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A New Species of the Cottid Fish Genus *Stlengis* (Teleostei: Scorpaeniformes) from Indonesia

Ronald Fricke and Heiko Brunken

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Abstract A new species of cottid fish, *Stlengis mesembrinus* collected from Indonesia, is described. It is distinguished from other species of this genus by its lateral line scale row of 29 scales, the additional row of 9 small dorsal scales, its large eye, its eight spines in the first dorsal fin, 13 rays in the second dorsal fin, 10 anal fin rays, and by its color pattern (e.g., first dorsal fin translucent, with several irregular darkish streaks). The present species is compared with the Japanese members of *Stlengis* and with the species of *Antipodocottus* known from the Tasman Sea and New Zealand; the origin of the present species is discussed.

During an examination of fish specimens in the collection of the Zoologisk Museum, Copenhagen (ZMUC), we found a new species of cottid fish from Indonesia. This first sculpin species from tropical waters belongs to the deepwater genus *Stlengis* Jordan et Starks, 1904 which was known previously only from Japan, and is zoogeographically a link between the three Japanese species of *Stlengis* and the two nearly related species of *Antipodocottus* from the Tasman Sea and New Zealand area. Measurement methods follow those used by Fricke (1981) for callionymid fishes.

Stlengis mesembrinus sp. nov.
(Figs. 1, 2)

Material. ZMUC P81868, holotype, 50.5 mm SL (standard length), Danish Kai Islands Expedition, St. 52, Kai Islands, Indonesia, 5°46′S, 132°49′35″E, 352 m, 7 May 1922.

Diagnosis. A *Stlengis* with 8 spines in the first dorsal fin, 13 rays in the second dorsal fin and 10 anal fin rays; 29 lateral line scales and an additional dorsal row of 9 scales; uppermost preopercular spine with four curved points at its dorsal margin additional to the main tip; eye 16.2% of SL.

Description. D_1. VIII; D_2. xii, 1; A. ix, 1; P_1. xviii~xix; P_2. I, ii; C. (ii) ii 7 i (ii). Lateral line scales 29; one additional dorsal scale row with 9 scales. Proportions see Table 1.

Head and body depressed, tail compressed. Head (measured to hind end of operculum) large, 2.6 in SL. Eye very large, its diameter 2.4 in head length. Interorbital width 8.2 in eye diameter. Jaws, vomer and palatines with villiform teeth. Cranial spines: one pair each of preocular and parietal spines present, the latter ones forming a short and low bony ridge. No supraorbital cirrus present. Pores of cephalic lateral line system not much enlarged (pore pattern see Fig. 1A). Anteriormost pore of mandibular series unpaired. Upper jaw length 2.5 in head length. Preoperculum with four spines; the lowermost projected downwards, the uppermost enlarged, upcurved and with four additional relatively large curved points at its dorsal margin (see Fig. 1B). Operculum posteriorly pointed, extending to the vertical through the second spine of the first dorsal fin. No slit behind last gill arch. Scales relatively deep embedded in the skin, most with serrated posterior margin.

Origin of first dorsal fin behind dorsal end of gill opening; predorsal (1) length 2.84 in SL. First spine of the first dorsal fin relatively short, 4.7 in head length; fifth spine longest, 2.63 in head length. Predorsal (2) length 1.74 in SL. Second dorsal fin base length 3.02 in SL. Rays of second dorsal fin unbranched, the last divided at its base. Anal fin beginning on the vertical through the second ray of the second dorsal fin. Preanal length 1.74 in SL. Anal fin rays unbranched, the last divided at its base. Anal fin base 4 in SL. Prepelvic fin length 3.28 in SL. Pelvic fin spine 3.23 in head length; pelvic

