SUPPLEMENTARY DATA 1

A new teiid lizard of the genus *Callopistes* Gravenhorst 1838 (Squamata, Teiidae) from the Lower Miocene of Argentina

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ILLUSTRATION OF CHARACTERS USED IN THE ANALYSIS

Description of characters used in the phylogenetic analysis. This list is based on the data matrices of McDowell and Bogert (1954), Meszoely (1970), Presch (1974a), Presch (1980), Rieppel (1980), Gauthier (1984), Pregill *et al*. (1986), Estes *et al*. (1988), Etheridge and de Queiroz (1988), Gauthier *et al*. (1988), Denton and O'Neill (1995), McGuire (1996), Wu *et al*. (1996), Lee (1997), Norell and Gao (1997), Sullivan and Estes (1997), Evans and Chure (1998), Gao and Norell (1998), Lee (1998), Zaher and Rieppel (1999), Rieppel and Zaher (2000a,b), Tchernov *et al*. (2000), Lee and Scanlon (2002), Nydam and Cifelli (2002), Conrad and Norell (2006), Hsiou (2007), Nydam *et al*. (2007), Conrad (2008), Rieppel *et al*. (2008), Brizuela (2010), Holliday *et al*. (2010), and Gauthier *et al*. (2012). Two new characters derived from our study were also added to the data matrix (characters 74 and 143). Thirty-eight characters were modified based on new observations by the authors.

(1) Lateral process of the premaxilla, in ventral view (modified from Conrad, 2008: 3): (0) V-shaped, strongly directed posteriorly; (1) rounded, directed posterolaterally. *Comments:* This character defines the muzzle shape in the group, confering a tapering condition in Teiinae and a more rounded contour in Tupinambinae. This character was originally scored by Norell and Gao (1997: 33) and Conrad (2008: 3) with distinct intentions (i.e, within anguimorphs and teiids, respectively). *Pogona* and *Chamaeleo* lack lateral processes of the premaxilla and thus were scored (?).

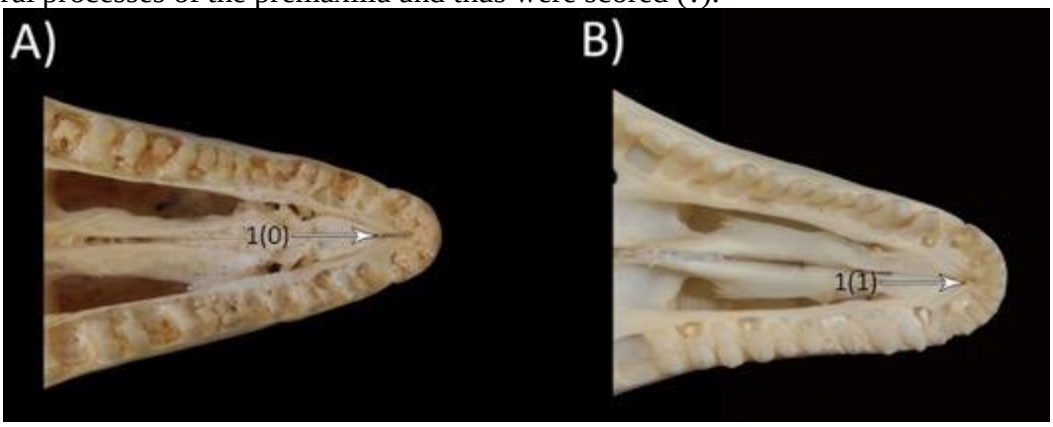


Figure 1S. A) *Ameiva ameiva* MZUSP 43047; B) *Crocodilurus amazonicus* MZUSP 92090. Ventral views of the skulls, no scale bar.

(2) Premaxilla internasal process shape in anterior view (Gauthier *et al*., 2012: 13): (0) tapers apically or parallel-sided across nares; (1) widens across nares.

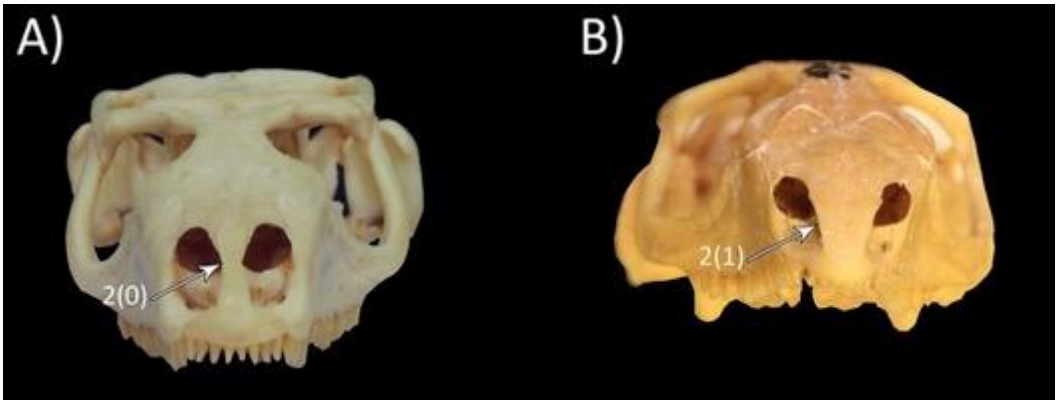


Figure 2S. A) *Callopistes maculatus* MZUSP 8037; B) *Teius teyou* MZUSP 426. Anterior views of the skulls, no scale bar.

(3) Premaxilla internasal process length, in dorsal view (Gauthier *et al*., 2012: 10): (0) less than half nasal lenght; (1) more than halfway to frontal between nasals; (2) nearly to, or articulates with, frontal.

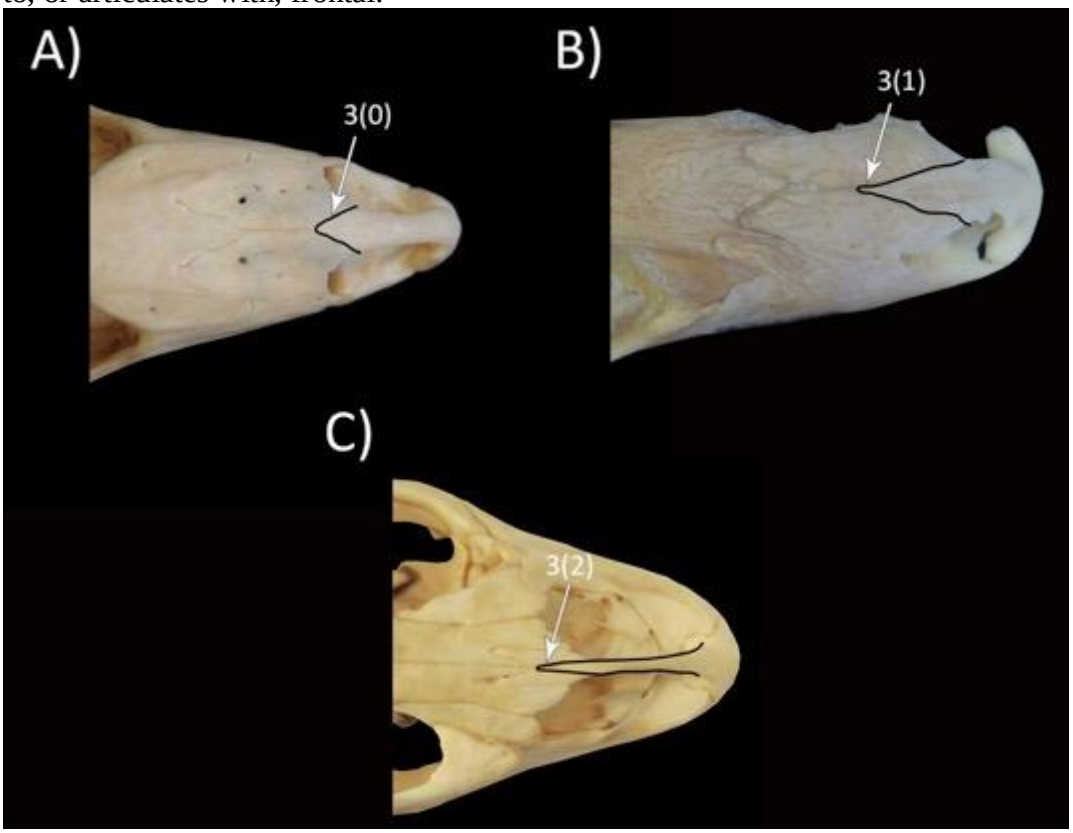


Figure 3S. A) *Ameiva ameiva* MZUSP 43047; B) *Tupinambis teguixin* MZUSP 92149; C) *Varanus exanthematicus* MZUSP 101252. Dorsal views of the skulls, no scale bar.

(4) Premaxilla, basal constriction of the internasal process (Brizuela, 2010: 3): (0) absent; (1) present.

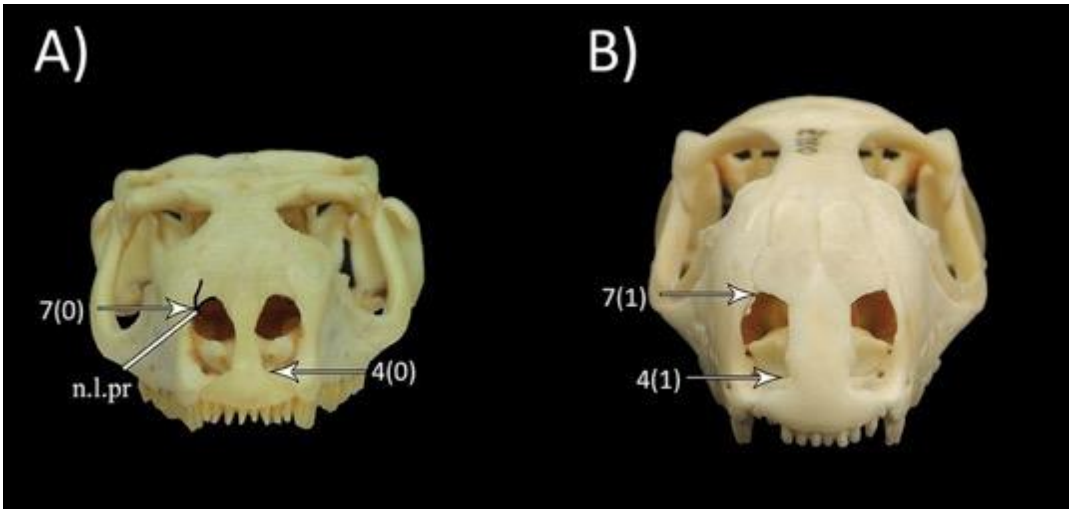


Figure 4S. A) *Callopistes maculatus* MZUSP 8037; B) *Salvator merianae* MZUSP 85000. Anterior views of the skulls, no scale bar. **Abbreviation**: ***n.l.pr***, nasolateral process.

(5) Premaxilla-maxilla aperture (Meszoely, 1970; Norell & Gao, 1997: 1; Gao & Norell, 1998: 44-45; Conrad, 2008: 17): (0) absent; (1) present.

Comments: Conrad (2008) mentions the nomenclatural usage of this character as so: "*this structure, a hole between the premaxilla and maxilla, has been referred to by a variety of names, including premaxillary foramen (Meszoely, 1970). Gao and Norell (1998: 44-45) favor the term used here, which helps to avoid confusion with the premaxillary foramen of lizards lacking the hole between the premaxilla and maxilla"*. We refer to the above-mentioned structure the same way as Conrad (2008).

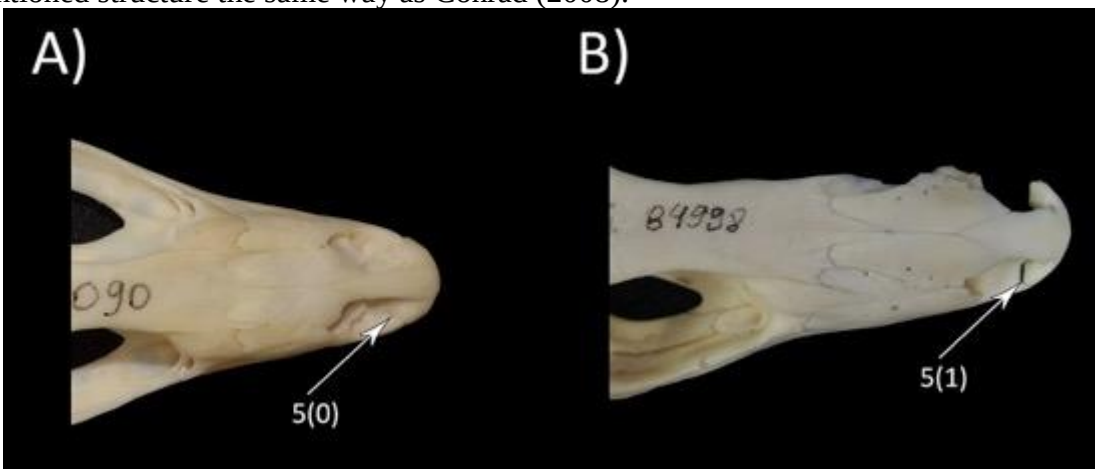


Figure 5S. A) *Crocodilurus amazonicus* MZUSP 92090; B) *Salvator merianae* MZUSP 84998. Dorsal views of the skulls, no scale bar.

(6) Nasals, anterior width (Gauthier *et al*., 2012: 18): (0) exceeds nasofrontal joint width; (1) is subequal to nasofrontal joint width; (2) less than anterior frontal width.

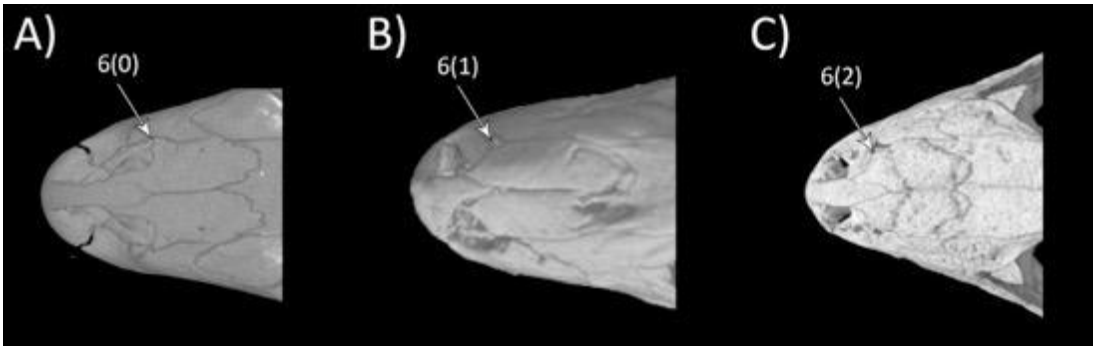


Figure 6S. A) *Callopistes maculatus* FMNH 53726; B) *Tupinambis teguixin* FMNH 22416; C) *Lacerta viridis* YPM 12858. Dorsal views of the skulls, no scale bar. Images derived from http://digimorph.org.

(7) Nasals, anterior border (modified from Conrad, 2008: 22; Gauthier *et al*., 2012: 22): (0) nasolateral process present, forming the posterior border and part of the labial border of the external nare (see Fig.4S:A); (1) nasolateral process absent (see Fig.4S:B). See illustration for this character under character 4.

Comments: This character was modified from its original definition. Scorings in Gauthier *et al*. (2012) were modified as follows: *Aspidocelis tigris* and *Gekko gecko* from state (1) to state (0).

(8) Nasals, ventral contact beneath premaxillary internasal process (Gauthier *et al*., 2012: 24): (0) broad contact below; (1) or not in contact except near apex.

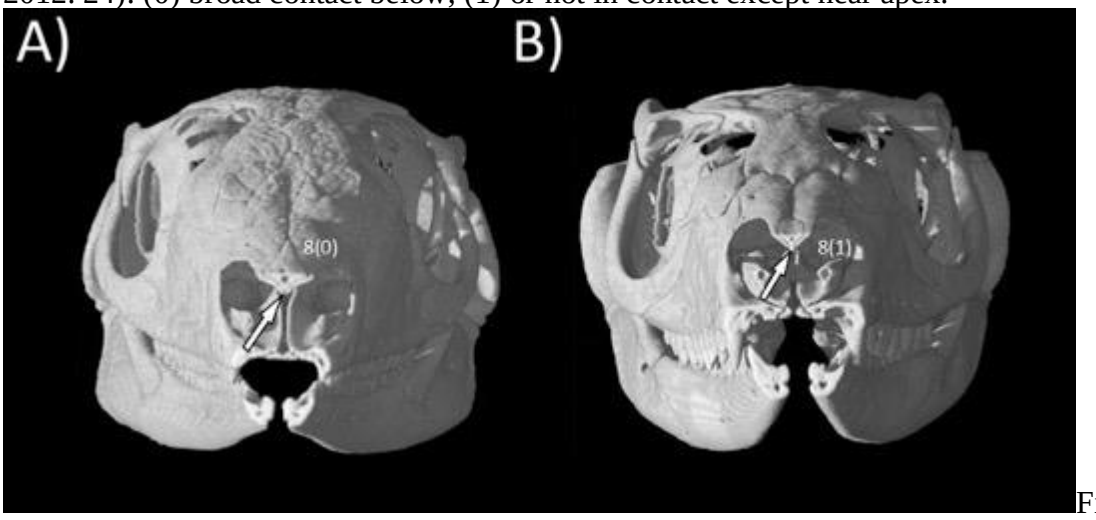


Figure 8S. A) *Aspidoscelis tigris* FMNH 161622; B) *Callopistes maculatus* FMNH 53726. Anterior coronal cutaway views of the skulls. No scale bar. Images derived from http://digimorph.org.

