Herpetologica, 65(4), 2009, 413–418

A NEW SPECIES OF *MICROCAECILIA* (AMPHIBIA: GYMNOPHONA: CAECILIIDAE) FROM SURINAME

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ABSTRACT: We describe a new species of the caecilian genus *Microcaecilia* (Amphibia: Gymnophiona: Caeciliidae) from the Lely Mountains, Suriname and provide new information about the identification and distribution of species of *Microcaecilia* across the Guiana Shield. The new species, *M. grandis*, is large (318 mm total length), has many premaxillary-maxillary teeth (>20), and has bicuspid vomeropalatine teeth. We determined that specimens from Suriname previously assigned to *M. unicolor* (Duméril, 1864) were misidentified and that *M. unicolor* is currently known only from French Guiana.

Key words: Amphibia; Distribution; Gymnophiona; *Microcaecilia*; New species; Suriname

THE CAECILIAN genus *Microcaecilia* was established by Taylor (1968) for three species of Neotropical caeciliids, originally described as *Rhinatrema unicolor* (Duméril, 1864), *Gymnopis rabei* (Roze and Solano, 1963) and the type by original designation *Dermophis albiceps* (Boulenger, 1882). Taylor (1969) added a fourth species, *M. supernumeraria*. In their review of the caecilians of Suriname, Nussbaum and Hoogmoed (1979) described a fifth species, *M. taylori*, which, uniquely among *Microcaecilia*, has only primary annuli. They also highlighted a specimen of *Microcaecilia* from the Lely Mountains that they considered might represent an undescribed species, or possibly a *M. unicolor*. We recently re-examined this specimen and compared it to the type specimens of all previously described species of *Microcaecilia*. Although it agrees in all respects with the most recent diagnosis of *Microcaecilia* (Wilkinson and Nussbaum, 2006), the Lely Mountain's specimen differs substantially from *M. unicolor* and all other *Microcaecilia* and represents a new species.

SPECIES DESCRIPTION

Microcaecilia grandis *sp. nov.*
(Fig. 1, Table 1)

Microcaecilia spec.: Nussbaum and Hoogmoed (1979) Zoologische Mededelingen Leiden 54. pp,. 226, 229–230.

Holotype.—National Museum of Natural History (formerly Rijksmuseum van Natuurlijke Historie, Leiden) RMNH 17738 (field number MSH 1974-141), a mature male from road S of Camp IV Suralco, Lely Mountains, Sipaliwini District, Suriname, 680–690 m asl, c. N 4° 23′, W 54° 44′, 1 December 1974, 12:30 h, high forest under a piece of rotten log; collected by M. S. Hoogmoed.

Paratype.—RMNH 17736 (Field number MSH 937), damaged, 16.5 km NE of airstrip, 4 km N Camp V Suralco, Lely Mountains, Sipaliwini District, Suriname, 9 May 1975, 14:00 h, high forest a few kilometres N of type locality, similar altitude and co-ordinates; collected by M. S. Hoogmoed.

Diagnosis.—A *Microcaecilia* that differs from *M. taylori* in having secondary annuli; from *M. rabei* in having more (>30) secondary annuli, and a less acuminate snout; and from all other *Microcaecilia* (*M. unicolor*, *M. supernumeraria* and *M. albiceps*) in having more numerous (>20) premaxillary-maxillary teeth in long series that extend posteriorly beyond the posterior margin of the choanae and bicuspid vomeropalatine teeth.

