

Description of two new species of shore-eels (Gobiesocidae: Cheilobranchinae: *Alabes*) from south-eastern Australia and Norfolk Island

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Abstract

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Two new species of *Alabes* are reported, one from Tasmania and the other from Norfolk Island. The first is similar in general appearance to *A. parvula*, but is considerably smaller in size (to 39 mm SL) and inhabits waters of much greater depth (160–348 m). The Norfolk Island species has a uniquely enlarged buccal region and is possibly endemic to this island.

Keywords

Alabes, Cheilobranchinae, Tasmania and Norfolk Island, Australia

Introduction

Following a study of the Australian subfamily Cheilobranchidae, Hutchins and Morrison, 2004 described five new species of *Alabes*, namely *A. elongatus*, *A. gibbosus*, *A. obtusirostris*, *A. occidentalis* and *A. scotti*. They also recognised four previously described species, *Alabes dorsalis* Richardson, *A. parvula* McCulloch, *A. hoesei* Springer and Fraser, and *A. brevis* Springer and Fraser, concurring with the findings of an earlier review (Springer and Fraser, 1976). The latter review also reported a single Norfolk Island specimen of doubtful identity but close to *A. parvula*, and indicated that further specimens should be collected before its status could be verified. As no new material of the Norfolk Island form had been forthcoming in the intervening years, Hutchins and Morrison, 2004 preferred not to provide a description, but did include it, as *Alabes* sp., in a table to the genus indicating its unique identity. Furthermore, they also examined, but did not report on, two specimens of a form similar to *Alabes dorsalis* which had been collected offshore from Tasmania at a depth of 160 m (*A. dorsalis* is a common intertidal species which occurs rarely to a maximum depth of 30 m). However, the two nondescript specimens were small (29–39 mm SL versus a maximum size of 120 mm for *A. dorsalis*), and were suspected of being juveniles that had possibly been carried offshore by ocean currents. Recently a third specimen of this form was taken at an even greater depth (348 m) near King Island, just to the north-west of Tasmania. It proved to be conspecific with the other two Tasmanian specimens, and although very similar to *A. dorsalis*, all three nevertheless represent an undescribed species. The purposes of the present paper, therefore, are to provide descriptions of these two rare species from Norfolk Island and Tasmania, and to expand the key of Hutchins and Morrison, 2004 to include them.

Methodology follows that of Hutchins and Morrison, 2004.

The following abbreviations refer to cephalic pores of the lateral line system: ANP, anterior nasal pore; LP, lacrymal pore; PNP, posterior nasal pore; POP, postocular pore. Standard length is abbreviated SL and head length is abbreviated HL. Type material is held in the Australian Museum, Sydney (AMS), Marine Research Laboratories, CSIRO, Hobart (CSIRO), and Museum Victoria, Melbourne (NMV).

Key to the species of *Alabes*

1. Pelvic fin rudiment present, located on ventral surface immediately behind gill opening 2
– Pelvic fin rudiment absent 6
2. Pelvic fin rudiment moderate in size, fin rays present; POP 1 3
– Pelvic fin rudiment small, pelvic fin rays (if present) not visible; POP 2, usually widely separated 5
3. Pelvic fin rudiment width equal to or wider than length of gill slit 4
– Pelvic fin rudiment less than length of gill slit (Tasmania) *A. bathys* sp. nov.
4. Body relatively robust (depth 9.3–11.6 in SL); dorsal fin fold relatively high, continued anteriorly to vertical through urogenital opening (snout to origin of dorsal fin fold 2.0–3.5 in SL); blackish circular blotches often present on middle of side of adult (NSW, Vic., Tas., and SA) *A. dorsalis*
– Body more slender (depth 12.5–14.9 in SL); dorsal-fin fold relatively low, origin falling well short of vertical through urogenital opening (snout to origin of dorsal fin fold 1.3–2.4 in SL); no dark circular blotches on side of large adult (WA) *A. elongata*

