length 45–56%. Percentage HL: eye diameter 31–45%, snout length 11–20%. Preopercular

spine with main tip curved upwards and with 1 antrorse point on upper edge; no antrorse spine at base.

Body with reddish brown to dark brown mottling dorsally, pale pinkish ventrally; dark brown margins on 2nd dorsal fin, caudal fin, anal fin and pelvic fins in both sexes; 1st dorsal fin of males obliquely banded, fin of females with proximal band only. Attains 21 cm TL.



Synchiropus monacanthus, 92 mm TL, holotype of *Callionymus bicornis*. Source: Norman 1939

DISTRIBUTION WIO: Socotra, Tanzania (Zanzibar), Mozambique to South Africa (Eastern Cape) and Madagascar.

REMARKS Found on soft bottom, at 175–549 m.

Synchiropus postulus Smith 1963

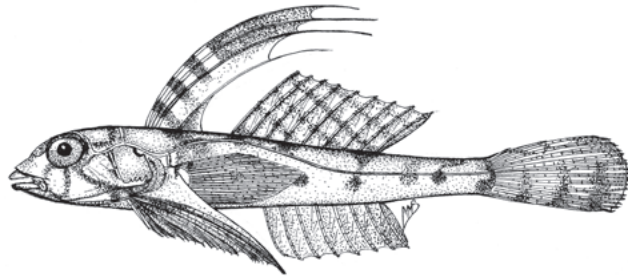
Dwarf dragonet

Synchiropus postulus Smith 1963: 560, Fig. 7, Pl. 86e (Ibo I., Mozambique); Fricke 1981*, 1983*, 1988*, 2002; SSF No. 239.9*.

Minysynchiropus laddi (*non* Schultz 1960): Nakabo 1982 [in part].

Dorsal fins 4 spines (spines of males elongate, filamentous; 1st dorsal fin of females lower than 2nd), 9 rays; anal fin 8 rays; pectoral fins 20 or 21 rays; caudal fin 10 or 11 rays, fin slightly rounded. Lateral line on head with branches on postorbital region and cheek, and lateral lines joined across nape only (not across top of peduncle). Percentage SL: HL 23–30%, body depth 18–23%, predorsal length 29–37%, and preanal length 55–59%. Percentage HL: eye diameter 33–44%, snout length 23–30%. Preopercular spine with 3–5 points on upper edge and main tip curved upwards; no antrorse spine at base.

Preserved specimens brown with darker saddles and blotches on sides; 1st dorsal fin darkly banded in males, without banding in females. Attains <30 mm TL.



Synchiropus postulus, 25 mm TL, female holotype (top) (N Mozambique); 25 mm TL, male (bottom) (Aldabra). Source: Smith 1963

DISTRIBUTION WIO: Oman, Tanzania to South Africa (Sodwana Bay), Aldabra and Mauritius.

REMARKS Found in tidepools and on coral reefs, to ~12 m deep.

Synchiropus sechellensis Regan 1908

Seychelles dragonet

PLATES 167 & 168

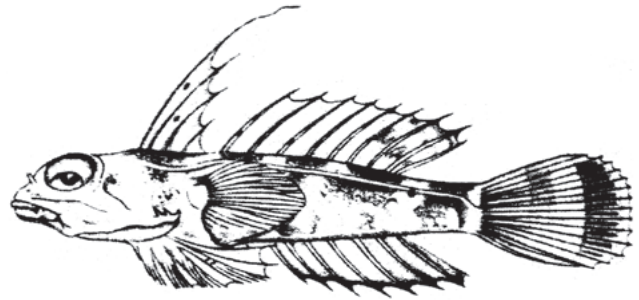
Synchiropus sechellensis Regan 1908: 249, Pl. 30, Fig. 1 (Seychelles); Smith 1963*; Smith & Smith 1963*; Kotthaus 1977*; Fricke 1981*, 1983*, 1988*, 2000; Manilo & Bogorodsky 2003.

Synchiropus altivelis Regan 1908: 249, Pl. 30, Fig. 2 (Seychelles) [secondary homonym of *Synchiropus altivelis* (Temminck & Schlegel 1845)]; Norman 1939*.

Neosynchiropus sechellensis: Nakabo 1982.

Dorsal fins 4 spines (1st spine filamentous in both sexes), 8 rays; anal fin 6 or 7 rays; pectoral fins 18–23 rays; caudal fin 9–11 rays, fin longer and deeper in males than in females. Lateral line with 2 branches in postorbital region of cheek, and lateral lines joined across nape and top of peduncle. Percentage SL: HL 27–33%, body depth 18–20%, predorsal length 25–32%, and preanal length 53–59%. Percentage HL: eye diameter 28–45%, snout length 33–37%. Preopercular spine with main tip curved upwards and with 2 additional curved points on upper edge, and 0–2 antrorse spines at base.