Description of the holotype.—Some morphometric and meristic data are in Table 1. Good condition except slight breaks in skin covering mandibles, some open scale pockets, some anterior dentary teeth missing, left of mid-ventral incision about 30 mm in length, beginning 65 mm anterior to body terminus. Male with multiple large testis lobes. Body dorsoventrally flattened throughout, relatively

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uniform, narrowing very slightly onto collars anteriorly and over last 6 mm posteriorly; ratio of length to width at mid-body about 40. In dorsal view, sides of head converge gently anteriorly to level of tentacles, more strongly to level of nares, snout tip bluntly rounded. In lateral view, top of head weakly convex; margins of upper jaw (lip) concave, strongly down-turned anterior to halfway between nares and tentacle; ridge bearing vomeropalatine teeth not visible; lower jaw robust, two-thirds to four-fifths height of upper jaw, its lips correspondingly convex. In ventral view, bluntly rounded snout projecting moderately beyond recessed mouth, margins of lower jaw and upper lips much more blunt than tip of snout. Eyes not visible. Tentacular apertures horseshoe-shaped, slightly elevated, laterally placed, much closer to lip than to top of head, visible dorsally and ventrally, slightly closer to corners of mouth than to nares. Nares small, dorsolateral, circular depressions with anterovertral teardrop-shaped aperture, just closer to level of anterior margin of mouth than to snout tip, equidistant from top and bottom of snout tip in lateral view, not visble from below. Tentacle about as far above as lip is below an imaginary line between nares and corner of mouth. Teeth, pointed, gently recurved, smaller posteriorly: dentaries largest, monocuspid, unserrated, some with well-developed posterolateral blade-like flange; premaxillary-maxillary teeth large, monocuspid; vomeropalatines much smaller, bicuspid, vomerine series forming semicircular arch; distance between vomeropalatine and premaxillary-maxillary series anteriorly almost equal to projection of snout; upper series extending posteriorly well (5–7 elements or more) past choanae, approaching corner of mouth. Palate strongly arched. Choanal apertures subcircular, separated from each other by little more than twice their individual widths, approximately level with tentacles; valves not seen, presumed deep. Tongue pointed, tip attached anteriorly, longitudinal lateral grooves posteriorly, no narial plugs. Nuchal region barely more massive than adjacent body. Two nuchal collars well-marked by three nuchal grooves, first two completely encircling body, bending slightly anteromedially on dorsum, third incomplete ventrally; substantial transverse groove on dorsum of second collar, just visible laterally. Behind collars, 122 primary annuli, grooves slightly raised, complete or nearly so dorsally, mostly separated mid-ventrally, 13 complete ventrally anterior to vent; small unsegmented terminal cap. First secondary annular groove present mid-dorsally on 80th primary annulus, none present on 81st and 82nd, all primaries behind 82nd divided by mid-dorsally complete secondary grooves, gradually extending further ventrolaterally, six complete ventrally (on primary annuli 114–119) anterior to vent region. Vent region interrupts last four or five annular grooves. Annular scales are present as far anterior as 12th primary annulus, at 12th and 20th annulus scales small and narrow (0.3 $\times$ 0.1 mm) in very shallow pockets; scales and pockets becoming larger posteriorly, near terminus pockets as deep as the width of a primary annulus, with multiple (7–9) rows of scales of varying size and shape (e.g., ovate, circular and somewhat quadrangular), generally more rhomboidal, largest (1.0 $\times$ 3.7) are those adpressed against posterior wall of pocket. There are no indications of scales in subdermal connective tissue. Body terminus slightly acuminate with no indication of terminal keel. In lateral view, ventral surface concave at level of vent. Vent in approximately circular depression, slightly transverse opening, not in discrete cloacal disc, its lips formed by somewhat irregular, short denticulations, five anterior and five posterior; pair of cloacal papillae on anterior denticulations. Gray-brown, more pale brown anteriorly, darker, more grey posteriorly particularly where secondary annuli are well developed, slightly darker mid-ventrally where annuli incomplete, with some scattered small pale patches. Mid-dorsal band (6 mm) with darker ground colouration and dense granular glands (white dots). Head slightly paler dorsally, much paler ventrally except for dark chin patch, with creamy white areas extending from lips to include tentacular apertures, nares and tip of snout. Area around vent up to annular grooves and some of terminal cap creamy white. Nuchal groves slightly darker than background on dorsum, slightly paler laterally and ventrally. Annular grooves mostly edged in white, more prominently posteriorly.