5. Head relatively large, length 6.7–7.6 in SL; PNP absent (WA) *A. brevis*
 – Head relatively small, length 9.7–11.4 in SL; PNP present (WA) *A. gibbosa*
6. Gill slit small, length 5.4–22.9 in HL; POP 1 or 2; nasal pores present or absent 7
 – Gill slit moderately large, length 3.1–4.3 in HL; no POP or nasal pores (Tas. and WA) *A. obtusirostris*
7. Origin of dorsal-fin fold over vertical through urogenital opening or behind; anal-fin fold prominent, extending about half way from caudal fin to urogenital opening; interorbital relatively wide, width 5.4–10.8 in HL; body translucent posteriorly in life, sides without alternating black and white bars 8
 – Origin of dorsal-fin fold just behind head; anal-fin fold absent or restricted to region just anterior to caudal fin; interorbital very narrow, width 8.8–22.6 (usually 15 or more) in HL; body orange in life (not translucent posteriorly), sides with alternating wide black and narrow white bars (NSW, Vic., and Tas.) *A. scotti*
8. Postocular pores 1; PNP absent; caudal-fin rays less than 7 or absent 9
 – Postocular pores 2; PNP usually present; caudal-fin rays 7–8 (NSW, Vic., Tas., SA, WA) *A. hoesei*
9. Origin of dorsal-fin fold over vertical through urogenital opening 10
 – Origin of dorsal-fin fold well posterior to vertical through urogenital opening (Norfolk I.) *springeri* sp. nov.
10. Lacrymal pores present; male with pattern of regular tiger-like bars anteriorly on side of body, not merging ventrally with longitudinal series of 4 blackish to dark-blue blotches on side of abdomen, area of blotches extending about half way between gill slit and urogenital opening (NSW, Qld) *A. parvula*
 – Lacrymal pores absent; male with irregular arrangement of tiger-like bars anteriorly on side of body, merging ventrally with 2–3 blackish blotches which extend about one-third distance between gill slit and urogenital opening (WA) *A. occidentalis*

Alabes bathys sp. nov.

Figures 1a, b; Table 1

Material examined. Holotype. NMV A14558, 39 mm SL, Tas., 30 km NNW of Cape Sorell (42°10.9'S, 144°48.9'E), WHOI epibenthic sled at 160 m, RS Wilson on board *RV Soela* (field no. S05/84 54), 20 Oct 1984.

Paratypes. NMV A28045-001, 29 mm SL, taken with holotype (disarticulated cleared and stained skeletal material); CSIRO H.6156-01, 38 mm SL, Tas., King I. Canyons, west of King I. (between 39°48'S, 143°08'E and 39°50'S, 143°07'E), Sherman sled at 348 m, FRV *Southern Surveyor* (field no. SS0404/35), 18 Apr 2004.

Diagnosis. *Alabes bathys* differs from all other species of *Alabes* by a combination of its moderately large gill opening (width 3.1–3.7 in HL), somewhat smaller pelvic fin rudiment (width 1.4–1.6 in gill opening) consisting of 2 apparent fin rays in each half, 4 cephalic pores (1 POP, 1 ANP, 2 LP) in the lateral line system, and its unique colour pattern.



Figure 1a. *Alabes bathys*, holotype, NMV A 14558, 39 mm SL, off Cape Sorell, Tas. (photograph courtesy of Rudie Kuitert, NMV).



Figure 1b. *Alabes bathys*, paratype, CSIRO H.6156-01, 38 mm SL, west of King I., Tas. (photograph courtesy of Alastair Graham, CSIRO)

Table 1. Measurements (mm) and counts of the holotype and paratypes of *Alabes bathys* sp. nov.

	Holotype NMV A14558	Paratype NMV A28045-001	Paratype CSIRO H.6156-01
Standard length	39	29	38
Head length	5.2	3.9	4.4
Snout length	1.3	0.8	1.4
Eye diameter	1.6	1.2	1.5
Interorbital width	0.7	0.5	0.6
Gill slit width	1.4	1.1	1.4
Head width	2.4	2.1	2.4
Body width at gill slit	1.8	1.7	1.8
Body width (max.)	1.8	1.7	1.8
Body depth (max.)	3.0	2.3	2.9
Snout to dorsal-fin fold	14	9.2	15
Snout to anal-fin fold	19	11	22
Snout to anus	14	11	14
Ventral fin width	0.9	0.8	1.0
Caudal fin rays	8	7?	8
Postocular pores	1	1	1
Posterior nasal pores	0	0	0
Anterior nasal pores	1	1	1
Dorsal lacrymal pores	1	1	1
Ventral lacrymal pores	1	1?	1
Sex	?	?	?

Description. Measurements of the holotype and paratypes are presented in Table 1 (counts and proportions in parentheses in the following description represent those of the paratypes where different from the holotype). Body elongate, subcylindrical, widest anteriorly (maximum body width at level of gill slit 21.7 [17.1–21.1] in SL), reaching a maximum depth about middle of body (depth 13.0 [12.6–13.1] in SL), tapering posteriorly; head small, cylindrical, length 7.5 (7.4–8.6) in SL, slightly wider than body, width 2.1 (1.8–1.9) in HL; snout short, round to slightly truncate in dorsal view, length 4.0 (3.1–4.6) in HL; nostrils small but obvious, anterior 1 tubular, posterior 1 with low raised rim; eye moderate in size, with prominent clear cornea, diameter of orbit 3.3 (2.9–3.3) in HL, bony interorbital rather narrow, width 7.4 (7.3–7.8) in HL.

