

Description of a new deepwater clingfish (Gobiesocidae) from New South Wales

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Abstract

A new species of deepwater clingfish, *Kopua kuiteri*, is described from New South Wales. It is distinguished from the only other member of the genus, *K. nuimata* Hardy, by the lower dorsal and anal fin-ray counts (6 and 7 versus 10-11 and 8-9 respectively), the absence of papillae in region D of the ventral sucking disc (present in *K. nuimata*), and the lower number of sensory pores on each side of the head (2 versus 7 respectively). These differences are discussed in the context of interspecific variation in other Australian and New Zealand genera.

Introduction

The monotypic gobiesocid genus *Kopua* Hardy is known only from deep water off the north island of New Zealand. Its type species, *K. nuimata* Hardy, 1984, was described from six specimens (19-28 mm SL) collected at depths between 160 and 337 m. Unlike other New Zealand clingfishes, *K. nuimata* is characterised by the unique condition of large eyes separated by a very narrow interorbital. In addition, the ventral sucking disc has a peculiar shape caused by a long and truncate posterior fringe.

During an investigation by the present author in 1982 aimed at discovering the number of clingfish species in southern Australian waters, an unusual specimen from deep water off Bermagui in New South Wales was examined. Its distinctive features included a large eye, very narrow interorbital, and a long, somewhat truncate posterior fringe to the ventral disc. At the time, this specimen was thought to represent an undescribed genus and species. When *Kopua nuimata* was described two years later, there was little doubt that the Australian specimen would also prove to be a member of this genus. However, a closer examination showed that the New Zealand and Australian forms differed considerably in respect to two characters thought to be important for distinguishing gobiesocid genera (*K. nuimata* has many more cephalic sensory pores than the Australian specimen and the pattern of papillae on the ventral sucking disc is different). It was decided to await more Australian material in the off chance that the single specimen was deformed. However, in the intervening years, no additional specimens have been found. Furthermore, after the examination of large numbers of gobiesocids, it is now considered unlikely that the single specimen is abnormal. The purpose of this paper, therefore, is to describe the Australian specimen as a new species of *Kopua*, and to comment on the importance of the differences between it and *K. nuimata*.

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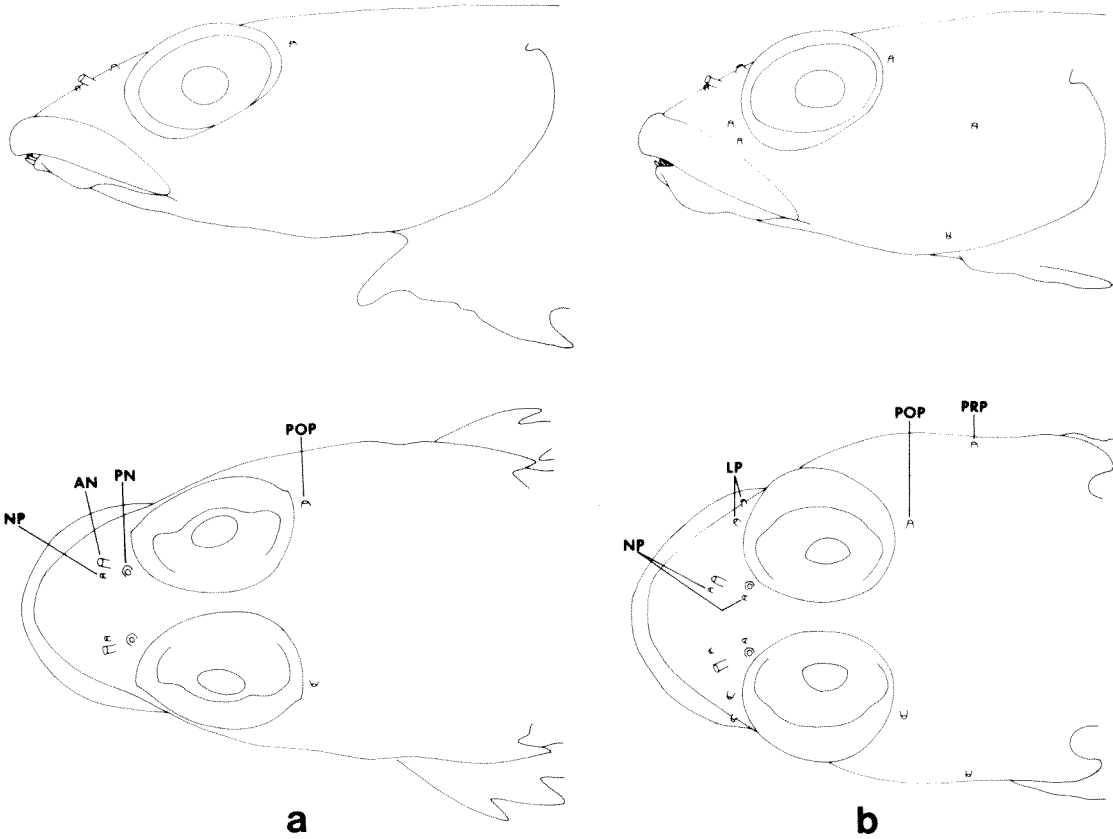


