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# FIRST RECORD OF THE LIZARD GENUS *PSEUDOCALOTES* (LACERTILIA: AGAMIDAE) IN BORNEO, WITH DESCRIPTION OF A NEW SPECIES

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***ABSTRACT.*** - The agamid genus *Pseudocalotes* is recorded from Borneo for the first time. The species is new and differs from the six known congeners in having two long, flexible scales in the temporal region and in having an inverted V formed by enlarged keeled prefrontal scales.

## INTRODUCTION

Recently during the course of an inventory of the herpetofauna of the Lanjak-Entimau Wildlife Sanctuary in southwestern Sarawak, Malaysia, we discovered a single individual of an undescribed species of agamid lizard. This specimen is clearly related to the species grouped by Moody (1980) in the genus *Pseudocalotes* Fitzinger, which has never been reported from Borneo. We describe this here as a new species.

## FAMILY AGAMIDAE

### *Pseudocalotes saravacensis*, new species
(Figs. 1-3)

***Material examined.*** - *Holotype* - male (Field Museum of Natural History 251522; RBS 8726), Nanga Segerak, 1°25'N 112°00'E, 240 m asl, headwaters of the Engkari River, Lanjak-Entimau Wildlife Sanctuary, Second Division, Sarawak, Malaysia, Borneo, coll. R.B. Stuebing, 10.viii.1993.

***Diagnosis.*** - A species of *Pseudocalotes* with tail distinctly swollen a short distance behind base; distal two-thirds of tail laterally compressed; two projecting, compressed, flexible scales ("spines") in the temporal region, the larger equal to the diameter of the tympanic scale; a nuchal crest of seven tall, flexible scales; slightly enlarged prefrontal scales forming an inverted V.

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Fig. 1. Holotype of *Pseudocalotes saravacensis*, new species, snout-vent length 82 mm.

***Description***. - Habitus stout, trunk cylindrical; head rather large, obtusely pointed in dorsal view, canthi very sharp; tail moderately long, with conspicuous swelling short distance behind root, then slender and laterally compressed to tip.

Dorsal scales of head heterogeneous in size and carination (Figs. 2, 3); most of scales on top and sides of snout with hair-like organelles associated with pits (fig. 3); canthal scales largest and most strongly keeled; five large, strongly keeled scales forming inverted, prefrontal V; other scales on top of snout smaller, each with short ridges or keels; supraoculars and supraciliaries large, with single keels; supraciliary crest interrupted over rear of eyelid followed by enlarged, compressed, serrate scale, but no supraciliary spine; scales forming medial border of supraocular region larger than others; frontal scales small, with short high keels or central cones; parietals small to large, with high keels or central cones; keels of many frontal and parietal scales serrate or with small spinules.

Rostral horizontal dimension three times vertical, separated from moderately large nasal by two superimposed, slender, keeled scales. Seven large, smooth supralabials, first touching nasal; scales of loreal region small to moderate, weakly keeled, continuous with row of weakly keeled suborbitals; enlarged suborbitals separated from supralabials by row of small keeled scales; scales of eyelid small, those forming border of opening largest and keeled; temporal scales larger than supralabials, keeled; two tall, compressed, flexible, spine-like temporal scales, the larger equal to diameter of tympanic scale; a single large, thin tympanic scale in shallow depression, smaller than opening of eyelid.

Width of mental subequal to rostral; seven infralabials, with shallow depression; a row of enlarged, obtusely keeled scales beginning at mental, parallel to but separated from labials by two rows of small scales, rows ending below center of orbit; scales under chin and throat very small, keeled; mass of masseter muscle covered by large, weakly keeled, acuminate, imbricate scales, the rows of keels pointing posteroventrad.

Nuchal crest of seven laterally compressed, elevated scales (Fig. 2); first and last ones small; tallest crest scale greater than length of opening in eyelid; remainder of neck scales small, acuminate, keeled.

