

**Assessing the status of *Anolis salvini* BOULENGER 1885 and  
*A. bouvierii* BOCOURT 1873 based on the primary types  
(Reptilia, Squamata, Polychrotidae)**

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Abstract

The examination of the holotype of *Anolis bouvierii* BOCOURT 1873 revealed that it is conspecific with *A. ortoni* COPE 1868. *Anolis vociferans* MYERS 1971 is placed in the synonymy of *Anolis salvini* BOULENGER 1885 because these nominal taxa are clearly conspecific. The type localities as given in the respective original descriptions of *A. bouvierii* and *A. salvini* are considered to be erroneous because they are far off the known ranges of the respective species.

**K e y w o r d s :** *Anolis bouvierii*, *Anolis ortoni*, *Anolis salvini*, *Anolis vociferans*, synonymy.

**Evaluierung des Status von *Anolis salvini* BOULENGER 1885 and *A. bouvierii* BOCOURT 1873  
anhand der Primärtypen (Reptilia, Squamata, Polychrotidae)**

**Z u s a m m e n f a s s u n g :** Die Untersuchung des Holotypus von *Anolis bouvierii* BOCOURT 1873 ergab, daß er artgleich mit *A. ortoni* COPE 1868 ist. *Anolis vociferans* MYERS 1971 wird in die Synonymie von *Anolis salvini* BOULENGER 1885 gestellt, da diese beiden nominellen Taxa eindeutig artgleich sind. Die betreffenden Typuslokalitäten, wie in den Originalbeschreibungen von *A. bouvierii* and *A. salvini* angegeben, werden als irrtümlich betrachtet, da sie weit außerhalb der bekannten Verbreitungsgebiete der jeweiligen Art liegen.

Introduction

BOCOURT (1873) described the new species *Anolis bouvierii* based on a ♂ specimen (holotype by monotypy, now MNHN 2464) from “Escuintla (République du Guatemala)” that he illustrated (dorsal head view, pl. 14, fig. 9) and for which he gave a detailed description. According to the original description the specimen was collected by AIMÉ BOUVIER who was a member of the “Commission scientifique du Mexique”. In 1885, BOULENGER described the new species *Anolis salvini* based on a ♂ specimen

(holotype by monotypy, now BMNH 1946.9.8.19) from “Guatemala” for which he mentioned F. D. GODMAN as the collector. The nominal species *A. bouvierii* and *A. salvini* have been listed on some checklists (e.g., PETERS & DONOSO-BARROS 1970, VILLA et al. 1988) but were omitted on several checklists of the Guatemalan herpetofauna (e.g., STUART 1963, CAMPBELL & VANNINI 1989). Since their respective original descriptions, the taxonomic identities of these two names have been uncertain. BOULENGER (1885)

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and BARBOUR (1934) listed *A. bouvierii* as a synonym of *A. ortoni* COPE 1868 without any justification. STUART (1955: 29–30) discussed the possible status of *A. bouvierii* and *A. salvini* and considers the possibility that “the type [of *A. salvini*] is actually a specimen of *intermedius* bearing incorrect locality data”. In the case of *A. bouvierii* he decided to “retain this name until more material from the vicinity of the type locality of *bouvierii* is forthcoming than to force the name into synonymy”. In the past decades, extensive collections of anoles have been made in the vicinity of Escuintla and in Guatemala in general (KÖHLER & ACEVEDO 2004) but no additional specimens have been assigned to these nominal species. I had the privilege of examining the respective types of *A. bouvierii* and *A. salvini* and with this note I attempt to clarify the identities of these nominal species. A description and head scalation drawings of both type specimens is provided.

## Materials and methods

A list of the comparative specimens examined is provided in the Appendix. Abbreviations for museum collections follow those of LEVITON et al. (1985). Nomenclature of scale characters follows that of KÖHLER (2003). Scale sizes were measured using the ocular micrometer of a stereo microscope (Leica MZ 12) and rounded to the nearest 0.01 mm. All other measurements were made using precision calipers and were rounded to the nearest 0.1 mm. Head length was measured from the tip of the snout to the anterior margin of the ear opening. Snout length was measured from the tip of the snout to the anterior border of the orbit. Head width was determined as the distance between the oral ricti. Dorsal and ventral scales were counted at midbody along the midline. Tail height and width were measured at the point reached by the heel of the extended hind leg. Subdigital lamellae were counted on phalanges ii to iv of the 4th toe.