Head and body rose-pink or red-orange, white ventrally, with irregular broad red bars and narrower white blotches; 1st dorsal fin of males with small brown ocelli, fin of females alternatively spotted with black and white and membranes 2–4 pale; caudal fin with 2 red-orange bars. Attains 11 cm TL.



Synchiropus sechellensis, 55 mm TL (Seychelles). Source: Regan 1908

DISTRIBUTION Indo-Pacific. WIO: Red Sea (including Gulf of Suez) to Somalia, Seychelles and Maldives; Lessepsian migrant to eastern Mediterranean Sea; elsewhere to Indonesia and New Caledonia.

REMARKS Known from soft bottom, in 37–68 m.

Synchiropus stellatus Smith 1963

Starry dragonet

PLATE 168

Synchiropus stellatus Smith 1963: 559, Pl. 85, Figs. A–B (Pinda, Mozambique); Fricke 1981*, 1983*, 1988*, 2002; SSF No. 239.10*; Allen & Steene 1987*, 1994; Randall 1992*, 1995*; Debelius 1993*, 1999*; Eichler & Lieske 1994*; Randall & Egmond 1994*; Kuitert 1998*; Manilo & Bogorodsky 2003; Fricke *et al.* 2009.

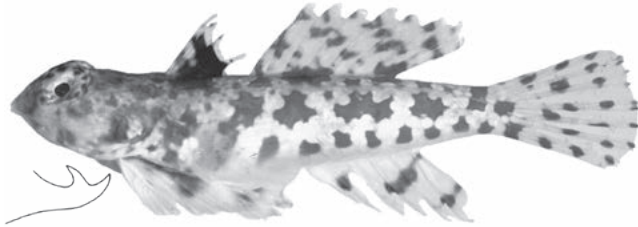
Synchiropus marmoratus (*non* Peters 1855): Allen & Steene 1987*.

Neosynchiropus stellatus: Heemstra & Heemstra 2004*.

Dorsal fins 4 spines (1st dorsal fin of males high and spines filamentous; 1st dorsal fin of females lower than 2nd), 8 rays; anal fin 7 rays; pectoral fins 19–24 rays; caudal fin 10 or 11 rays, fin slightly rounded. Lateral lines on head with branches on postorbital region and cheek, and a branch connecting across nape; no branch across top of peduncle. Percentage SL: HL 27–34%, body depth 16–19%, predorsal length 26–30%, and preanal length 52–57%. Percentage HL: eye diameter 36–45%, snout length 18–20%. Preopercular

spine with main tip curved upwards and with 1 additional point on upper edge; no antrorse spine at base.

Body mottled pink or golden brown with stellate blotches of red or brownish red, and silvery to white ventrally; tiny black blotches mostly on head and fins; 1st dorsal fin of males with wavy black lines and ocelli, fin of females mostly black with white margin; anal fin of males mostly black, fin of females with red blotches; caudal fin pale bluish white, with red or orange blotches forming bars. Attains 80 mm TL.



Synchiropus stellatus, 37 mm SL, preopercular spine inset (S Mozambique). PC Heemstra © NRF-SAIAB

DISTRIBUTION Indian Ocean. WIO: northern Mozambique (Ibo I.) to South Africa (Aliwal Shoal), Seychelles, Mauritius, Maldives and Sri Lanka; elsewhere to western Indonesia.

REMARKS Found in seagrass beds of littoral areas and near reefs, at 5–40 m.

Synchiropus tudorjonesi Allen & Erdmann 2012

Redback dragonet

PLATE 168

Synchiropus tudorjonesi Allen & Erdmann 2012: 10 (Cenderawasih Bay, West Papua Province, Indonesia); Tea & Gill 2016.

Dorsal fins 4 spines (higher in males), 8 rays; anal fin 6–7 rays; pectoral fins 19–21 rays; caudal fin 8–9 rays, fin large and slightly rounded. Lateral line bifurcate on nape, with one branch connected to other side and the other branch running to behind eye; no branches across top of peduncle. Percentage SL: HL 30–36%, body depth 21–22%, predorsal length 34–40%, and preanal length 59–63%. Percentage HL: eye diameter 38–42%, snout length 23–27%. Preopercular spine with main tip very small, curved upwards and with usually 1 (rarely 2–3) curved spinules on upper edge; no antrorse spine at base.

