

## Two New Species of *Atrobuca* (Sciaenidae) from the Bay of Bengal

Kunio Sasaki

Department of Biology, Faculty of Science, Kochi University,  
2–5–1 Akebono-cho, Kochi 780, Japan

(Received May 12, 1995; in revised form September 19, 1995; accepted September 20, 1995)

**Abstract** Two new species of the sciaenid genus *Atrobuca* are described from the Bay of Bengal; *A. antonbruun*, distributed from Burma to the east coast of India and *A. bengalensis* from Sri Lanka. Both species differ from all other congeners in having weakly differentiated teeth on the lower jaw. *A. antonbruun* is distinguished from *A. bengalensis* by having usually X first dorsal fin spines (vs IX), 27–29 dorsal fin soft rays (vs 30–31), usually 17–18 pectoral fin rays (vs 19), usually 13–14 lower gill rakers (vs 11), cycloid scales on the anterior half of the body (vs ctenoid), and swimbladder appendages strongly enveloping the bladder (vs weakly enveloping).

In the most recent review of the Indo-West Pacific sciaenid genus *Atrobuca*, Sasaki and Kailola (1988) questioned the identity of *A. nibe* (Jordan and Thompson), reported by Trewavas (1977) from the Bay of Bengal, because of the latter's noting that specimens had greater numbers of dorsal fin soft rays and gill rakers compared with those from Japan (type locality) and China. The location of a number of Bay of Bengal "*nibe*" specimens, collected by R/V *Anton Bruun* during the International Indian Ocean Expedition between 1950 and 1965, made possible their critical evaluation, resulting in the recognition of an undescribed species. Furthermore, additional material from the Bay of Bengal revealed a second undescribed *Atrobuca* species existing in that region. The two species are described below.

Methods for counts and measurements follow Sasaki and Kailola (1988). Standard length and head length are expressed throughout as SL and HL, respectively. Paratype data are shown in parentheses when different from the holotype. Institutional abbreviations follow Leviton et al. (1985).

### *Atrobuca antonbruun* sp. nov.

(Figs. 1, 3–5)

*Argyrosomus argentatus* (non Houuttuyn): Talwar and Joglekar, 1972: 2 (Orissa).

*Atrobuca nibe* (non Jordan and Thompson): Mohan, 1972: 92, fig. 2f (Calcutta); Trewavas, 1977: 341 (in part, Bay of Bengal); Mohan, 1981: 6, fig. 7 (Bay of Bengal).

**Holotype.** USNM 324670, 193.8 mm SL, Burma, 15°04'N, 95°51'E, 41–46 m, 31 Mar. 1963, trawl, R/V *Anton Bruun*.

**Paratypes.** USNM 324158, (2 specimens), 110.2–113.5 mm SL, Burma, 15°20'N, 96°24'E, 26–27 m, 31 Mar. 1963; USNM 324576, (6), 109.7–197.2 mm SL, Burma, 14°52'N, 96°39'E, 48–64 m, 31 Mar. 1963; USNM 325470, (2), 108.4–135.8 mm SL, collected with holotype. All paratypes were trawled by R/V *Anton Bruun*.

**Diagnosis.** A species of *Atrobuca* with the following combination of characters: dorsal fin rays IX–X+I (usually X+I), 27–29; pectoral fin rays 17–19 (usually 17–18); gill rakers 6–8 (usually 7–8) +1+11–15 (usually 13–14); vertebrae 10+15, last well-developed pleural rib on 10th vertebra; HL 31.4–34.2% SL; caudal peduncle length 21.8–25.7% SL; eye diameter 6.6–8.7% SL (20.5–24.6% HL); interorbital width 8.1–9.8% SL (24.9–29.7% HL); pectoral fin length 23.4–29.9% SL; second anal fin spine length 5.0–9.4% SL (15.6–27.5% HL); gill filament length 3.7–4.7% SL (11.1–14.3% HL); inner row teeth on lower jaw weakly differentiated, closely spaced; scales on anterior half of body (except on nape) cycloid; swimbladder appendages enveloping full length of bladder; ventral limbs of former weakly curved posteromedially, with forwardly-directed branches; posteriormost two or three appendages short, bud-like; mouth lining light mottled grey anteriorly; membrane between opercular spines paler posteriorly.

