

Two New Species of *Nibeia* (Sciaenidae) from Northern Australia and Papua New Guinea

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Abstract Two new species of the sciaenid genus *Nibeia* are described; *N. squamosa* from northern Australia and Papua New Guinea and *N. microgenys* from northern Australia. Both species differ from all known congeners in having a small, inferior mouth, with the lower jaw teeth uniform in size. *N. squamosa* is distinguished from *N. microgenys* by a higher number of lateral line scales (57–60 vs. 48–50), the last pleural rib on the 11th vertebra (vs. 10th), and a longer and more slender caudal peduncle (length 25.9–30.4%SL, depth 6.3–7.9% SL vs. 21.5–26.3, 8.0–10.3). *N. squamosa* exhibits hyperostosis in some elements, such as the frontals and dorsal and anal pterygiophores.

The sciaenid genus *Nibeia* comprises six species, distributed along the coasts of India and Ceylon and eastwards to Queensland, Australia and Japan (Trewavas, 1977). One of these, *Nibeia semifasciata* Chu et al., 1963, a species previously known from Chinese coasts and Bangkok, was reported from Papua New Guinea by Roberts (1978). Examinations of Roberts's specimens revealed, however, that they were not *N. semifasciata*, but instead represented an undescribed species. Additional material from Australia showed that not only did the species occur also in northern Australia, but also that a second undescribed species of *Nibeia* existed in that region. These two new species are described below.

Both new species belong to the tribe Nibeini of the subfamily Otolithinae as defined by Trewavas (1977) and modified by Sasaki (1989), in having five mental pores, a pair of deeply cephalic swimbladder appendages, and the sagitta with a sharply curved sulcus tail. However, the two new species depart from Trewavas's definition of *Nibeia* in having the lower jaw teeth uniform in size, rather than distinctly large and small. Reasons for keeping them in *Nibeia* are provided below.

Methods for counts and measurements follow Sasaki and Kailola (1988). Standard length and head length are expressed throughout as SL and HL, respectively. Data for the holotype are presented first, followed by ranges for paratypes in parentheses. Institutional abbreviations follow Leviton et al. (1985).

Nibeia squamosa sp. nov. (Figs. 1–4)

Nibeia semifasciata (not of Chu et al., 1963): Roberts, 1978: 59, fig. 33 (Fly River, Papua New Guinea).

Holotype. USNM 217221, 526.5 mm SL, Lake Herbert Hoover (locality known as Lake Boset), Wam River (which drains Lake Herbert Hoover), and swampy lagoons along main stream of Middle Fly, 509–512 km upriver from Toro Pass, Fly River, Papua New Guinea, 07°22.6'S, 141°08.03'E, 27 November 1975, coll. T. Roberts.

Paratypes. AMS I. 21481-001 (formerly USNM 217223), 326.5 mm SL, mainstream Lower Fly, Papua New Guinea, 07°49'S, 141°39'E, 8 December 1975, coll. T. Roberts; AMS I. 22081-015, 93.3 mm SL, lagoon, east of Normanton, Queensland, 29 October 1980, coll. D. Hoese and H. Larson; NTM S. 11197-001, 571.5 mm SL, Northern Territory; NTM S. 11400-001, 2 specimens, 533.0 and 566.0 mm SL, Daly River, Northern Territory, 9 April 1984; NTM S. 11401-001, 424.4 mm SL, Point Stuart, Shady Camp, Northern Territory, 30 June 1983; NTM S. 11566-001, 3 specimens, 448.5–528.8 mm SL, Chambers Bay, Northern Territory, 12°13'S, 131°35'E, 2 February 1985; NTM S. 12585-001, 292 mm SL, east of Legune Station, Victoria River, Northern Territory, 1–2 m, September 1986; QM I. 11560, 286.8 mm SL, QM I. 20043, 564.8 mm SL, QM I. 20044, 373.8 mm SL, QM I. 20066, 513 mm SL, Karumba, Gulf of Carpentaria, northwestern Queensland; QM I. 25443, 574.3 mm SL, Norman River, 17°29'S, 140°50'E, September 1988; QM I. 26267, 474 mm SL, Norman River, 1989; USNM 217222, 2 specimens, 334.4 and 442.4 mm SL, side channel of Strickland, 4 km downstream from Massy Bakers Junction, 450 km upriver from Toro Pass, Fly River, Papua New Guinea, 07°22.06'S,