Figure 1. Lateral and dorsal view diagrams of the heads of both species of *Kopua* showing the differences in their cephalic pore systems: a. *K. kuiteri* sp. nov., holotype, 37 mm SL; b. *K. nuimata*, NMNZ P.13110, 28 mm SL (abbreviations: AN-anterior nostril; LP-lacrymal pore; NP-nasal pore; PN-posterior nostril; POP-postocular pore; PRP-preopercular pore).

The methods used follow Hutchins (1983). The material examined is housed at The Australian Museum, Sydney (AM), National Museum of New Zealand, Wellington (NMNZ), and Western Australian Museum, Perth (WAM).

Systematics

Kopua kuiteri sp. nov.

Figures 1a, 2, and 3

Holotype

AMS I.22886-001, 37 mm SL, off Bermagui, New South Wales (36°25'S, 150°04'E), inside empty cowry shell, collected by bottom trawl at 92-110 m, R. Kuitert, 3 August 1980.

Diagnosis

This species is placed in the genus *Kopua* because of the large eyes, extremely narrow interorbital, and its distinctively shaped ventral sucking disc. It is separated from *Kopua nuimata*, the only other known member of the genus, by its lower fin-ray counts, the lack of cephalic sensory pores in the preoperculomandibular and lacrymal series, and the absence of a posterior patch of papillae on the anterior half of its ventral sucking disc (region D).

Description

As only a single specimen of this species is known, its measurements are included in the following account, accompanied by the proportional meristics in parentheses.

Dorsal fin rays 6; anal fin rays 7; pectoral fin rays 23; pelvic fin rays 1,4; caudal fin rays 14 (segmented rays only); vertebrae 34 (from radiograph); branchiostegals 6.

Body moderately robust, subcylindrical anteriorly, compressed posteriorly, depth 5.2 mm (7.1 in SL) and width 6.9 mm (5.4 in SL); caudal peduncle very short but deep, length 0.9 mm and depth 3.9 mm; head moderately wide posteriorly and compressed, head length 15 mm (2.5 in SL) and head width 8.3 mm (1.8 in its length); snout somewhat triangular in dorsal view, rounded anteriorly, length 3.6 mm (4.2 in head length); nostrils moderate in size, tubular, posterior one much shorter than anterior, both without flaps; posterior nostril level with or slightly anterior to front border of eye; eye large, diameter 4.3 mm (3.5 in head length); bony interorbital very narrow, width 0.7 mm (21.4 in head length).