(9) Nasal-prefrontal suture (Estes *et al*., 1988: 4; Gauthier *et al*., 2012: 19): (0) present; (1) absent.

Comments: In their study, Gauthier *et al.* (2012) scored *Tupinambis teguixin, Pholidobolus montium* and *Rhineura floridana* as (?), but there was no visible contact in

the analysed specimens in this study, so we scored them as state (1). Also, scoring for *Lepidophyma flavimaculatum* was modified from state (0) to state (1).

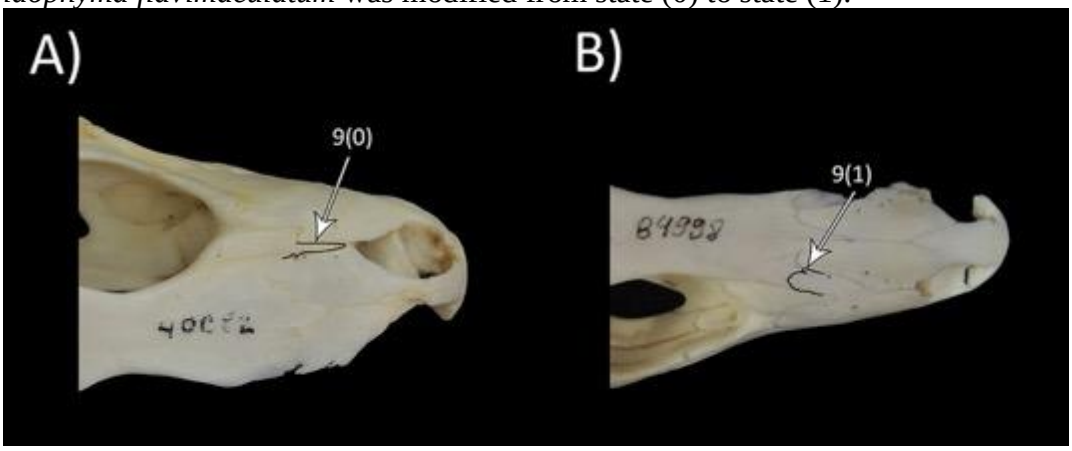


Figure 9S. A) *Dracaena guianensis* MZUSP 40082; B) *Salvator merianae* MZUSP 84998. Dorsal views of the skulls, no scale bar.

(10) Maxilla, contact between the premaxillary process of the maxilla and the lateral (maxillary) process of the premaxilla, in lateral view (extensively modified from Brizuela, 2010: 7): (0) the anterior margin of the premaxillary process of the maxilla contacts the anterolateral margin of the premaxillary lateral process on an abutment; (1) the anterior margin of the premaxillary process of the maxilla dorsally overlaps the anterolateral margin of the premaxillary lateral process, but does not fit into it; (2) the anterolateral margin of the premaxillary lateral process dorsally overlaps the anterior margin of the premaxillary process of the maxilla; (3) the anterior margin of the premaxillary process of the maxilla (tapered) fits into a notch on the lateral surface of the premaxillary lateral process.

Comments: Scorings were modified to include all the analysed taxa, not only teiids.

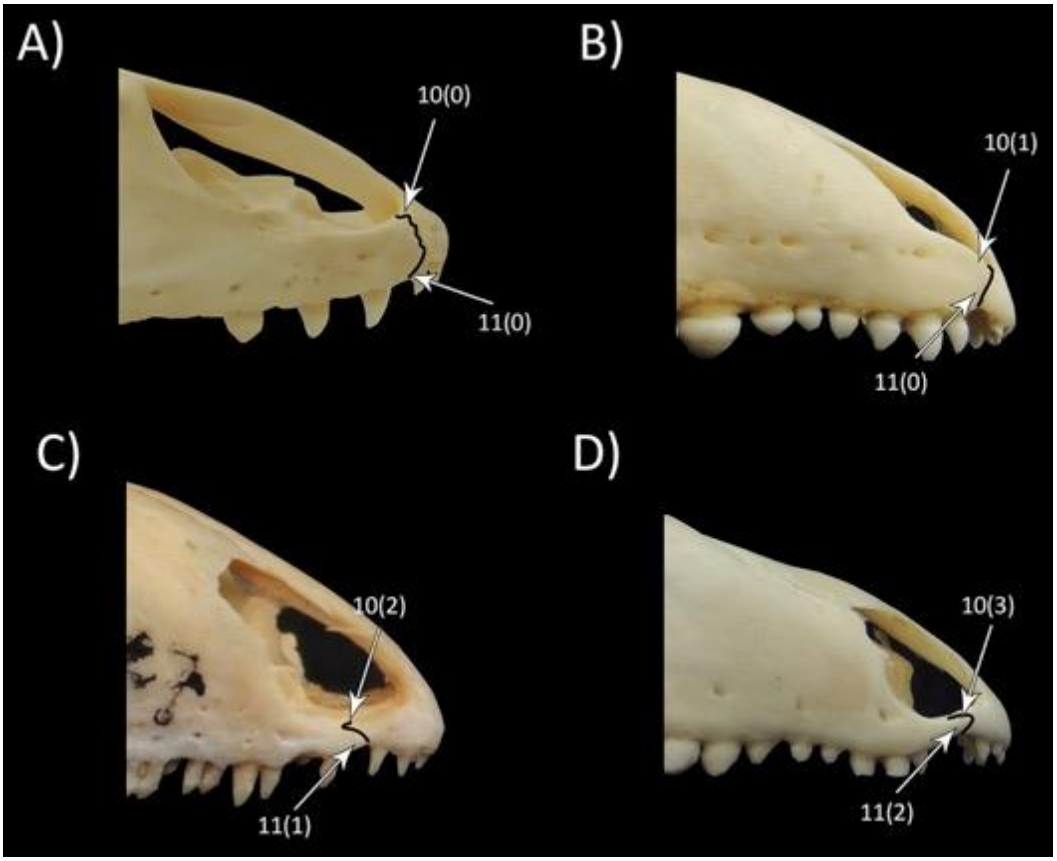


Figure 10S. A) *Varanus exanthematicus* MZUSP 101252; B) *Dracaena guianensis* MZUSP 40082; C) *Ameiva ameiva* MZUSP 43047; D) *Salvator merianae* MZUSP 84998. Labial views of the skulls, no scale bar.

(11) Maxilla, labial surface of the premaxillary process shape in lateral view (modified from Brizuela, 2010: 9): (0) robust (see Fig.10S:A,B); (1) tapered (see Fig.10S:C); (2) same as above, but the anterior margin of the premaxillary process of the maxilla is curved dorsally (see Fig.10S:D). See illustration of this character under character 10.

(12) Maxilla, nasal process inclination (modified from Conrad, 2008: 29; Gauthier *et al*., 2012: 118): (0) steeply inclined, forming a "step"; (1) weakly inclined, maxilla does not form a "step" anterior to the posterior border of the nare.

Comments: This character may, at first, seems related to a retracted external nare. Although this may be the case for some taxa, like *Varanus exanthematicus*, some taxa show a weakly inclined maxillary nasal process, but no retracted naris (e.g. *Lialis burtonis*), and so we redefined the original description.

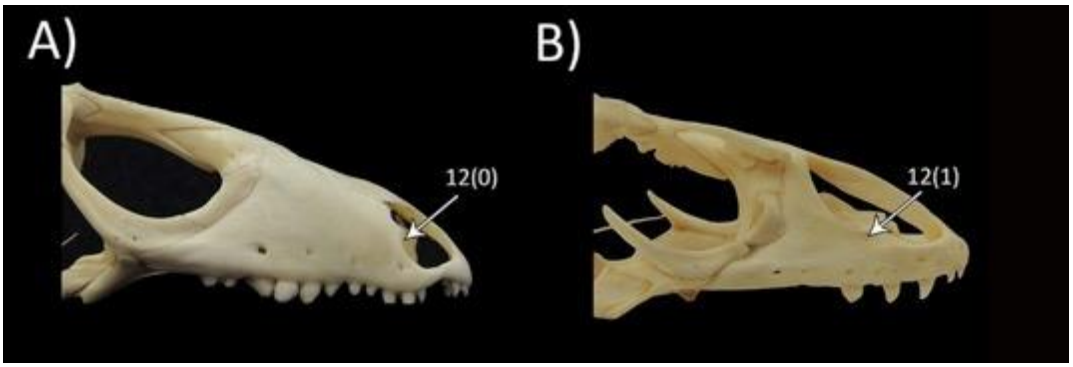


Figure 12S. A) *Salvator merianae* MZUSP 84998; B) *Varanus exanthematicus* MZUSP 101252. Lateral views of the skulls, no scale bar.

(13) Maxilla, anteromedial process lying between vomers and premaxillae (Estes *et al*., 1988: 12; Denton & O'Neill, 1995: 4; Nydam & Cifelli, 2002: 4; Nydam *et al*., 2007: 4; Conrad, 2008: 25): (0) absent (vomers contact the premaxillae); (1) present (vomers do not contact the premaxillae).

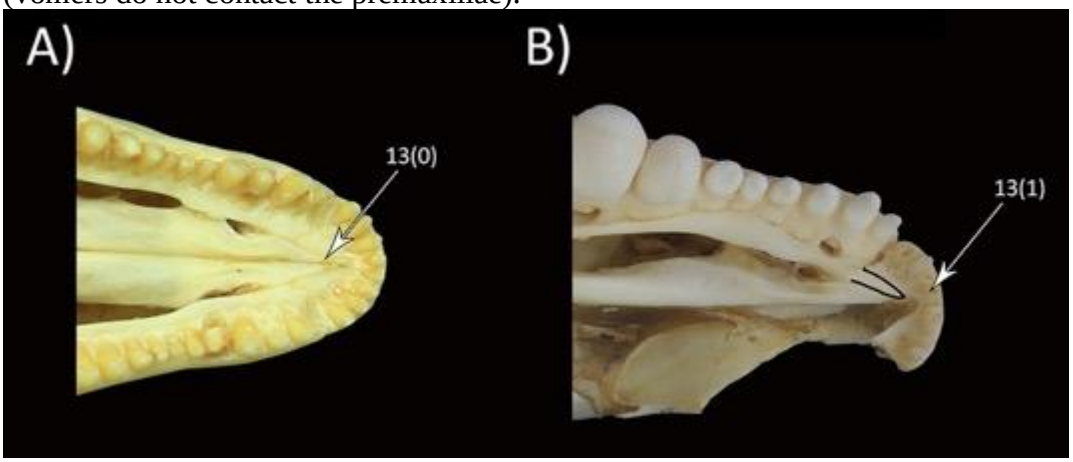


Figure 13S. A) *Callopistes maculatus* MZUSP 8037; B) *Dracaena guianensis* MZUSP 40082. Ventral views of the skulls, no scale bar.

(14) Prefrontal boss (Gauthier *et al*., 2012: 130): (0) absent; (1) present and poorly developed; (2) present and projecting as a canthal crest.

Comments: This character refers to a prefrontal boss at the level of the contact between the prefrontal and lacrimal, that may be higher or lesser accentuated. In previous morphological studies (Conrad, 2008; Gauthier *et al*., 2012), both this and the following character (*character 16*: prefrontal dorsolateral tuberosity) were considered to represent a single structure and scored as such. Here, we divided them in two distinct characters, as they are clearly two different structures (*e.g*., taxa which show a prefrontal boss but lack a dorsolateral tuberosity). We also modified Gauthier *et al*.'s (2012) scorings of characters 14 and 15 for *Callopistes maculatus* and *Tupinambis teguixin* from state (0) to (1) since both taxa present a prefrontal boss and a dorsolateral tuberosity. The authors also scored *Pogona vitticeps* and *Chamaeleo laevigatus* as lacking (0) a prefrontal boss, but it is clear that both taxa retain a prefrontal boss that projects as a canthal crest (state 2).

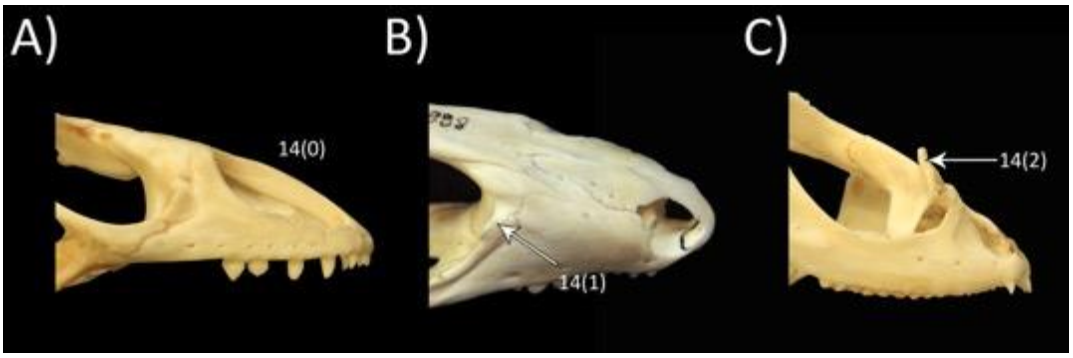


Figure 14S. A) *Varanus exanthematicus* MZUSP 101252; B) *Salvator merianae* MZUSP 84998; C) *Pogona vitticeps* MZUSP 100553. Right lateral views of the skulls, no scale bar.

(15) Prefrontal, dorsolateral tuberosity (Conrad, 2008: 34): (0) absent; (1) present. *Comments*: See comments for this character under character 15.

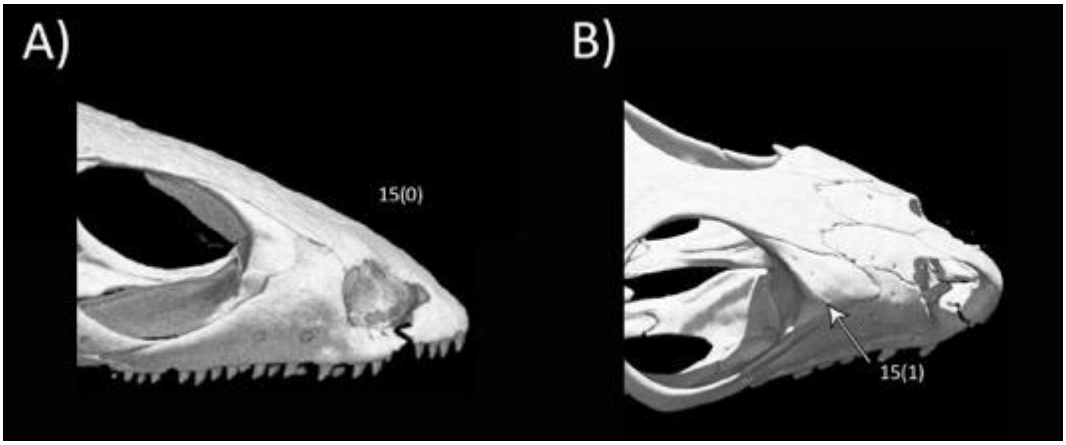


Figure 15S. A) *Colobosaura modesta* USNM 341978; B) *Callopistes maculatus* FMNH 53726. Lateral (A) and dorsolateral (B) views of the skulls, no scale bar. Images derived from http://digimorph.org.

(16) Prefrontal, contact with jugal (Conrad, 2008: 39): (0) absent; (1) present.

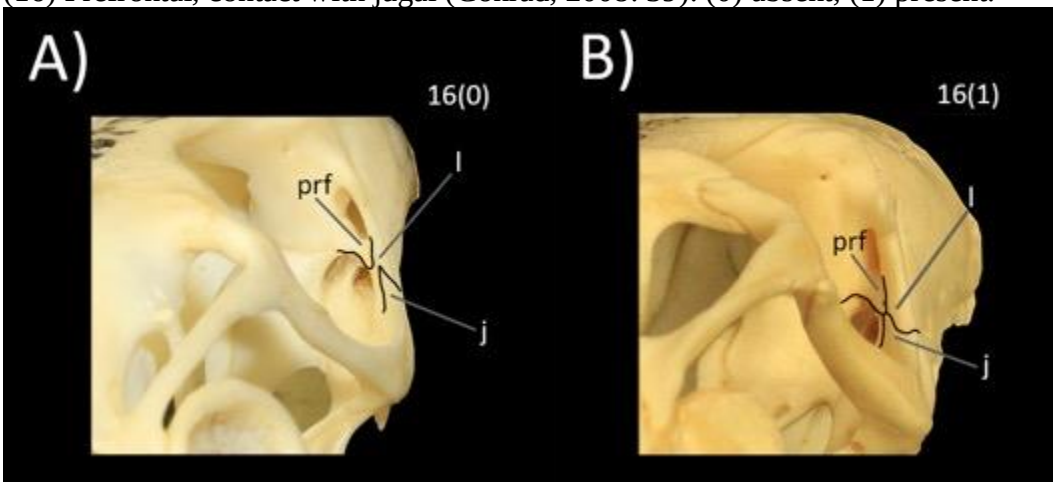


Figure 16S. A) *Crocodilurus amazonicus* MZUSP 12624; B) *Salvator merianae* MZUSP 84998. Posterolateral views of the skulls, no scale bar. **Abreviations**: **j**, jugal; **l**, lacrimal; **prf**, prefrontal.

