

## A NEW SPECIES OF TOAD OF THE GENUS ANSONIA (ANURA: BUFONIDAE) FROM BORNEO

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**ABSTRACT.** – A new species of bufonid frog of the genus *Ansonia* is described from Sabah, northern Borneo. The new species is distinguished from others in the genus by absence of a tympanum. The tadpole assigned to this species is also distinguished from other known larvae of *Ansonia* by its possession of a distinct abdominal sucker behind the oral disc and by the absence of an upper jaw sheath. This species is the twelfth *Ansonia* known from Borneo.

**KEY WORDS.** – Bufonid frog, *Ansonia*, Borneo

### INTRODUCTION

Despite the extensive sampling of the frog fauna of Sabah in the last two decades, new species continue to be discovered. Here we report a new species of the toad genus *Ansonia*, a genus that has undergone radiation in Borneo, with the 12 species now known from the island showing altitudinal specialization and morphological differentiation in adults and larvae (Inger, 1992; Inger & Tan, 1996; Inger & Stuebing, 1997).

### MATERIALS AND METHODS

Adults and a juvenile were euthanized, then preserved in 4% formalin, and transferred to 70% ethanol after two to four weeks. Larvae were preserved and held in 4% formalin. Specimens are now in the collections of Sabah Parks (SP) and Field Museum of Natural History (FMNH). We also examined comparative material of other species of *Ansonia* in the collection of FMNH.

#### *Ansonia anotis*, new species (Fig. 1)

Holotype. – SP 01762 (field no. 18519), an adult female, from

Sungai Wario (880m ASL), Sayap Station (6°14'N/116°32'E), Kinabalu Park, Kota Belud District, Sabah, Malaysia. Collected on a log beside the stream by the Zoology Unit, Sabah Parks, 26 Mar. 1996.

Paratypes. – SP 02017 (field no. 18664), a male, from same locality as holotype. Collected on rock at the bank of the stream by the Zoology Unit, Sabah Parks, 5 Aug. 1996. FMNH 237054, a juvenile from Sungai Purulon (360 m ASL, 5°13'N/115°57'E), near Kampong Makaniton, 14 km N of Tenom, Crocker Range National Park, Tenom District, Sabah, Malaysia. Collected 2 m above ground in a small hole in the trunk of a large tree, by Robert F. Inger, Tan Fui Lian & Paul Yambun, 22 Jun. 1989.

**Etymology.** – Specific name from “an” (G) without, and “otos” (G) ear, referring to the absence of the tympanum.

**Diagnosis.** – A species of *Ansonia* lacking a tympanum; snout projecting beyond lower jaw; first finger not reaching swollen tip of second; tips of outer fingers expanded into distinct, spatulate discs; web extending beyond distal subarticular tubercles of third and fifth toes.

**Description.** – Body and legs slender, head and body about same width, hind limb long. Snout truncate or slightly pointed at tip, projecting beyond lower jaw dorsally, sloping downward and back to lower jaw; top of snout distinctly concave; nostril lateral, near tip of snout, directly above tip of lower jaw; canthi sharp, weakly constricted; lores vertical,

not concave; head width at front border of eye about half width at rear of head; eye large, diameter about equal to length of snout; interorbital slightly wider than upper eyelid, distinctly wider than internarial; tympanum absent, not found after cutting through depressor muscle. No parotoids or cranial crests.

Fingers long, first finger much shorter than second, tip of first not reaching base of tip of second; tips of second to fourth fingers expanded into spatulate discs much wider than other phalanges; subarticular tubercles visible, weakly raised; two low, rounded palmar tubercles, outer larger. Tips of toes rounded, not wider than other phalanges; fifth toe slightly longer than or equal to third; first toe with full web to base of disc, one phalanx free; second toe with  $1\frac{1}{2}$  to 2 phalanges free of full web on medial side and full web to base of disc laterally; third toe with 2 phalanges free medially and  $1\frac{1}{2}$  free laterally; fourth toe with 3 phalanges free on both sides; fifth with 1 to  $1\frac{1}{2}$  free medially; subarticular tubercles weak; inner metatarsal tubercle oval, low, outer smaller but distinctly raised; no tarsal ridge.