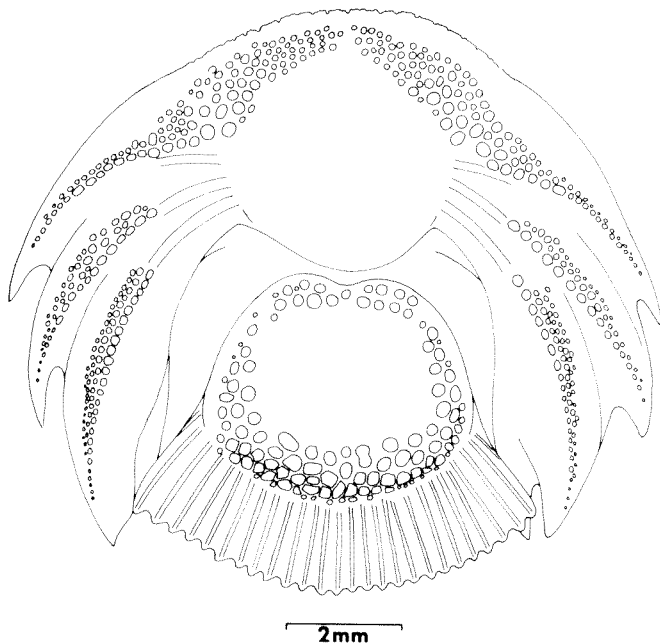


Figure 2. Ventral sucking disc of *Kopua kuiteri* sp. nov., holotype, showing arrangement of papillae on ventral surface (anterior end faces top of page).

Skin smooth and scaleless; lateral line sensory system consists of moderate-sized open pores and minute papillae, the former found only on the head (Figure 1a); each pore has a short tubular opening served by a canal in underlying bones; two pores only on each side of head, one postorbital and one nasal; papillae arranged in longitudinal series laterally on body, more scattered on head, although linear series of about six papillae from nostrils to behind corner of mouth, and line of three on lower jaw adjacent to lip fold (due to the difficulty in detecting these papillae, they are not described further here).

Gill opening wide, membranes joined across isthmus but not attached to it; upper attachment of gill membrane opposite second or third pectoral fin ray; upper attachment of pelvic fin membrane opposite 12th pectoral fin ray; axial dermal flap very small, upper attachment opposite 17th-18th pectoral fin ray; ventral disc double, somewhat circular, moderately large, both length and width 10.3 mm (3.6 in SL); striated posterior fringe long, with distinctly squared posterolateral corners (Figure 2); disc papillae arranged as in Figure 2.

Mouth distinctly subterminal, with large fleshy lips; lip fold of lower jaw not continued across symphysis; teeth in both jaws conical, erect, moderate in size, and bluntly rounded, those anteriorly more flattened and incisorlike; upper jaw with single row of lateral teeth, forming two rows anteriorly (some scattered smaller and more acute teeth posterior to anterior rows); lower jaw with similar teeth to upper, except some lateral teeth noticeably larger and anterior rows forming a tooth patch on either side of symphysis, anteriormost projecting forward, those behind smaller, erect and more pointed; palatine and vomerine teeth absent; gill filaments on all four gill arches; gill rakers short and pointed (unable to be counted).

Bases of dorsal and anal fins short, that of dorsal equal to and originating slightly more anterior to that of anal fin; snout to origin of dorsal fin 27 mm (1.4 in SL); urogenital opening centred between origin of anal fin and rear margin of ventral disc; a prominent genital papilla present.

Subopercular element present, forming terminal bone posteriorly on side of head, but not spinelike; condition of dorsal postcleithral, ventral postcleithral, and pelvis not known.

Colour of holotype in alcohol: overall pale yellowish brown, with blackish brown eyes.

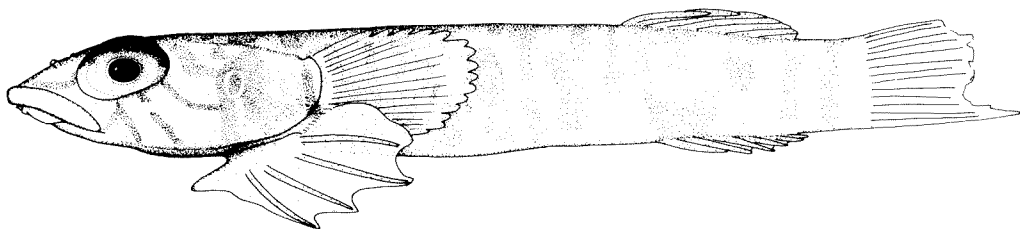


Figure 3. *Kopusia kuiteri* sp. nov., holotype, AMS I.22886-001, 37 mm SL, lateral view.

Colour when fresh (based on colour transparencies of the freshly collected holotype): ground colour pale yellowish brown, with numerous irregularly shaped orange to reddish-orange blotches on head and body, those on latter tending to form cross-bands on back and sides (Figure 3); head with several reddish lines and dashes continued from lower border of eye to ventral surface; a pale purple ringlike mark on side of head about half way between eye and pectoral fin base, subequal in size to pupil; dorsal and anal fins with reddish rays, those of other fins pale red to hyaline, all integuments hyaline; eye orangish, more blackish dorsally, with a pale ring enclosing black pupil.