Body bright red with black pectoral-fin base, diffuse blackish zone on ventral half of side punctuated by

variable-sized white spots; male with moderately elevated spinous dorsal fin with four black oblique bands, alternating with narrower bands of yellow and blue; female with shorter, mainly black spinous dorsal fin. Attains 50 mm TL.

DISTRIBUTION WIO: Maldives; elsewhere, east to western New Guinea (West Papua, Indonesia), north to southern Japan.

REMARKS Found in coral reefs with scattered corals and sponges, at 50–70 m.

GLOSSARY

antitropical distribution – the distribution pattern where a group is found north and south of, but not in, the tropics (also anti-equatorial).

antrorse (spine) – pointing or curving anteriorly.

serrae – saw-like teeth or serrations.

FAMILY DRACONETTIDAE

Slope dragonets

Ronald Fricke and M Eric Anderson

Body elongate, rounded in cross-section; head broad and moderately depressed. Two dorsal fins: 1st dorsal fin 3 spines; 2nd dorsal fin 12–15 rays, all unbranched except last ray divided to base; anal fin without spines, 12 or 13 rays, all branched, last ray divided to base; pelvic fins large, jugular, widely separated, with 1 spine, 5 soft rays. Jaws with villiform teeth in bands, no teeth on palate. Nostrils paired. Gill opening broad, extending from upper edge of pectoral-fin base almost to pelvic-fin base; gill rakers small, few. Opercle and subopercle reduced, each with straight, sharp spine; no preopercular spine. Lateral line developed on head only, vestigial on body, set in a groove. No scales.

Relatively rare, in tropical to warm-temperate waters of all three major oceans. Little is known of their life-history stages; larvae planktonic, adults benthic on soft bottom, from edge of outer continental shelf and on seamounts, to ~600 m deep. Reviews of the family by Briggs & Berry (1959), Nakabo (1982) and Fricke (1992). Two genera and ~12 species; probably 3 species in WIO, only 1 at depths of <200 m.

GENUS *Draconetta* Jordan & Fowler 1903

Diagnosis as for the single species.

Draconetta xenica Jordan & Fowler 1903

Highfin slope dragonet

PLATE 168

Draconetta xenica Jordan & Fowler 1903: 939, Fig. 1 (Suruga Bay, Japan);

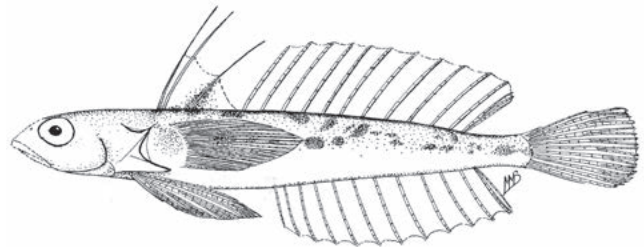
Briggs & Berry 1959; Fricke 1992, 2002.

Draconetta africana Smith 1963: 548, Fig. 1 (off southern Kenya).

First dorsal fin 3 spines, thin and flexible; 2nd dorsal fin 12 rays; anal fin 12 rays; pectoral fins 21–25 rays; caudal fin 12–14 rays, fin rounded, middle rays bifurcate. Percentage SL: HL 23–28%, body depth 12–13%, predorsal length 29–32%, preanal length 45–52%, eye diameter 10–13%, and upper jaw length 10–12%. First dorsal fin higher in males than females, 1st spine of males higher than any rays of 2nd dorsal fin; pectoral fins reach 3rd or 4th anal-fin membrane; pelvic fins reach 1st anal-fin membrane. Opercle spine gently curved upwards. Lateral line in groove on body not disconnected from lateral line on head; one LL scale on cheek, another LL scale behind eye; supraorbital LL present across nape. Vertebrae 8 + 14.

Females pale brown, with darker brown blotches (more apparent in larger fish); lower sides of body with orange

blotches; sides of head silvery, with orange spots and stripes; 1st dorsal-fin membranes with brown swathes or nearly entirely brown in larger fish; 2nd dorsal fin translucent, with brown spots; anal fin dark red, violet distally; caudal fin orange with brown lines. Males similar to females but more yellowish; 1st dorsal fin yellowish brown, 2nd dorsal fin yellow with silvery blue lines; anal fin yellow basally with bluish lines, dark red distally; caudal fin yellow, dark red distally. Attains 9 cm SL.



Draconetta xenica, 75 mm TL, holotype of *D. africana* (Kenya).

Source: Smith 1963

DISTRIBUTION Throughout tropical Indo-Pacific. WIO: records from Kenya, Mozambique and South Africa (Knysna); elsewhere to South China Sea, southern Japan, New Caledonia and Hawaii.

REMARKS Found on soft bottom, at 128–350 m.