A new fossorial scincine lizard of the genus *Pseudoacontias* (Reptilia: Squamata: Scincidae) from Nosy Be, Madagascar

Shuichi Sakata, Tsutomu Hikida

Department of Zoology, Graduate School of Science, Kyoto University, Kitashirakawa-Oiwakecho, Sakyo, Kyoto 606-8502, Japan
e-mail: shu@zoo.zool.kyoto-u.ac.jp, tom@zoo.zool.kyoto-u.ac.jp

**Abstract.** A new species of fossorial skink, the third member of the genus *Pseudoacontias*, is described from Nosy Be, an island off the northwest coast of Madagascar. This species most resembles *P. madagascariensis* in limbless body, but differs in color pattern, number of supralabials and infralabials, height of subocular, and overlap relation of primary temporal and supralabials.

**Introduction**

The Malagasy fossorial scincine genus *Pseudoacontias* includes two species, *P. madagascariensis* and *P. angelorum*. The former, a limbless skink, was described as a new genus and a new species in 1889 by Barboza du Bocage, and the latter having only flap-like hind limbs, was discovered about a hundred years later by Nussbaum and Raxworthy (1995). Both species are known only from the holotype.

We surveyed a reptilian fauna of the Lokobe Reserve, Nosy Be Island in 2000 and pitfall-traped a single limbless skink belonging to the genus *Pseudoacontias*. This skink resembles *P. madagascariensis* in limbless body, but differs from it in coloration and squamation. Unfortunately the holotype of *P. madagascariensis* was lost in the 1978 fire (Brygoo, 1980), but Nussbaum and Raxworthy (1995) revised the genus and summarized all available data for *P. madagascariensis*. Here, we describe the third species of *Pseudoacontias* from Madagascar.
Materials and methods

The specimen was euthanized by injection with nembutal solution, fixed in 10% buffered formalin, soaked in water to remove formalin, and stored in 75% ethanol. The mouth was fixed opened to examine the palate condition. Hemipenes were extruded by formalin injection. The specimen is identified by a catalog number of the Zoological Collection of the Kyoto University Museum (KUZ) and by the field number (TH). The collection site’s latitude and longitude were determined by a hand-held GPS receiver (GARMIN eTrex).

The measurements were done with dial calipers and recorded to the nearest 0.1 mm, as follows: SVL, tail length, head length (snout tip to posterior margin of parietals), snout length (snout tip to anterior corner of eye), head width (the widest width at temporal region), and mid-body width. Vertebral characters were determined by radiographs (Softex M-60, Softex Co.).

We follow Nussbaum and Raxworthy (1995) in the form of description, but slightly modified it to make clear the scale overlap patterns in head shields (Greer, 1990; Greer and Nussbaum, 2000; Greer and Shea, 2000). We also regarded the last supraocular in the previous descriptions as pretemporal, following Greer and Shea (2000). The paravertebral scales were defined as middorsal scales from the posterior end of parietals to the dorsal scales above the posterior margin of preanals.

**Pseudoacontias unicolor sp. nov.** (figs. 2, 3)

*Holotype.* KUZ R50725 (TH0245), mature male, collected 27 December 2000, near Ambanoro, about 100 m elevation, 13°24'25"S, 48°18'11"E, Lokobe Reserve, Nosy Be Fivondronana, Antsiranana Province, Madagascar by Jules Medard and Tsutomu Hikida.

*Paratypes and other specimens.* None.

*Diagnosis.* A *Pseudoacontias* lacking hind limbs; frontonasal quadrangular; supraocular scales two, first separated from parietal; pretemporal single; interparietal triangular with two slightly longer sides; supralabials five; subocular supralabial as tall as other supralabials; infralabials five; lower eyelid moveable and consisting of two rows of small scales; mid-body scale rows 30; presacral vertebrae 81.

*Description of holotype.* An adult male (fig. 2), with both hemipenes extruded. Testes unpigmented, 12.1 by 4.8 mm, with developed epididymides.

Measurements (mm): SVL, 227.8; tail length, 47.2 (regenerated portion, 14.7); head length, 16.6; snout length, 7.8; head width, 12.5; mid-body width, 18.2.

Head much narrower than body; snout bluntly conical; nostrils anterolaterally oriented, close together (1.7 mm), barely visible from above; ear openings absent, depression in normal position of ear opening; neck distinct from body; ossified shoulder girdle indiscernible by X-ray examination; ossified elements of pelvic girdle reduced in size; body greatly elongated with 81 presacral vertebrae; body and tail slightly compressed, ellipsoidal in cross section; tail regenerated, tapering abruptly to blunt point; fore limbs absent; hind limbs absent.

