

**ON THE OCCURRENCE OF ANCHOVIELLA
BAGANENSIS (HARDENBERG) AND
A. BATAVIENSIS (HARDENBERG) ALONG THE
SOUTH-EAST AND SOUTH-WEST
COASTS OF INDIA**

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THREE species of white-baits (Genus: *Anchoviella*) were described by Day (1878-89) from Indian waters under the generic name *Engraulis* Cuvier, 1817; viz., *E. commersonianus* (Lacépède, 1803), *E. indicus* (van Hasselt, 1823), and *E. tri* (Bleeker, 1852). Weber and de Beaufort (1913) recognised five species from the Indo-Australian archipelago, but used the generic name *Stolephorus* Lacépède, 1803. Important contributions to the knowledge of the systematics of these fishes have been made by Hardenberg (1933 and 1934) and by Fowler (1941). It was Fowler (1911) who emended *Stolephorus* Lacépède (strictly belonging to subfamily Dussumieriini, Clupeidæ) and created the new genus *Anchoviella* (Engraulidæ) with *Engraulis perfasciatus* Poey, orthotypic as the genotype.

Of late, Misra (1947) and Nair (1953) recognised four Indian species of *Anchoviella*. The occurrence of a fifth species was recorded by Varadarajan in 1953.

The correct designation of the five species hitherto recorded from India are *Anchoviella commersonii* (Lacépède, 1803), *A. tri* (Bleeker, 1852), *A. heteroloba* (Ruppell, 1835), *A. indica* (van Hasselt, 1823), and *A. zollingeri* (Bleeker, 1849).

Hardenberg (1933) described for the first time *Stolephorus baganensis* and *Stolephorus insularis* and split the former into two 'varieties' *S. baganensis baganensis* and *S. baganensis macrops* and the latter into four 'groups', viz., *S. insularis insularis*, *S. insularis bataviensis*, *S. insularis baweanensis* and *S. insularis oceanicus*.

Fowler (1941) rejected all the above varieties and groups and recognised only the species. He also changed the specific name *insularis* into *bataviensis* since the former is preoccupied for *Stolephorus insularum* Jordan and Seale, 1926. In renaming *S. insularis*, while rejecting its 'groups' as valid entities, the name *bataviensis* of the second group is elevated to specific rank. Thus

Anchoviella bataviensis given by Fowler stands for *Stolephorus insularis* and its 'groups' and *A. baganensis* for *S. baganensis* and its 'varieties'. As the present study does not give enough proof for separation of the species dealt with into varieties or groups, the classification of Fowler is adopted here.

Regarding the distribution of these white-baits Hardenberg states that *Stolephorus baganensis* is chiefly found along the estuaries of Borneo, Sumatra and Java and rare in those parts of the coasts where no big rivers enter the sea. He mentions the possibility of its occurrence along the coasts of the Asiatic continent also, while he found his *S. insularis* groups regularly along the Java coast in small numbers and they seemed to occur "especially near islands at some distance from the coast" as the Lingga-archipelago, Bawean and Kangean archipelago. It has also been observed by him in the Molluccas.

White-baits agreeing with *A. baganensis* (Hardenberg) and *A. bataviensis* (Hardenberg) have been identified in collections of marine fish catches at Mandapam and Trivandrum. Descriptions of these fishes along with systematic notes on other species of *Anchoviella* recorded hitherto from India and a field Key for all these species are given here, as this is the first* record of these forms from the Indian sub-continent.

Anchoviella baganensis (Hardenberg)

- Stolephorus baganensis* Hardenberg, *Treubia*, 13 (1): 107, 1931 (No description); *Nat. Tijdschr. Ned. Indie*, 93: 258, 1933; *Treubia*, 14, (3): 319, 1934.
- Stolephorus baganensis baganensis* Hardenberg, *Nat. Tijdschr. Ned. Indie*, 93: 260, 1933; *Treubia*, 14 (3): 320, 1934.
- Stolephorus baganensis macrops* Hardenberg, *Nat. Tijdschr. Ned. Indie*, 93: 260, 1933; *Treubia*, 14 (3): 320, 1934.
- Anchoviella baganensis* Fowler, *Bull. U.S. Nat. Mus.*, 13 (100): 711, 1941. D 1. 13-15; A. 1. 18-21; P. 11-13, V. 7; L. 1. 37-40; L. tr. 7.