TABLE 1.—Morphometric and meristic data for the holotypes of *Microcaecilia grandis* sp. nov. and *M. unicolor*, and data ranges for a series of *M. unicolor* from French Guiana (MNHNP 581, 581a, 581b, 1991-407, 1903-31, 1903-31A, 1903-30, 1903-32, 1903-32A, 1903-32B, 1903-32D, 1903-33). All measures are in mm. Figures in parentheses are from Nussbaum and Hoogmoed (1979).

	M. grandis sp. nov.	*M. unicolor*	
	Holotype RMNH 17738	Holotype MNHNP 581	ranges (n = 12)
Sex	M	F	
Total length	318 (324)	190	105–201
Primary annuli	121	107	107–117
Secondary annuli	42 (41)	69	52–74
Secondaries complete ventrally	6 (6)	44	23–52
Vertebrae	128	112	112–122
Snout tip to jaw angle	8.3	4.3	3.2–5.0
Head width at corner of mouth	6.8	3.3	2.5–4.2
Snout tip to first nuchal groove	10.4 (10.8)	5.4	3.8–6.2
Head with at occiput	7.1 (7.5)	3.6	2.9–4.5
Width at mid-body	12.2 (8.0)	5.4	2.9–6.0
Projection of snout beyond mouth	1.5	1.0	0.9–1.5
Length of body behind vent	2.2	1.1	0.8–1.6
Intertentacular distance	6.1	2.9	2.3–3.6
Internarial distance	2.5 (2.5)	1.1	1.0–1.5
Distance from naris to corner of mouth	7.4	4.0	2.9–4.2
Distance from tentacle to corner of mouth	3.5	2.0	1.4–2.2
Distance from naris to lip	1.4	1.0	0.8–1.1
Distance from tentacle to lip	0.6	0.5	0.4–0.5
Distance from tentacle to naris	4.1 (4.4)	1.9	1.4–2.2
Width of first nuchal collar	3.1	2.3	1.3–2.3
Width of second nuchal collar	3.7	2.4	1.7–2.6
Premaxillary-maxillary teeth	29 (29)	16	14–16
Vomeropalatine teeth	28 (42)	25	22–27
Dentary teeth	20 (21)	20	19–25

Color in life (based on slides made in the field by MSH and as given by Nussbaum and Hoogmoed, 1979).—Snout pinkish, anterior part body purple-blue, posteriorly body is darker, being nearly black at end of body. Area around cloaca pinkish white.

Variation.—A second referred specimen, RMNH 17736, appears to be a *Microcaecilia grandis* in very poor condition; comprising about the anterior half with a partially crushed skull. It was damaged as it was dug up by a bulldozer opening up a new trail in high forest. This specimen agrees with the holotype in colour (although it is a little paler), head shape, tentacle position, visibility of the eye and most dental characters. It differs in not having posterior flanges on any dentary teeth. Standard measures cannot be made, but a few cranial details can be made out. The eyes are under bone, the tentacular aperture/groove is entirely within the maxillopalatine, the mesethmoid is not exposed, the choanae lie entirely within the maxillopalatine, the vomers are in contact medially and extend to the posterior level of the choanae, an edentate pseudoectopterygoid in present.

Etymology.—The species is named for its large size. The epithet *grandis* is designated a genderless noun in apposition.

Remarks.—There are some minor differences between the data for the holotype of *M. grandis* reported here and in Nussbaum and Hoogmoed (1979) and a single substantial difference in the number of vomeropalatine teeth (Table 1). These teeth are very difficult to count, and the counts reported should best be considered lower and upper bounds on the actual number.