Rostral scale small, confined to extreme anterior tip of snout, overlapping first supralabial and supranasal; nostrils largely within posterolateral portions of rostral, in contact (or nearly so) with first supralabial and supranasal; a pair of supranasals, overlapped by
Figure 1. Map of Madagascar, showing Nosy Be, the type locality of *Pseudoacontias unicolor*. Closed circle indicates Marojejy, the type locality of *P. angelorum* Nussbaum and Raxworthy, 1995.

first supralabial, overlapping frontonasal and loreal; left prefrontal overlapping right one; frontonasal large, overlapping laterally by loreal and first supraocular (only slightly on right side), and overlapping posteriorly frontal and first supraocular; prefrontals absent; frontal as large as frontonasal, overlapping laterally by first and second supraocular, and overlapping parietals and interparietal; frontoparietals absent; interparietal triangular with two slightly longer sides converging to a bluntly rounded apex posteriorly, overlapping parietals; transparent spot on interparietal absent; a pair of parietals large, quadrangular, anteriorly overlapped by second supraocular and pretemporal, and overlapping paravertebrals; left parietal overlapping right one behind interparietal; supralabials five, two preorbital, one subocular and two postorbital; second supralabial longest, twice as long as first and third; third supralabial, subocular, as tall as other supralabials; loreal single, quadrangular, as long as frontonasal which borders it above, overlapped below by first and second supralabials, and overlapping first supraocular (in left side only), first superciliary and preocular posteriorly; preocular single; presubocular single; supraoculars two, overlapped by superciliaries; superciliaries four; two upper palpebral scales in anterior corner; lower eye-
lid moveable and consisting of two lows of small scales; postsubocular one, overlapped by subocular supralabial, and overlapping fourth supralabial, pretemporal and primary temporal; pretemporal one, overlapped by second supraocular, last superciliary and postsubocular, and overlapping parietal, primary temporal and upper secondary temporal; primary temporal, overlapping upper and lower secondary temporals and fifth supralabial; upper secondary temporal long, slightly shorter than parietal, overlapped by parietal, and overlapping upper secondary temporal and upper tertiary temporal; lower secondary temporal, overlapping fifth supralabial and two tertiary temporals; upper tertiary temporal overlapping lower one; mental small, half as wide as rostral, much smaller than postmental; postmental large, anteriorly overlapped by mental and first and second infralabials; infralabials five, third longest; three pairs of chin shields, first separated by one scale, second separated by two scales, and third separated by four scales; ventral throat scales much smaller than surrounding scales, forming a whorl of small scales not in alignment with rows of body scales; body and tail covered with rows of smooth cycloid scales; mid-body scale rows 30; paravertebral scales 167, anterior four or five pairs twice as wide as other ones; left second paravertebral fused with neighbor scale; small scale patch present in normal position of hind limb insertion; three preanal scales larger than ventral body scales, medial overlapping lateral ones.
A new skink from Madagascar

Figure 3. Dorsal (A), lateral (B) and ventral (C) views of the head scalation of the holotype of *Pseudoacontias unicolor* sp. nov. (KUZ R50725), and dorsal (D) and lateral (E) views of the head scalation of the holotype of *P. madagascariensis* scanned from the original description (Barboza du Bocage, 1889). Scale bar is only for *P. unicolor*. Abbreviations: 1°, primary temporal; 2°, secondary temporal; 3°, tertiary temporal; cs, chinshield; e, enlarged paravertebral; f, frontal; fn, frontonasal; i, interparietal; il, inflalabial; m, mental; pa, parietal; pm, postmental; po, preocular; pso, presubocular; poso, postsubocular; psl, postsupralabial; pt, pretemporal; r, rostral; sc, supraciliary; sl, supralabial; sn: supranasal; so, supraocular.

After about one year in alcohol, coloration slightly fainted. Head, body and tail uniformly brownish gray, no lines or other pattern in dorum; ventral scales slightly lighter than dorsal, anteriorly no distinct lines, but posteriorly indistinct dark lines on center of scales; midventral four scales entirely dark anteriorly and four-lined posteriorly, five ventrolateral dark lines on body; five dark lines on ventral tail.

*Etymology.* This species is named on the basis of its uniformly grayish dorsal coloration. The name *unicolor* is formed from Latin words *uni* (one) and *color* (color).
**Habitat and natural history notes.** The holotype was taken from a pitfall trap with drift fences on the floor in the primary forest at 0715 h. The pit line made of eleven 20-liter buckets with 10 m intervals was placed in slope within the forest during 25-30 December 2000. The collecting site was a low mountain area near the seashore. The amphibians and reptiles captured by pitfall traps, except for *Pseudoacontias*, were one microhylid frog, *Rhomibophryne testudo*, several zonosaurine lizards, *Zonosaurus rufipes*, and two scincine lizards, *Amphiglossus stumpfi*.