Body elongate and laterally compressed. Height (at the level of the pelvic fins) 4.6-5.6 in length.† Diameter of eye 3.2-3.6 in length of head, and 0.62-0.8 in length of snout. Snout 4.2-5.6 in head. Head 3.9-4.5 in length.

* After the communication of this paper for publication, Dutt and Babu Rao have recorded *Anchoviella insularis* Hardenberg from Waltair on the east coast of India. *Curr. Sci.*, 27 (7), 265-66, 1958.

† Standard length measured from tip of snout to base of caudal fin.

Maxillaries extend to the posterior margin of the opercula, dilated above mandibular joint and with elongated sharpenings and pointed posterior ends. Lower margins of the maxillaries with fine spiny serrations. Operculum and preoperculum entire with no serrations. Origin of dorsal nearer to caudal than to tip of snout. A small independent spine in front of dorsal which can be felt by a slight forward movement of the finger near the base of dorsal. Origin of anal before end of dorsal. Base of anal fin 4.4-5.3 in length. Pectorals pointed, longer than the postorbital part of head. Ventrals larger than the diameter of eye, caudal forked. Gill rakers (on lower arm of the first gill arch) 20-26. Scales cycloid. Those in front of dorsal usually with more or less parallel striæ running across while the striæ on the scales behind the dorsal more or less broken in the middle and reticulated especially on those on the caudal peduncle. Abdominal spiny scutes 6-7 between pectoral fins and the ventrals. Vertebrae 39-41, usually 40.

The colour of the fresh specimens yellowish white with a prominent silvery lateral band from head to caudal. A glistening greenish black pigment concentration forms a blotch on the occiput. Thin, paired pigment lines of greenish black pigments run from end of dorsal to caudal.

These are small-sized fishes and the largest specimen observed during this study was 64 mm. in total length. Present observations show that these fishes mature at about 50-55 mm. in total length while Hardenberg (1933) found the species becoming mature at about 7 cm. in the Javan Seas. Mature ovarian eggs are oval-shaped without a knob.

Localities.—Thangachimadam, Pullamadam, Attankarai and Thondi in the Palk Bay and Trivandrum in the Arabian Sea.

Anchoviella bataviensis (Hardenberg)

<i>Stolephorus insularis</i>	Hardenberg, <i>Nat. Tijdschr. Ned. Indie</i> , 93: 260, 1933; <i>Treubia</i> , 14 (3): 321, 1934.
<i>Stolephorus insularis insularis</i>	Hardenberg, <i>Nat. Tijdschr. Ned. Indie</i> , 93: 261, 1933; <i>Treubia</i> , 14 (3): 341, 1934.
<i>Stolephorus insularis bataviensis</i>	Hardenberg, <i>Nat. Tijdschr. Ned. Indie</i> , 93: 261, 1933; <i>Treubia</i> , 14 (3): 341, 1934.
<i>Stolephorus insularis baweanensis</i>	Hardenberg, <i>Nat. Tijdschr. Ned. Indie</i> , 93: 261, 1933; <i>Treubia</i> , 14 (3): 341, 1934.
<i>Stolephorus insularis oceanicus</i>	Hardenberg, <i>Nat. Tijdschr. Ned. Indie</i> , 93: 261, 1933; <i>Treubia</i> , 14 (3): 341, 1934.

Anchoviella bataviensis Fowler, *Bull. U.S. Nat. Mus.*, 13 (100): 708, 1941.
D.1. 14-15; A. 1. 19-22; P. 13-15; V. 7; L.1. 37-39; L.tr. 7-8.

Body elongate, more or less compressed laterally. Height 4.8-5.2 in length. Diameter of eye 3.2-3.7 in length of head, and 0.65-0.83 in length of snout. Snout 4.4-5.4 in head. Head 3.7-4.2 in length.

Maxillaries extend to the posterior margin of the opercula, dilated at the level of the mandibular joints with smoothly curved dorsal sharpenings and pointed posterior ends. Lower margins of the maxillaries with fine spiny serrations. Operculum and preoperculum entire with no serrations. Origin of anal before end of dorsal. Base of anal fin 4.4-5.3 in length. Pectorals pointed, longer than the postorbital part of head. Ventrals slightly longer than the diameter of eye. Caudal forked. Gill rakers 19-21.

Scales cycloid with parallel striæ. Striæ on those behind the dorsal fin slightly reticulated in the middle; more so on those on the caudal peduncle. Abdominal spiny scutes 4-7 between pectoral and ventral fins, usually 6. Vertebrae 39-40.