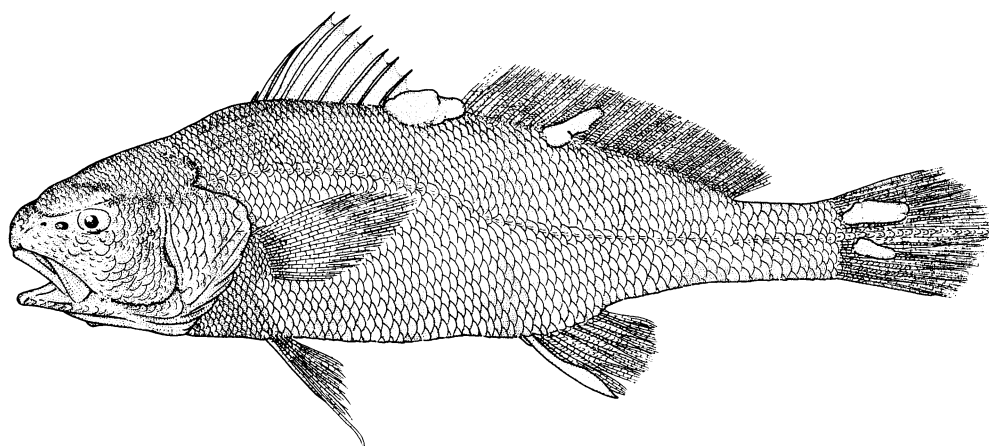


Fig. 1. *Nibea squamosa* sp. nov., holotype, USNM 217221, 526.5 mm SL, from Fly River, Papua New Guinea.

141°29.00'E, 6-7 December 1975, coll. T. Roberts.

Other material. QM IO. 25443, otolith only (from 583 mm SL specimen), Norman River, northwestern Queensland, 17°29'S, 140°50'E, September 1988, coll. D. Tuma.

Diagnosis. A species of *Nibea* distinguished from its congeners by the following combination of characters: mouth small, inferior (upper jaw length 32.2-37.5% HL, lower jaw length 34.3-40.4% HL); lower jaw teeth uniform in size; number of lateral line scales 57-60; last pleural rib on 11th vertebra; caudal peduncle long and slender (length 25.9-30.4% SL, depth 6.3-7.9% SL).

Description. Dorsal rays X+I, 27 (X+I, 28-31); anal rays II, 7 (II, 7); pectoral fin rays 19 (18-20); lateral line scales 57 (57-60); scales above lateral line 10 (9-13), below lateral line 12 (13-17); gill rakers 4 + 1 + 8 (3-6 + 1 + 6-9); vertebrae 11 + 14 (11 + 14), last pleural rib on 11th vertebra, first anal proximal radial between 11th and 12th vertebrae; swimbladder appendages 18 (in one paratype). Proportions as % SL: head length 28.8 (26.4-32.6); body depth 27.8 (24.0-28.5); body width 15.6 (12.4-16.0); caudal peduncle length 26.7 (25.9-30.4); caudal peduncle depth 7.5 (6.3-7.9); snout length 8.6 (7.0-8.7); eye diameter 3.7 (3.3-4.2); interorbital width 10.0 (7.0-10.2; see section on hyperostosis); upper jaw length 10.8 (9.0-11.1); lower jaw length 11.2 (9.9-12.1); pectoral fin length 20.2 (17.0-23.4); pelvic fin length 16.3 (15.0-20.6); second dorsal spine length 7.7 (7.6-13.2); third dorsal spine 13.3 (12.0-14.9); fourth dorsal spine 12.8 (11.4-14.3); fifth dorsal spine 11.9 (9.0-13.8); second anal spine length 11.8 (10.8-20.7); gill raker length 0.8 (0.6-1.7); gill filament length 3.8 (2.2-5.3). Proportions

as % HL: snout length 30.0 (24.7-29.9); eye diameter 12.9 (11.0-22.4); interorbital width 34.6 (22.7-34.7; see section on hyperostosis); upper jaw length 37.7 (32.2-37.5); lower jaw length 39.1 (34.3-40.4); second anal spine length 40.9 (37.8-63.5); gill raker length 2.9 (2.2-5.3); gill filament length 13.1 (9.3-14.0). Proportions as % eye diameter: gill raker length 22.6 (17.6-31.4); gill filament length 101.5 (53.8-102.0).

Body elongate, moderately compressed; caudal peduncle noticeably long, slender.

