

MINYCLUPEOIDES DENTIBRANCHIALUS, A NEW GENUS AND SPECIES OF RIVER HERRING FROM THE LOWER MEKONG BASIN OF CAMBODIA (TELEOSTEI: CLUPEIDAE: PELLONULINAE)

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ABSTRACT. – *Minyclupeoides dentibranchialus*, new genus and species, is a very small member of the herring subfamily Pellonulinae discovered recently in the Lower Mekong basin of Cambodia. It differs from other known members of the subfamily in its near total lack of scales. A single scale bearing a lateral line pore occurs on each side of the body at the level of the shoulder. The largest specimen is only 22.5 mm and a gravid female is 21.5 mm. This is substantially smaller than any of the four species of Pellonulinae or river herrings previously known from the Mekong basin. Type specimens are deposited in the California Academy of Sciences, San Francisco (CAS) and in the Zoological Reference Collection of the Raffles Museum for Biodiversity Research, National University of Singapore (ZRC).

KEYWORDS. – Pellonulinae, river herrings, *Minyclupeoides dentibranchialus*.

INTRODUCTION

Pellonulinae is an Old World subfamily of Clupeidae or herrings found mainly in rivers and in fresh water. As presently defined it has representatives in Africa (including Madagascar), tropical Asia and in temperate as well as tropical parts of the Australian region (including New Guinea) (Whitehead, 1985: 132–189). Four species representing three genera have been reported from the Mekong Basin (Rainboth, 1996: 59–60). Of these, apparently only *Clupeichthys aesarnensis* occurs in the middle and upper parts of the Mekong basin above the rapids of Khone Falls in southern Laos. All four are found in the Lower Mekong basin in Cambodia. Here a new genus and species is described from the Lower Mekong basin in Cambodia. The specimens were collected in the extensive flood plain of the Takeo-Angkor Borei area of south-central Cambodia at the height of the rainy season in September 2000.

Further research may show that Pellonulinae is an artificial assemblage. The diagnosis of the subfamily provided in Whitehead (1985: 132) consists mainly of a few general and loss characters and carries little conviction. The peculiar character of the last two fin rays separated from the rest of the anal fin rays by a distinct gap in the Malagasy *Spratellomorpha* and Southeast Asian *Corica* and *Clupeichthys* presumably indicates a close relationship of these genera. On the other hand, the occurrence of dorsal as well as ventral scutes in the “double-armoured” Australian *Potamolosa* and *Hyperlophus* might indicate the relationships

of these genera lie elsewhere (for details see Whitehead, 1985).

Of the four species of Pellonulinae known until now in the Mekong Basin, three — *Corica laciniata*, *Clupeichthys aesarnensis*, and *Clupeichthys goniognathus* — are distinguished by having the last two rays in the anal fin separated from the preceding rays by a rayless and membraneless gap equivalent to the space occupied by two or three fin rays. Internally the space is occupied by the elongate pterygiophore joining the last ray in the elongate anterior part of the anal fin to the last two rays. Only *Clupeoides borneensis* has a continuous anal fin with no gaps in the rays. In this respect the new species is like *C. borneensis*, but it differs from that species in its very small size, almost complete lack of scales, and several other characters.

***Minyclupeoides*, new genus**

Type species. – *Minyclupeoides dentibranchialus*, new species.

Diagnosis. – *Minyclupeoides* has the anal fin entire, with no gap separating the last two rays from the preceding ones. In this and some other respects it agrees with the Southeast Asian pellonulin genus *Clupeoides*. It differs from *Clupeoides* in having the body entirely or almost entirely scaleless and numerous (instead of few) teeth on the maxillary bone. Other characters, some of them possibly diagnostic, include a single pored humeral scale on the body near the posterodorsal

attachment of the opercle; pectoral and pelvic fin axillary scales absent; and a flattened or ventrally slightly concave sheath-like structure, not a modified procurrent ray or a modified scale, at beginning of upper and lower procurrent caudal fin rays. The latter structure, provisionally identified as a caudal scute, is longer and wider but thinner than the first procurrent caudal fin ray and lies superficially to it. Gill rakers denticulate, with numerous tiny conical teeth similar to those on the jaws (as in some other pellonulins).

Etymology. – The genus name *Minyclupeoides* is from the Greek “minys”, small, and *Clupeoides*, generic name of larger and fully-scaled riverine clupeids also inhabiting the Mekong Basin.

