

STATUS AND DISTRIBUTION OF *COILIA MYSTUS*
(LINNAEUS, 1758) (PISCES : ENGRAULIDAE) IN
THE INDO-WEST PACIFIC SEAS*

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ABSTRACT

There has been considerable disagreement in the status of the Indo-Pacific species of *Coilia* Gray, 1831, with a long maxilla reaching beyond the gill-opening. Whitehead made a study of the various nominal species and provisionally grouped them into two species complexes namely, the *mystus* complex and the *macragnathos* complex, and provided a key to their separation.

In the present paper the taxonomic value of the free pectoral rays, abdominal scutes and gillrakers, earlier used for separating the various nominal species of the *mystus* complex are discussed. *Coilia mystus* (Linnaeus) is regarded as a distinct species with *Coilia clupeoides* Lacépède, *Coilia playfairii* McClelland, *Coilia grayii* Richardson, and *Coilia lindmani* Bleeker as junior synonyms. *Coilia nasus* Schlegel and *Coilia ectenes* Jordan and Seale, however, agree better with *Coilia macragnathos* Bleeker than with the above species. Further, *Coilia mystus* (Linn.), hitherto not reported from the Indian waters, is recorded for the first time from the Indian Seas on the basis of four specimens collected from the south-east coast of India. The specific status of earlier records of *Coilia macragnathos* Bleeker from Thailand is discussed and its distributional range indicated.

INTRODUCTION

THE RAT-TAILED ANCHOVIES contribute a considerable fishery along the Indian Coast. Day (1878) recorded six species of *Coilia* Gray, 1831, namely *reynaldi*, *ramcarti*, *cantoris*, *quadragesimalis*, *dussumieri* and *borneensis*, from the Indian Seas and three of these species viz., *cantoris*, *quadragesimalis* and *borneensis* have been placed in synonymy as a result of subsequent studies (Jones and Menon, 1952 ; Whitehead, 1966, 1967 a ; Whitehead *et al.*, 1966). Subsequently, Whitehead (1967b) described a new species, *Coilia neglecta* and Rao and Jayaswal (in press) described another new species, *Coilia whiteheadi* from Indian waters. All these species of *Coilia* have a short maxilla not reaching beyond the gill opening.

During a study of the fish collections from the southwest coast of India in the Zoological Survey of India, four well preserved specimens, 114-190 mm in standard length, of *Coilia* with a long maxilla reaching well beyond the gill-opening, were recognised. Whitehead (1967 b) provisionally grouped the *Coilia* species with

* Presented at the 'Symposium on Indian Ocean and Adjacent Seas — Their Origin, Science and Resources' held by the Marine Biological Association of India at Cochin from January 12 to 18, 1971.

a long maxilla into two species-complexes namely, the *mystus* complex and the *macrognathos* complex and suggested that further study should be conducted to straighten up the taxonomy of these groups.

According to Whitehead (1967 c) the range of *Coilia mystus* (Linnaeus) extends from Sumatra, Borneo, Thailand to China and Japan, and that of *Coilia macrognathos* Bleeker is restricted to Sumatra, Borneo and Thailand. In this paper the specimens of *Coilia* with a long maxilla from the Kerala Coast are assigned to *Coilia mystus* (Linnaeus), thereby extending the range of distribution of this species to India. The specific status of the various species of *mystus* complex is discussed. Further, the specific status of earlier records (Hora, 1923 ; Fowler, 1935 ; Smith, 1945) of *Coilia macrognathos* Bleeker from Thailand is also discussed and the distributional limits of this species demarcated.

The author is thankful to Dr. A. P. Kapur, Director, Zoological Survey of India for his encouragement during the course of this study. The author is also grateful to Dr. A. G. K. Menon, Superintending Zoologist, Zoological Survey of India, for his sustained guidance in the preparation of this paper and to Dr. Peter Whitehead, British Museum (Natural History), London, for his expert opinion regarding the taxonomy of these clupeoids.

SYSTEMATIC ACCOUNT

Coilia mystus (Linnaeus, 1758) (Fig. 1)

Clupea mystus Linnaeus, 1758, *Syst. Nat.*, 10th ed., 1, p. 319 (? Canton) ; Schneider, 1801, *Syst. Ichthyol.*, p. 428 ; Cuvier, 1817, *Regne Animal.*, 1st ed., 2, p. 176 ; *Idem, ibid.*, 2nd ed., 2, p. 323.