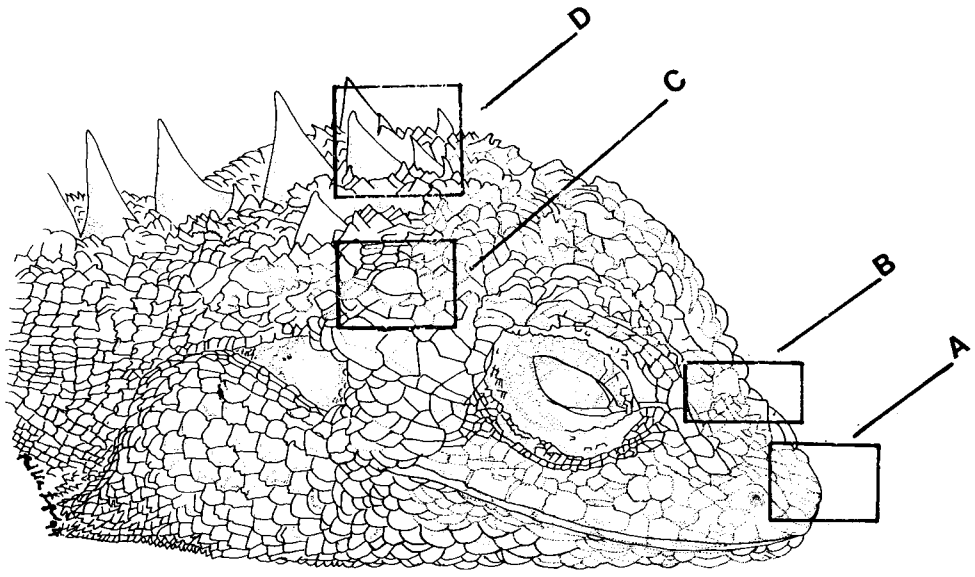


Fig. 2. Scalation of head and neck of *Pseudocalotes saravacensis*, new species. Scale bar = 5 mm. Rectangles correspond to illustrations in fig. 3.

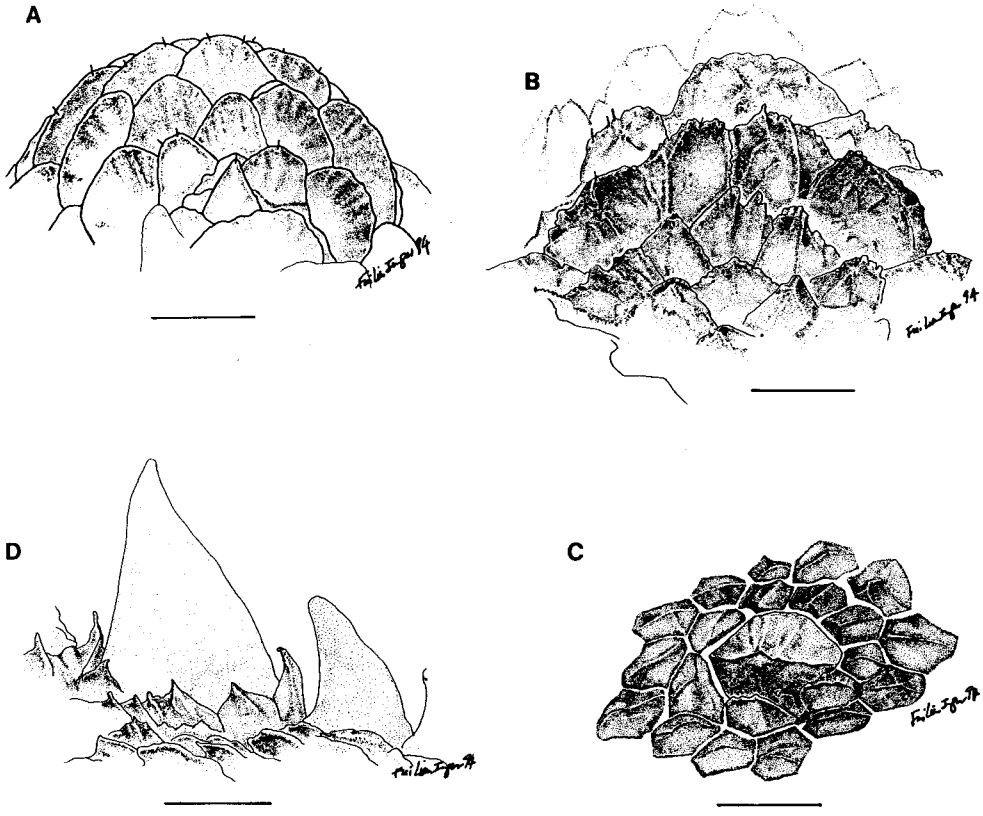


Fig. 3. Scalation of parts of head and neck of *Pseudocalotes saravacensis*, new species. A. Dorsal view of end of snout. B. Scales of prefrontal region. C. Conical scale of supratympanic region. D. Scales of anterior portion of nuchal crest. Locations of drawings shown in fig. 2. Scale bars = 1 mm.

No antehumeral fold or conspicuous gular pouch.

Scale rows around the body 68; dorsal and lateral scales of trunk homogeneous in size except for slightly enlarged row of vertebral scales; several of vertebral scales distinctly compressed, with raised keels but not forming a crest; ventrals slightly smaller than laterals; all trunk scales keeled, acuminate, imbricate; rows of keels on laterals pointing posteroventrad; ventrals with sharpest keels and projecting tips.

Base of tail with small, keeled scales, those of mid-dorsal row larger, compressed and distinctly elevated to form short, low crest; swollen area of tail 10.5 mm behind rear of thigh; scales of swollen area of tail 2-4 times size of preceding scales, with heavy, obtuse keels, those of mid-dorsal row largest and continuing low caudal crest; tail sharply constricted and laterally compressed behind swollen area with no middorsal or midventral row; subcaudals slightly enlarged.