**Description.** Dorsal fin rays X+I, 28 (IX–X+I,

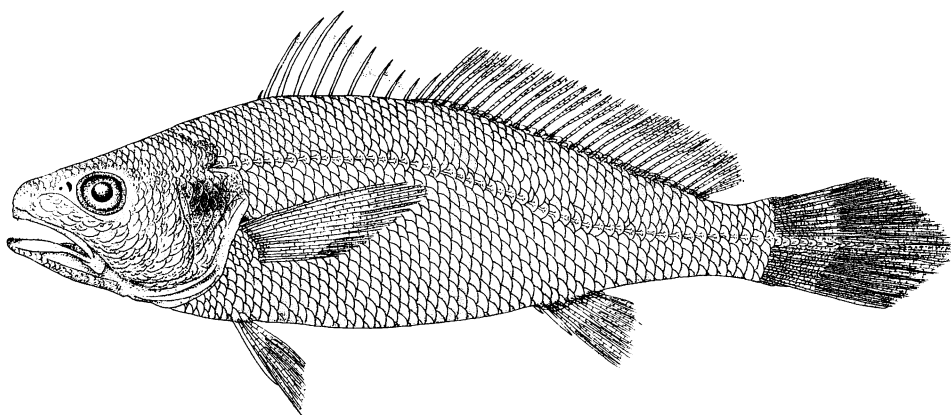


Fig. 1. *Atrobucca antonbruun* sp. nov., holotype, USNM 324670, 193.8 mm SL.

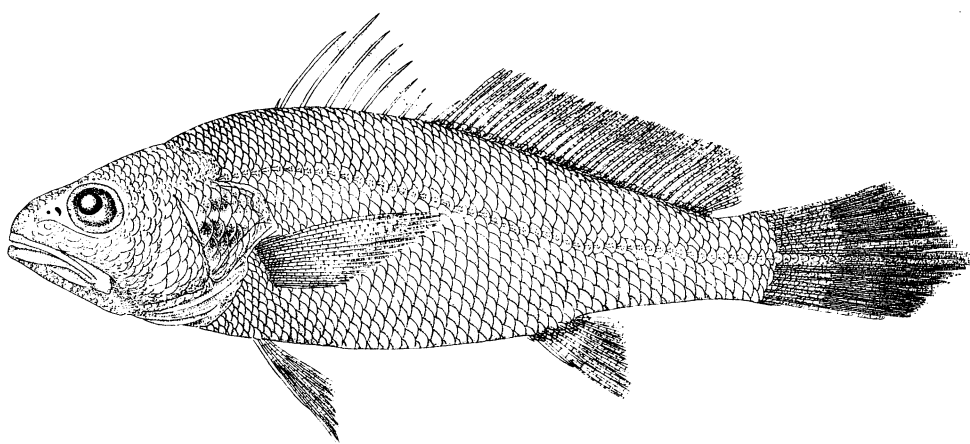


Fig. 2. *Atrobucca bengalensis* sp. nov., holotype, USNM 324673, 239.6 mm SL.