Snout blunt, obtusely rounded, slightly overhanging on upper jaw. Snout pores five upper and five marginal, outer pair of the latter in a deep notch. Mental pores in three pairs, anterior pair with common opening.

Mouth small, inferior, cleft angle when closed 20°; upper jaw projecting beyond lower jaw; maxillary reaching posterior margin of pupil.

Upper jaw with an outer row of enlarged teeth, and an inner band of small, conical teeth, comprising two or three rows anteriorly, three of four rows posteriorly. Lower jaw with a band of uniformly small, conical teeth (except for very slightly enlarged, innermost, posterior teeth), comprising five or six rows.

Eye small, diameter less than interorbit. Nostrils immediately before eye; anterior nostril semicircular with raised rim; posterior nostril laterally oblong. Posterior margin of preoperculum sharply backwardly convex at angle. Gill rakers very short, obtuse; gill filaments about four times as long as gill rakers adjacent to angle of gill arch.

Scales cycloid on snout, cheek, throat, pectoral

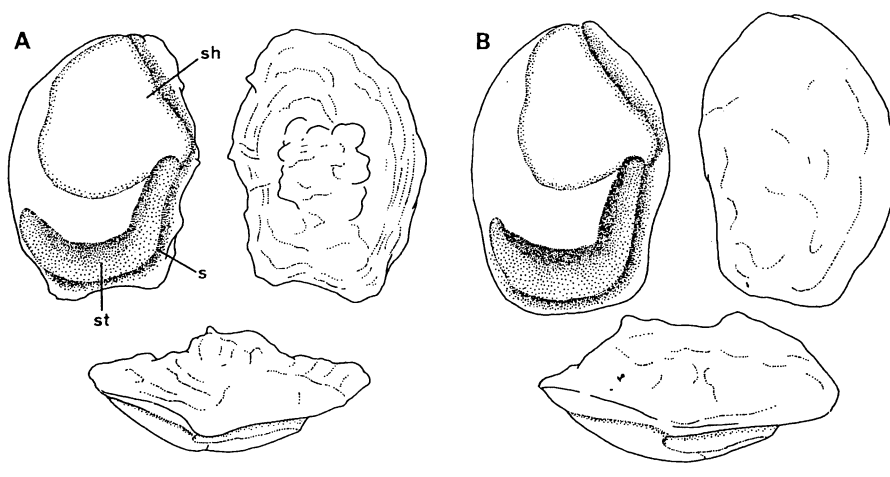


Fig. 2. Sagittae of (A) *Nibea squamosa* sp. nov. (QM IO.25443) and (B) *N. microgenys* sp. nov. (QM I. 22693, paratype). Left, inner surface; right, outer surface; bottom, lateral view. s, sulcus; sh, sulcus head; st, sulcus tail. Bar = 5 mm.

axil, and dorsal, anal, and caudal fins; ctenoid elsewhere.

Pectoral fin rounded, inserted just below dorsal fin origin, reaching posteriorly to level with 11th dorsal spine. Pelvic fin with short filament. Second anal spine long and robust (see section on hyperostosis), its length equal to first soft ray.

Sagitta thick, shield-shaped; sulcus head pear-shaped; sulcus tail sharply curved, narrowly separated from ventral edge of sagitta (Fig. 2A).

Swimbladder carrot-shaped, with a number of fan-like appendages along sides; anteriormost pair of appendages entering head through septum transversum; posteriormost pair tube-like, directed posteriorly. Drumming muscle present in both sexes.

Colour in preservative: uniform brownish yellow, slightly paler below; a series of oblique dark spots along scale rows on anterior part of back below spinous dorsal fin. Mouth lining, branchial cavity, peritoneum pale; pectoral axil slightly dusky. Spinous dorsal, margin of soft dorsal, and posterior half of caudal fins dusky. Colour when fresh: unknown.

Hyperostosis. Hyperostosis of certain elements occurs in *Nibea squamosa*. Such elements include the frontals, supraoccipital, operculum, second and third dorsal spines, second anal spines, first dorsal and anal pterygiophores, and vertebrae. Furthermore, bony lumps develop on the dorsal and caudal fins. Although development is variable, swelling is generally greater in larger specimens.