Mystus clupeoides Lacépède, 1803, *Hist. nat. Poiss.*, 5, p. 466 (Sea of Indies) ; Whitehead, 1967, *Bull. Brit. Mus. nat. Hist. (Zool.)*, Suppl. 2, p. 149 (type redescribed).



Fig. 1. *Coilia mystus* (Linnaeus) from the southwest coast of India.

Choetomus playfairii McClelland, 1844, *Calcutta Jour. nat. Hist.*, 4, p. 405, pl. 24, fig. 3 (China).

Coilia grayii Richardson, 1845, *Ichth. Voy. Sulphur*, p. 99, pl. 54, figs. 1 & 2 (China Seas) ; Jordan and Seale, 1926, *Bull. Mus. Comp. Zool.*, 67, p. 361 ; Fowler, 1941, *Bull. U.S. natn. Mus.*, 13 (100), p. 722 ; Whitehead, 1966, *Bull. Brit. Mus. nat. Hist. (Zool.)*, 14 (2), p. 39 (type redescribed).

- Coilia playfairii* Richardson, 1845, *Ichth. Voy. Sulphur*, p. 100, pl. 54, figs. 3 & 4; *Idem*, 1846, *Ichth. China Japan*, p. 309; Whitehead, 1966, *Bull. Brit. Mus. nat. Hist. (Zool.)*, 14 (2), p. 41.
- Engraulis mystus*; Valenciennes, 1848, *Hist. nat. Poiss.*, 21, p. 73.
- Coilia lindmani* Bleeker, 1858, *Act. Soc. Sci. Indo-Nearl.*, 3, p. 48 (Sumatra); Weber and de Beaufort, 1913, *Fishes Indo-Australian Archipelago*, 2, p. 49; Fowler, 1941, *Bull. U. S. natn. Mus.*, 13 (100), p. 723; Whitehead, Boeseman and Wheeler, 1966, *Zool. Verh.*, 84, p. 142 (type redescribed).
- Coilia clupeioides* Günther, 1868, *Cat. Fish. Brit. Mus.*, 7, p. 404.
- Coilia mystus*; Jordan and Seale, 1926, *Bull. Mus. Comp. Zool.*, 67, p. 359; Whitehead, 1967, *J. mar. biol. Ass. India*, 9 (1), p. 30; *Idem, ibid.*, 9 (2), p. 273, fig. 56.
- Coilia macrogathos* Hora, 1923, (*nec. Bleeker*), *J. nat. Hist. Soc., Siam*, 6 (2), p. 174; Fowler, 1935, *Proc. Acad. nat. Sci. Philad.*, 87, p. 96, fig. 15; Smith, 1945, *Bull. U.S. natn. Mus.*, (188), p. 52.

Material

4 examples, 104-190 mm in standard length; Cochin (Kerala State); Coll. Dr. A. Daniel on 23-9-1960. Zoological Survey of India Reg. No. F 6169/2.

Description

Br. St. 11, D III 11, A II 85-89, P VII 10-11, V I 6. Gillrakers on first arch 20-21 + 1 + 28-29. Abdominal scutes 15-16 pre-pelvic, 21-24 post-pelvic.

In percentages of standard length: body depth 15.35-18.94, head length 16.82-17.93, snout length 3.84-4.13, eye-diameter 3.81-4.32, length of upper jaw 16.00-17.98, length of lower jaw 11.84-12.50, pectoral fin length 22.63-28.84, pelvic fin length 6.89-8.65, predorsal distance 26.31-29.65, prepelvic distance 26.20-28.07, preanal distance 41.23-44.20.

Body compressed, depth about equal to head length; belly sharply keeled, scutes beginning on isthmus. Maxilla pointed posteriorly, reaching to beyond pectoral base, projecting well beyond 2nd supra-maxilla; a series of fine teeth along lower edge of maxilla. Posterior supra-maxilla expanded posteriorly, slightly turned downwards; anterior supra-maxilla narrow, about 1/4 as deep as posterior supra-maxilla. Lower jaw short with steeply rising coronoid process, teeth as in upper jaw.

Gillrakers moderate, twice length of corresponding gill filaments, 3/4 eye-diameter; rakers with coarse serrae of even lengths along inner face. Pseudobranch attenuated, 4/5 eye-diameter, filaments minute. Muscular portion of isthmus just reaching to hind margin of branchiostegal membrane.