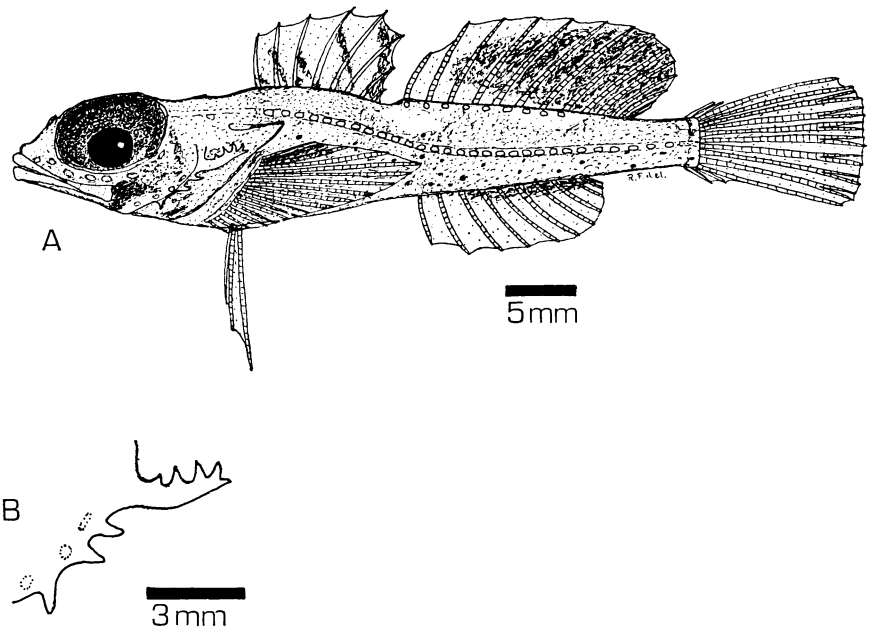

Fig. 1. *Stlengis mesembrinus* n. sp., ZMUC P81868, holotype, 50.5 mm SL, Kai Islands, Indonesia, 352 m. A, Lateral view. B, Spines of left preoperculum.

fin rays unbranched, 2nd ray longest, 1.8 in head length. Pectoral fin rays unbranched. Pectoral fin distally pointed, reaching back to 1st anal fin ray. Longest pectoral fin ray 1.63 in head length. Caudal fin length 3.8 in SL.

Color in alcohol: Body brown; head and parts of back light brown. Eye dark grey. Suborbital area with a dark brown blotch. Body with a number of small dark brown spots. First dorsal fin translucent, with a number of indistinct brown streaks. Central and posterior parts of second dorsal fin dark brown (see Fig. 1A). Posterior three-fourths of anal fin base dark brown, rest of fin translucent. Dorsalmost pectoral fin membrane brown, rest of fin translucent. Pelvic and caudal fins translucent.

Distribution. This new species is known only from the type locality, Kai Islands, Indonesia. The holotype has been collected at a depth of 352 m.

Etymology. μεσημβρινός (Gr.) means "southern".

Discussion

The present species is placed in the genus *Stlengis* because it agrees with the generic characters given by Jordan and Starks (1904), Bolin (1936) and Watanabe (1960). *Stlengis mesembrinus* can be distinguished from the Japanese species *Stlengis misakia* (Jordan and Starks, 1904: 237～238, fig. 2, Sagami Bay) by the smaller lateral line scales, the lateral line scale number (34～37 in *S. misakia*, 29 in *S. mesembrinus*), the additional scale row at the second dorsal fin base, the larger eye (*S. misakia*: eye 2.8～4.0 in head), and the color pattern of the first and second dorsal fins and of the body. The new species is distinguished from *S. osensis* Jordan and Starks (1904: 236～237, fig. 1, Suruga Bay) by the much smaller dorsal and lateral line scale rows and by the lacking ventral scale row, one less point at the dorsal margin of the preopercular spine (uppermost) (5 in *S. osensis*), the larger eye (*S. osensis*: 2.8～3.8 in head), the smaller and fewer pores of the cephalic lateral line system, and the different color patterns of the first and second dorsal fins. It differs from *S. distoechus* Bolin (1936: 328～330, fig. 26, pl. 34 A, Wakayama, Japan) by the shorter dorsal scale row (*S. distoechus* with 23～28 scales, instead of 9 in *S. mesembrinus*), by the lower