The anterolateral portion of each frontal swells

into an individually-variable, longitudinal protuberance, thus resulting in a markedly wide range for interorbital width in specimens larger than 400 mm SL (Fig. 3, compare with the usual range of *N. microgenys* sp. nov.). Swelling of the supraoccipital was detected externally in NTM S. 11400-001 (566 mm SL), the anterior portion of the supraoccipital ridge being slightly swollen. The operculum was thick and heavy in specimens of more than 400 mm SL, although there was no change in its shape with increasing size. The second dorsal spine usually tapers distally. However, in QM I. 20066 (513 mm SL), the spine was distally swollen and hooked. In addition, the third dorsal spine of some large specimens had the posterior basal portion slightly inflated. The second anal spine undergoes similar, but more prominent swelling. The posterior margin of the spine was not at all or only slightly inflated distally in specimens less than 400 mm SL, but was clearly inflated in larger specimens, with a hollow in the distal half of the spine being obvious in radiographs of USNM 217222 (442 mm SL) and USNM 217221 (527 mm SL). The first dorsal and anal pterygiophores also undergo hyperostosis. Of five radiographed specimens, the first dorsal and anal pterygiophores were slender and peg-like in AMS I. 21481-001 (327 mm SL) and USNM 217222 (334 mm SL); the anterior margins are slightly expanded in QM I. 20044 (374 mm SL); and the entire pterygiophores were remarkably inflated in USNM 217222 (442 mm SL) and USNM 217221 (527 mm SL). Regarding

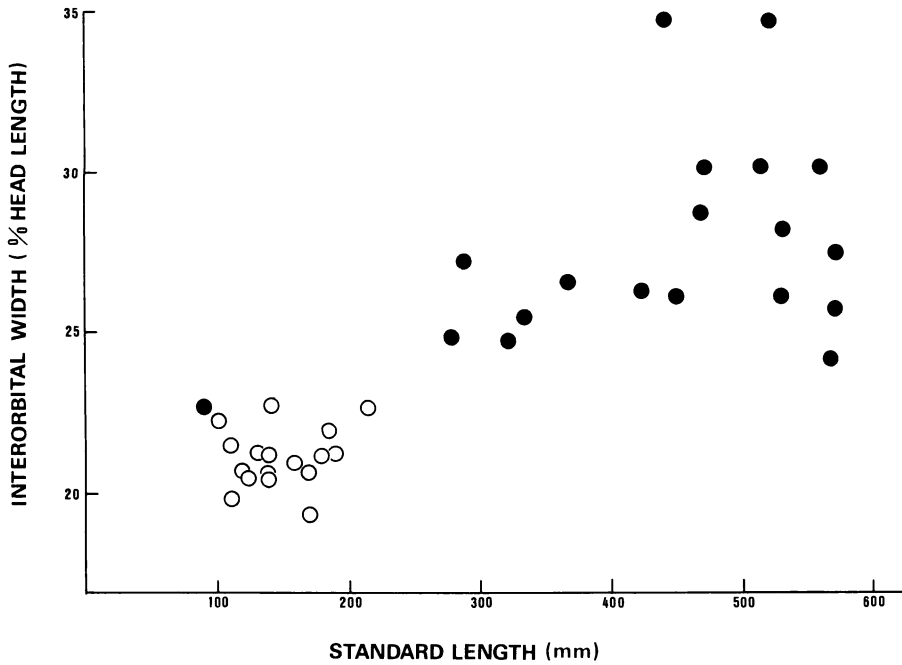


Fig. 3. Relationship between interorbital width as % HL and SL in *Nibea squamosa* sp. nov. (solid circles) and *N. microgenys* sp. nov. (open circles).