Dorsal preceded by small spine, dorsal fin origin just behind vertical from pelvic base. Pectoral fin filaments reaching to 5th branched anal ray. Pelvic fin origin nearer to pectoral fin base than to anal fin origin by 1/2 eye-diameter. Anal fin origin well behind last dorsal ray.

Scales caducous. Abdominal scutes trenchant, the post-pelvic scutes with slender ascending arms, alternately long and short.

Colour: Silvery brown in alcohol, fins hyaline.

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DISCUSSION

Workers have been divided on whether *Coilia grayii* Richardson, *Coilia clupeioides* (Lacépède), *Coilia playfairii* (Mc Clelland), *Coilia lindmani* Bleeker, *Coilia nasus* Schlegel and *Coilia ectenes* Jordan and Seale are distinct species or whether they are conspecific with *Coilia mystus* (Linnaeus). Lonnberg (1896) identified a specimen at Uppsala (Sweden) as the type of *Coilia mystus* and distinguished this species, with 7 free pectoral filaments, from *C. clupeioides*, with 6 pectoral filaments. Lonnberg (1896) gave no gillraker count but on the pectoral filament number placed *C. grayii* in the synonymy of *C. mystus*.

Cuvier (1829) considered Russell's (1803) '*pedda poorawah*' identical with *Coilia mystus*. Valenciennes (1848) pointed to the discrepancy between the anal counts in these nominal species (84 vs. 55) and Whitehead (1967 a) showed Russell's species to be conspecific with *Thryssa purava* (Hamilton, 1822).

Fowler (1941) treated *C. grayii* and *C. lindmani* as distinct species and referred *C. playfairii*, *C. nasus* and *C. clupeioides* in the synonymy of *Coilia mystus* (Linnaeus).

Boeseman (1947) redescribed the syntypes of *Coilia nasus* Schlegel and considered it a distinct species. Whitehead, Boeseman and Wheeler (1966) examined the type of *Coilia lindmani* Bleeker and considered it a valid species. Whitehead (1966) examined the type of *Coilia grayii* Richardson in the British Museum and considered it conspecific with *Coilia mystus*. Whitehead (1966) discussed the status of *Coilia playfairii* (Mc Clelland) and considered it a valid species. Later, Whitehead (1967 a) also discussed the status of *Coilia clupeioides* (Lacépède) and concluded that it is identical with *Coilia mystus* (Linnaeus).

These nominal species of the *mystus* complex are stated to have 6-7 free filamentous pectoral rays, 36-49 abdominal scutes and 27-30 gillrakers on the lower arm of the first gill arch. The meristic differences separating the various nominal species are in significant and the author is in agreement with Whitehead (1967 b) in considering *clupeioides* Lacépède, *playfairii* McClelland, *grayii* Richardson and *lindmani* Bleeker as junior synonyms of *Coilia mystus*. *Coilia nasus* Schlegel has, however, a much higher scute number (46 vs. 36-39) and agrees better with *Coilia macrognathos* Bleeker than with the above species. *Coilia ectenes* Jordan and Seale would also probably fall under *Coilia macrognathos* in view of its high scute number. Fowler's (1941) record of *mystus* specimens with 6 pectoral filaments and 18-20 + 22-23 gillrakers are probably *Coilia macrognathos*.

Von Martens (1867), Hora (1923), Fowler (1935) and Smith (1945) erroneously reported *Coilia macrognathos* from Thailand. Fowler (1925) gave a gillraker count of 22 in the eight specimens examined by him which are clearly *Coilia mystus*. These specimens also differ from *C. macrognathos* in that the dorsal fin origin is posterior (vs. anterior in *mystus*) to the pelvic fin origin. Smith's (1945) specimens were also characteristic in this diagnostic feature. Further, two specimens of *Coilia macrognathos* from Nontaburi (Thailand) in the collections of the Zoological Survey of India (Reg. No. F 10563/1) which constituted Hora's (1923) study material, were on examination, found to be misidentified. They have 6 pectoral filaments, 23 + 1 + 30 gillrakers and 14 + 23 - 24 abdominal scutes, and agree well with Fowler's figure (1935) of *macrognathos* now shown to be *Coilia mystus*. It is, therefore, not surprising that Whitehead (1967 c) did not encounter *Coilia macrognathos* but only *Coilia mystus* from Malayan waters. It seems that *Coilia mystus* is a very widespread species in the Indo-pacific whereas *Coilia macrognathos* is restricted to its type-locality, Borneo.

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* Not referred in original.