27–29); anal fin rays II, 7; pectoral fin rays 17 (17–19); lateral line scales 51 (49–52); scales above lateral line 10 (8–10), below lateral line 15 (13–16); gill rakers 7+1+13 (6–8+1+11–15); vertebrae 10+15, last well-developed pleural rib on 10th vertebra, first anal proximal radial between 10th and 11th vertebrae; swimbladder appendages not counted (28–29 in 2 paratypes). Proportions as % SL: head length 30.9 (31.4–34.2); body depth 30.0 (27.2–32.2); body width 14.3 (11.4–15.6); caudal peduncle length 23.0 (21.8–25.7); caudal peduncle depth 10.7 (9.5–11.9); snout length 8.9 (7.9–9.3); eye diameter 6.8 (6.6–8.7); interorbital width 9.2 (8.1–9.8); upper jaw length 14.5 (13.9–17.4); lower jaw length 17.4 (16.2–18.9); pectoral fin length 25.1 (23.4–29.9); pelvic fin length 19.0 (18.4–21.1); second dorsal fin spine length 9.6 (11.4–14.9); third dorsal fin spine length 11.5 (12.7–15.4); fourth dorsal fin spine

length 11.6 (11.2–13.7); fifth dorsal fin spine length 10.0 (9.7–12.5); second anal fin spine length 6.0 (5.0–9.4); gill raker length 3.6 (3.4–4.9); gill filament length 4.1 (3.7–4.7). Proportions as % HL: snout length 28.9 (24.7–27.9); eye diameter 21.9 (20.5–24.6); interorbital width 29.7 (24.9–28.8); upper jaw length 46.9 (43.2–46.9); lower jaw length 56.4 (52.5–55.5); second anal fin spine length 19.4 (15.6–27.5); gill raker length 11.5 (10.7–14.3); gill filament length 13.4 (11.1–14.3). Proportions as % eye diameter: gill raker length 52.7 (51.7–68.9); gill filament length 61.1 (47.2–65.9).

Snout pointed, slightly longer than eye diameter, its dorsal profile nearly straight. Snout pores three upper and five marginal, outer pair of marginal pores in a slight notch. Mental pores three pairs, anterior pair small, at front of chin separated by symphysis.

Mouth terminal, cleft angle when mouth closed

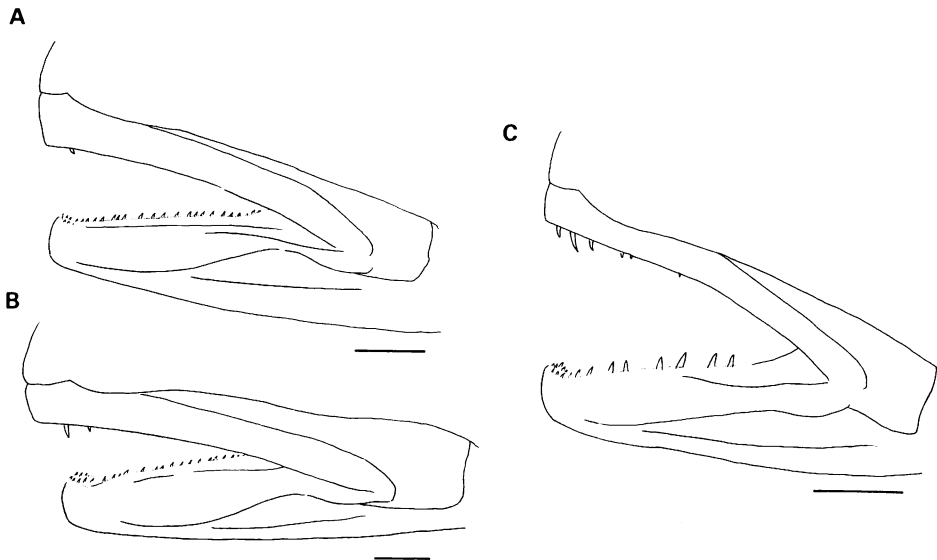


Fig. 3. Mouths of three *Atrobuca* species. A) *A. antonbruun* sp. nov., USNM 324670, holotype; B) *A. bengalensis* sp. nov., USNM 325473, paratype; C) *A. nibe*, BSKU 36385. Bar = 5 mm.