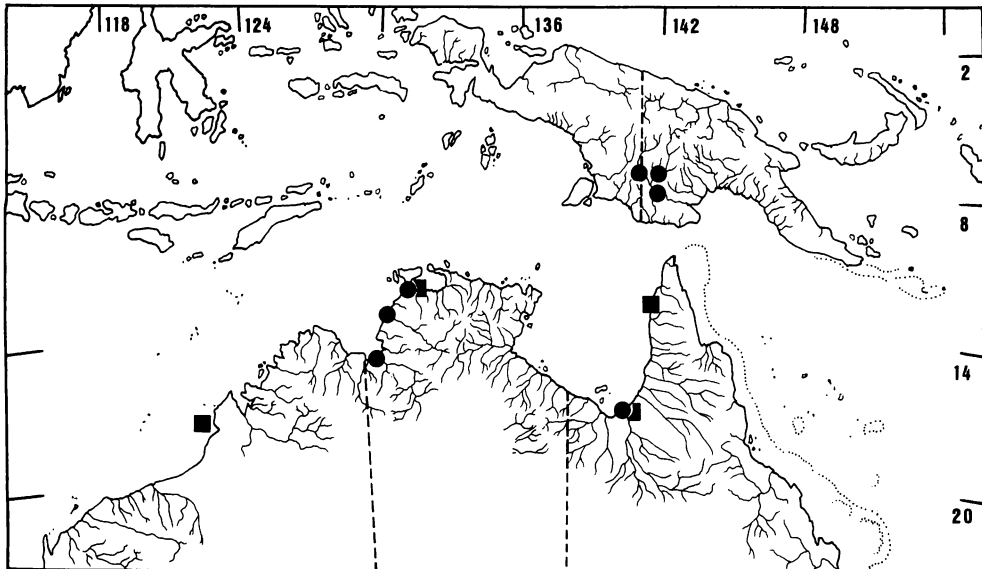


Fig. 4. Distribution of *Nibea squamosa* sp. nov. (circles) and *N. microgenys* sp. nov. (squares). Symbols may indicate more than one record from each locality.

vertebrae, the centra of the 22nd vertebra were slightly more robust than those of adjacent vertebrae in AMS I. 21481-001 (327 mm SL) and USNM 217222 (334 mm SL), whereas the centra of the

21st–23rd vertebrae (particularly the 22nd) were markedly thickened in the three largest specimens examined. In addition, bony lumps generally develop on the dorsal and caudal fins in specimens

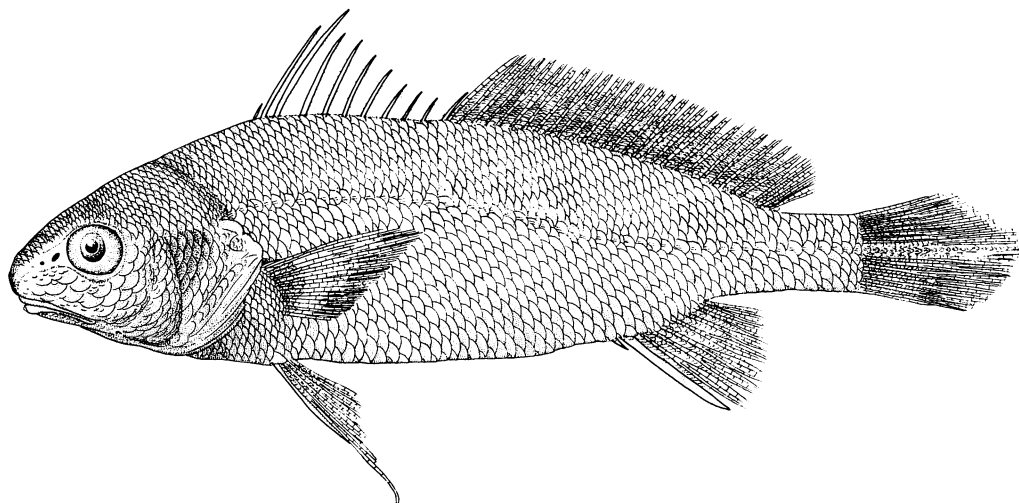


Fig. 5. *Nibea microgenys* sp. nov., holotype, QM I.26784, 141.7 mm SL, from Embley River, Weipa, North Queensland, Australia.

greater than 300 mm SL. Most commonly, such lumps occur at the base of the 11th dorsal spine (seen in 11 of 13 specimens greater than 300 mm SL).

Distribution. Known from Papua New Guinea (Fly River) and northern Australia (rivers and coasts of Northern Territory and northwestern and northern Queensland) (Fig. 4).

Etymology. The specific name is derived from *squama* (L.), scale, in reference to the numerous lateral line scales in this species.

Nibea microgenys sp. nov.
(Figs. 2–5)

Holotype. QM I. 26784, 141.7 mm SL, Embley River, Weipa, North Queensland, Australia.