Limbs with keeled, acuminate, imbricate scales, those on dorsal surfaces slightly larger than others; midventral scales of digits with double row of pointed keels; fourth finger with 16 scales from base to claw, fourth toe with 20.

No enlarged preanals; no femoral or preanal pores.

Color in preservative: dorsal and lateral surfaces dark brown, without distinct markings, head slightly lighter; underside of head and trunk whitish, light area extending up side of head at rear, covering masseter muscle mass, lower postorbital, and side of neck; side of head, chin and throat with small black speckling. Tail with faint, but distinct dark blotches or bands, separated into dorsal and ventral rows in proximal third. In life (Fig. 1), trunk with poorly defined greenish areas; nuchal crest scales, masseter mass, and lower part of neck with orange-red wash; swollen area of tail greenish.

Snout-vent length 82 mm, tail 161, head to rear of tympanic scale 25, head to rear of masseter mass 30; length of swollen part of tail 16, width 8.

***Habitat.*** - The lizard was discovered on a 3 cm vine, 2 m above ground, next to a large tree (DBH 70 cm). The vegetation is mixed old secondary growth and dipterocarp forest covering former slash-and-burn agricultural plots (*circa* 50+ yrs). The terrain is hilly, with steep slopes.

***Etymology.*** - The new species is named after the state in which it was found.

***Comparisons.*** - Moody (1980) recognized six species of *Pseudocalotes*: *P. brevipes* (Werner) [northern Vietnam]; *P. flavigula* (Smith) [West Malaysia]; *P. floweri* (Boulenger) [southern Thailand and West Malaysia]; *P. microlepis* (Boulenger) [northern Tenasserim, Burma]; *P. poilani* (Bourret) [Laos]; *P. tympanistriga* (Gray) [Java]. *Pseudocalotes saravacensis*, new species, differs from all of these in having two long, flexible, spine-like scales in the temporal region and in having keeled scales forming an inverted prefrontal V. Two species, *P. tympanistriga* and *P. flavigula*, have far fewer scales (< 55) around the body than *P. saravacensis* (68); *P. floweri* has 48-62 (Taylor, 1963). *Pseudocalotes brevipes*, *P. floweri* and *P. microlepis* differ from *P. saravacensis* in having dark lines radiating from the eye (Werner, 1904; Taylor, 1963; Boulenger, 1888) and *P. microlepis* is yellow or orange dorsally and laterally (Boulenger, 1888). *Pseudocalotes flavigula* and *P. floweri* also differ

from *P. saravacensis* in having larger dorsal head scales rather uniform in size. *Pseudocalotes flavigula* also has smooth mental and gular scales. According to Bourret's (1939) description of *P. poilani*, this species differs from *P. saravacensis* in having granular dorsal head scales, black lines on the neck, and dark lateral bands.

At least three species of *Pseudocalotes* other than *P. saravacensis* have scale organelles on the head: *P. flavigula*, *P. floweri* and *P. microlepis*. We have not been able to examine the other species.

One additional Bornean lizard, *Calotes kinabaluensis* de Grijs, needs to be considered. So far as we can tell, it is known only from the holotype and its generic assignment remains in doubt, although it may prove to be a *Pseudocalotes*. From de Grijs' (1937) description, *C. kinabaluensis* differs from *P. saravacensis* in lacking elevated temporal "spines", in having a row of elevated, pointed scales from the mental to the beginning of the gular sac, in having distinctly enlarged, smooth scales on the lower jaw directly below the tympanum, in having smooth scales on the side of the head, and in having only 54 scales around the body. In addition, the trunk of *C. kinabaluensis* has black bands on a lighter background (probably green in life).

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## LITERATURE CITED

Boulenger, G. A., 1888. An account of the reptiles and batrachians obtained in Tenasserim by M. L. Fea, of the Genoa Civic Museum. *Ann. Mus. Civ. Genova*, Ser. 2, **5**: 474-486.

Bourret, R., 1939. Notes herpétologiques sur l'Indochine Française. XVIII. Reptiles and batraciens reçus au Laboratoire des Sciences naturelles et de l'Université au cours de l'année 1939. Descriptions de 4 espèces et d'une variété nouvelles. *Annexe Bull. Instruction Publique*, no. 4, Décembre, pp. 5-39.

de Grijs, 0. 0., 1937. Eine neue Eidechse aus Nord-Borneo: *Calotes kinabaluensis*. *Zool. Anz.*, **117**: 136-138.

Moody, S. M., 1980. *Phylogenetic and historical biogeographical relationships of the genera in the family Agamidae (Reptilia: Lacertilia)*. Doctoral Dissertation, University of Michigan, Ann Arbor. 373 pp.

Taylor, E. H., 1963. The lizards of Thailand. *Univ. Kansas Sci. Bull.*, **44**: 687-1077.

Werner, F., 1904. Beschreibung neuer Reptilien aus den Gattungen *Acanthosaura*, *Calotes*, *Gastropholis* und *Typhlops*. *Zool. Anz.*, **27**: 461-464.