Distribution

Kopua kuiteri is known only from the type locality off southern New South Wales.

Comparisons

Kopua kuiteri and *K. nuimata* share several important features: both have a similar-shaped ventral disc, a small axial dermal flap, a large eye and very narrow interorbital, teeth which are very close in both their shape and arrangement, and both lack flaps on the rim of the anterior nostril. In addition, both species are the only gobiesocids known to inhabit relatively deep waters in the Australian and New Zealand region. However, *K. kuiteri* possesses only two sensory pores on each side of the head, whereas *K. nuimata* has 7 (Figures 1a and 1b). *Kopua kuiteri* lacks the posterior nasal pore, all lacrymal pores, and all preoperculomandibular pores, whereas *K. nuimata* has an anterior and a posterior nasal pore, two lacrymal pores, and two preopercular pores (both species have only one postorbital pore and lack all mandibular pores). In addition, *K. kuiteri*, unlike *K. nuimata*, has no papillae in region D of its ventral sucking disc. The lower dorsal and anal fin-ray counts for *K. kuiteri* are also significant (6 and 7 respectively, versus 10-11 and 8-9 for *K. nuimata*).

Remarks

Hardy (1984) described *Kopua nuimata* as a new genus and species of deepwater gobiesocid from New Zealand. The discovery of the first Australian deepwater species, herein described as *K. kuiteri*, now extends the range of the genus across the Tasman Sea. No other Australian or New Zealand gobiesocid genus has so far been shown to have a distribution encompassing this region. Although *K. kuiteri* possesses most if not all of the distinguishing features of the genus (see Comparisons above), its major differences when compared to the New Zealand species are difficult to explain in the context of presumed gobiesocid evolution. Hutchins (1983) and Shioyaki and Dotsu (1983) both suggested that the arrangement and number of cephalic sensory pores were important for indicating relationships in the family. A survey of all Australian and New Zealand clingfishes by the present author reaffirmed this (for example, all four species of the Australian *Aspasmogaster* share identical pore patterns (Hutchins 1984), as do the three species of the Australian *Parvicrepis*, both species of the Australian *Lepadichthys*, the two species of *Trachelochismus* from New Zealand, and the two species of *Modicus* from New Zealand). However, the five species currently making up the Australian genus *Cochleoceps* can be separated into three groups based on the number of preoperculomandibular pores, two species with six, two with four and one with five (see

Hutchins 1983). These groupings are also supported by other character differences, which appears to indicate that more than one genus is represented (Hutchins, in preparation). Furthermore, the pattern of papillae on the ventral disc was shown by Briggs (1955) to be a good indicator of relationships. On the other hand, the present study has shown that considerable differences in the cephalic pores and ventral disc papillae exist between the two species of *Kopua*. Consequently, it would appear that these characters are not good indicators of close relationship in all cases, especially for a taxon inhabiting both sides of the Tasman. Other gobiesocids from Australia and what appears to be their New Zealand counterparts have previously been placed in separate genera belonging to different subfamilies on the basis of certain character differences (Briggs 1955). For example, Briggs placed the Australian monotypic *Creocele* and the New Zealand monotypic *Diplocrepis* in separate subfamilies based on the different number of gills (four and three respectively) (this arrangement has been criticised by other workers, e.g. Springer and Fraser 1976, and Hardy 1983). Allowing for this discrepancy, in addition to some differences in the number and pattern of the cephalic pore system, the two closely resemble each other in overall morphology, both internally and externally. Obviously other characters besides the number of gills and the arrangement of both the cephalic pores and ventral disc papillae need to be investigated. Further studies might show that the Australian and New Zealand gobiesocids have more in common than was earlier believed.

Additional material examined.

Kopua nuimata, NMNZ P.13110, paratype, 28 mm SL, Rangatira Knoll, NW of White Island, 292-337 m, RV Tangaroa, 23 January 1981; NMNZ P.9928, paratypes, 3: 25-27 mm SL, Middlesex Bank, NW of Three Kings Islands, 206-221 m, RV Tangaroa, 31 January 1981.

Acknowledgements

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