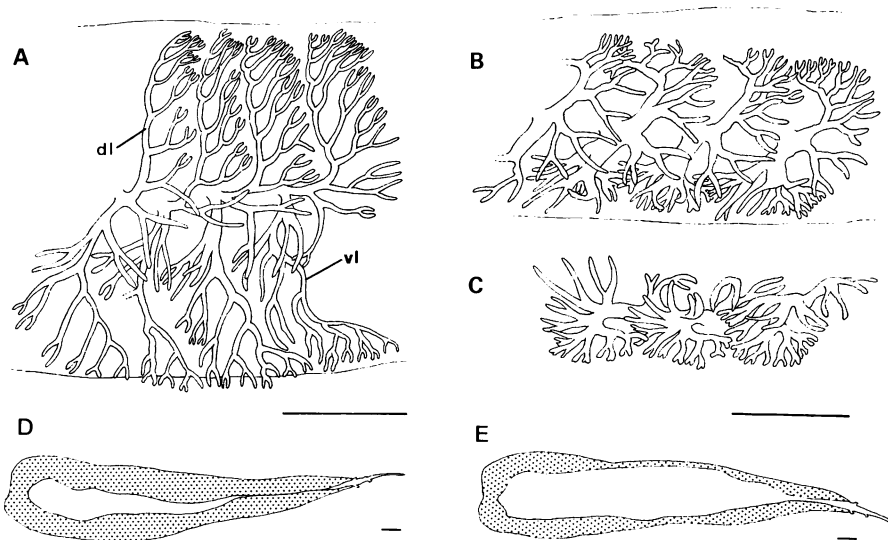


Fig. 4. Swimbladders of two *Atrobuca* species. A) and D) *A. antonbruun* sp. nov., USNM 324576, paratype, lateral view of 7th to 10th appendages (A) and schematic illustration of dorsal view of swimbladder showing association of dorsal limbs (dotted area) with bladder (D); B), C) and E) *A. bengalensis* sp. nov., USNM 325473, paratype, lateral view of 5th to 8th (B), ventral view of 6th to 8th (C) appendages, and as in D (E). *dl*—dorsal limb; *vl*—ventral limb. Bar = 5 mm.

30°; jaws meeting evenly at front; maxillary reaching to level with posterior 2/3 of eye. Upper jaw with an outer row of weakly enlarged teeth and an inner band of small, conical teeth, comprising a single anterior row, two or three posterior rows. Lower jaw with an outer row of small, conical teeth and an

inner row of weakly differentiated, closely spaced teeth (Fig. 3A). No teeth exposed upon lower lip when mouth closed.

Eye diameter slightly less than interorbital width. Anterior nostril rounded, posterior nostril vertical, slit-like. Gill rakers moderately long, slender, as long

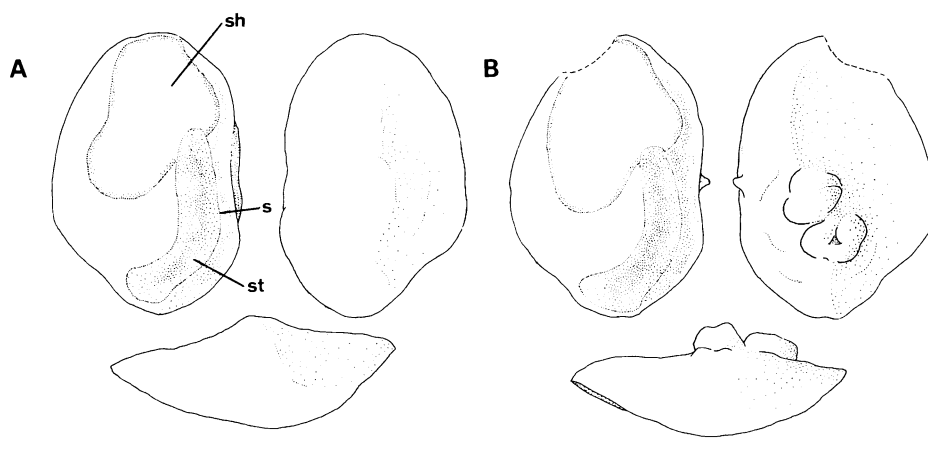


Fig. 5. Sagittae of two *Atroubucca* species. A) *A. antonbruun* sp. nov., USNM 324576, paratype; B) *A. bengalensis* sp. nov., USNM 325473, paratype. Left—inner surface; right—outer surface; bottom—lateral view. s—sulcus; sh—sulcus head; st—sulcus tail. Bar = 5 mm.

as gill filaments adjacent to angle of gill arch.