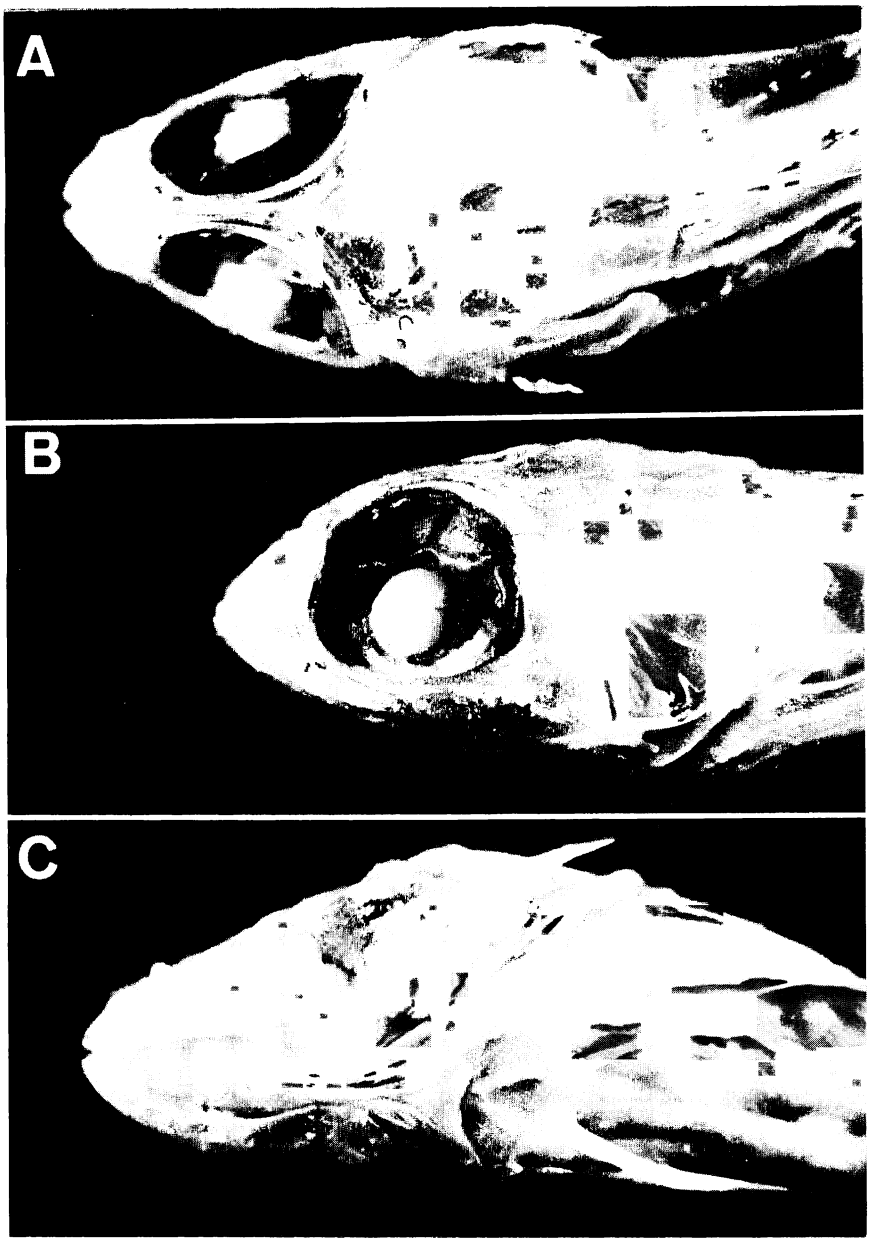

Fig. 2. *Stlengis mesembrinus* n. sp., ZMUC P81868, holotype, Kai Islands, Indonesia, 352 m. A, Dorsal view, head. B, Lateral view, head. C, Ventral view, head.

number of lateral line scales (34～37 in *S. distoechus*), and by the different color patterns of the first and second dorsal fins and of the pectoral fin. *Stlengis mesembrinus* can be distinguished from *Antipodocottus galatheae* Bolin (1952: 432～441, figs. 1～2, Tasman Sea; Nelson, 1975: 80～86, figs. 1～2, tab. 1, New Zealand) and *A. megalops* DeWitt (1969: 30～34, fig. 1) by the lacking supraorbital cirrus, the presence of a dorsal scale row, one more point on the dorsal side of the uppermost preopercular spine as *A. galatheae*, and a different color pattern of the first dorsal fin and of the body.

Stlengis mesembrinus seems to be nearest re-

Table 1. Proportions of the holotype of *Stlengis mesembrinus* n. sp. from the Kai Islands (expressed as hundredths of SL).