Paratypes. AMS I. 26864-002, 185.1 mm SL, Norman River, salt water, northwestern Queensland; NTM S. 10177-002, 3 specimens, 100.9–140.1 mm SL, King Creek, Shoal Bay, Northern Territory, 16 August 1973; NTM S. 11142-001, 170.2 mm SL, Buffalo Creek, Darwin, Northern Territory, 10 May 1983; NTM S. 12162-002, 179.4 mm SL, Buffalo Creek, Darwin, Northern Territory, 2 m, May 1987; NTM S. 12182-001, 2 specimens, 160.7–186.9 mm SL, Howard River, Darwin, Northern Territory, 13 July 1986; QM I. 22693, 3 specimens, 132.5, 141.1, 142.8 mm SL, collected with the holotype; QM I. 23792, 167.0 mm SL, Embley River, near Weipa, North Queensland, 10 August 1987; QM I. 26548, 3 specimens, 108.9–121.5 mm SL, Albatross Bay, 12°40'S, 141°39'E, 10 m, North Queensland, 1 March 1990; WAM P. 13689-001, 216.0 mm, Broom, 17°58'S, 122°14'E, Western Australia, 19 June 1965.

Diagnosis. A species of *Nibea* distinguished from its congeners by the following combination of characters: mouth small, inferior (upper jaw length 32.0–38.4% HL, lower jaw length 33.5–40.1% HL); lower jaw teeth uniform in size; number of lateral line scales 48–50; last pleural rib on 10th vertebra; caudal peduncle short and deep (length 21.5–26.3% SL, depth 8.0–10.3% SL).

Description. Dorsal rays X+I, 30 (X+I, 29–31); anal rays II, 7 (II, 7); pectoral fin rays 19 (18–19); lateral line scales 49 (48–50); scales above lateral line 10 (10–14), below lateral line 12 (12–17); gill rakers 6+1+8 (4–6+1+5–8); vertebrae 10+15 (10+15), last pleural rib on 10th vertebra, first anal proximal radial between 10th and 11th vertebrae; swimbladder appendages 19 (21 in two paratypes). Proportions as % SL: head length 30.4 (28.8–31.8); body depth 28.5 (25.3–31.7); body width 13.0 (12.3–17.3); caudal peduncle length 23.1 (21.5–26.3); caudal peduncle depth 9.4 (8.0–10.3); snout length 8.6 (7.1–8.7); eye diameter 6.8 (5.1–7.4); interorbital width 6.4 (6.1–6.9); upper jaw length 10.5 (9.6–11.7); lower jaw length 10.8 (10.0–12.2); pectoral fin length 19.3 (17.8–20.9); pelvic fin length 19.8 (18.5–21.2); second dorsal spine length 13.1 (8.6–12.8); third dorsal spine 14.6 (14.8–17.6); fourth dorsal spine 12.8 (13.6–17.6); fifth dorsal spine 12.8 (11.9–14.8); second anal spine length 16.2 (13.2–17.4); gill raker length 1.8 (1.0–1.9); gill filament length 3.5 (3.0–3.9). Proportions as % HL: snout length 28.3 (23.4–29.1); eye diameter 22.3 (17.0–24.3); interor-

bital width 21.1 (19.4–22.9); upper jaw length 34.6 (32.0–38.4); lower jaw length 35.5 (33.5–40.1); second anal spine length 53.5 (44.4–57.3); gill raker length 5.8 (3.4–6.2); gill filament length 11.6 (10.1–12.3). Proportions as % eye diameter: gill raker length 26.0 (19.8–27.8); gill filament length 52.1 (29.4–72.1).

Body moderately elongate, compressed; caudal peduncle short, deep.

Snout steeply curved, pointed, projecting in front of upper jaw. Snout pores five upper and five marginal, outer pair of the latter in a deep notch. Mental pores in three pairs, anterior pair with common opening.

Mouth small, inferior, cleft nearly horizontal when closed; upper jaw projecting beyond lower jaw, maxillary reaching posterior margin of pupil.

Upper jaw with an outer row of enlarged teeth, and an inner band of small, conical teeth, comprising five or six rows. Lower jaw with a band of uniformly small, conical teeth (except for very slightly enlarged, innermost, posterior teeth), comprising five or six rows anteriorly, three or four rows posteriorly.

Eye moderately large, diameter equal to interorbit. Nostrils immediately before eye; anterior nostril semicircular with a raised rim; posterior nostril obliquely oblong. Posterior margin of preoperculum rounded gradually at angle. Gill rakers short, slender, their tips rounded; gill filaments about twice as long as gill rakers adjacent to angle of gill arch.

Scales cycloid on snout, cheek, throat, pectoral axil, and dorsal, anal, and caudal fins; ctenoid elsewhere.

Pectoral fin pointed, inserted just below dorsal fin origin, reaching posteriorly to level with first dorsal soft ray. Pelvic fin with short filament. Second anal spine long, its length equal to first anal soft ray.