Scales cycloid on head and anterior half of body (except on nape); ctenoid on nape and posterior half of body. Two or three rows of cycloid scales covering basal portions of soft dorsal and anal fins.

Pectoral fins long, extending backward below second or third dorsal fin soft ray; pelvic fins about 2/3 length of pectoral fins. Second anal fin spine slender, length less than half first anal fin soft ray. Caudal fin rhomboid.

Swimbladder (Fig. 4A, D) carrot-shaped, tapering posteriorly; lateral appendages well developed (except posteriormost 2 or 3 bud-like), embedded in thick wedge of fat tissue; dorsal and ventral limbs slender, elongate, arising immediately above appendage onto swimbladder, highly branched, enveloping full length of bladder, meeting opposite members along posterior 1/3 of latter (Fig. 4D); main arm of ventral limb becoming weakly posteromedially oriented (dorsal and ventral limb fine detail—see Fig. 4A).

Sagitta (Fig. 5A) shield-shaped; sulcus head pear-shaped, nearly reaching anterior margin of sagitta; sulcus tail hockeystick-shaped, slightly curved and truncated at end.

*Colour in alcohol.*—Body light brownish, slightly paler below; obscure dark oblique lines on back. Lower lip edged with brown; mouth lining light mottled grey anteriorly, dark brown posteriorly. Operculum appears dark brown owing to dark brown lining of branchial cavity; membrane between opercular spines paler posteriorly. Peritoneum dark

brown. Pectoral axil dark brown. Spinous dorsal fin, margins of soft dorsal and caudal fins dusky; pectoral fins lightly mottled grey; pelvic and anal fins pale.

*Colour when fresh.*—Unknown.

**Distribution.** Bay of Bengal from Burma (present material) to east coast of India (Mohan, 1972; Talwar and Joglekar, 1972).

**Etymology.** Named after R/V *Anton Bruun* in recognition of that vessel's contributions to the biology of the Indian Ocean fishes.

**Remarks.** For comparisons with related species, see this section under *A. bengalensis* sp. nov.

*Atroubucca bengalensis* sp. nov.  
(Figs. 2–5)

**Holotype.** USNM 324673, 239.6 mm SL, Sri Lanka, Trincomalee, St. John's Fish Market, 23 Sept. 1969, P. C. Heemstra.

**Paratypes.** USNM 325473, 2 specimens, 191.9–239.5 mm SL, collected with holotype.

**Diagnosis.** A species of *Atroubucca* with the following combination of characters: dorsal fin rays IX + I, 30–31; pectoral fin rays 19; gill rakers 7–8 + 1 + 11; vertebrae 10 + 15, last well-developed pleural rib on 10th vertebra; HL 32.6–34.7% SL; caudal peduncle length 25.5–26.1% SL; eye diameter 7.4–7.7% SL

(21.4–23.6% HL); interorbital width 6.6–7.1% SL (19.1–21.9% HL); pectoral fin length 24.0–25.5% SL; second anal fin spine length 7.6–8.0% SL (22.0–24.3% HL); gill filament length 4.7–4.9% SL (14.0–14.4% HL); inner row teeth on lower jaw weakly differentiated, closely spaced; scales on body ctenoid; swimbladder appendages (except posterior two or three) lying along lateral surface of bladder; ventral limbs of former strongly curved posteromedially, with forwardly-directed branches; posteriormost two or three appendages short, bud-like; mouth lining dark; membrane between opercular spines paler posteriorly.