Predorsal (1) length	35.25
Predorsal (2) length	57.43
Preanal fin length	57.62
Prepelvic fin length	30.50
Head length	39.01
Body depth	20.40
Caudal peduncle length	16.24
Caudal peduncle depth	6.93
Caudal fin length	26.34
Eye diameter	16.24
Upper jaw length	15.64
1st D_1 spine	8.32
5th D_1 spine	14.85
1st D_2 ray	7.92
2nd D_2 ray	13.66
5th D_2 ray	19.41
1st A ray	7.52
5th A ray	11.88
Longest P_1 ray	23.96
1st P_2 spine	12.08
2nd P_2 ray	21.78

lated to *S. misakia* because of the scale row pattern and the mandibular pore shape and pattern. This agrees with Bolin's (1936: 327) theory that *S. misakia* was the first to split from the ancestor stock. Probably, the speciation of *misakia/mesembrinus* occurred first, and *osensis/distoechus* speciated later.

Bolin (1952: 436~441) discussed the origin of his genus *Antipodocottus* and postulated migration of *Stlengis* from Japan to the Tasman Sea during a glacial period. The new *Stlengis mesembrinus* is a link between the Japanese *Stlengis* species and the Tasman Sea *Antipodocottus* and permits to prove some of Bolin's proposals. Bolin proposed a migration route through Taiwan, Philippines, New Guinea and the Solomon Islands to be plausible. This route seems to be right, since *S. mesembrinus* has been found at the Kai Islands, west of New Guinea (it should be noted that migration in cottids takes place only in the planktonic larval and postlarval stages).

Bolin also discussed the preferred temperature ranges of *Stlengis* (7~10°C) and *Antipodocottus* (7~8°C; 4~8°C according to DeWitt, 1969). He supposed that *Stlengis* migrated westward and southward during a glacial period when the sea had a lower temperature, and that the later (during the following interglacial period) increasing temperature would have forced the fish to adjust itself to a higher temperature or to greater depths (that means, to a higher pressure). In *Antipodocottus*, most probably the latter case occurred. This genus is living at a greater depth than any other *Stlengis* species, but nearly in the same temperature range as the Japanese *Stlengis*. The new species *Stlengis mesembrinus*, however, has been found at a depth of 352 m in tropical waters. The bottom temperature at that depth must have been at least 13°C, probably more (Wyrtki, 1971; H. Leach, personal communication). Most probably, *S. mesembrinus* represents the other case and adjusted itself to warmer temperatures and not to greater depths (the other species of *Stlengis* and *Antipodocottus* have been found at depths of 278~594 m). As mentioned by Bolin (1952: 441), the more or less enclosed Philippine and Indonesian basins "must have acted as a temperature unit displaying little horizontal variation; . . . their comparatively small areas provided no suitable regions of refuge" ("suitable" means a low temperature level). Most probably, the ancestor of the Indonesian *Stlengis* settled down in the Indonesian and in the eastern New Guinea areas; when the temperature increased, the eastern New Guinea population migrated southward along the east coast of Australia to the Tasman Sea, while the western (Indonesian) population did not find a region of refuge and was forced to adapt to a higher temperature level. It seems that it is easier for a stenotherm deepwater sculpin species to adjust to a higher pressure rather than to a warmer temperature; but if there is no access to an area with a lower temperature level, the species may be able to adapt to the higher temperature.

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(RF: Saalestrasse 3 A, D-3300 Braunschweig, Federal Republic of Germany; HB: Zoologisches Institut, Technische Universität, Gausstrasse 22, D-3300 Braunschweig, Federal Republic of Germany).

インドネシアから採集されたカジカ科魚類の1新種 *Stlengis mesembrinus*

Ronald Fricke • Heiko Brunken

インドネシアのKai諸島付近の水深352mからカジカ科クシカジカ属に含まれる1新種 *Stlengis mesembrinus* が採集された．本種は，側線鱗数が29～30であること，背側に9枚の小鱗からなる鱗列を持つこと，目が大きいこと，背鰭が8棘13軟条からなり，臀鰭が10軟条からなること，そして背鰭の斑紋などの特徴で，本属のいずれの既知種とも識別される．

本種は熱帯海域から採集された初めてのカジカ科魚類であるため，日本産のクシカジカ属魚類およびタスマニア海に分布するカジカ科魚類 *Antipodocottus* と比較検討された．また，*Antipodocottus* の分散経路に関するBolin (1952) の見解についても検討され，本種の起源について考察が加えられた．