Sagitta thick, shield-shaped; sulcus head pear-shaped; sulcus tail sharply curved, narrowly separated from ventral edge of sagitta (Fig. 2B).

Swimbladder carrot-shaped, with a number of fan-like appendages along sides; anteriormost pair of appendages entering head through septum transversum; posteriormost two or three pairs tube-like, directed posteriorly. Drumming muscle present in males, absent in females.

Colour in preservative: brownish-gray on dorsal side of body and flank, whitish below. Mouth lining and peritoneum pale; operculum gray due to blackish branchial cavity; pectoral axil gray. Spinous dorsal fin blackish; soft dorsal fin gray; pectoral, pelvic, and

anal fins pale; caudal fin gray. Colour when fresh: unknown.

Distribution. Known from northwestern and northern Australia (rivers and coasts of northeastern Western Australia, Northern Territory, and northwestern and northern Queensland) (Fig. 4).

Etymology. The specific name is derived from *mikros* (Gr.), small, and *genys* (Gr.), jaw, in reference to the small mouth in this species.

Discussion

Trewavas (1977) recognized seven genera in the tribe Nibeini, but later Sasaki (1989) excluded *Protonibea* from this group. Trewavas defined *Nibea* on the basis of the following combination of characters: differentiated lower jaw teeth; first pair of swimbladder appendages cephalic; strong second anal spine; no chin barbels; no specialized scales. Both new species are in accord with these characters except in having uniformly small, lower jaw teeth.

Similar dentition to the species described here is also seen in *Aspericorvina*, *Paranibea*, and *Dendrophysa*, in the Nibeini. However, it seemed unwise to assign the new species to any of these genera, owing to a lack in the former of such diagnostic characters as—scales with few, erect, enlarged ctenii (*Aspericorvina*), very thick papillose lips (*Paranibea*), a mental barbel (*Dendrophysa*). Accordingly, variability in lower jaw teeth (uniform size or differentiated) is considered to be a characteristic of *Nibea*. Since dentition is variable in such well defined sciaenid genera as *Johnius* (see Trewavas, 1977) and *Stellifer* (see Chao, 1978), differences in this aspect alone are not sufficient to justify generic separation of species.

In sciaenids, dentition pattern is usually correlated with the size and position of the mouth, i.e. inner row teeth on the lower jaw tend to be enlarged in sciaenids with a large, oblique or terminal mouth, whereas they tend to be not at all or only weakly enlarged in those with a small, subterminal or inferior mouth. This pattern is followed in the species described here, their mouths being relatively smaller and more inferior than those of the six previously recognized species of *Nibea*, viz. upper jaw length as % HL is 32.2–37.5 in *squamosa* and 32.0–38.4 in *microgenys* (vs. 37.5–45.5 in other species; Trewavas, 1977, pers. obs.); lower jaw length is 34.3–40.4 in *squamosa* and 33.5–40.1 in *microgenys* (vs. 40.0–53.0 in other species).

Although *squamosa* and *microgenys* share the same mouth position and dentition, they differ from one another in the number of lateral line scales (57–60 in *squamosa* vs. 48–50 in *microgenys*), the position of the last pleural rib (11th vertebra vs. 10th), and in caudal peduncle length and depth (length 25.9–30.4% SL, depth 6.3–7.9% SL vs. 21.5–26.3, 8.0–10.3).

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オーストラリア北部とパプア・ニューギニアから得られたニベ属の2新種

佐々木邦夫

オーストラリア北部とパプア・ニューギニアから得られたニベ属 *Nibe* の2新種を記載した。 *N. squamosa* はオーストラリア北部の沿岸とパプア・ニューギニアのフライ川水系から、 *N. microgenys* はオーストラリア北部の沿岸からそれぞれ採集された。これらの新種は口が小さく、かつ下位であること、さらに下顎歯の大きさが一様であることで本属の他種と区別される。 *N. squamosa* は *N. microgenys* と側線鱗数（前者では57–60、後者では48–50）、最後の肋骨の付着位置（前者では第11椎体、後者では第10椎体）、および尾柄長と尾柄高（前者ではそれぞれ体長の25.9–30.4%と6.3–7.9%、後者では21.5–26.3%と8.0–10.3%）などの点で異なる。 *N. squamosa* では成長に伴い、前頭骨や背鰭・臀鰭の担鰭骨などが肥厚する。

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