(17) Dermal skull bone ornamentation, frontal/parietal (modified from previous works: Estes *et al*., 1988: 129; Conrad, 2008: 10; Gauthier *et al*., 2012: 572): (0) absent, dermal skull roof smooth; (1) lightly rugose about frontoparietal suture; (2) rugosity present over dorsum; (3) present on jugal postorbital bar.

Comments: We unified the character descriptions in Conrad's (2008) and Gauthier *et al*.'s (2012) matrices. Scorings in Gauthier *et al*. (2012) were modified for *Tiliqua scincoides* and *Smaug mossambicus* from state (2) to state (3).

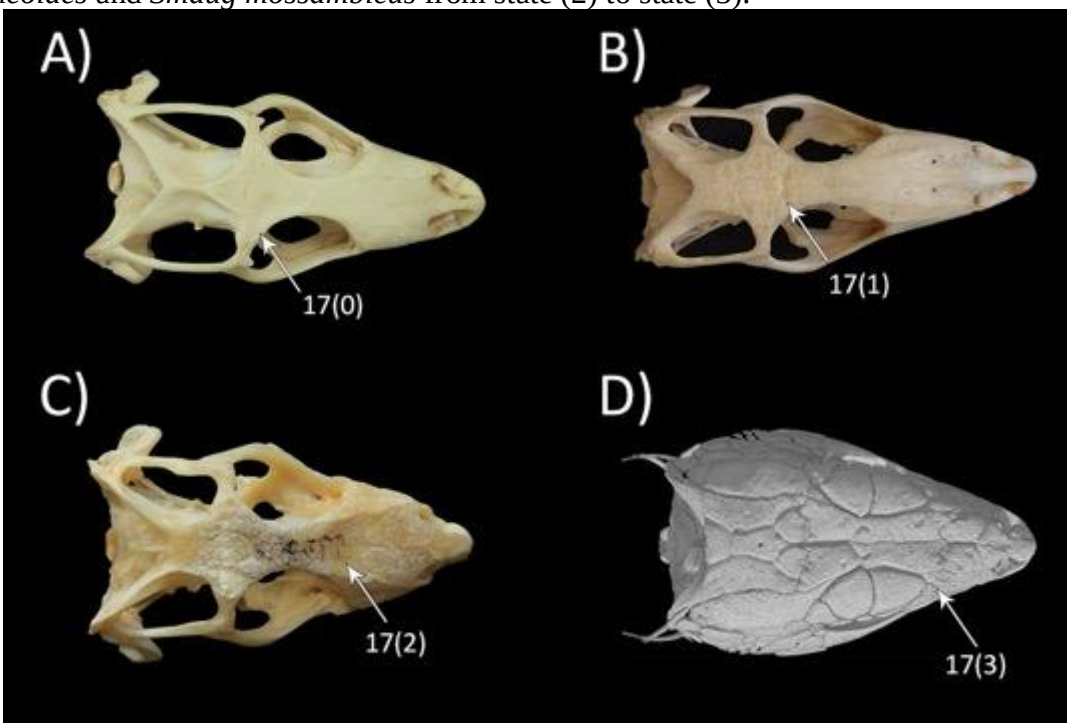


Figure 17S. A) *Callopistes maculatus* MZUSP 8037; B) *Ameiva ameiva* MZUSP 43047; C) *Dicrodon guttulatum* MZUSP 19384; D) *Lacerta viridis* YPM 12858. Dorsal views of the skulls, no scale bar. Image (D) derived from http://digimorph.org.

(18) Ontogenic fusion of frontals (Estes *et al*., 1988: 6; Denton & O'Neill, 1995: 1; Nydam & Cifelli, 2002: 1; Nydam *et al*., 2007: 1; Conrad, 2008: 55; Gauthier *et al*., 2012: 36): (0) paired; (1) fused.

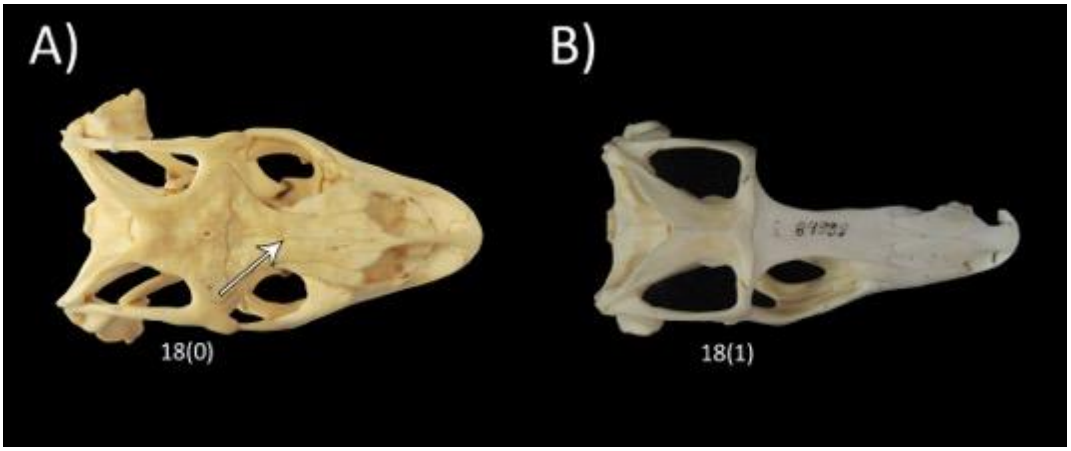


Figure 18S. A) *Varanus exanthematicus* MZUSP 101252; B) *Salvator merianae* MZUSP 84998. Dorsal views of the skulls, no scale bar.

(19) Frontal/parietal shape, in dorsal view (Presch, 1974a: 20; Sullivan & Estes, 1997: 17; modified in Brizuela, 2010: 49): (0) convex; (1) flat; (2) concave by peripherical thickening of the parietal.

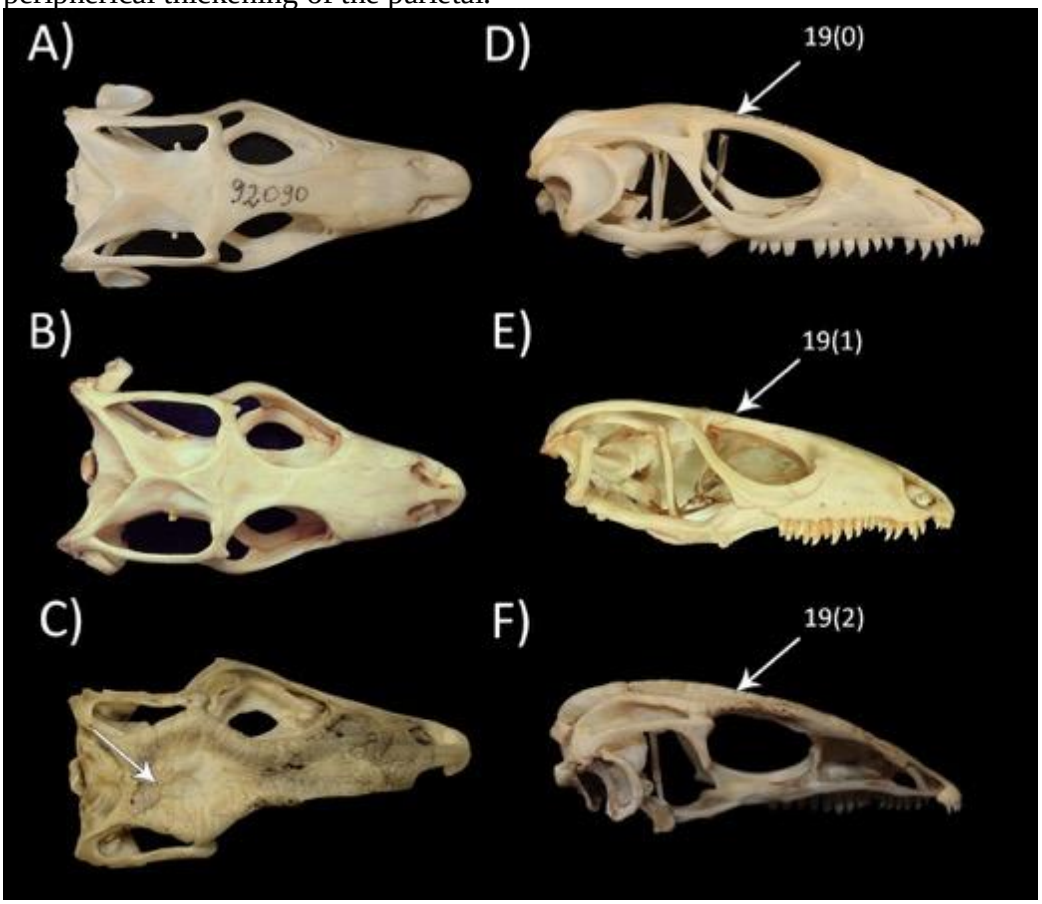


Figure 19S. A) Dorsal view of *Crocodilurus amazonicus* MZUSP 92090; B) dorsal view of *Callopistes maculatus* MZUSP 8037; C) dorsal view of *Kentropyx calcarata* MZUSP 81580, white arrow indicating the concavity of the frontoparietal roof; D)

lateral view of *Crocodilurus amazonicus*; E) lateral view of *Callopistes maculatus*; F) lateral view of *Kentropyx calcarata*. No scale bar.

(20) Frontoparietal suture interdigitation (Estes *et al*., 1988: 11; modified from Gauthier *et al*., 2012: 56): (0) frontal overlaps parietal dorsally; (1) mostly straight transverse contact or lightly interdigitated; (2) strongly interdigitated.

Comments: Gauthier *et al*.'s (2012) matrix presented five different states of frontoparietal interdigitation. In our study, we retain only the three states that were observed in the analysed taxa (states 3 and 4 were inexistent or autapomorphic). Also, Gauthier *et al*.'s (2012) scorings for *Teius teyou*, *Colobosaura modesta* and *Pholidobolus montium* have been modified from state (1) to state (2).

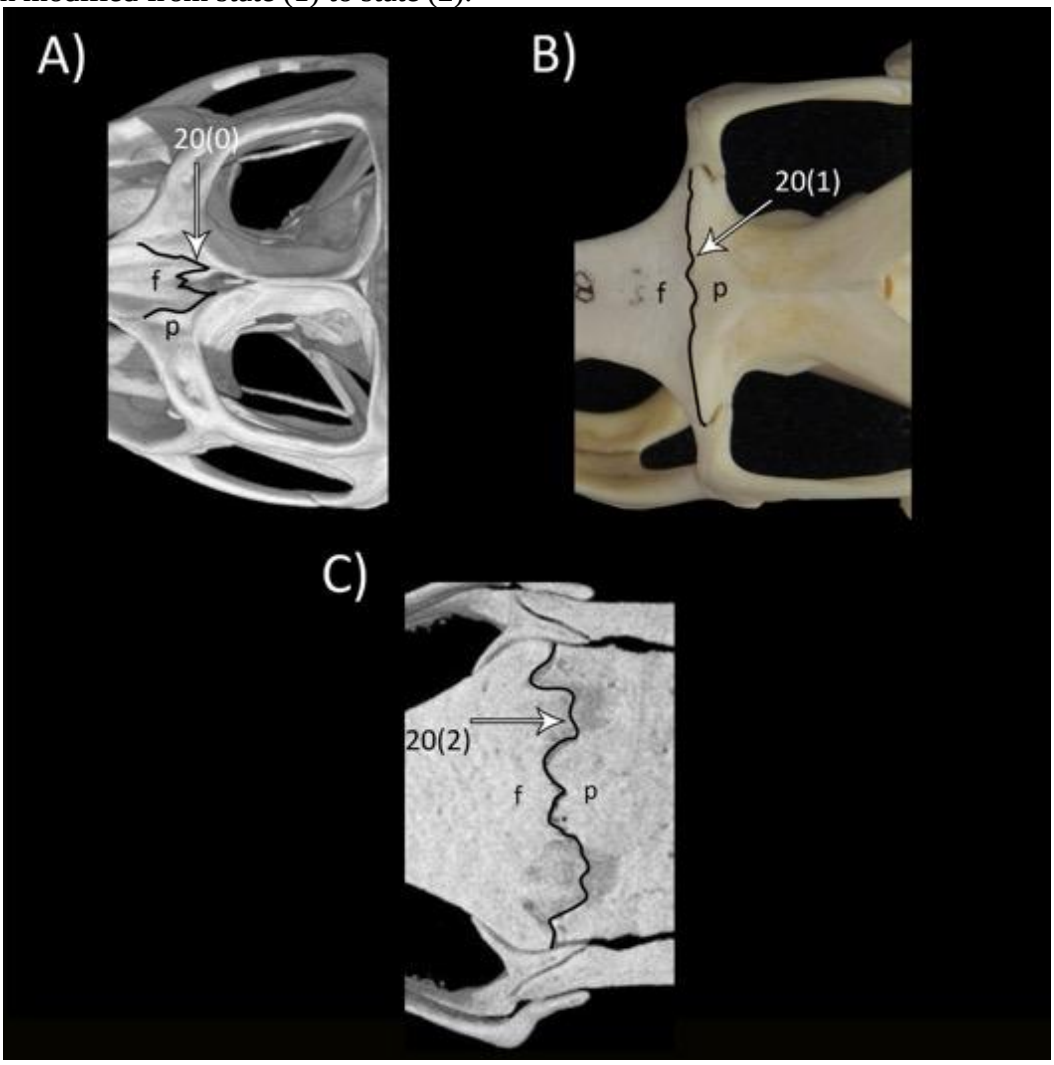


Figure 20S. A) *Sphenodon punctatus* YPM 9194; B) *Salvator merianae* MZUSP 84998; C) *Colobosaura modesta* USNM 341978. Dorsal close-up views of the skulls, no scale bar. **Abbreviations**: **f**, frontal; **p**, parietal. Images (A and C) derived from http://digimorph.org.

(21) Parietal, frontal tabs overlapping the frontal (modified from Estes *et al.*, 1988: 22; Conrad, 2008: 74): (0) absent; (1) present and visible dorsally; (2) present and visible dorsally and ventrally.

Comments: We re-defined state (2) of Conrad's (2008) matrix based on Estes *et al.*'s (1988) character description. On his matrix, Conrad (2008) scored the members of the subfamily Teiinae as state (1); we modified these taxa, given that all the observed teiids present state (2).

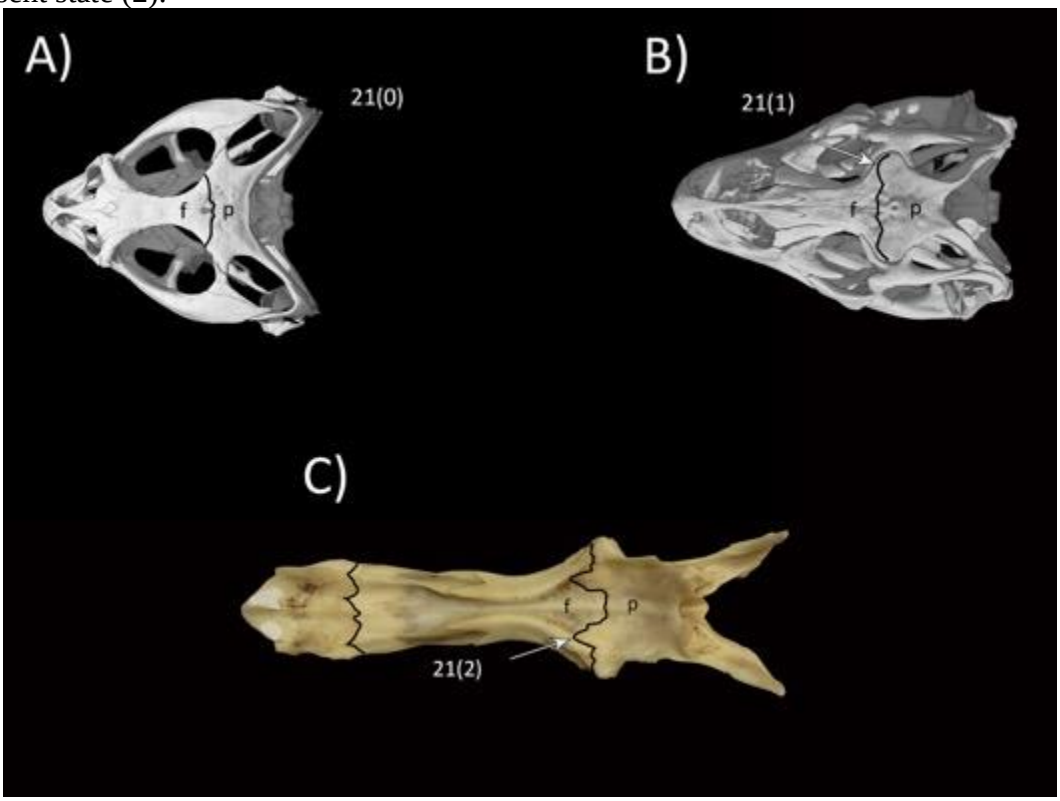


Figure 21S. A) *Uromastyx aegyptius* FMNH 78661; B) *Varanus exanthematicus* FMNH 58299; C) *Ameiva ameiva* MZUSP 2295. (A) and (B) dorsal views of the skulls, and (C) ventral view of nasals, frontal and parietal articulated. No scale bar. **Abbreviations**: **f**, frontal; **p**, parietal. Images (A) and (B) derived from http://digimorph.org.