Remarks. – Recognition of a new genus primarily because of a single loss character is in some instances strongly contraindicated. Species in nearly all fish groups that become adapted to permanent life in caves almost invariably lose the eyes. It serves no useful purpose to recognize every species of cavefish as representing a distinct genus just because it has lost its eyes. Loss of the scales covering the body is relatively or extremely rare in most groups of teleosts that are normally fully scaled. It is sometimes associated with reduction in body size but by no means always. Total or near total loss of scales is relatively rare in clupeoid fishes. In Pellonulinae it is otherwise known only in the diminutive West African *Thrattidion noctivagus* Roberts, 1972. *Minyclupeoides* differs from *Thrattidion* in many ways, including retention of a single scale in the humeral area. *Thrattidion* has retained a row or two of scales associated with the ventral scutes (for details see Whitehead, 1985: 163–164) and has a complex termination of the lateral line with numerous short canals and pores but no scales instead of the single short canal and pore on one scale present in *Minyclupeoides*. Loss of all body scales except for a humeral scale present in *Minyclupeoides* is otherwise unknown among clupeoids.

***Minyclupeoides dentibranchialis*, new species**

(Figs. 1–2)

Holotype. – ZRC 50699, 21.3 mm, Cambodia, Mekong Basin, Takeo-Angkor Borei flood plain near Takeo during rainy season, 20–22 Sep.2000, Tyson R. Roberts.

Paratypes. – ZRC 50700, 32 ex.: 18.3–22.5 mm, collected with holotype (including 9: 20.0–21.4 mm stained with alizarin but not cleared); CAS 224372, 13: 19.4–21.0 mm, collected with holotype (including 3: 20.0, 21.0 and 21.0 mm, cleared and stained with alcian).

Diagnosis. – *Minyclupeoides dentibranchialis* apparently is a very small species (largest specimen collected 22.5 mm; a 21.5 mm female is gravid). It apparently is most closely related to the Southeast Asian pellonulin genus *Clupeoides*. It differs from the only species of *Clupeoides* in the Mekong Basin, the much larger and fully-scaled *C. borneensis*, in having abdominal scutes 9–10+4–6=13–16 (vs. 12+6–9=18–21); gill rakers on lower limb of first gill arch 13 (vs. 18–

24); and apparently in having much more numerous teeth on the maxillary bone, 25–27 (a drawing of teeth on the maxillary bone of *C. borneensis* shows only 7 teeth; Whitehead, 1985: 175).

Further comparisons. – Only four species of *Clupeoides* are recognized by Wongratana, 1980 (Whitehead, 1985: 174). All of them are fully scaled. *Minyclupeoides dentibranchialis* agrees with *C. borneensis* but differs from the other species of *Clupeoides* in having teeth on the premaxillary bone. It agrees with *C. borneensis* and *C. hypselosoma* in having the supramaxillary bone with a slender anterior process that is absent or truncated in *C. papuensis* and *C. venulosus*.

Description. – Maxillary teeth 25–27. Premaxillary teeth 7–8. Dentary teeth 4–5. Gill rakers on first gill arch 7/1/13. Pseudobranchial filaments 8. Dorsal fin rays iii10^{1/2}–11^{1/2}. Anal fin rays 16^{1/2}–17^{1/2}. Pectoral fin rays 10–11. Pelvic fin rays 7. Caudal fin rays 10–11,10/9,8. Abdominal scutes 9–10+4–6=13–16. Predorsal bones 11. Vertebrae 18+18=36 (vertebral counts of other Mekong Pellonulinae unknown).

Colouration. – The types and only known specimens were collected after dark and immediately preserved. Thus no observations are available on the coloration in life. Preserved specimens fixed in formalin and stored in 75% ethyl alcohol are largely colorless except for the head and abdomen. The iris, opercle, and subopercle are silvery, as is the peritoneum. The straw-coloured pale brown or tan body itself is nearly devoid of pigment cells. There are virtually no melanophores on the side of the body, predorsal surface, and ventral surface.

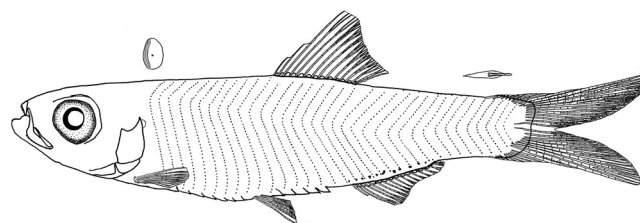


Fig. 1. *Minyclupeoides dentibranchialis* new species: Composite drawing of several specimens superficially stained with alizarin. Inset above left: humeral scale with lateral line pore; inset above right: upper procurrent caudal scale-like sheath (median structure) with first upper procurrent caudal fin ray (paired structure).