Entire dorsal and lateral surfaces covered with small, round to oval, conical tubercles, each with a brown tip, but not spinose; tubercles not arranged in rows or clusters; none enlarged in temporal or scapular regions; ventral surface coarsely granular.

Coloration in preservative of dorsal and lateral surface slight gray to brown, with many small, roundish dark spots; limbs with complete or broken dark crossbars; ventral surfaces cream or pale brown, female with brown throat and abdomen with indistinct brownish areas, male and juvenile immaculate cream. In life, the light dorsal areas between the interorbital and sacrum were light green in the juvenile.

The male has an enlarged testis (length 6.6 mm), but no vocal sac opening, no nuptial pad, and no mandibular spines. The female has half-developed, non-pigmented ova.

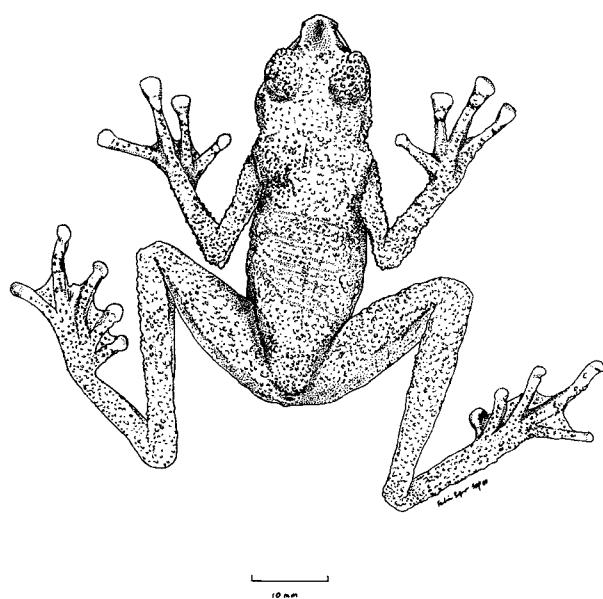


Fig. 1. Holotype of *Ansonia anotis*, new species. Scale bar = 10 mm.

Table 1. Measurements (mm) of type series of *Ansonia anotis*. Dimensions defined below.

| Sex       | Female | Male | Juvenile |
|-----------|--------|------|----------|
| SVL       | 52.1   | 37.1 | 23.6     |
| T         | 28.5   | 22.6 | 15.1     |
| HW        | 15.1   | 10.3 | 6.5      |
| HW(E)     | 6.8    | 5.7  | 4.2      |
| HL        | 16.1   | 11.4 | 7.0      |
| Snout L   | 5.9    | 4.6  | 3.3      |
| Snout D   | 5.2    | 3.8  | 2.4      |
| Eye diam. | 5.9    | 5.2  | 3.3      |
| IO        | 5.4    | 4.4  | 2.5      |
| IN        | 3.7    | 3.3  | 2.3      |
| Hand      | 15.6   | 11.9 | 7.0      |
| Foot      | 23.8   | 17.5 | 10.1     |

SVL, snoutvent length; T, length of tibia; HW, width at rear of head; HW(E), head width at front margin of eye; HL, head length from rear of jaw to tip of snout; Snout L, front margin of eye to tip of snout; Snout D, canthus to margin of upper lip, midway between eye and nostril; Eye diam., horizontal diameter of eye; IO, interorbital width; IN, internarial width; Hand, proximal edge of outer palmar tubercle to tip of third finger; Foot, proximal edge of inner metatarsal tubercle to tip of fourth toe.

Measurements are given in Table 1.

**Tadpole.** – *Ansonia anotis* was the only species of *Ansonia* found at Purulon, the site where the juvenile was obtained, and only one form of larval *Ansonia* was found at that site, the form referred to as *Ansonia* “sucker” in Inger (1992). Provisionally, that tadpole form (FMNH 241557-64) is assigned to *A. anotis*. We have a second series of this larval form from Malutut (FMNH 241555-56) (340 m ASL), approximately 10 km from Purulon.