(22) Parietal, parasagittal crest strongly developed on the dorsolateral surface for the insertion of the adductor mandible musculature (modified from Denton & O'Neill, 1995: 10; Nydam & Cifelli, 2002: 10; Nydam *et al*., 2007: 10; Conrad, 2008: 75; Gauthier *et al*., 2012: 93): (0) absent; (1) present.

Comments: We excluded state 2 (*dorsally projected***)** of Gauthier *et al*.'s (2012) matrix given that this state was autapomorphic for *Corytophanes cristatus*.

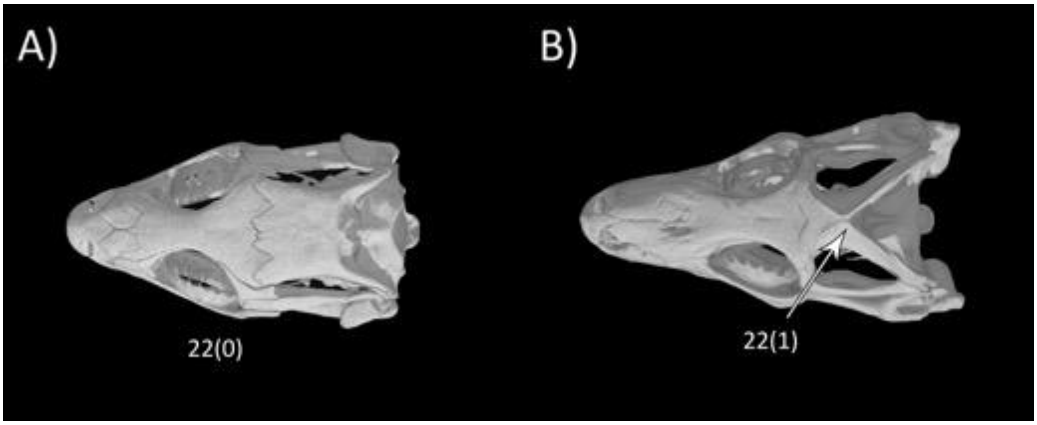


Figure 22S. A) *Pholidobolus montium* FMNH 197865; B) *Tupinambis teguixin* FMNH 22416. Dorsal views of the skulls, no scale bar. Images derived from http://digimorph.org.

(23) Parietal, nuchal fossa width (Gauthier *et al.*, 2012: 94): (0) narrow; (1) wide; (2) overgrown by parietal (nearly) to midline.

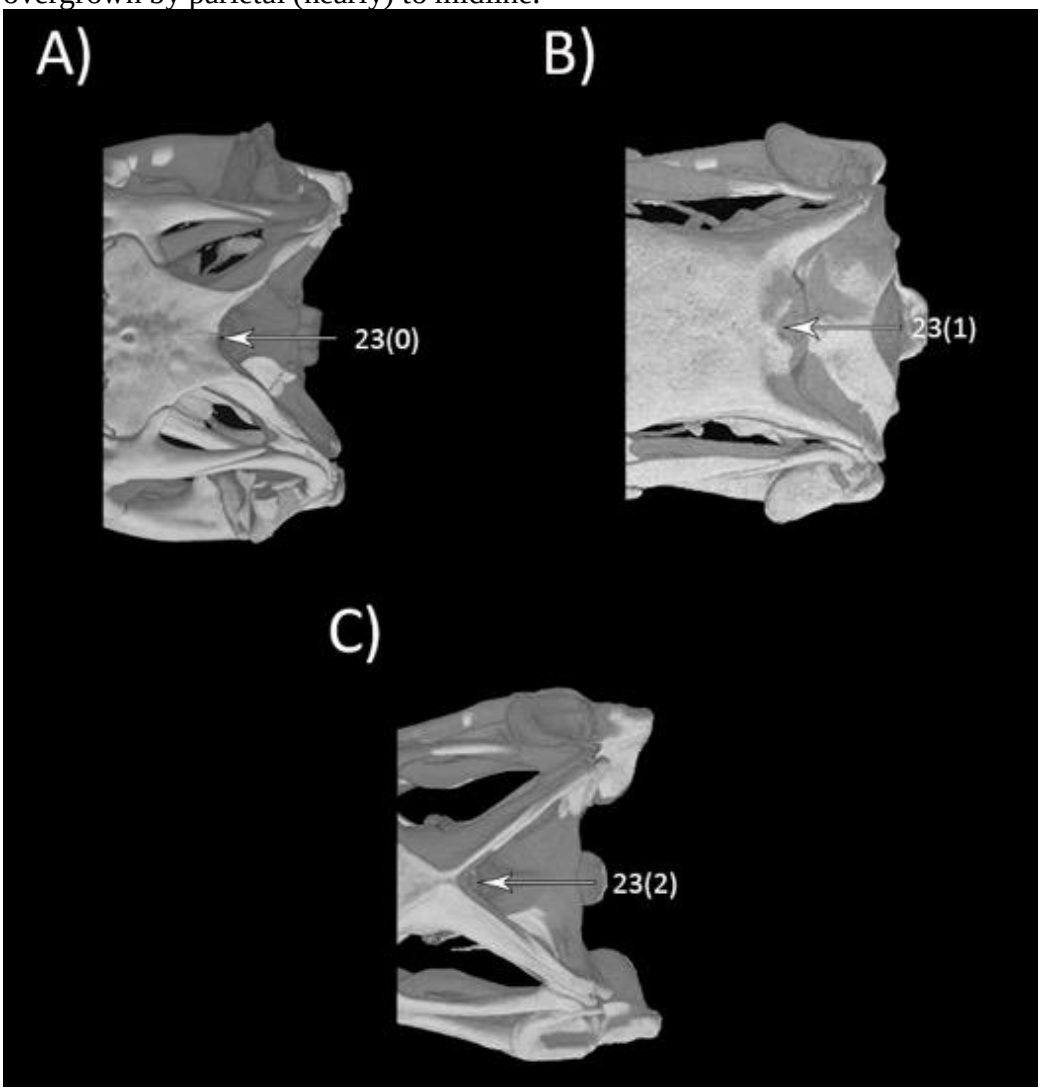


Figure 23S. A) *Varanus exanthematicus* FMNH 58299; B) *Pholidobolus montium* FMNH 197865; C) *Tupinambis teguixin* FMNH 22416. Dorsal close-up views of the skulls, no scale bar. Images derived from http://digimorph.org.

(24) Parietal, *decensus parietalis* (Estes *et al*., 1988: 23; Denton & O'Neill, 1995: 15; Nydam & Cifelli, 2002: 15; Nydam *et al*., 2007: 15; Conrad, 2008: 76): (0) absent; (1) present as anteroposteriorly elongate crest; (2) present, anteroposteriorly narrow ventral projection.

Comment: We follow usage of this character according to Conrad (2008).

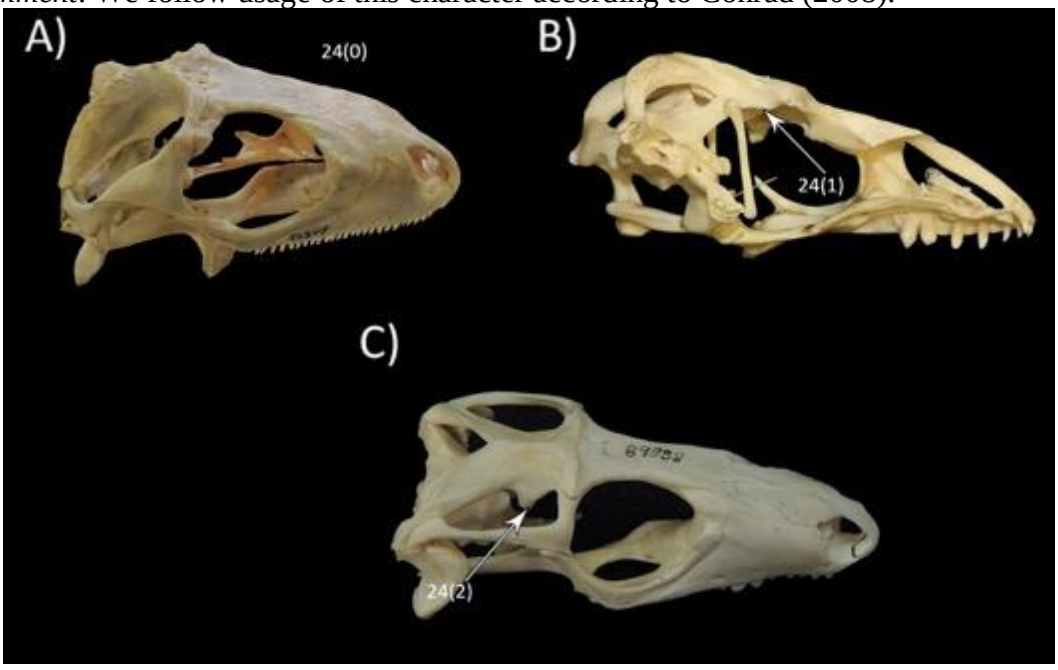


Figure 24S. A) *Iguana iguana* MZUSP 92878; B) *Varanus exanthematicus* MZUSP 101252; C) *Salvator merianae* MZUSP 84998. Dorsolateral (A and C) and dorsal views (B) of the skulls, no scale bar.

(25) Parietal foramen (modified from Estes *et al*., 1988: 25, 26; Denton & O'Neill, 1995: 16; Nydam & Cifelli, 2002a: 16; Nydam *et al*., 2007: 16; Conrad, 2008: 77; Gauthier *et al*., 2012: 104, 105): (0) present, on the parietal; (1) present, on the frontal; (2) present at the frontoparietal suture; (3) absent.

Comments: This character was originally described as two different characters by Estes *et al*. (1988: 25, 26), the first being the presence/absence of a parietal foramen and the second its position on the skull roof, the latter being ordered. We follow usage of this character according to Conrad (2008).

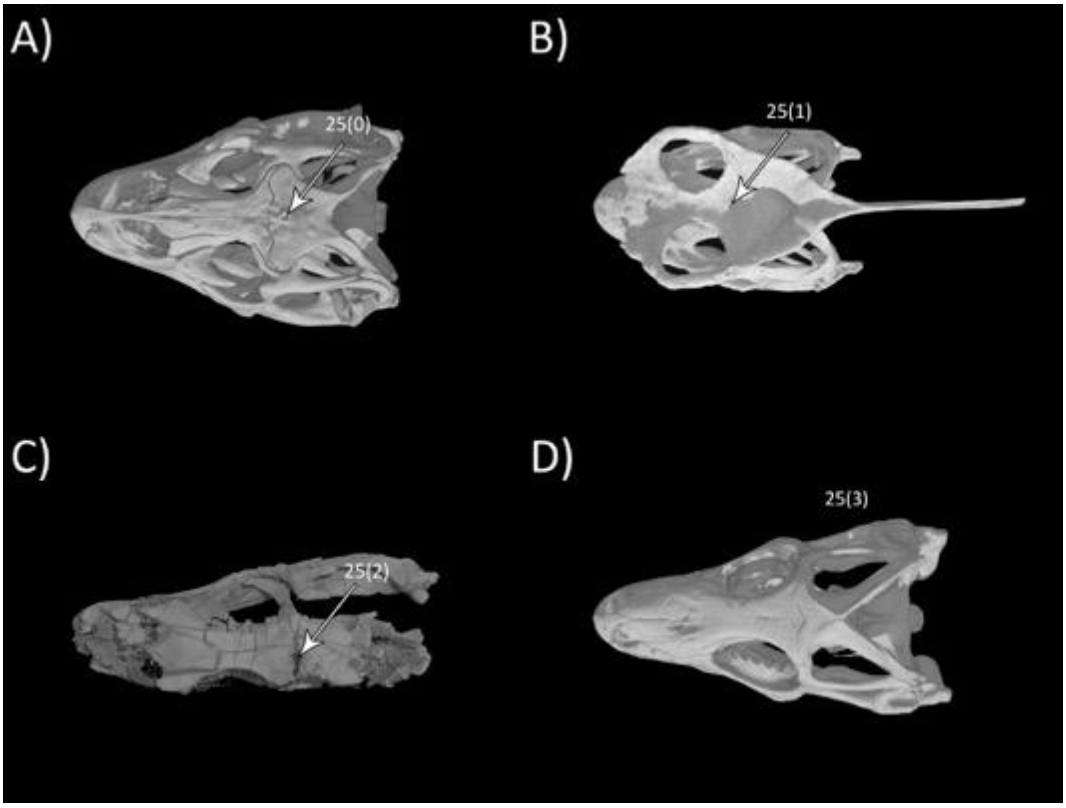


Figure 25S. A) *Varanus exanthematicus* FMNH 58299; B) *Corytophanes cristatus* FMNH 69227; C) MPCN-PV 002; D) *Tupinambis teguixin* FMNH 22416. Dorsal views of the skulls, no scale bar. Images (A), (B) and (D) derived from http://digimorph.org.

(26) Postfrontal (Estes *et al*., 1988: 12; Gauthier *et al*., 2012: 62); (0) present; (1) absent; (2) fused to postorbital; (3) fused to frontal.

Comments: We follow usage of this character according to Gauthier *et al*. (2012).

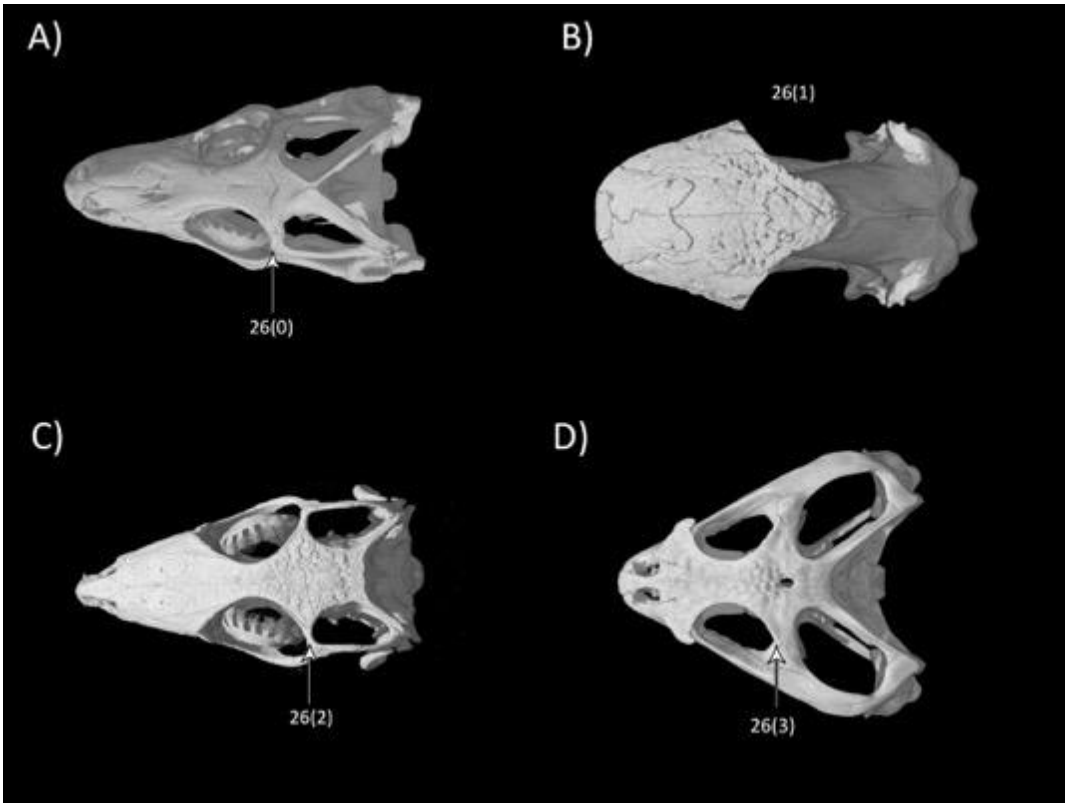


Figure 26S. A) *Tupinambis teguixin* FMNH 22416; B) *Rhineura floridana* FMNH 31774; C) *Aspidoscelis tigris* FMNH 161622; D) *Pogona vitticeps* ROM 22699. Dorsal view of the skulls, no scale bar. Images derived from http://digimorph.org.

(27) Postfrontal, shape (Conrad, 2008: 92): (0) anteroposteriorly elongate; (1) irregularly shaped, not elongate in mediolateral or anteroposterior planes; (2) mediolaterally developed bar bordering the orbit and supratemporal fenestra.