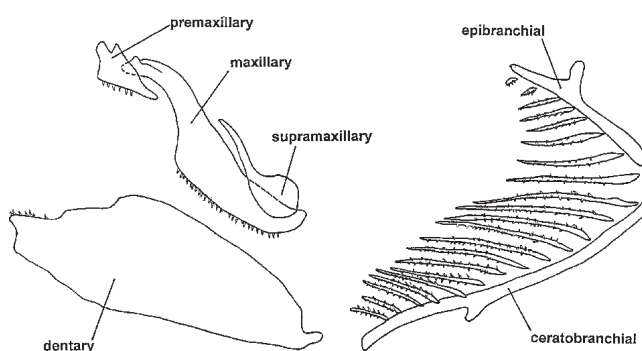


Fig. 2. *Minyclupeoides dentibranchialis* new species: Jaw bones (left); first gill arch with denticulate gill rakers (right).

The dorsal part of the body posterior to the dorsal fin has a row or two of about ten melanophores. Even the external dorsal surface of the head overlying the brain has no melanophores. The few patches of pigment cells over the brain are intracranial. The largest concentration of melanophores occurs on the caudal fin, particularly on the upper lobe and on the innermost ray or two of the lower lobe. The upper procurrent caudal rays have scattered melanophores. Melanophores extend along the length of the uppermost (simple) principal caudal fin ray, and on the distal fourth or third of the upper lobe branched rays. The paired fins are nearly or quite devoid of melanophores. The base of the anal fin, particularly posteriorly, has a few large melanophores.

Gill arches. – In *Minyclupeoides*, as perhaps in all Pellonulinae, the gill rakers (derived from primitive branchial toothplates) are armed with tiny teeth. The first gill arch has 7+1+13 rakers on the outer face of the first epibranchial and first ceratobranchial (Fig. 2). These are most elongate toward the angle of the arch. Each gill raker is armed with up to 20 or so small conical teeth, about equally distributed on the leading and trailing edges of the raker. There are no gill rakers on the inner face of the first gill arch, and the only teeth on the first gill arch are on the gill rakers. The second gill arch has 6/1/9 gill rakers on the outer face and one on the inner. These rakers are less elongate than those on the first gill arch, but are similar toothed. The ventral face of the first epibranchial armed with about a dozen small conical teeth similar to those on the gill rakers. These teeth articulate directly with the epibranchial. The third gill arch has 2/1/9 gill rakers on the outer face and none on the inner; these rakers apparently have no teeth. The fourth arch has 2/1/7 gill rakers on the outer face and 9 on the inner face of the ceratobranchial; these rakers are toothless. The fifth branchial arch has 9 toothless gill rakers on the outer face; lower pharyngeal tooth plate with 8 small scattered conical teeth.

Etymology. – The species or trivial name *dentibranchialus* is from the Latin “dent”, tooth, and “branchus”, gills, in reference to the heavily denticulate gill rakers on the gill arches.

DISCUSSION

Clupeidae or herrings are well-known for their deciduous or caducous squamation. Most clupeid species typically lose the scales very easily. Preserved specimens almost invariably are missing from a few to many scales. But rarely are all of the scales missing. When scales that normally are present have been lost the delicate skin bears evidence of tearing such that the position formerly occupied by the scales is still evident. That *M. dentibranchialus* normally lacks scales almost entirely has been confirmed by examination of all of the specimens in the type series. The specimens are in very good condition. Three were examined after being cleared and stained with alcian blue, which typically stains scales of small fishes, and nine after being superficially stained with alizarin but not cleared. Except for a pair of humeral scales overlying the pectoral girdle they are scaleless. The skin is intact,

without injury due to scale loss. Several of the specimens are egg-bearing females, so the specimens are adult and absence of scales is not a juvenile character.

A scale-like sheath immediately anterior to the upper and lower procurrent caudal fin rays possibly is characteristic of all or many Pellonulinae. The structure is present in a large species of uncatalogued *Clupeichthys* from the Irrawaddy Delta. In these fish, as in *Minyclupeoides*, the scale-like sheaths are median structures with no sign of circuli (which, if present, would identify them as scales) or of lepidotrichia (which would identify them as modified fin rays). They are tentatively identified with the caudal scute reported in numerous lower teleosts including Clupeidae by Fujita (1990). In the small pellonulin *Minyclupeoides* the procurrent caudal fin rays are without lepidotrichia, but in this *Clupeichthys* even the smallest anteriormost procurrent caudal fin ray is segmented.

ACKNOWLEDGMENTS

This paper was written during a visit to the Zoological Reference Collection of the Raffles Museum of Zoology in October–December 2006. I thank Kelvin P. K. Lim, Martyn Low Ern Yee, the late Yeo Keng Loo, Tan Swee Hee, Greasi Simon and Peter Ng for making my stay pleasant and productive. Final revision was done while the author was a guest in the Fische Sammlung of the Naturhistorisches Museum Wien.

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