**Description.** Dorsal fin rays IX+I, 31 (30–31); anal fin rays II, 7; pectoral fin rays 19; lateral line scales 52; scales above lateral line 13 (11–12), below lateral line 17 (15); gill rakers 7+1+11 (7–8+1+11); vertebrae 10+15, last well-developed pleural rib on 10th vertebra, first anal proximal radial between 10th and 11th vertebrae; swimbladder appendages not counted (25 in two paratypes). Proportions as % SL: head length 34.7 (32.6–34.2); body depth 28.0 (27.3–29.9); body width 14.4 (11.7–13.7); caudal peduncle length 25.6 (25.5–26.1); caudal peduncle depth 11.3 (12.0–12.1); snout length 8.3 (8.1–8.2); eye diameter 7.4 (7.6–7.7); interorbital width 6.6 (6.9–7.1); upper jaw length 14.1 (14.7–14.9); lower jaw length 16.9 (16.7–17.1); pectoral fin length 25.5 (24.0–24.9); pelvic fin length 20.7 (18.9–20.3); second dorsal fin spine length 14.0 (11.5–12.9); third dorsal fin spine length 15.9 (13.4–15.1); fourth dorsal fin spine length 14.0 (13.1–14.4); fifth dorsal fin spine length 12.5 (11.9–12.0); second anal fin spine length 7.6 (7.9–8.0); gill raker length 4.0 (4.0–4.3); gill filament length 4.8 (4.7–4.9). Proportions as % HL: snout length 23.9 (24.1–24.8); eye diame-

ter 21.4 (22.2–23.6); interorbital width 19.1 (20.3–21.9); upper jaw length 40.7 (43.6–45.2); lower jaw length 48.7 (50.1–51.1); second anal fin spine length 22.0 (23.6–24.3); gill raker length 11.7 (11.6–13.1); gill filament length 14.0 (14.3–14.4). Proportions as % eye diameter: gill raker length 54.5 (52.2–55.4); gill filament length 65.2 (60.8–64.3).

Snout pointed, as long as eye diameter, dorsal profile convex. Snout pores three upper and five marginal, outer pair of marginal pores in a slight notch. Mental pores three pairs, anterior pair small, at front of chin separated by symphysis.

Mouth terminal, cleft angle when mouth closed 30°; both jaws meeting evenly at front; maxillary reaching to level with posterior 4/5 of eye. Upper jaw with an outer row of moderately enlarged teeth and an inner band of small, conical teeth, comprising a single anterior row, two or three posterior rows. Lower jaw with an outer row of small, conical teeth and an inner row of weakly differentiated, closely spaced teeth (Fig. 3B). Anterior two or three enlarged teeth on upper jaw exposed upon lower lip when mouth closed.

Eye diameter slightly greater than interorbital width. Anterior nostril rounded, posterior nostril vertical, slit-like. Gill rakers moderately long, slender, slightly shorter than gill filaments adjacent to angle of gill arch.

Scales cycloid on head and anterior 1/4 of throat, ctenoid elsewhere. Two or three rows of ctenoid scales covering basal portions of soft dorsal and anal fins.

Pectoral fins long, extending backward below third or fourth dorsal fin soft ray; pelvic fins about 2/3 length of pectoral fins. Second anal fin spine slender, its length less than half of first anal fin soft ray. Caudal fin rhomboid.