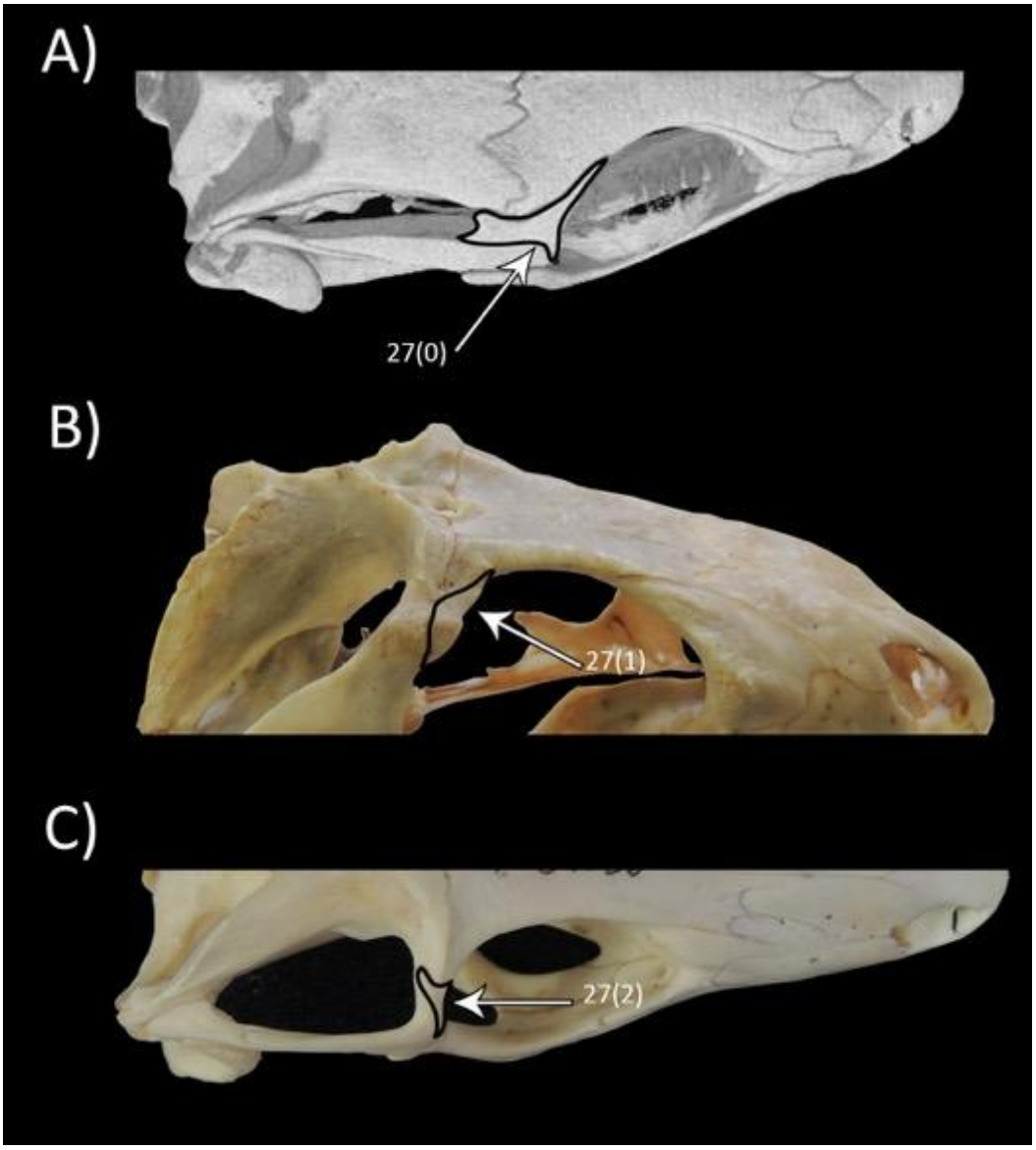


Figure 27S. A) *Pholidobolus montium* FMNH 197865; B) *Iguana iguana* MZUSP 92878; C) *Salvator merianae* MZUSP 84998. Dorsal (A and C) and dorsolateral (B) views of the skulls, no scale bar. Image (A) derived from http://digimorph.org.

(28) Postfrontal, distal shape (Gauthier *et al*., 2012: 64): (0) tapering to point (passing anterior to postorbital); (1) bifid (clasps postorbital).

Comments: Gauthier *et al.*'s (2012) scoring 0 for *Heloderma suspectum* seems to be a miscoding, since this taxon does not present a postorbital, and so it cannot be scored for this character.

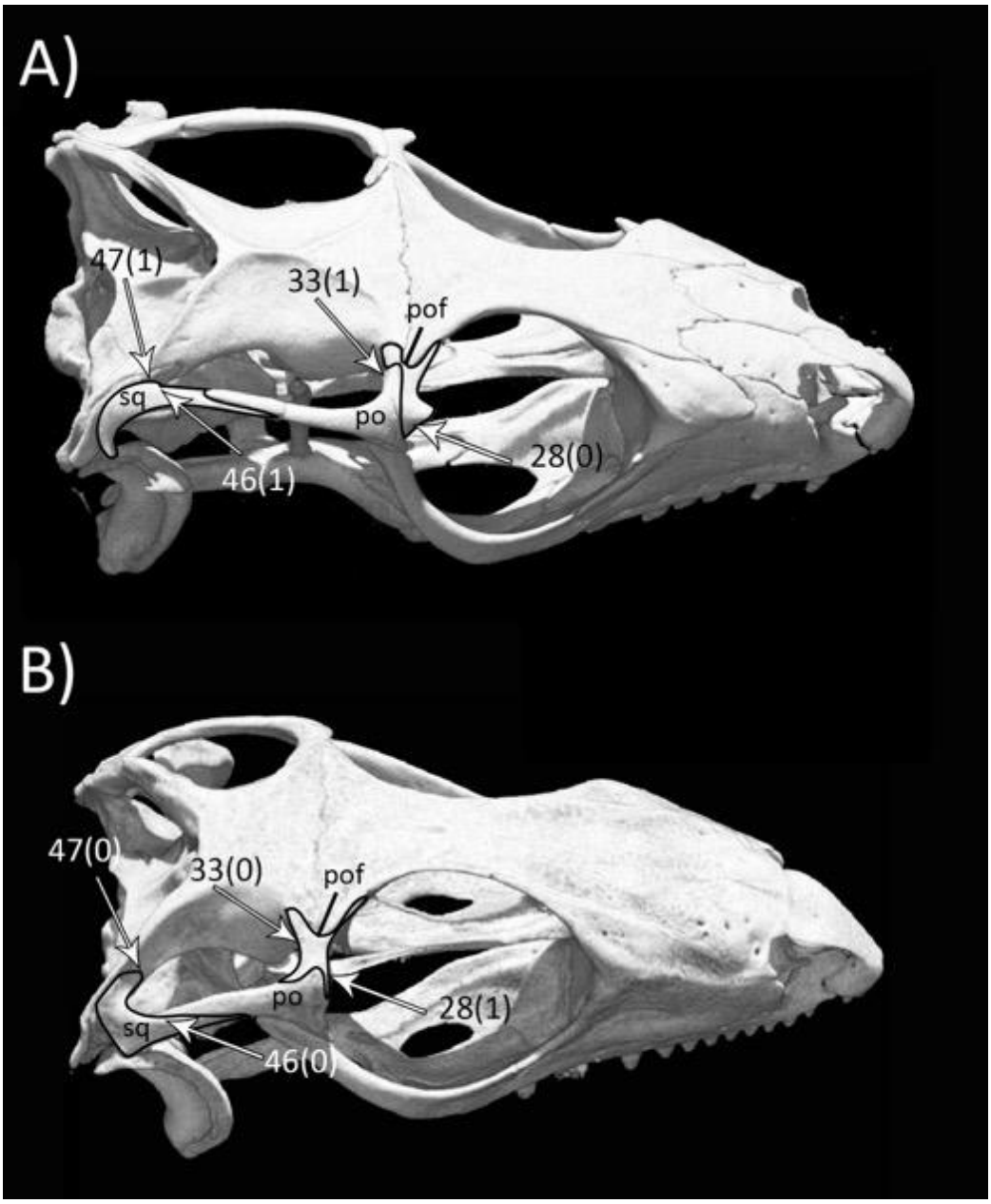


Figure 28S. A) *Callopistes maculatus* FMNH 53726; B) *Teius teyou* FMNH 10873. Dorsolateral views of the skulls, no scale bar. **Abbreviations**: **po**, postorbital; **pof**, postfrontal; **sq**, squamosal. Images derived from http://digimorph.org.

(29) Postfrontal/postorbital, anterior tubercle (McGuire, 1996: 7; Conrad, 2008: 90; Brizuela, 2010: 42): (0) absent; (1) present.

Comments: We follow usage of this character according to Conrad (2008). We refrain the author's scoring for the members of the family Teiidae as state 0, given that we observed differences between the taxa (see the Supporting Information for illustration of this character). We also disagree with Conrad's scoring state 0 for *Varanus exanthematicus*, in which the tubercle is present (1).

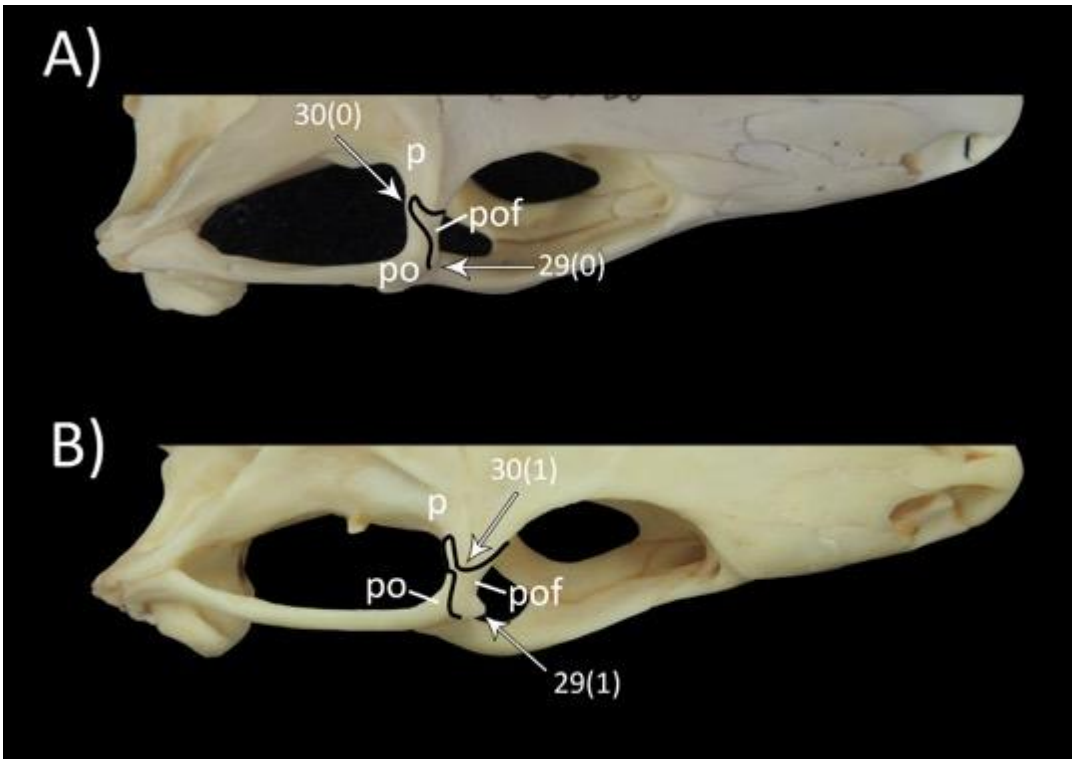


Figure 29S. A) *Salvator merianae* MZUSP 84998; B) *Callopistes maculatus* MZUSP 8037. Dorsal views of the skulls, no scale bar. **Abbreviations**: **p**, parietal; **po**, postorbital; **pof**, postfrontal.

(30) Postfrontal/postorbital, forking of the medial surface (Rieppel & Zaher, 2000a: 25; Conrad, 2008: 89): (0) absent (see Fig.29S:A); (1) present (see Fig. 29S:B). See illustration of this character under character 29.

Comments: Conrad's (2008) scoring for *Heloderma suspectum* was modified from state 0 to state 1.

(31) Postorbital (Estes *et al*., 1988: 16; Gauthier *et al*., 2012: 68): (0) present; (1) absent.

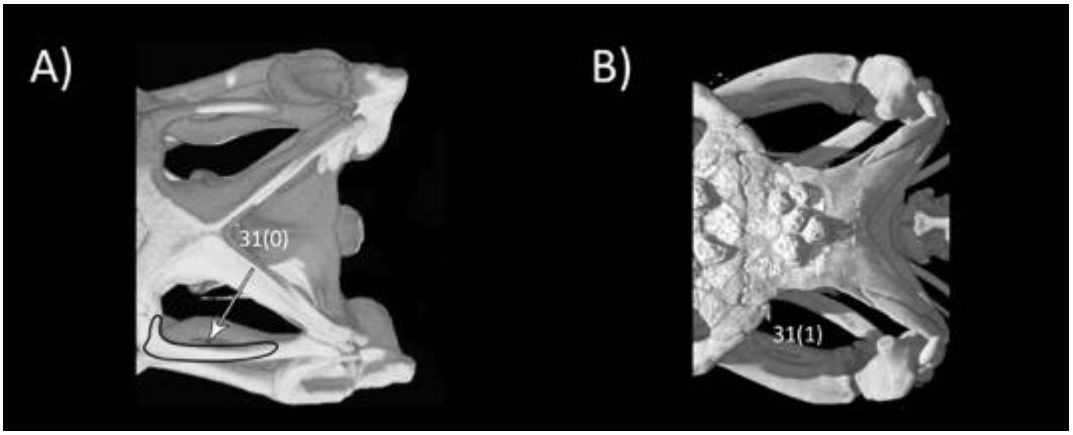


Figure 31S. A) *Tupinambis teguixin* FMNH; B) *Heloderma suspectum* TNHC 62766. Dorsal view of the skulls, no scale bar. Images derived from http://digimorph.org.

(32) Postorbital extent posteriorly (Estes *et al*., 1988: 17; Conrad, 2008: 96; Gauthier *et al*., 2012: 87): (0) to end of parietal table or less; (1) posterior to parietal table.

Comments: Gauthier *et al.*'s (2012) scorings were modified as follows: *Enyalioides laticeps* and *Varanus exanthematicus* from state (0) to state (1).

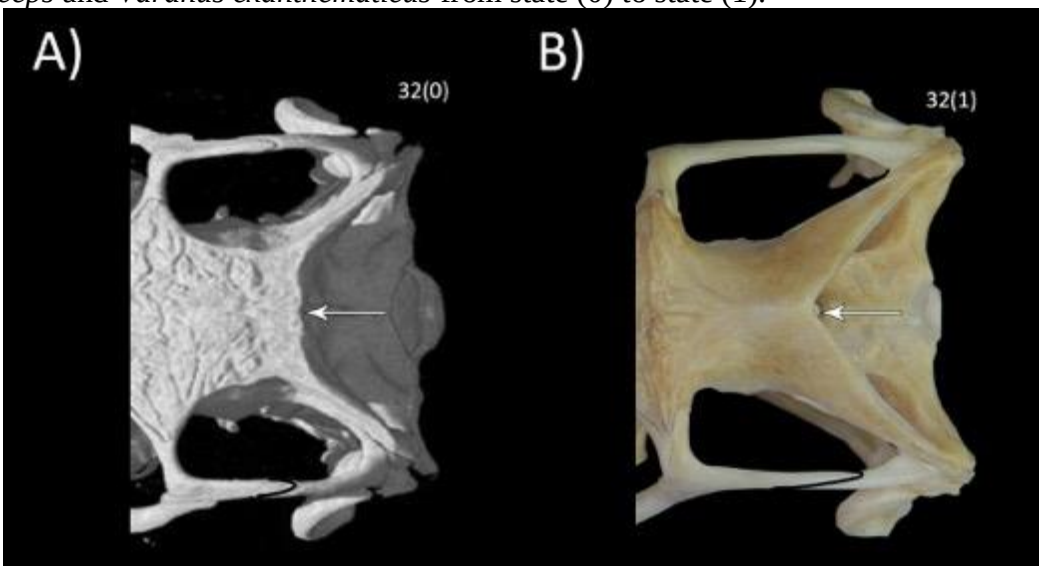


Figure 32S. A) *Aspidoscelis tigris* FMNH 161622; B) *Tupinambis teguixin* MZUSP 92149. The white arrows indicate the end of the parietal table. Dorsal views of the skulls, no scale bar. Image (A) derived from http://digimorph.org.

(33) Postorbital spreads onto dorsal surface of postfrontal (Gauthier *et al*., 2012: 85): (0) absent (see Fig.28S:B); (1) present (see Fig.28S:A). See illustration of this character under character 28.

(34) Postorbital-parietal contact (modified from Gauthier *et al*., 2012: 71): (0) postorbital entirely distal, separated by postfrontal from parietal; (1) postorbital with discrete process extending toward parietal behind postfrontal; (2) postorbital contacts parietal ventrolaterally at frontoparietal suture.

Comments: Gauthier *et al*.'s (2012) matrix presented four different states; here, we retain only the three observed states in the analysed taxa, to avoid disturbance in the analysis (state 3 would be non-existant). Also, we modified state 1 (*postorbital process extending dorsally on the postfrontal*), given that this process is actually visible ventrally on the postfrontal, not dorsally (see the Supporting Information for illustration of this character). Additionally, Gauthier *et al*.'s (2012) scorings were modified as follows: *Smaug mossambicus* from (?) to state (1); and *Lepidophyma flavimaculatum* and *Aspidoscelis tigris* from (0) to state (2).