## Results

### Status of *Anolis bouvierii*

Description of the holotype of *Anolis bouvierii* (MNHN 2464): Adult ♂ as indicated by swollen base of tail and very large dewlap; snout-vent length (SVL) 56.0 mm; tail missing except 14 mm of anterior portion; tail slightly compressed in cross section, tail height 3.6 mm, tail width 2.2 mm; axilla to groin distance 24.7 mm; head length 14.2 mm, head length/SVL ratio 0.254; snout length 6.2 mm; head width 8.8 mm; longest toe of adpressed hind limb reaching tympanum; shank length 13.0 mm, shank length/head length ratio 0.915; longest finger of extended forelimb reaching 2.5 mm beyond snout; longest finger of adpressed forelimb reaching to a point 2.0 mm anterior insertion of hind limbs. All dorsal and lateral head scales smooth and flat (Fig. 1); 7 postrostrals; 7 scales between nasals; 1 scale between nasal and rostral; a distinct prefrontal depression present; supraorbital semicircles well differentiated, in broad contact medially; supraorbital disc composed of 6–8 enlarged, smooth scales; a single elongated superciliary anteriorly, followed by much smaller scales posteriorly; no parietal depression; interparietal scale large, 2.31 mm × 1.25 mm (length × width), surrounded by scales of much smaller size; 1 scale present between interparietal and supraorbital semicircles; canthal ridge weak, composed of 3 (posteriormost one largest) large and 3 small anterior canthal scales; 9 scales present between second canthals; 9 scales present between posterior canthals; 26 (right)–28 (left) smooth loreal scales in a maximum of 6 horizontal rows at level of second canthal; subocular scales distinctly enlarged; 6 supralabials to level below center of eye; 4 suboculars in broad contact with 4 supralabials; ear opening 1.0 mm × 1.2 mm (length × height); mental distinctly wider than long, almost

completely divided medially, bordered posteriorly by 4 postmentals (outer pair about twice the size of medial scales); 6 infralabials to level below center of eye; sublabials undifferentiated; smooth granular scales present on chin and throat; dewlap extending from level below oral ricti to midventer; dorsum of body with granular, smooth to weakly keeled, rounded scales, no medial rows enlarged, dorsal scales about 0.24 mm × 0.19 mm (length × width); about 56 medial dorsal scales in one head length; about 109 medial dorsal scales between levels of axilla and groin; lateral scales homogeneous, average size 0.17 mm in diameter; ventral scales smooth, flat, rounded, subimbricate, about 0.31 mm × 0.27 mm (length × width); about 49 ventral scales in one head length; about 75 ventral scales between axilla and groin; about 160 scales around midbody; most caudal scales weakly to strongly keeled; caudal middorsal scales distinctly enlarged, without whorls of enlarged scales, although an indistinct division in segments is discernible; no enlarged postanal scales; no tube-like axillary pocket; limb scales smooth or weakly keeled, imbricate; digital pads dilated; distal phalanx narrower than and raised from dilated pad; 17 lamellae under phalanges ii–iv of fourth finger; 28 (right)–27 (left) lamellae under phalanges ii–iv of fourth toe. Overall coloration grayish brown with some ill-defined darker markings.

Taxonomic conclusions: I agree with BOULENGER (1885) and BARBOUR (1934) that the holotype of *Anolis bouvierii* is conspecific with *A. ortoni* COPE 1868. Diagnostic characters (see also AVILA-PIRES 1995) include:

- (1) smooth, flat, rounded, subimbricate ventral scales and granular, smooth to weakly keeled, rounded dorsal scales;