Colour yellowish white in fresh state with prominent silvery lateral band on sides from head to caudal. Greenish black pigment concentration on the occiput forming a blotch. A pattern formed by greenish black pigments remotely resembling the letter 'H', the cross-bar of H being placed transversely just behind the darker occipital blotch and the longitudinal arms pulled out to the sides half way down, the anterior arms skirting the hind border of the eye socket and the posterior just behind the opercular edge. Tip of mandible and snout powdered with greenish black pigments. Median line on top of head pigmented. Greenish black colour of the pigments turn black in preserved specimens.

Medium-sized fishes. Largest specimen observed during the study 106.5 mm. in total length. They are found to be mature at 75-80 mm. total length. Mature ovarian eggs are bottle-shaped.

Localities.—Thangachimadam, Munakad, and Attankarai in the Palk Bay, Kadarsapat in the Gulf of Mannar and Trivandrum in the Arabian Sea.

All the characters of *A. baganensis* and *A. bataviensis* studied at present are in agreement with those given by Hardenberg (1933), except the comparatively lesser height and the lesser count of lateral transverse scales noted in both the Indian forms. Counts of various meristic characters are given in Table I.

TABLE I

Showing the number (and frequency of distribution within the particular ranges) of fin rays, lateral line scales, abdominal spines, gill rakers and vertebrae in *Anchoviella baganensis* and *A. bataviensis* from the Indian waters

Meristic characters	No. of fishes examined		Remarks
	<i>Anchoviella baganensis</i>	<i>Anchoviella bataviensis</i>	
1 Dorsal fin rays	1·13	4	Small spine in front of the dorsal in <i>A. baganensis</i> not included in the count
	1·14	23	
	1·15	6	
2 Anal fin rays	1·18	18	..
	1·19	10	13
	1·20	4	40
	1·21	1	5
	1·22	..	2
3 Pectoral fin rays	11	11	..
	12	16	..
	13	6	23
	14	..	34
	15	..	3
4 Lateral line scales	37	2	12
	38	16	24
	39	11	24
	40	4	..
5 Lateral transverse scales	7	33	5
	8	..	55
6 Abdominal spines	4	..	1
	5	..	4
	6	20	53
	7	13	2
7 Gill rakers	19	..	13
	20	3	21
	21	12	25
	22	1	1
	23	5	..
	24	3	..
	25	4	..
	26	5	..
8 Vertebrae	39	2	26
	40	21	34
	41	10	..

NOTES ON THE SYSTEMATICS OF THE OTHER INDIAN SPECIES

A. indica.—One of the big-sized white-baits. Elongated and rounded than laterally compressed. Maxillaries reach the preopercula. Origin of anal before end of dorsal. 3–4 abdominal spiny scutes, usually 4. Gill rakers 21–25. Vertebrae 41–42, usually 41. Mature ovarian eggs oval-shaped, with a knob.

A. commersonii.—Another big-sized fish of the genus. More or less compressed laterally. Maxillaries reach gill openings. Origin of anal before end of dorsal. Abdominal spiny scutes usually 4. Gill rakers 22–25. Vertebrae 39–40. Mature ovarian eggs oval-shaped, with a knob. A characteristic broad paired pigment line on back from head to dorsal. Pigments greenish black in very fresh specimens otherwise black.

A. heteroloba.—Small-sized and slender fishes with a prominent snout, not much compressed laterally. Maxillaries reach the preopercula. Origin of anal behind the end of dorsal. Abdominal spiny scutes generally 5–6. Gill rakers 23–25. Vertebrae 41–43; usually 42. Mature ovarian eggs oval-shaped without a knob.

A. zollingeri.—Small-sized and slender fishes, not very much compressed laterally. Maxillaries with rounded posterior ends reaching mandibulatory joints. Origin of anal behind end of dorsal. Abdominal spiny scutes 4–5. Gill rakers 25–28. Vertebrae 41–43, usually 42. Mature ovarian eggs oval-shaped without a knob.

A. heteroloba and *A. zollingeri* are of a darkish hue compared to the yellowish fleshy white colour of the other species of the genus.

A. tri.—Specimens of *A. tri* have not been met with in the present collections made at Trivandrum and Mandapam or at other important fishing centres of the Malabar coast and the author believes that *A. tri* is not as common in our waters as it is thought to be. However it is included in the present list, as other workers have recorded this fish from Indian waters. The characters pertaining to this fish and the figure are given basing on observations made by previous authors.