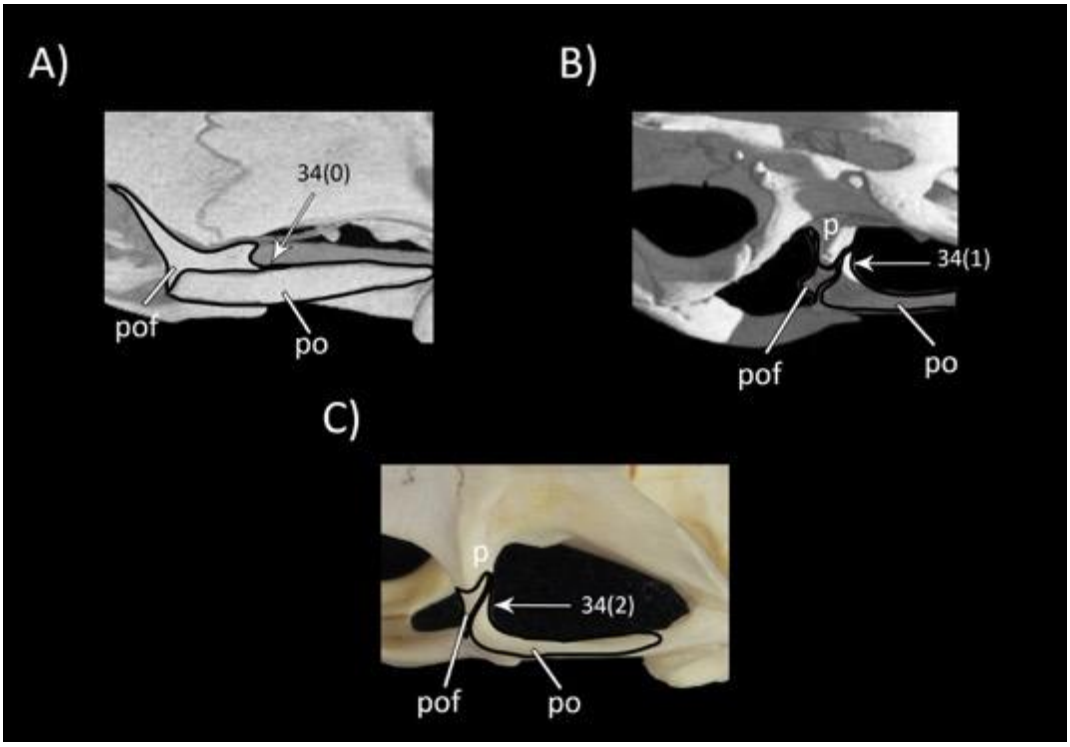


Figure 34S. A) *Pholidobolus montium* FMNH 197865; B) *Callopistes maculatus* FMNH 53726; C) *Salvator merianae* MZUSP 84998. The white arrows indicate the postorbital-parietal contact in (B) and (C) and the absence of such contact in (A). Close-up views of the posterolateral (A and C) and ventral (B) portions of the skulls, no scale bar. **Abbreviations**: **p**, parietal; **po**, postorbital; **pof**, postfrontal. Images (A) and (B) derived from http://digimorph.org.

(35) Postorbital overlaps squamosal (Gauthier *et al*., 2012: 78): (0) laterally into V-shaped recess in squamosal; (1) dorsomedially; (2) dorsally; (3) squamosal lies in trough beneath postorbital.

Comments: This character was modified from Gauthier *et al.*'s (2012) original description. We excluded state 3 (*postorbital in long V-shaped trough dorsally and then rotating dorsolaterally posteriorly*) of Gauthier's original matrix because it was non-representative in our analysis.

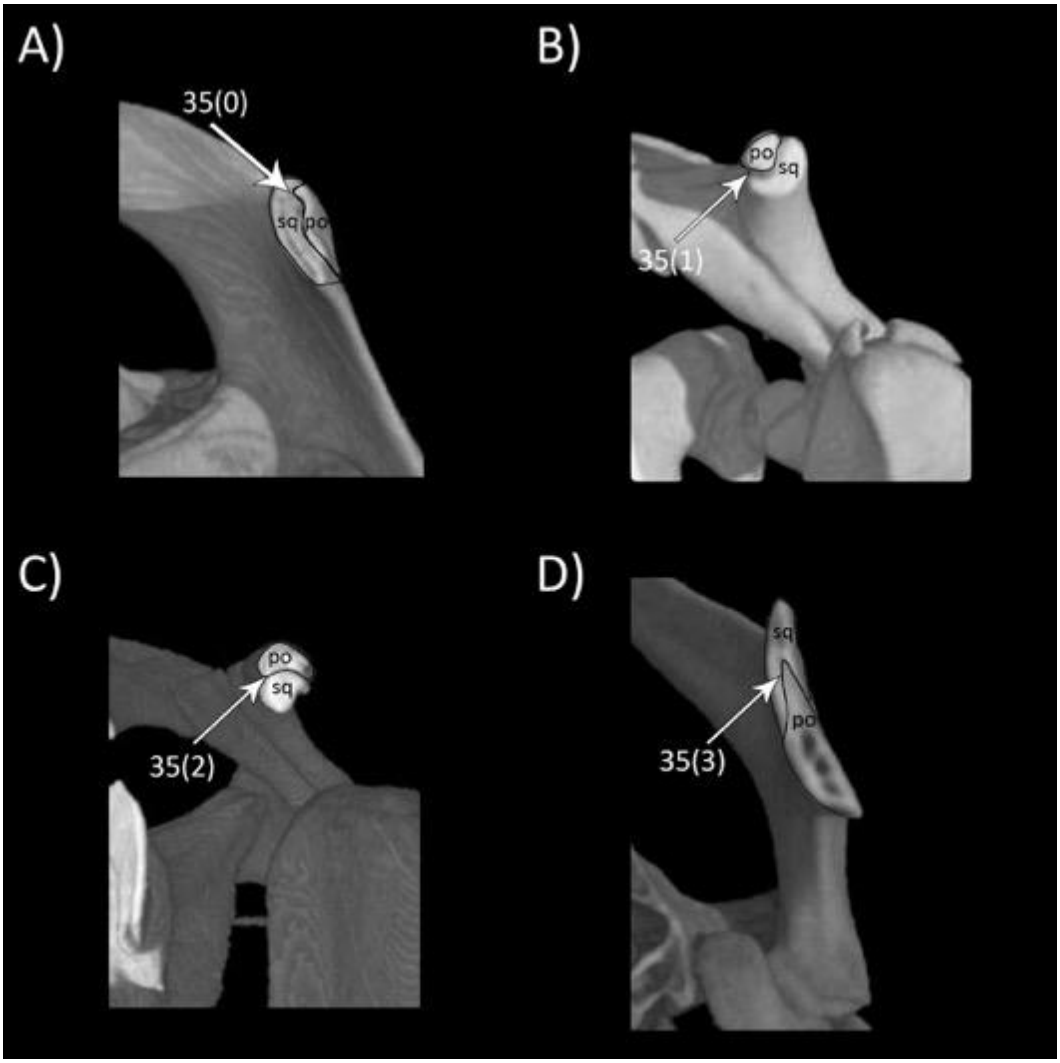


Figure 35S. A) *Sphenodon punctatus* YPM 9194; B) *Varanus exanthematicus* FMNH 58299; C) *Callopistes maculatus* FMNH 53726; D) *Chamaeleo laevigatus* FMNH 47572. Anterior close-up cutaways of the skulls, no scale bar. **Abbreviations**: **po**, postorbital; **sq**, squamosal. Images derived from http://digimorph.org.

(36) Postfrontal-jugal articulation (Brizuela, 2010: 43; Gauthier *et al*., 2012: 66): (0) widely separated; (1) nearly in contact, but still separated; (2) in contact.

Comments: We follow usage of this character according to Gauthier *et al*. (2012). The species *Callopistes maculatus* presents high level of polymorphism. Different from what Brizuela (2010) noticed on the re-description of the fossil *Callopistes bicuspidatus* (IML PVL-4618), the postfrontal-jugal articulation is not synapomorphic of this taxon, given that the contact between these two elements is present also in the observed specimens of *C. maculatus*. Thus, this character reinforces the phylogenetic relationship between these two taxa. Also, we discarded the state 3 (*indeterminate*) of Brizuela's (2010) matrix since it would be equal to scoring it as (?). We modified Gauthier *et al*.'s (2012) scoring for *Heloderma suspectum* from state (1) to (2).

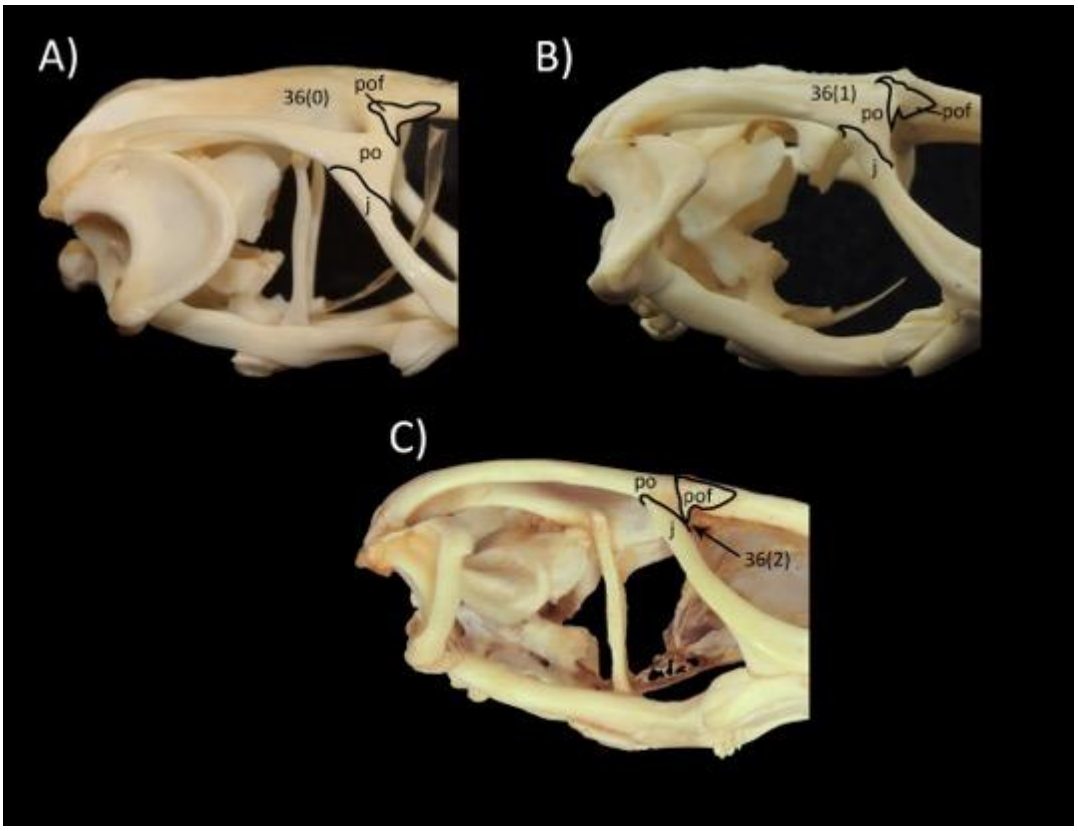


Figure 36S. A) *Crocodilurus amazonicus* MZUSP 92090; B) *Salvator merianae* MZUSP 84998; C) *Callopistes maculatus* MZUSP 8037. Right lateral views of the skulls, no scale bar. **Abbreviations**: **j**, jugal; **po**, postorbital; **pof**, postfrontal.

(37) Lacrimal (Estes *et al*., 1988: 28; Gauthier *et al*., 2012: 137): (0) present; (1) absent.

Comments: Gauthier *et al.*'s (2012) scorings were modified as follows: *Smaug mossambicus* and *Pholidobolus montium* from state (0) to state (1) (lacrimal bone absent).

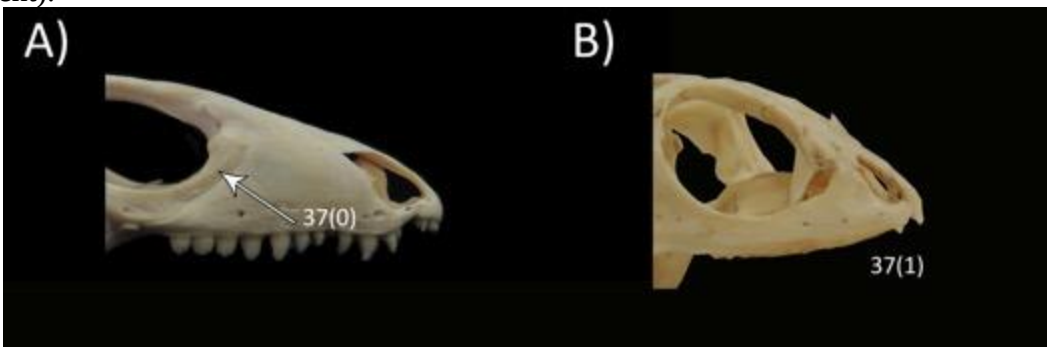


Figure 37S. A) *Salvator rufescens* MZUSP 93083; B) *Pogona vitticeps* MZUSP 100553. Lateral views of the skulls, no scale bar.

(38) Jugal (Estes *et al*., 1988: 32; Gauthier *et al*., 2012: 142): (0) present; (1) absent.

Comments: We follow usage of this character according to Gauthier *et al*. (2012). Estes *et al*.'s (1988) character describes not only the presence or absence of the jugal element but also its postorbital bar and is presented below (see character 44).

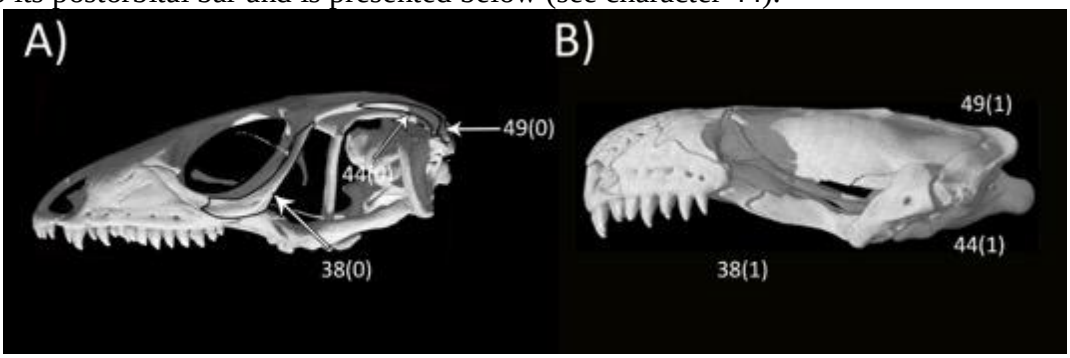


Figure 38S. A) *Callopistes maculatus* FMNH 53726; B) *Amphisbaena fuliginosa* FMNH 22847. Lateral view of the skulls, no scale bar. Images derived from http://digimorph.org.

(39) Jugal, external surface (modified from Brizuela, 2010: 26): (0) flat throughout its entire length (depression absent); (1) with a relatively well-defined concavity (depression present).

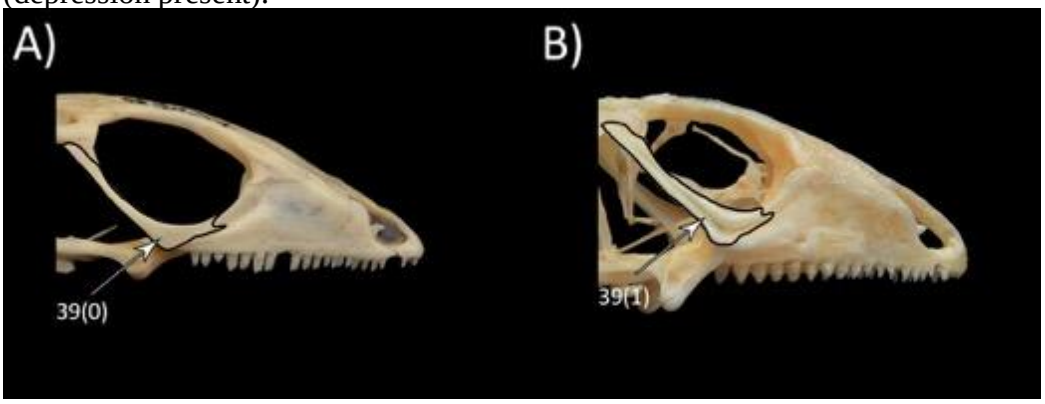


Figure 39S. A) *Cnemidophorus lemniscatus* MZUSP 40410; B) *Dicrodon guttulatum* MZUSP 19384. Lateral views of the skulls, no scale bar.

(40) Jugal, suborbital process height (modified from Brizuela, 2010: 29; Gauthier *et al*., 2012: 150): (0) less than one-half the orbit; (1) one-half or more of the orbit.

Comments: We redefined the character states from both Brizuela (2010) and Gauthier *et al*. (2012), adding a metrical parameter to the height of the suborbital process of the jugal. The suborbital ramus height is measured from the highest point of the orbit, on the ventral margin of the frontal, to the lowest point of the orbit, at the jugal suborbital process.