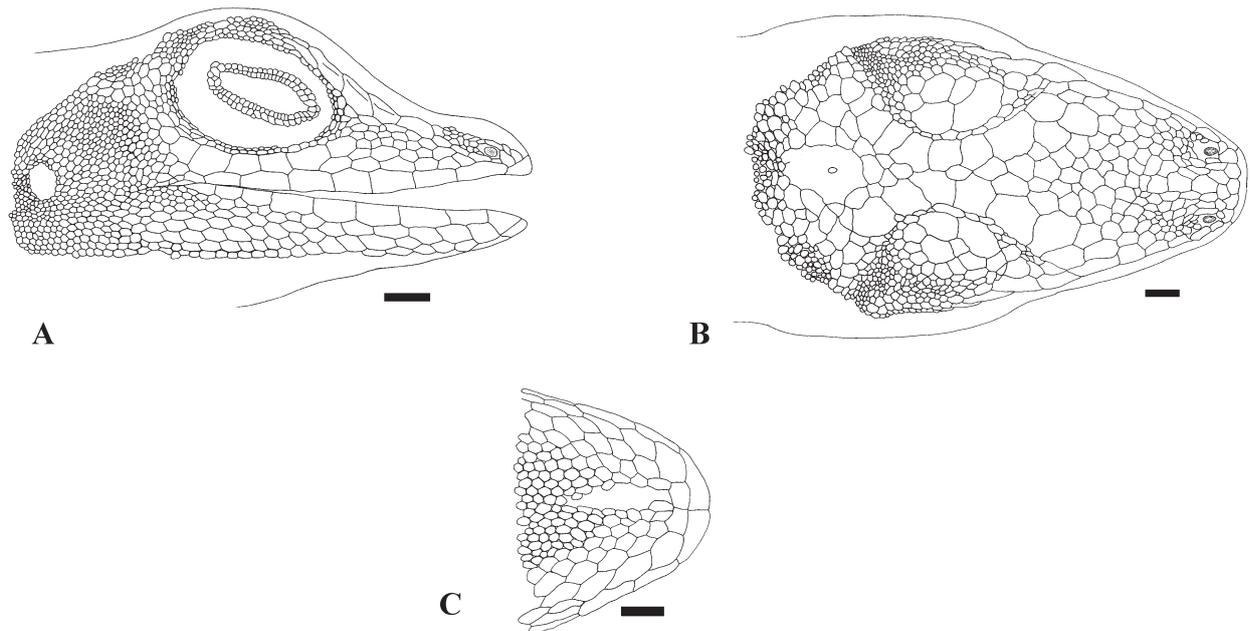


Fig. 1. Head of holotype of *Anolis bouvierii* (MNHN 2464). — A) lateral view. — B) dorsal view. — C) ventral view. — Scale bars = 1.0 mm

- (2) scales on dorsal surface of head mostly smooth, scales of supraorbital semicircles usually in broad contact with each other;
- (3) three to five suboculars in contact with supralabials;
- (4) usually 5–6 loreal scale rows at level of second canthal;
- (5) no enlarged postanal scales;
- (6) large dewlap in males;
- (7) short legs.

Among other specimens, my comparative material includes ANSP 11404 (holotype of *A. ortoni* COPE 1868) and some newly collected specimens from Ecuador and Peru (SMF specimens, see appendix). *Anolis ortoni* is widely distributed in northern South America east of the Andes and does not reach Central America (AVILA-PIRES 1995). Therefore, I regard the type locality “Escuintla (République du Guatemala)” as stated in the original description of *A. bouvierii* to be erroneous.

#### Status of *Anolis salvini*

Description of the holotype of *Anolis salvini* (BMNH 1946.9.8.19): Adult ♂ as indicated by swollen base of tail and pair of enlarged postanal scales; SVL 56.0 mm; tail length 69.0 mm, tail complete; tail slightly compressed in cross section, tail height 2.7 mm, tail width 2.1 mm; axilla to groin distance 25.0 mm; head length 14.9 mm, head length/SVL ratio 0.266; snout length 6.6 mm; head width 9.6 mm; longest toe of adpressed hind limb reach-

ing shoulder; shank length 11.3 mm, shank length/head length ratio 0.758; longest finger of extended forelimb reaching 0.5 mm beyond snout; longest finger of adpressed forelimb reaching to a point 3 mm anterior insertion of hind limbs. All dorsal and lateral head scales smooth and flat (Fig. 2); 7 postrostrals; 7 scales between nasals; 1 (right)–2 (left) scales between nasal and rostral; a distinct prefrontal depression present; supraorbital semicircles well differentiated, separated medially by a minimum of one scale row; supraorbital disc composed of 7–9 enlarged, smooth scales; a single, very elongated superciliary anteriorly, followed by much smaller scales posteriorly; a small parietal depression present; interparietal scale small, 1.21 mm × 1.02 mm (length × width), surrounded by scales of only slightly smaller size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge weak, composed of 4 (posteriormost one largest) large and 3 small anterior canthal scales; 5 scales present between second canthals; 6 scales present between posterior canthals; 20 (right)–21 (left) smooth loreal scales in a maximum of 4 horizontal rows at level of second canthal; subocular scales distinctly enlarged; 7 supralabials to level below center of eye; 3 suboculars in broad contact with 4 supralabials; ear opening 0.3 mm × 1.2 mm (length × height); mental distinctly wider than long, almost completely divided medially, bordered posteriorly by 4 postmentals (outer pair greatly enlarged, about 10 times the size of medial scales); 7 infralabials to level below center of eye; sublabials undifferentiated; keeled granular scales present on chin and throat; dewlap extending from level below oral ricti to chest; dorsum of body with smooth, rounded, juxtaposed to subimbric-