Snout very broadly rounded in dorsal view, body widest just anterior to eyes; body tapering slightly, then narrowing abruptly at end; a ventrolateral notch at level between eyes and nares; eyes dorsal. Oral disc slightly narrower than widest part of body; upper lip with small papillae across entire margin; lower lip with marginal papillae only; upper and lower rows of labial teeth with about same lateral extension; no upper jaw sheath; lower jaw sheath not divided. A sharply defined abdominal sucker with free lateral and posterior margins immediately behind oral disc; tip of snout to rear of sucker 0.70-0.78 of headbody length. Tail slender; origin of dorsal fin at end of proximal third of tail. Headbody length 10-13 mm (stages 34-38). Headbody black dorsally and laterally.

**Comparisons.** – This is the only Bornean species of *Ansonia* without a visible tympanum. The other species of *Ansonia* without visible tympana are *A. muelleri* and *A. mcgregori* from the Philippine Islands (Inger, 1960). However, both of those have a tympanic annulus partially covered by the depressor mandibulae muscle; the tympanum is completely lacking in *A. anotis*. All the other Bornean species of *Ansonia* have a heterogeneous mixture of round and elongate, large

and small tubercles or warts on the back; in *A. anotis* the tubercles are almost homogeneous in size and all are conical. If the male paratype is mature, *A. anotis* differs from all other members of the genus except *A. minuta* in lacking a nuptial pad. If the tadpole is correctly assigned, this is the only species of *Ansonia* in which the larva has a ventral abdominal sucker.

In general habitus, size, and long digits, *A. anotis* is similar to *A. longidigita*, but differs from the latter in coloration (*A. longidigita* lacks dorsal spots), expansion of the finger tips, and absence of tympanum. The same characters distinguish *A. anotis* from *A. leptopus*. In size, general habitus, and expansion of finger tips, *A. anotis* resembles *A. latidisca*, but differs from the latter in lacking a tympanum and yellow spots on the abdomen posteriorly and in having many small interorbital tubercles (instead of two rows of large tubercles in that position) and slightly longer legs (0.56-0.64 versus 0.46-0.55 in *latidisca*).

*Ansonia anotis* differs greatly in size from the other species having enlarged finger tips: males of *A. hanitschi* 23-28 mm, females 29-34; *A. minuta* males 21-23, females 23-28; *A. platysoma* males 20-24, females 24-29. In addition, *A. anotis* differs from *A. hanitschi* in lacking dorsal ridges formed by coalesced tubercles, from *A. minuta* in lacking a tarsal ridge, and from *A. platysoma* in having a distinctly spotted dorsum. The remaining species of *Ansonia* differ from *A. anotis* in lacking expanded finger tips and in having a distinct tympanum.

If the juvenile and the tadpoles are correctly assigned to *A. anotis*, this species apparently occurs over much of the Crocker Range at moderate elevations.

Because *Ansonia anotis* appears to represent an extreme of specialization within the genus in several characters, the question arises whether this species represents a new genus. Although adults of most species of the genus have exposed tympana, two species (*A. muelleri* and *A. mcgregori*) have skin covering the tympanum; the absence of a tympanic

annulus in *A. anotis* represents the extreme of variation. Among larval forms of *Ansonia* (see Inger, 1992), species vary in the size of the halves of the divided upper jaw sheath, from large (*A. leptopus*) to very small (*A. longidigita*) to absent (*A. anotis*). Also among the larvae, species vary in the expansion of the postdental portion of the suctorial lip from smallest (*A. leptopus*) to largest (*A. longidigita*), with the sucker of *A. anotis* representing an even further extension. In two respects larval *A. longidigita*, not *A. anotis*, represent the extremes of specialization: streamlining of the body and disparity between lengths of upper and lower labial tooth rows (Inger, 1992). Thus, although *A. anotis* is divergent from the other species in some respects, patterns of specialization within the genus do not completely isolate it from the others. For this reason, we believe it best to retain *anotis* within the genus *Ansonia*.

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