**Table 1.** Selected meristic characters of *Atrobuca antonbruun* sp. nov., *A. bengalensis* sp. nov. and *A. nibe*

|                                | First dorsal fin spines |    | Dorsal fin soft rays |    |                   |    |    | Pectoral fin rays |    |                         |    |    |    |    |    |    |    |    |    |    |    |
|--------------------------------|-------------------------|----|----------------------|----|-------------------|----|----|-------------------|----|-------------------------|----|----|----|----|----|----|----|----|----|----|----|
|                                | IX                      | X  | 27                   | 28 | 29                | 30 | 31 | 32                | 16 | 17                      | 18 | 19 |    |    |    |    |    |    |    |    |    |
| <i>A. antonbruun</i> sp. nov.  | 1                       | 23 | 4                    | 13 | 7                 | —  | —  | —                 | —  | 7                       | 15 | 2  |    |    |    |    |    |    |    |    |    |
| <i>A. bengalensis</i> sp. nov. | 3                       | —  | —                    | —  | —                 | 1  | 2  | —                 | —  | —                       | —  | 3  |    |    |    |    |    |    |    |    |    |
| <i>A. nibe</i>                 | 1                       | 29 | —                    | 5  | 3                 | 7  | 12 | 3                 | 6  | 17                      | 6  | 1  |    |    |    |    |    |    |    |    |    |
|                                | Upper gill rakers       |    |                      |    | Lower gill rakers |    |    |                   |    | Upper+lower gill rakers |    |    |    |    |    |    |    |    |    |    |    |
|                                | 5                       | 6  | 7                    | 8  | 9                 | 10 | 11 | 12                | 13 | 14                      | 15 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| <i>A. antonbruun</i> sp. nov.  | —                       | 2  | 14                   | 8  | —                 | —  | 1  | 2                 | 11 | 8                       | 2  | —  | —  | —  | 1  | —  | 1  | 10 | 7  | 4  | 1  |
| <i>A. bengalensis</i> sp. nov. | —                       | —  | 2                    | 1  | —                 | —  | 3  | —                 | —  | —                       | —  | —  | —  | —  | —  | 2  | 1  | —  | —  | —  | —  |
| <i>A. nibe</i>                 | 8                       | 21 | 1                    | —  | 1                 | 16 | 11 | 2                 | —  | —                       | —  | 1  | 6  | 10 | 11 | 2  | —  | —  | —  | —  | —  |

Swimbladder (Fig. 4B, C, E) carrot-shaped, tapering posteriorly; lateral appendages well developed (except posteriormost 2 or 3 bud-like), embedded in thick wedge of fat tissue; dorsal and ventral limbs thick, shortened, arising immediately above appendage insertion onto swimbladder, highly branched, posteriorly 2 or 3 enveloping bladder and nearly meeting opposite members, remainder lying beside and weakly overlapping bladder (Fig. 4E); main arm of ventral limb becoming strongly posteromedially oriented (dorsal and ventral limb fine detail—see Fig. 4B, C).

Sagitta (Fig. 5B) shield-shaped; sulcus head pear-shaped; sulcus tail hockeystick-shaped, slightly curved and truncated at posterior end; outer surface of sagitta with two, large granules.

*Colour in alcohol.*—Body dull brown on back and sides owing to broad, dark margined scale pockets, slightly paler below. Upper and lower lips edged with brown; mouth lining dark brown. Operculum appears blackish owing to blackish lining of branchial cavity; membrane between opercular spines paler posteriorly. Peritoneum dark brown. Pectoral axil dusky. All fins brown, darker distally.

*Colour when fresh.*—Unknown.

**Distribution.** Known only from the type locality.

**Etymology.** Named after the Bay of Bengal in which the type specimens were collected.

**Remarks.** In the most recent review of *Atrobucca*, Sasaki and Kailola (1988) recognized eight species. *A. antonbruun* and *A. bengalensis* differ from all of these in having the inner row teeth on the lower jaw weakly differentiated and closely spaced (Fig. 3A, B), compared with distinctively enlarged and broadly spaced (Fig. 3C) in the latter.