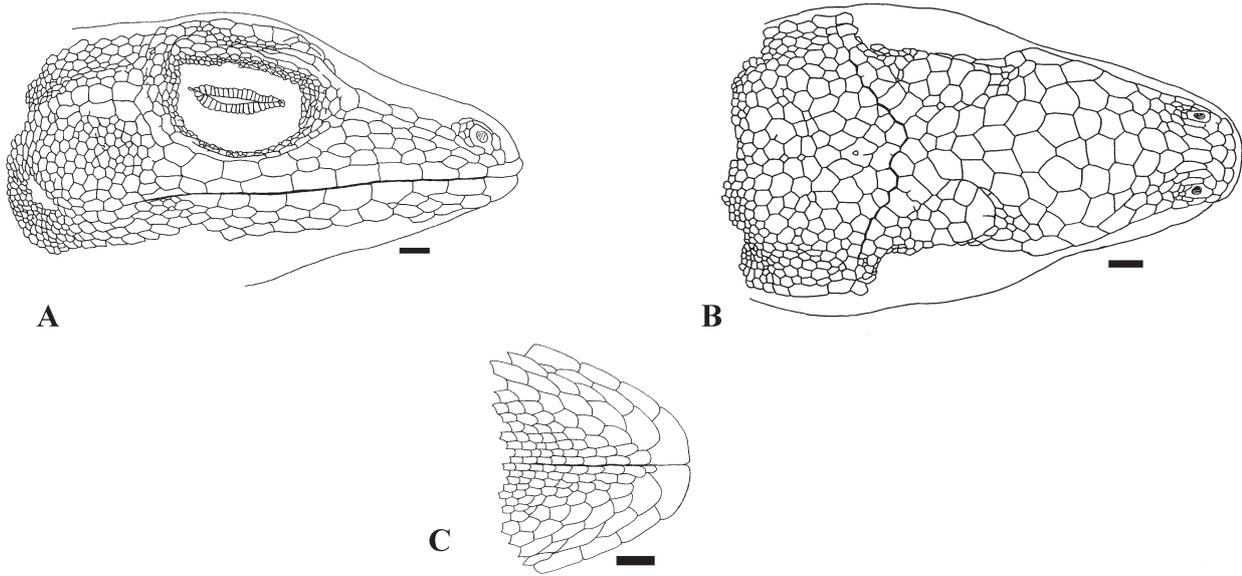


Fig. 2. Head of holotype of *Anolis salvini* (BMNH 1946.9.8.19). — A) lateral view. — B) dorsal view. — C) ventral view. — Scale bars = 1.0 mm

cate scales, no medial rows enlarged, dorsal scales about  $0.37 \text{ mm} \times 0.29 \text{ mm}$  (length  $\times$  width); about 38 medial dorsal scales in one head length; about 75 medial dorsal scales between levels of axilla and groin; lateral scales homogeneous, average size  $0.34 \text{ mm}$  in diameter; ventral scales smooth, flat, rounded, juxtaposed to subimbricate, about  $0.41 \text{ mm} \times 0.29 \text{ mm}$  (length  $\times$  width); about 41 ventral scales in one head length; about 76 ventral scales between levels of axilla and groin; about 122 scales around midbody; most caudal scales keeled; caudal mid-dorsal scales distinctly enlarged, without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of distinctly enlarged postanal scales (Fig. 3), postanal scale width  $0.8 \text{ mm}$ ; no tube-like axillary pocket; limb scales keeled, imbricate; digital pads dilated; distal phalanx narrower than and raised from dilated pad; 16 lamellae under phalanges ii–iv of fourth finger; 25 lamellae under phalanges ii–iv of fourth toe. Dorsal and lateral surfaces of trunk with a lichenous pattern consisting of ill-defined darker markings and oval-shaped pale blotches; upper limb and tail surfaces with faint dark crossbands; a dark butterfly-shaped marking across base of tail; venter dirty white.