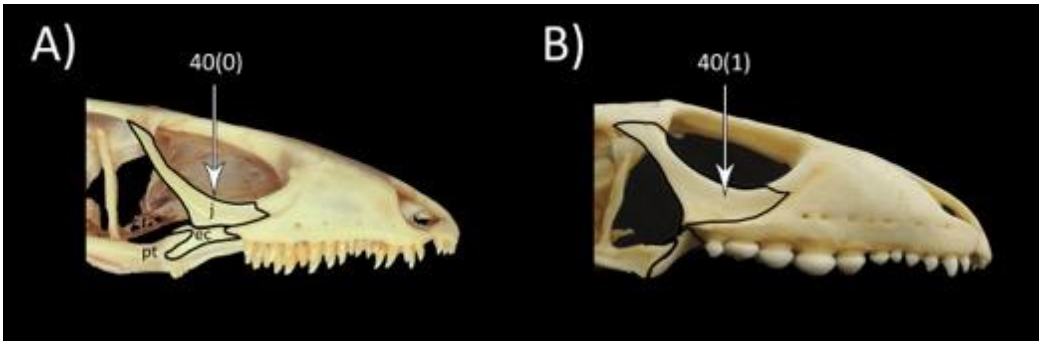


Figure 40S. A) *Callopistes maculatus* MZUSP 8037; B) *Dracaena guianensis* MZUSP 40082. Lateral views of the skulls, no scale bar. **Abbreviations**: **ec**, ectopterygoid; **j**, jugal*;* **pt**, pterygoid.

(41) Jugal postorbital ramus development (Estes *et al.*, 1988: 32; Gauthier *et al.*, 2012: 152): (0) complete bony postorbital bar; (1) incomplete bony postorbital bar; (2) bony postorbital bar absent.

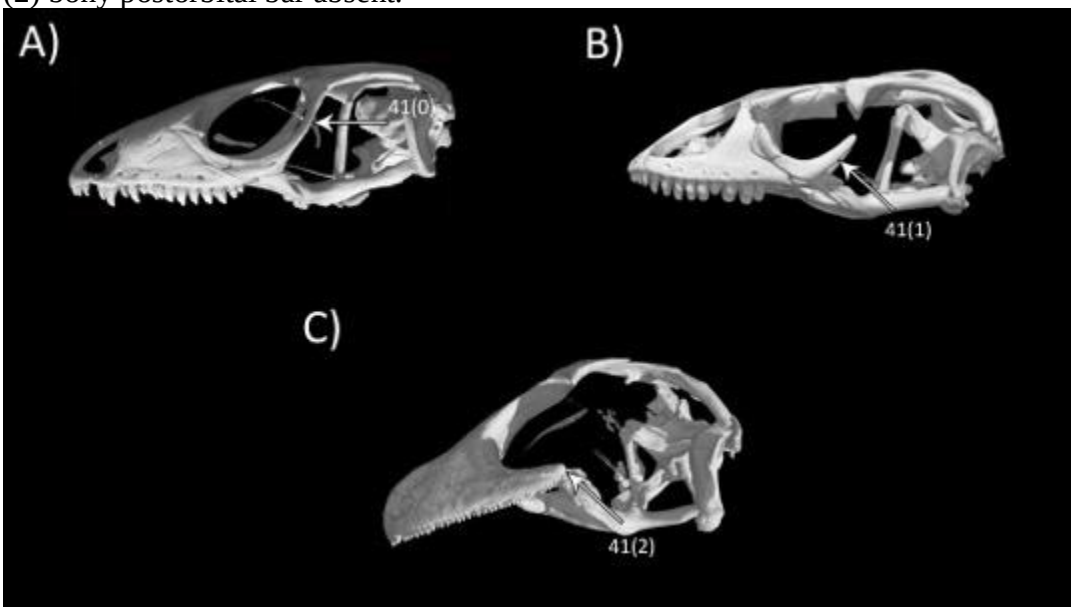


Figure 41S. A) *Callopistes maculatus* FMNH 53726; B) *Varanus exanthematicus* FMNH 58299; C) *Gekko gecko* FMNH 186818. Lateral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(42) Jugal posterior process (also known as posteroventral or zygomatic) (Gao & Norell, 1998: 14; Conrad, 2008: 48; Brizuela, 2010: 26; Gauthier *et al*., 2012: 155): (0) complete lower temporal bar; (1) reduced to a discrete bony posterior process; (2) absent.

Comments: We follow usage of this character according to Gauthier *et al*. (2012). Scoring for *Pholidobolus montium* was modified from state (1) to state (2).

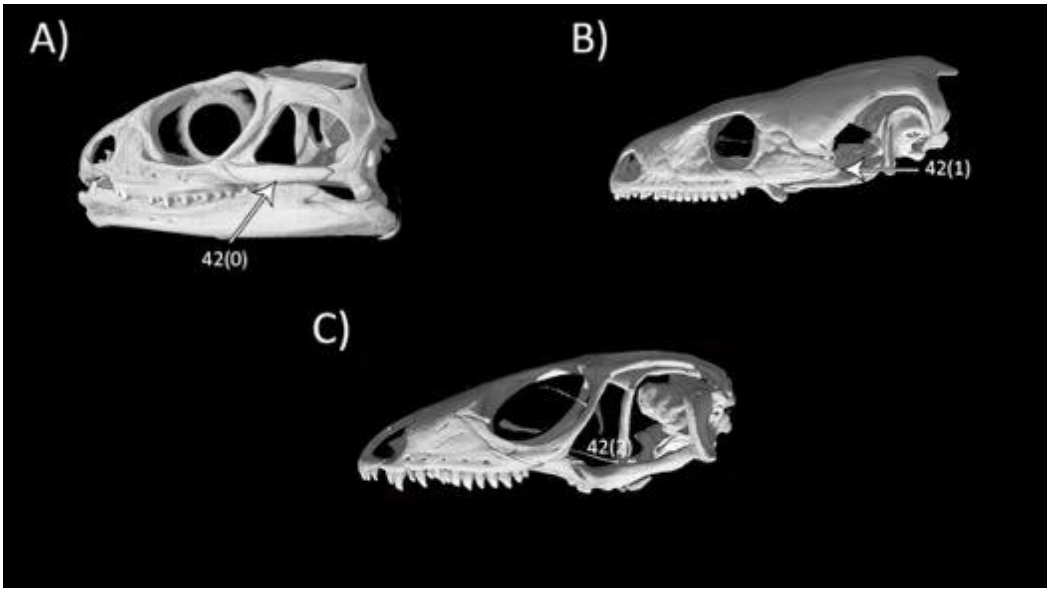


Figure 42S. A) *Sphenodon punctatus* YPM 9194; B) *Lepidophyma flavimaculatum* LACM 128570; C) *Callopistes maculatus* FMNH 53726. Lateral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(43) Jugal contacts squamosal (Estes *et al.*, 1988: 18; modified from Gauthier *et al.*, 2012: 154): (0) point-to-point contact; (1) absent; (2) broad contact.

Comments: We follow usage of this character according to Gauthier *et al*. (2012). State 2 (*broad contact*) is new to Gauthier *et al*.'s (2012) matrix. The jugal-squamosal contact corresponds to the contact in the postorbital process of the jugal, not with the contact between the posterior process (lower temporal bar) of the quadratojugal and the squamosal, a condition present in *Sphenodon punctatus*. Therefore, this taxon was coded as state 1 (absent).

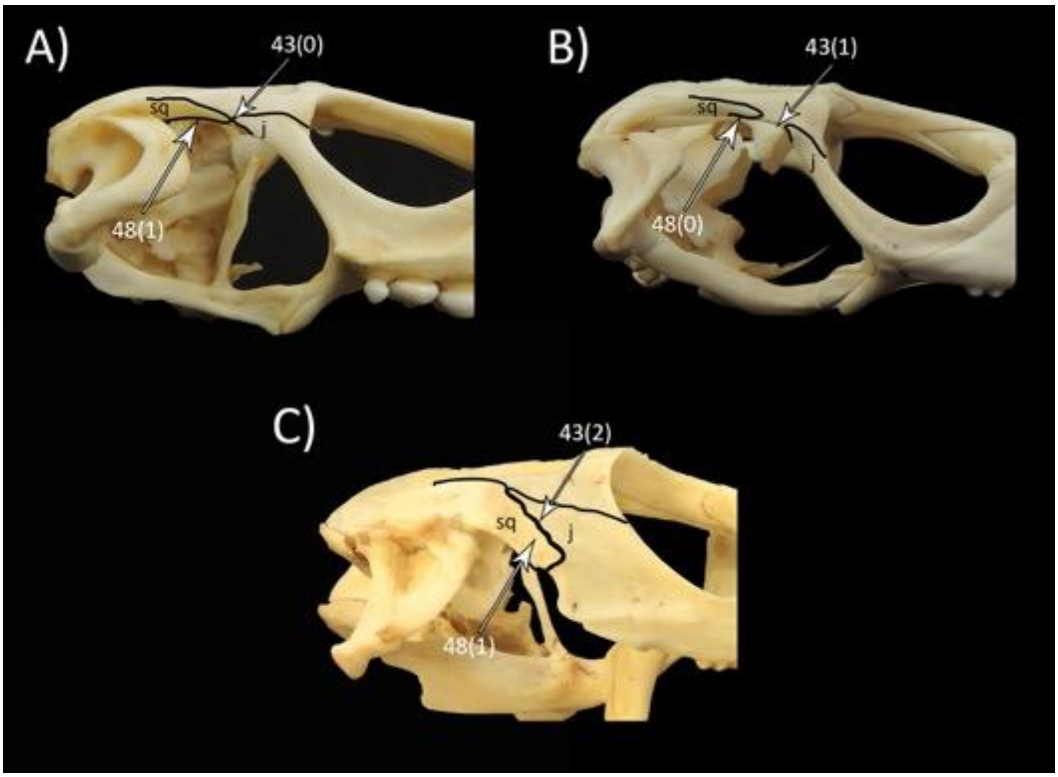


Figure 43S. A) *Dracaena guianensis* MZUSP 40082; B) *Salvator merianae* MZUSP 84998; C) *Pogona vitticeps* MZUSP 100553. Right lateral views of the skulls, no scale bar. **Abbreviations**: **j**, jugal; **sq**, squamosal.

(44) Squamosal (Estes *et al*., 1988: 33; Gauthier *et al*., 2012: 159): (0) present (see Fig.38S:A); (1) absent (see Fig.38S:B). See illustration of this character under character 38.

(45) Squamosal temporal ramus-parietal contact (Gauthier *et al*., 2012: 161): (0) temporal ramus diverges from parietal supratemporal process; (1) temporal ramus broadly contacts parietal supratemporal process.

Comments: Scorings from Gauthier *et al.* (2012) were modified as follow: *Rhineura floridana* was originally scored as state (1), but this species does not possess a squamosal and thus it cannot be scored for this character (-); *Colobosaura modesta* was scored as state (1), but according to our own observation of the species, it does not present a broad contact between the temproal ramus of the squamosal and the parietal supratemporal process (state 0).

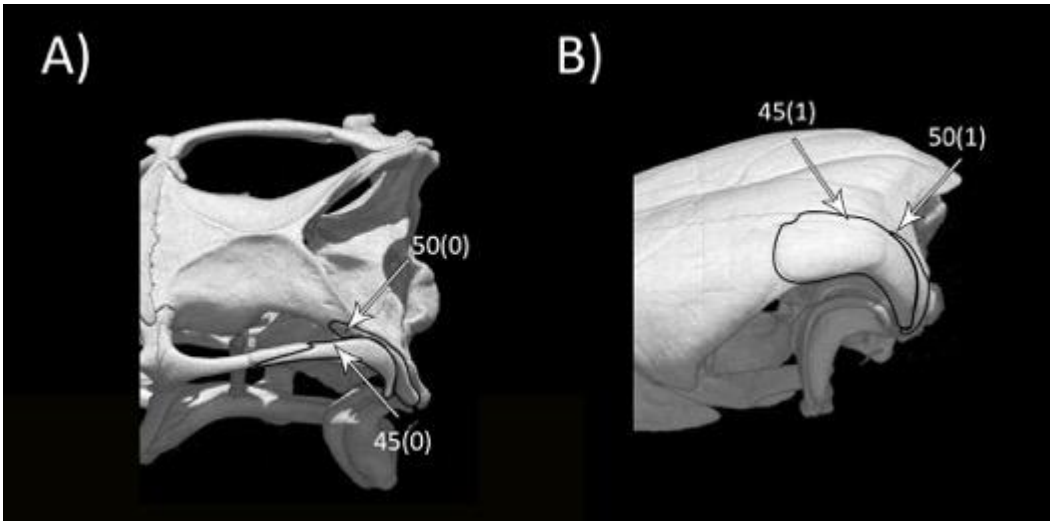


Figure 45S. A) *Callopistes maculatus* FMNH 53726; B) *Lepidophyma flavimaculatum* LACM 128570. Dorsolateral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(46) Squamosal, base of temporal ramus (Gauthier *et al*., 2012: 162): (0) diverges from parietal (see Fig.28S:B); (1) base lies against parietal (see Fig.28S:A). See illustration for this character under character 28.

Comments: Gauthier *et al.*'s (2012) scoring for *Rhineura floridana* was modified same as above.

(47) Squamosal ascending process (Estes *et al.*, 1988: 34; Gauthier *et al*., 2012: 165): (0) present (Fig.28S:B); (1) absent (see Fig.28S:A). See illustration for this character under character 28.

(48) Squamosal, anterior process (Sullivan & Estes, 1997: 23): (0) barlike, round (see Fig.43S:B); (1) modified into tapered blade (see Fig.43S:A,C). See illustration for this character under character 43.

(49) Supratemporal (Estes *et al*., 1988: 35; Gauthier *et al*, 2012: 166): (0) present (see Fig.38S:A); (1) absent (see Fig.38S:B). See illustration for this character under character 38.

(50) Supratemporal shortens (modified from Gauthier *et al*., 2012: 167): (0) supratemporal longer than squamosal-parietal contact (see Fig.45S:A); (1) supratemporal very small (see Fig.45S:B). See illustration for this character under character 45.

Comments: We modified the original character description by Gauthier *et al*. (2012), excluding state 1 (*supratemporal shorter than squamosal-parietal contact*) for being non-informative for our analysis.

(51) Anteromedial edge of supratemporal fenestra (Denton & O'Neill, 1995 [6]; Nydam & Cifelli, 2002a [6]; Nydam *et al*., 2007 [6]): (0) formed completely by

postfrontal and/or postorbital, parietal excluded from the fenestra; (1) formed by anterolateral extensions of the parietal.

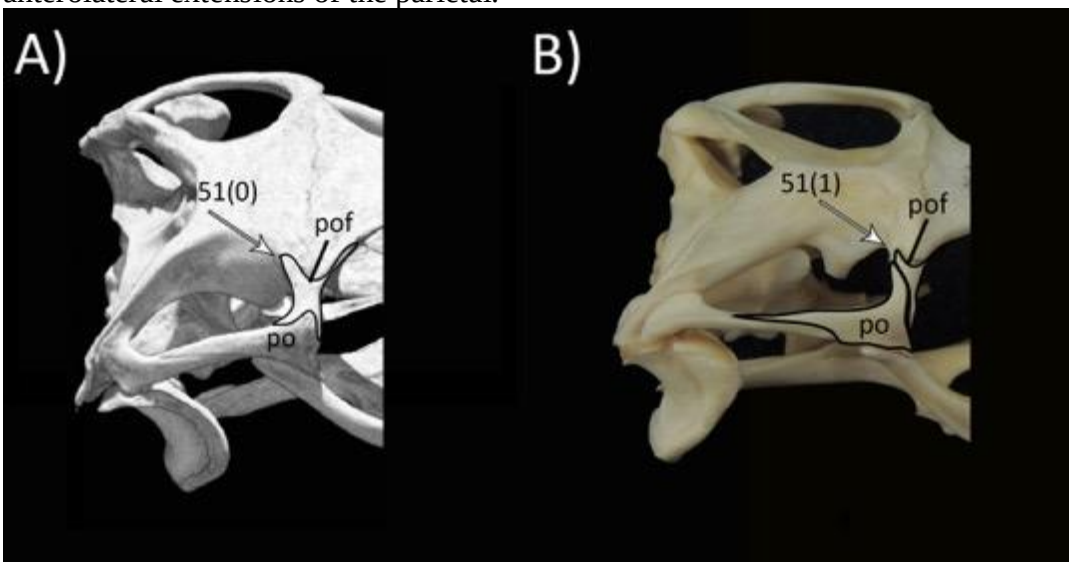


Figure 51S. A) *Teius teyou* FMNH 10873; B) *Salvator merianae* MZUSP 84998. Dorsolateral views of the skulls, no scale bar. **Abbreviations**: **po**, postorbital; **pof**, postfrontal. Image (A) derived from http://digimorph.org.

(52) Palpebral bone (Estes *et al*., 1988: 36; Conrad, 2008: 101): (0) absent; (1) present, a single ossification articulating with or located near the prefrontal.

Comments: We follow usage of this character according to Conrad (2008).