DISCUSSION

Nussbaum and Hoogmoed (1979) refrained from describing a new species on the basis of RMNH 17738 because they were unsure as to

FIG. 1.—RMNH 17738, holotype of *Microcaecilia grandis* sp. nov. Scale bars in mm.

its differentiation from *Microcaecilia unicolor*. Comparison with *M. unicolor* reveals substantial differences. Most obviously, RMNH 17738 has more primary annuli than *M. unicolor*, fewer primaries divided by secondary grooves, and fewer secondary grooves that are complete ventrally (see Table 1). It also differs in color in life and in preservative with *M. unicolor* being more uniformly dark grey apart from the head and a light spot around vent. Additionally, RMNH 17738 differs from *M. unicolor*, *M. supernumeraria* and *M. albiceps* in having bicuspid vomeropalatine teeth and more numerous premaxillae-maxilopalatine teeth that extend further posterior beyond the choanae, features which it shares with with *M. rabei* and *M. taylori*. RMNH 17738 is distinguished from the latter by the presence of secondaries and from *M. rabei* by having more secondaries and a less acuminate head.

Two small, immature specimens, RMNH 17732 and RMNH 17733 from the Brokopondo District, Brownsberg (about 75 km W of the Lely Mountains), Suriname differ from the holotype of *M. grandis* most substantially in having more (>60) primary annuli divided by secondary grooves. These specimens were assigned to *M. unicolor* by Nussbaum and Hoogmoed (1979) and are the basis of their inclusion of this species in the caecilian fauna of Suriname. However, unlike that species and similar to *M. grandis*, the Brownsberg specimens have bicuspid vomeropalatine teeth and long premaxillary-maxillary series. These specimens are either the young of *M. grandis* or they represent a further undescribed species of *Microcaecilia*. It is possible that a high number of vomeropalatine teeth distinguish *M. grandis* from RMNH 17732 and 17733. At the moment we refrain from making a decision about the correct specific identification because of lack of material and leave the Brownsberg specimens (RMNH 17732-33) *incertae cedis* as *Microcaecilia* cf. *grandis*. Thus *M. unicolor* should be removed from the list of species known to occur in Suriname. Collection of additional material from the Lely Mountains and Brownsberg would help resolve these uncertainties. Given that it is known with certainty from only two specimens collected over 30 yr ago, we recommend that the conservation status of *M. grandis* be "data deficient."

Nussbaum and Hoogmoed's (1979) uncertainty over the circumscription of *M. unicolor* was compounded by Taylor's (1968) treatment of *M. unicolor*. Taylor's description of this species was based on a specimen from Guyana that differs so substantially from the type series (e.g., in having more than twice as many premaxillary-maxillary teeth) that it most probably represents an as yet undescribed species. We stress that the only definite records of *M. unicolor* are from French Guiana and that this species is unknown from Suriname or Guyana.

Based on dentition, *Microcaecilia* seems to comprise two species groups. Both short premaxillary-maxillary tooth rows and monocuspid vomeropalatine teeth are derived features that support the monophyly of a group, comprising *M. unicolor*, *M. supernumeraria* and the type species *M. albiceps*. Other than relatively few secondaries, the second group, comprising *M. rabei*, *M. taylori* and *M. grandis* currently lacks any putative synapomorphies and may be paraphyletic.

Acknowledgments.—The material described here was collected by M. S. Hoogmoed under grants W956-2 and W87-78 from WOTRO the Netherlands Foundation for Advancement of Tropical Research. Access and transport to, and lodging in, the Lely Mountains were facilitated by ir. J. J. Janssen of Suralco's Geological Department during the early stages of exploration for bauxite in the Lely Mountains in 1974 and 1975. His cooperation and friendship are still warmly appreciated. MW thanks Philippe Gaucher (CNRS) and Céline Dupuy (Direction des Services Veterinaires de la Guyane) for enabling him to gain familiarity with *Microcaecilia unicolor* in the field. We thank Roger Perez and the Museo di Biologia, Univerisidad Central de Venezuela, Caracas, Rainer Gunther and the Museum für Naturkunde, Berlin, Alain Dubois and Ivan Ineich, and the Muséum national d'Histoire naturelle, Paris and the National Museum of Natural History, Leiden for loans of specimens. Figure 1 was prepared by Harry Taylor, NHM.

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Accepted: 22 August 2009
Associate Editor: Michael Harvey