**Taxonomic conclusions:** A comparison of the holotype of *Anolis salvini* with all other known species of anoles from Central America lead me to the conclusion that it is clearly conspecific with *A. vociferans* MYERS 1971. Diagnostic characters include:

- (1) an overall lichenous coloration, and a dark butterfly-shaped marking across base of tail;
- (2) short legs;
- (3) a pair of distinctly enlarged postanal scales;

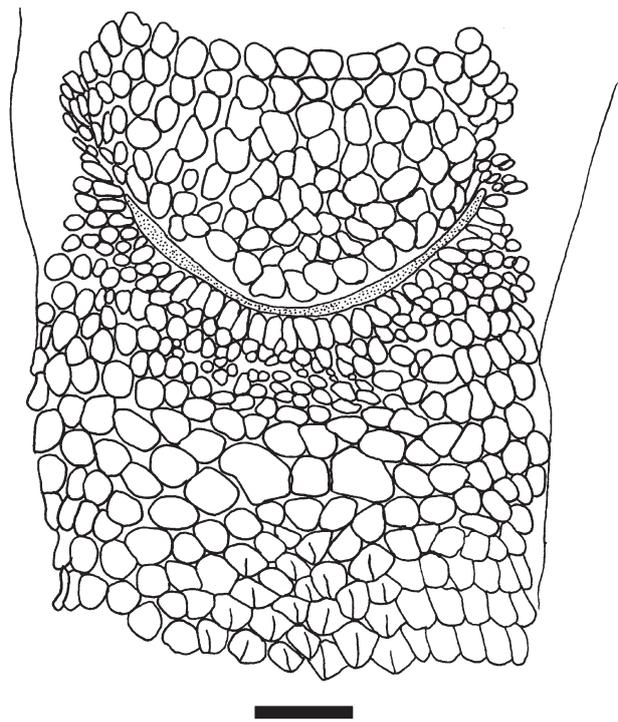


Fig. 3. Cloacal region of *Anolis salvini* (BMNH 1946.9.8.19). — Scale bar = 1.0 mm

- (4) smooth, flat, rounded, juxtaposed to subimbricate ventral scales;
- (5) low number of loreal scales and loreal scale rows.

Among other specimens, my comparative material includes the ♂ holotype of *A. vociferans* (AMNH 69621)

and a series of the species that I recently collected in western Panama (SMF specimens, see appendix).

Therefore, I herewith place *Anolis vociferans* MYERS 1971 in the synonymy of *Anolis salvini* BOULENGER 1885. This species is currently known from several localities in the Cordillera de Talamanca of Costa Rica and Panama (MYERS 1971, SAVAGE 2002, KÖHLER 2003). The type locality “Guatemala”

as stated in the original description of *A. salvini* is clearly erroneous. This is not too surprising given other documented mixups in locality data in the GODMAN & SALVIN collections. STUART (1955) stated that “the material [including the holotype of *A. salvini*] may have been received by the British Museum somewhat after the main bulk of the earlier parts of the collection had been turned over to the Museum”.

## Discussion

The name *Anolis vociferans* has been used in the past 35 years for a poorly known species of anole that has been documented from two localities in Costa Rica and a few localities in western Panama (MYERS 1971, SAVAGE 2002). Given the few mentioning of this species in the literature, I have no concern in respect of nomenclatural stability regarding the change of name for this species to *A. salvini*.

The clarification of the identities of the respective holotypes of *A. bouvierii* and *A. salvini* removes these nominal taxa from the Guatemalan checklists where they have had a “status incertus” for a long time.

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gisches Forschungsinstitut und Museum A. Koenig (ZFMK), Bonn.

## Appendix

### Comparative material examined

(♂ = male; ♀ = female; j = juvenile)

*Anolis ortonii* (21 specimens): Brasil: lower Río

Madeira, SMF 10972 (j); Marajo, SMF 24842 (♀); Caldeiras, Marjo, SMF 30391-405 (7 ♂♂, 8 ♀♀).

— Ecuador: Río Napo or upper Río Marañón, ANSP 11404; Pastaza: Arútam, SMF 86113-15 (2 ♂♂, 1 ♀).

*Anolis salvini* (14 specimens): Panama: Chiriquí:

4 km W Cerro Punta, 1829 m, AMNH 69621

(♂); Bambito, 6 mi S Cerro Punta, USNM 203831; above Boquete, ZFMK 27608-11 (1 ♂, 3 ♀♀); Pelo Santo, 4 mi NW El Volcán, 4600 ft, ANSP 26287; Cerro Jurutungo, 8°54'30.5" N, 82°43'22.4" W, 1860 m, SMF 85451-52 (1 ♂, 1 ♀); Cerro La Pelota, 8°49'51" N, 82°36'50" W, 1580–1640 m, SMF 85453-57 (3 ♂♂, 2 ♀♀).

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