**Comparisons.** We compared the present species with the previous two species of this genus using data from the descriptions of the holotypes. *Pseudoacontias unicolor* resembles *P. madagascariensis* in lacking all limbs, differentiating it from *P. angelorum* which has rudimentary flaplike hind limbs without toes. There are some distinctive differences between *P. unicolor* and *P. madagascariensis*, in color pattern. The former has a uniformly brownish gray dorsum, whereas the latter possesses black longitudinal lines on a light gray background. The numbers of supralabials and infralabials are five in *P. unicolor* and six in *P. madagascariensis*. The large second supralabial in *P. unicolor* is probably the fused second and third supralabials of the other two species. The subocular is as tall as the other supralabials in *P. unicolor*, but significantly taller than the others in *P. madagascariensis*. The overlap relation of primary temporal and supralabials differs between species. A primary temporal is overlapping the last two supralabials in *P. madagascariensis* (fig. 3E) as in *P. angelorum*, whereas it is overlapped by fourth supralabial and overlapping the last supralabial in *P. unicolor* (fig. 3A). Midbody scale rows are 30, 32 and 34, in *P. unicolor, P. madagascariensis* and *P. angelorum*, respectively. But, such difference may appear as an intraspecific variation.

The nuchals were recognized in *P. angelorum* (Nussbaum and Raxworthy, 1995), but not so differentiated in *P. unicolor* and *P. madagascariensis*. The first pairs of paravertebrals in the latter two species are distinctly narrower than those of the former. Then, we regarded the latter two have no nuchals, although their first four or five pairs of paravertebrals are wider than the following paravertebrals. The second right paravertebral in *P. unicolor* is wider than first paravertebrals (fig. 3A) and it is comparable to the nuchals in *P. angelorum*.

**Discussion**

The scale overlap patterns recently have been recognized as important characters in squamate taxonomy (Greer, 1993; Greer and Nussbaum, 2000; Greer and Shea, 2000). Although the head scale overlap patterns were not included in the description of *P. angelorum*, the figures of head scales showed clearly overlap patterns. In most cases, anterior scales are overlapping posterior scales. However, the figures of *P. madagascariensis* seem to have been drawn incorrectly. At least overlap relations among rostral, supranasals, frontonasal, and loreals were not accurate. In this figure frontonasal were shown as overlapping supranasals anteriorly and loreals laterally (fig. 2D). It is probably true that its frontonasal...
must be overlapped by supranasals, loreals and first superciliary, and overlapping frontal and first supraocular as seen in *P. unicolor*, *P. angelorum*, and other skinks. The shape of frontonasal was described as triangle, but might be quadratoangularas in *P. angelorum* and *P. unicolor*. The overlap relations among rostral, supranasals, loreals and first supralabials must be corrected as anterior ones overlapping posterior ones.

The generic diagnosis is modified to accommodate the present new species. Nussbaum and Raxworthy (1995) found two characters, a whorl of small throat scales and small size of mental in *P. angelorum*. Although they thought them probable generic characters, they did not include these characters in the generic diagnosis, since their character states were unknown for *P. madagascariensis*. We confirmed these character states in the present new species, and add them to the generic diagnosis.

*Pseudoacontias* Barboza du Bocage

*Pseudoacontias* Barboza du Bocage, 1889: 125. Type species *Pseudoacontias madagascariensis* Barboza du Bocage, 1889, by monotypy.

**Diagnosis.** Scincines with elongated bodies; palatines separated; fore limbs absent; hind limbs present or absent; tail relatively long, 55-57% of SVL; mouth nearly terminal; eye small but distinct; lower eyelid scaly; ear opening absent; a whorl of small throat scales; rostral scale small, not encasing snout posteriorly; nostril mostly contained in rostral, but bordering first supralabial and supranasal posteriorly; supranasals small, meeting in midline above rostral; frontonasal large, nearly equal in size to frontal; no prefrontals; frontal large, bell-shaped, overlapped by two or three supraoculars, and overlapping interparietal and parietals; parietals large rectangular; interparietal triangular, excluded from contact with supraocular; postnasal absent; frontoparietal absent; loreal single, quadrangular, greatly elongated, nearly as long as frontonasal, overlapped by first two or three supralabials ventrally; preocular single; postsubocular one or two; pretemporal single; supralabials five or six; infralabials five or six.

**Content.** Three species: *Pseudoacontias madagascariensis* Barboza du Bocage, 1889, *P. angelorum* Nussbaum and Raxworthy, 1995 and *P. unicolor* described above.

**Distribution.** Madagascar. Known localities are Marojejy Reserve, the type locality of *P. angelorum*, and Lokobe Reserve, the type locality of the new species (fig. 1). Both localities are in northern rainforests. The exact type locality of *P. madagascariensis* is not known. The members of the genus might be discovered in rainforests, in northern or eastern Madagascar, judging from their habitat preference.

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