*A. antonbruun* differs from *A. bengalensis* in having a higher number of first dorsal fin spines (usually X vs IX;  $0.001 < p < 0.0025$ , Mann-Whitney U-test), lower numbers of dorsal fin soft rays (27–29 vs 30–31;  $p = 0.001$ ) and pectoral fin rays (usually 17–18 vs 19;  $p = 0.0025$ ), and a higher number of lower gill rakers (usually 13–14 vs 11;  $0.001 < p < 0.0025$ ) (Table 1). Furthermore, the structure of the swimbladder appendages differs between the two species. In *A. antonbruun*, most appendages are strongly associated with the dorsal and ventral surfaces of the bladder wall (Fig. 4D), with the ventral limb of each appendage turning slightly posteromedially

(Fig. 4A), whereas those of *A. bengalensis* lie mostly on the sides of the bladder wall (Fig. 4E), with the ventral limb of each turning strongly posteromedially (Fig. 4B, C). It is unwise to consider such obvious differences as merely intraspecific variations, especially when the swimbladders from specimens of comparable body size are compared. In addition, *A. antonbruun* is distinguishable from *A. bengalensis* owing to the cycloid scales on the anterior half of the body (vs ctenoid), although it is possible that the validity of the character is limited to *antonbruun* specimens less than 200 mm SL (largest available, 197.2 mm SL), since Sasaki (1995) showed that a transition from cycloid to ctenoid scales occurs at a fairly late stage of ontogeny (120–200 mm SL) in the sciaenid, *Panna heterolepis*.

Misidentifying at that time undescribed *A. antonbruun* as *A. nibe*, Trewavas (1977) noted that the species in the Bay of Bengal had lower numbers of dorsal fin rays and higher numbers of gill rakers than *A. nibe* off Taiwan, China and Japan (type locality). Such differences do not represent intraspecific variation of *A. nibe*, but instead strengthen the independent species status of *A. antonbruun* (Table 1; dorsal fin soft rays,  $p < 0.001$ , upper gill rakers,  $0.001 < p < 0.0025$ , lower gill rakers,  $p < 0.001$ , upper + lower gill rakers,  $p < 0.001$ ). Although Sasaki (1995) demonstrated a trend toward gill raker numbers decreasing with growth in the sciaenid genus *Panna*, such has not been evident in *Atrobucca* specimens examined so far.

#### Acknowledgments

I thank the cataloging staff of the Fish Division, USNM, who registered much USNM material upon my request. G. Hardy, Thames, New Zealand, read the manuscript and offered helpful comments.

#### Literature Cited

- Leviton, A. E., R. H. Gibbs, Jr., E. Heal and C. E. Dawson. 1985. Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia*, 1985: 802–832.
- Mohan R. S. L. 1972. A synopsis to the Indian genera of the fishes of the family Sciaenidae. *Indian J. Fish.*, 16: 82–98.
- Mohan, R. S. L. 1981. An illustrated synopsis of the fishes

Two New Species of *Atrobucca*

- of the family Sciaenidae of India. Indian J. Fish., 28: 1-24.
- Sasaki, K. 1995. A review of the Indo-West Pacific sciaenid genus *Panna* (Teleostei, Perciformes). Japan. J. Ichthyol., 42: 27-37.
- Sasaki, K. and P. J. Kailola. 1988. Three new Indo-Australian species of the sciaenid genus *Atrobucca*, with a reevaluation of generic limit. Japan. J. Ichthyol., 35: 261-277.
- Talwar, P. K. and A. Joglekar. 1972. Systematic status of *Sciaena bleekeri* Day, 1876 (Sciaenidae: Pisces). Rec. Zool. Surv. India, 66: 1-5.
- Trewavas, E. 1977. The sciaenid fishes (croakers or drums) of the Indo-West-Pacific. Trans. Zool. Soc. Lond., 33: 253-541, pls. 1-14.

ベンガル湾から得られたクログチ属(ニベ科)の2新種

佐々木邦夫

ベンガル湾から得られたニベ科クログチ属 *Atrobucca* の2新種を記載した。 *A. antonbruun* はビルマとインド東岸から、 *A. bengalensis* はスリランカから採集された。両新種ともに下顎内列歯の肥厚が弱いことで本属の他種と区別される。 *A. antonbruun* は *A. bengalensis* と背鰭条数、胸鰭条数、鰓耙数および鱗と鰾の状態が異なる。

(〒780 高知市曙町2-5-1 高知大学理学部生物学教室)