Skin smooth and scaleless, usually covered with mucus layer; lateral line sensory system consists of small open pores and minute papillae (latter very difficult to detect); 4 pores on each side of head, consisting of 1 POP and 1 ANP, and 2 LP. Gill opening a moderately wide slit, located on ventral surface of head, length 3.7 (3.1–3.5) in HL; gills 3?; branchiostegals 3; mouth terminal, gape not reaching vertical line through anterior margin of eye (pigmented area), lips narrow, somewhat fleshy; teeth in cleared and stained paratype small, conical, canine-like, 1 row of 6–8 teeth on each side of upper and lower jaws, largest anteriorly (premaxilla also with 3 much smaller teeth forming a 2nd row along inner base of main row); palatine and vomerine teeth absent. Dorsal and anal-fin folds resemble low fins, but lack both fin rays and underlying pterygiophores; caudal fin with 8 (7–8) fin rays, continuous with dorsal and anal-fin folds; bases of dorsal and anal-fin folds relatively long, insertion of dorsal-fin fold over or slightly behind vertical through urogenital opening, insertion of anal-fin fold well behind vertical through urogenital opening (snout to insertion of dorsal-fin fold 2.7 [2.6–3.2], snout to insertion of anal fin fold 2.0 [1.7–2.6], snout to urogenital opening 2.8 [2.7–2.8], all in SL); urogenital opening with prominent papilla. Total vertebrae not known for holotype but cleared and stained paratype has a total of 68 vertebrae, not including hypural plate (21 precaudal), with last epineural on 24th vertebra.

Colour in alcohol. Head and body overall pale brown, fins more translucent.

Colour in life. (Based on colour transparency of holotype, see fig. 1a): head and body pale brown, abdominal region more pinkish ventrally; body becoming more translucent posteriorly, vertical fins almost totally transparent; middle of side with longitudinal series of whitish spots from head almost to caudal fin, each spot about equal or subequal to eye diameter; dorsal surface with longitudinal series of similarly coloured short cross-bands, continued onto dorsal-fin fold as vertical bars; a few pale spots on anal-fin fold. Larger paratype differs in its ground colour, being a more pale greyish green (fig. 1b).

Distribution. *Alabes bathys* is known only from western Tas., in the region of Cape Sorrell and King I.

Remarks. This species has so far only been collected by dredge from deep coastal waters at depths between 160 and 348 m. It shares with *Alabes dorsalis* a large ventral gill slit and prominent

ventral fin rudiment, but differs in the relatively narrow width of the latter fin (maximum width 1.4–1.6 versus 0.8–1.0 for *A. dorsalis*, all in length of gill slit). It also has a narrower body (maximum depth 12.6–13.1 versus 9.3–11.6 in SL), lacks the dark circular markings along the body and its small size (maximum length 42 mm TL versus 120 mm TL in *A. dorsalis*).

Etymology. This species is named *bathys* (from the Greek “bathys” meaning deep) with reference to its deep water habitat.

Alabes springeri sp. nov.

Figure 2 ; Table 2

Alabes parvulus (non McCulloch) Springer and Fraser, 1976: 21.

Material examined. Holotype. AMS I.18497-001, 31 mm SL, Norfolk I., Emily Bay, Point Hunter (29°04'S, 167°57'E), rotenone at 1 m, C. Anderson et al., 16 Sep 1975.

Diagnosis. *Alabes springeri* differs from all other species of *Alabes* by a combination of its small gill opening (8.8 in HL), lack of a pelvic-fin rudiment, narrow interorbital space (8.8 in HL), presence of only 2 cephalic pores in the lateral line system, and the posteriorly placed origin of the dorsal-fin fold.

Description. Measurements of the holotype, the only known specimen, are presented in Table 2. Body elongate and subcylindrical, reaching a maximum depth at level of about anterior 3rd of body, then tapering posteriorly, body depth 11.1 in SL, maximum body width (= width at level of gill slit) 15.5 in SL; caudal peduncle absent (caudal fin joined to dorsal and ventral-fin folds); head small, length 7.0 in SL, a little wider than deep (head width 1.9 in HL); snout short, rather rounded to slightly truncate anteriorly in dorsal view, length 3.1 in HL; nostrils small but obvious, anterior one tubular, posterior one with low raised rim; eye moderate in size, with prominent clear cornea, diameter of orbit 3.7 in HL, noticeably greater than bony interorbital width (8.8 in HL).