Medium-sized and laterally compressed white-baits, they are said to resemble *A. baganensis*. Maxillaries reach gill openings. Origin of anal before end of dorsal. 4–7 abdominal spiny scutes. Paired broad pigment lines from head to dorsal and paired thin ones from dorsal to caudal. A small spine present in front of dorsal.

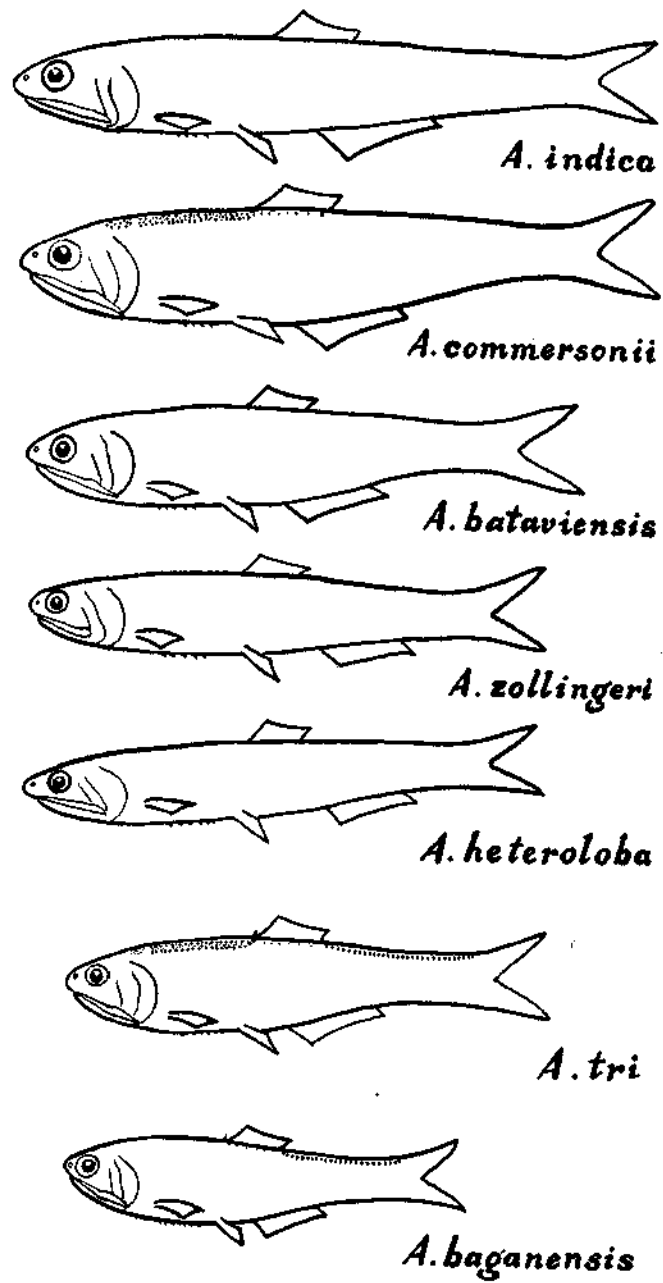


FIG. 1. Outline figures of Indian species of *Anchoviella*.

KEY TO THE INDIAN SPECIES

- I. Maxillary reaches gill opening.
- A. A small spine in front of dorsal. Paired, thin, pigment line from end of dorsal fin to caudal.
- (a) Paired, pigment lines on dorsal profile from head to dorsal also *A. tri*
- (b) No paired pigment lines on the dorsal profile between head and dorsal *A. baganensis*
- B. No spine in front of dorsal. No pigment line from dorsal to caudal.
- (a) Paired pigment lines from head to dorsal *A. commersoni*
- (b) No regular pigment lines on the back *A. bataviensis*
- II. Maxillary does not reach gill opening.
- A. Origin of anal below dorsal *A. indica*
- B. Origin of anal behind dorsal.
- (a) Maxillary tapering behind, reaching preoperculam *A. heteroloba*
- (b) Maxillary rounded behind, reaching mandibular joint *A. zollingeri*

SUMMARY

Occurrence of *Anchoviella baganensis* (Hardenberg) and *Anchoviella bataviensis* (Hardenberg) is recorded for the first time from Indian waters (from the seas off Trivandrum on the south-west coast of India and around Mandapam on the south-east coast). Short descriptions of the above two species collected at these centres and notes on the systematics of other Indian forms with a Key for identification of *Anchoviella* species so far recorded from Indian waters are given.

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