Skin smooth and scaleless, normally covered with a thick mucus layer; lateral line sensory system consists of minute papillae (latter very difficult to detect); cephalic pores 2 on each side of head, 1 POP and 1 ANP. Gill opening a narrow slit, located on ventral surface of head, width 8.8 in HL; gills and branchiostegals not examined; mouth subterminal, upper jaw projecting over lower jaw, upper and lower lips rather narrow, rear corner of mouth not reaching anterior margin of eye (pigmented area); teeth incisorform, 1 row in upper and lower jaws; palatine and vomerine teeth absent. Dorsal and anal-fin folds resemble low fins, but lacking both fin rays and underlying pterygiophores, continuous with caudal fin; caudal fin without visible fin rays, although there is evidence that the posterior portion of the specimen was damaged at some time (portion of caudal and anal-fin folds lost, and some vertebral elements also protruding through side of body); bases of dorsal and anal-fin folds relatively short, insertion of dorsal-fin fold well behind vertical through urogenital opening (snout to insertion 1.8, snout to urogenital opening 2.6, both in SL), snout to insertion of anal-fin fold 1.4 in SL; urogenital opening with small papilla. Total vertebrae 71 (from Springer and Fraser, 1976), with last epipleural on 20th vertebra.

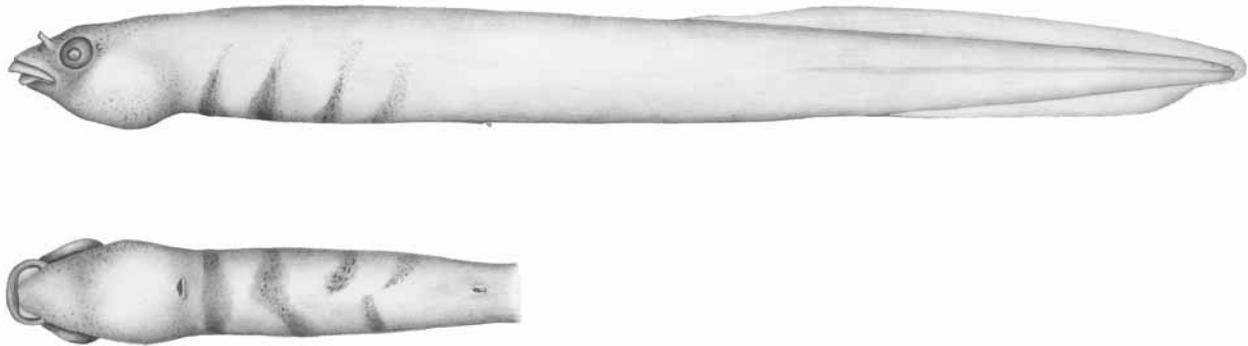


Figure 2. *Alabes springeri*, holotype, AMS I.18497-001, 31 mm SL, Norfolk I., Emily Bay, Point Hunter (illustration courtesy of Victor Springer, USNM).

Table 2. Measurements (mm) and counts of the holotype of *Alabes springeri* sp. nov.

	Holotype AMS I.18497-001
Standard length	31
Head length	4.4
Snout length	1.4
Eye diameter	1.2
Interorbital width	0.5
Gill slit width	0.5
Head width	2.3
Body width at gill slit	2.0
Body width (max.)	2.0
Body depth (max.)	2.8
Snout to dorsal fin fold	17
Snout to anal fin fold	22
Snout to anus	12
Caudal fin rays	0
Postocular pores	1
Posterior nasal pores	0
Anterior nasal pores	1
Dorsal lacrymal pores	0
Ventral lacrymal pores	0
Sex	Male?

Colour in alcohol. Head and body overall pale brown, fins more translucent. Springer and Fraser, 1976 illustrated some partial cross banding on the abdominal region, triangular in shape (see fig. 2), but this has since faded.

Colour in life. Unknown

Distribution. *Alabes springeri* is known only from the type locality (Norfolk I.).

Remarks. This species inhabits shallow coastal waters (single specimen taken from a depth of 1 m). It is most similar to *Alabes parvula* from eastern Australia, differing in the exceptionally short base of the dorsal-fin fold, different shape of the dark bars on the side of the abdomen (triangular-shaped versus more squarish in *A. parvula*), and the expanded shape of the buccal region (not expanded in *A. parvula*). Like other members of the *Alabes parvula* complex (*A. parvula*, *A. occidentalis*, and *A. hoesei*), it lacks a pelvic fin rudiment, has a very small gill slit, its body probably is transparent in life (at least posterior to urogenital opening), and its maximum size is less than 50 mm TL (see Table 1 in Hutchins and Morrison, 2004). This species is named *springeri* in honour of V.G. Springer (USNM) who, with T. Fraser in 1976, first reported the apparent uniqueness of the Norfolk Island specimen. (NB. registration number AMS I.18470-002 was inadvertently assigned to this specimen by Springer and Fraser, 1973: 21, but that number belongs to one of the paratypes of *Alabes hoesei* which was described in the same paper).

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