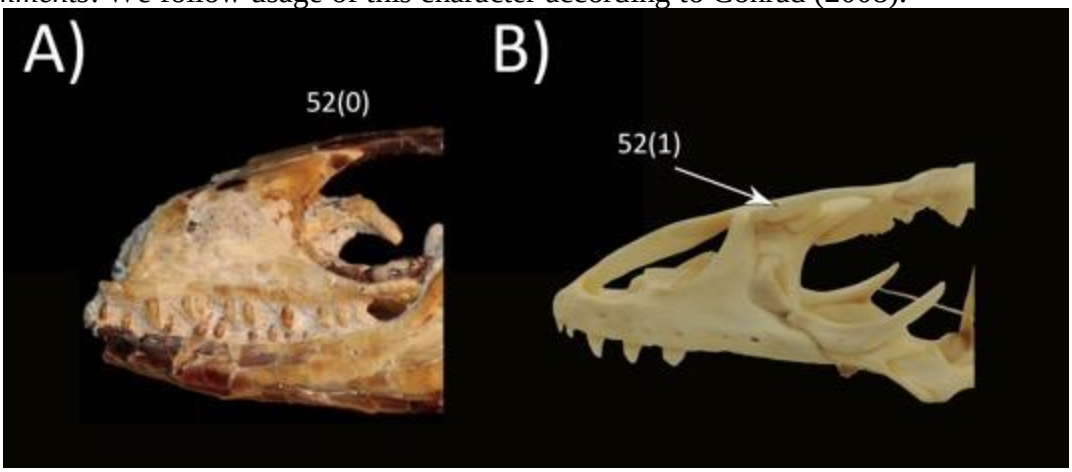


Figure 52S. A) MPCN PV-002; B) *Varanus exanthematicus* MZUSP 101252. Left lateral views of the skulls, no scale bar.

PALATE

(53) Vomer, fusion (Estes *et al*., 1988: 38; Gauthier *et al*., 2012: 212): (0) absent; (1) partial; (2) fully fused.

Comments: We follow usage of this character according to Gauthier *et al*. (2012). Scoring for *Corytophanes cristatus* was modified from state (2) to state (0), given that the specimens analysed did not present fused vomers.

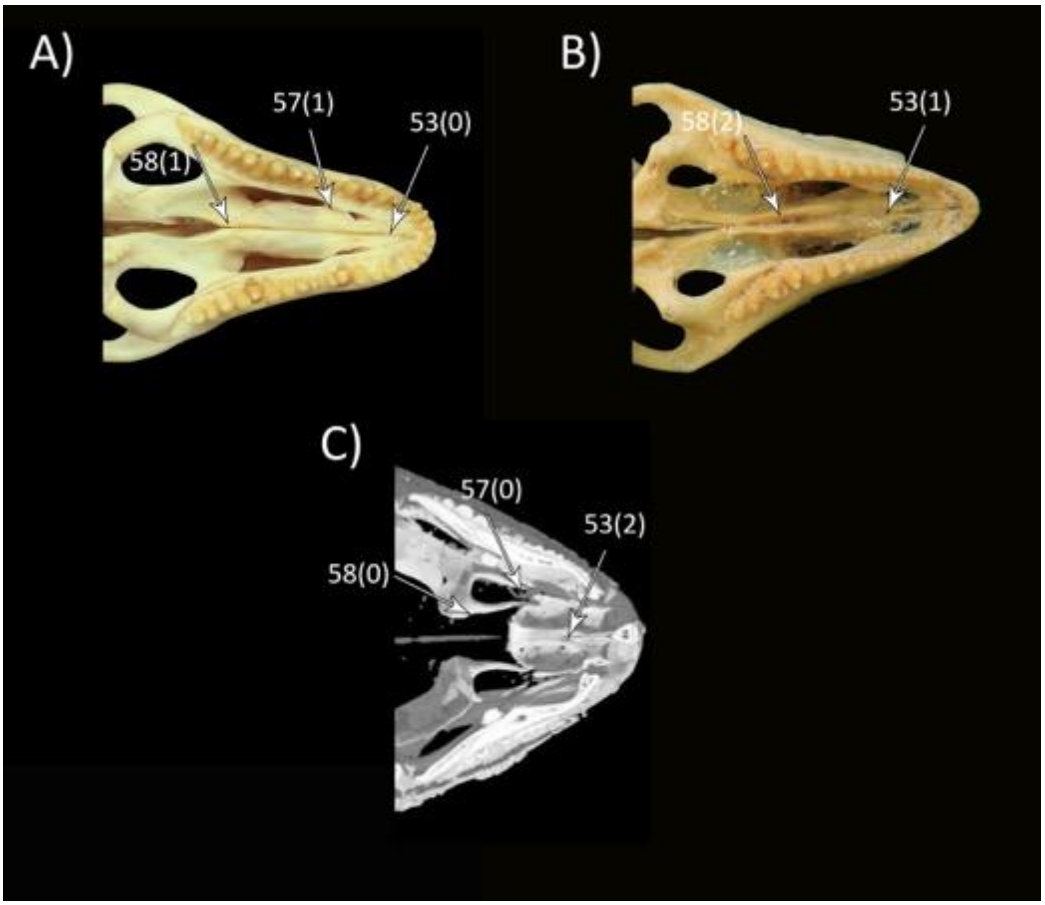


Figure 53S. A) *Callopistes maculatus* MZUSP 8037; B) *Teius teyou* MZUSP 426; C) *Gekko gecko* FMNH 186818. Images (A) and (B), anterior portion of the skulls in ventral view; image (C), dorsoventral horizontal cutaway of the skull, derived from http://digimorph.org.

(54) Vomer size (Estes *et al*., 1988: 39; Gauthier *et al*., 2012: 213): (0) relatively small, extends posteriorly less than half the length of the maxillary tooth row; (1) elongate posteriorly, extends one half or more the length of the maxillary tooth row and usually restricting internal naris.

Comments: We follow usage of this character according to Estes *et al*. (1988).

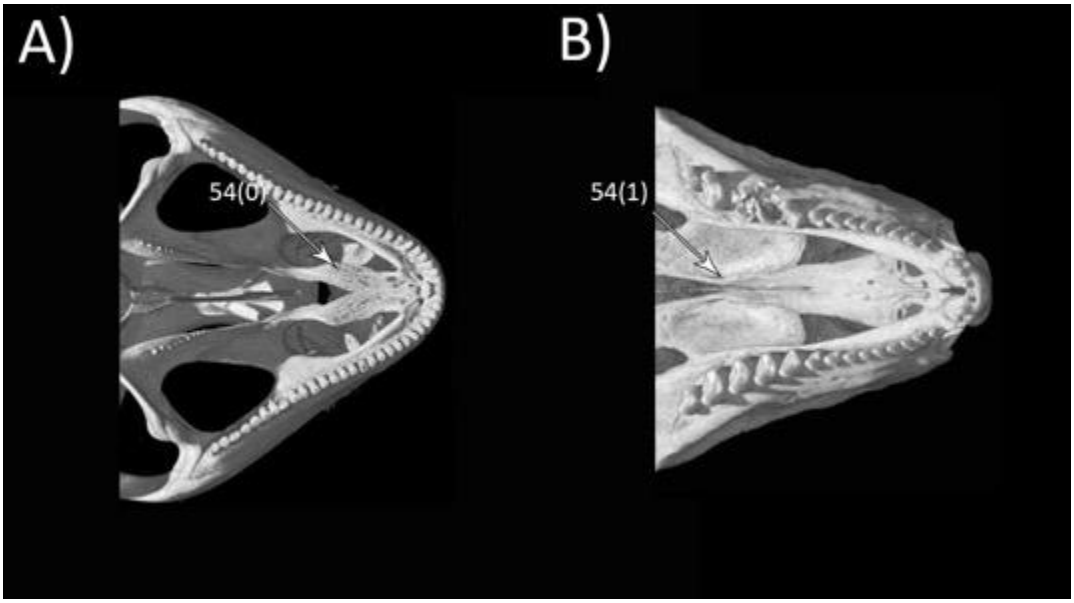


Figure 54S. A) *Enyalioides laticeps* FMNH 206132; B) *Teius teyou* FMNH 10873. Ventral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(55) Vomer (Gauthier *et al*., 2012: 214): (0) main portion plate-like; (1) main portion rod-like.

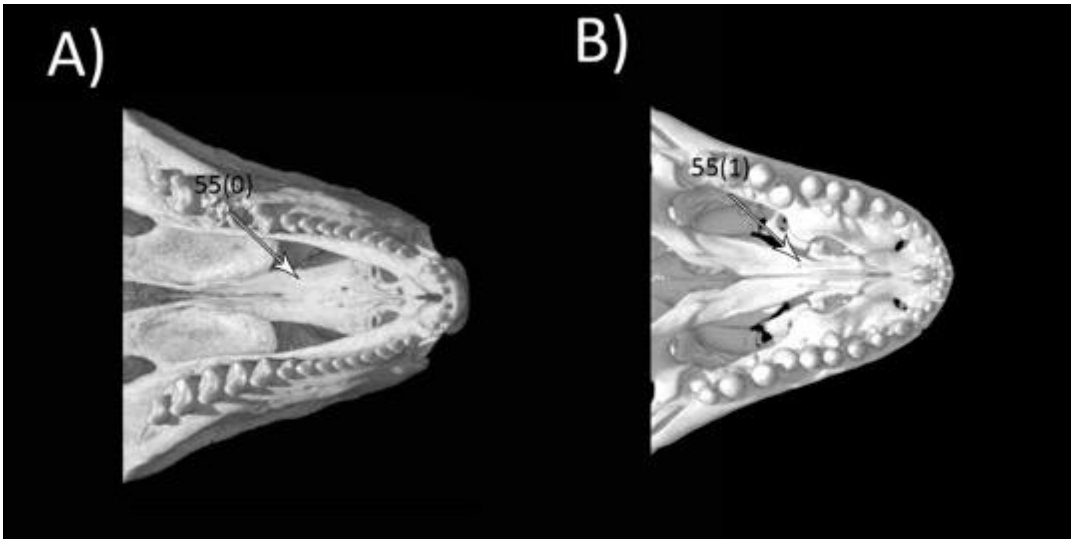


Figure 55S. A) *Teius teyou* FMNH 10873; B) *Varanus exanthematicus* FMNH 58299. Ventral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(56) Vomer overlaps (dorsally) the palatal shelf of the maxilla behind posterior margin of opening of vomeronasal organ (Gauthier, Estes & De Queiroz, 1988; Gauthier *et al*., 2012: 215): (0) absent; (1) present.

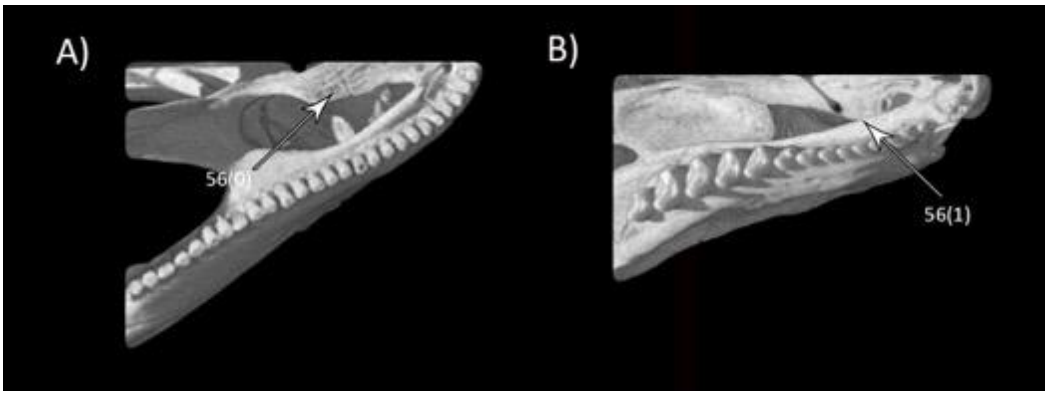


Figure 56S. A) *Enyalioides laticeps* FMNH 206132; B) *Teius teyou* FMNH 10873. Ventral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(57) Vomer (Estes *et al*., 1988: 42; Lee, 1998: 89; Rieppel *et al*., 2008; Brizuela, 2010: 74; modified from Gauthier *et al*., 2012: 216): (0) does not establish any sutural contact with the palatal shelf of the maxilla behind the incisura Jacobsoni (see Fig.53S:C); (1) establishes narrow contact with the palatal shelf of the maxilla behind the incisura Jacobsoni (see Fig.53S:A). See illustration for this character under character 53.

Comments: This character describes the vomeronasal fenestra, a ventral opening on the palate region that is only present when no sutural contact between the maxillae and vomers is present. Gauthier *et al.*'s (2012) matrix presented a third state 2 (*establishes broad contact with the palatal shelf of the maxilla along entire length of the lateral margin of vomer*), which is non-informative and thus was excluded from our analysis (is found only in Serpentes). Within the family Teiidae, the authors scored only *Aspidoscelis tigris* as state (1), but we observed some variation on the sutural contact between vomers and maxillae on *Teius teyou* and *Callopistes maculatus* and so scored these taxa as [0/1].

(58) Palatines (Lee, 1998: 99; Gauthier *et al*., 2012: 231): (0) separated (see Fig.53S:C); (1) anterior contact only (see Fig.53S:A); (2) contact extends to midpoint, or beyond (see Fig.53S:B). See illustration for this character under character 53.

(59) Septomaxilla, anterolateral process on the lateral transverse crest (modified from Brizuela, 2010: 23): (0) absent; (1) present, reduced to a laterally dislocated "spur"; (2) present, well developed anteromedially.

Comments: Brizuela (2010) described this process as an anteromedial process. However, we consider the process to be in an anterolateral position on the transverse crest of the septomaxilla and changed its definition accordingly.

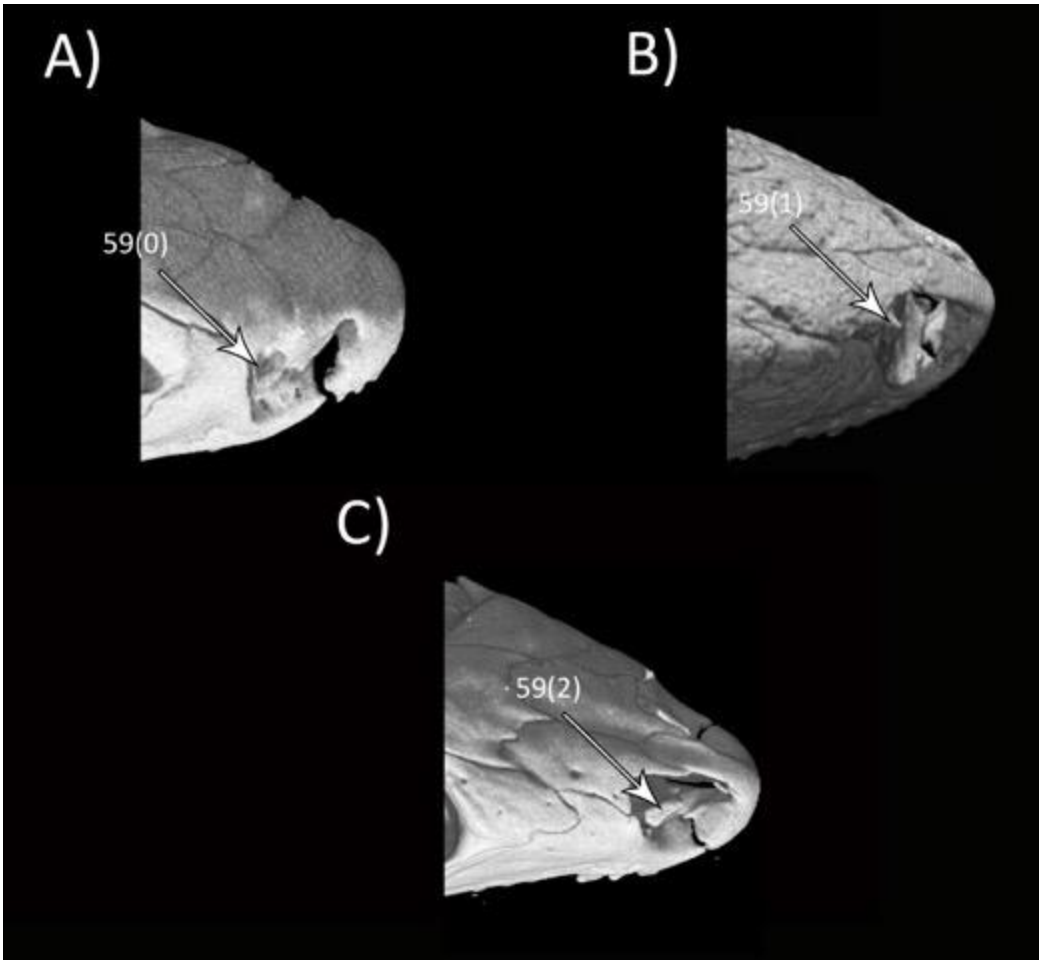


Figure 59S. A) *Colobosaura modesta* USNM 341978; B) *Lacerta viridis* YPM 12858; C) *Callopistes maculatus* FMNH 53726. Dorsolateral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(60) Ectopterygoid-palatine contact lateral to suborbital fenestra (Presch, 1974a; Presch, 1980: 13; Estes *et al*., 1988: 45; Denton & O'Neill, 1995: 5; Lee, 1998: 102; Brizuela, 2010: 77; Gauthier *et al*., 2012: 273): (0) broad lateral contact; (1) narrow lateral contact; (2) contact absent, maxilla forming external edge of suborbital fenestra.

Comments: We slightly changed the definition and common usage of this character (Denton & O'Neill, 1995).

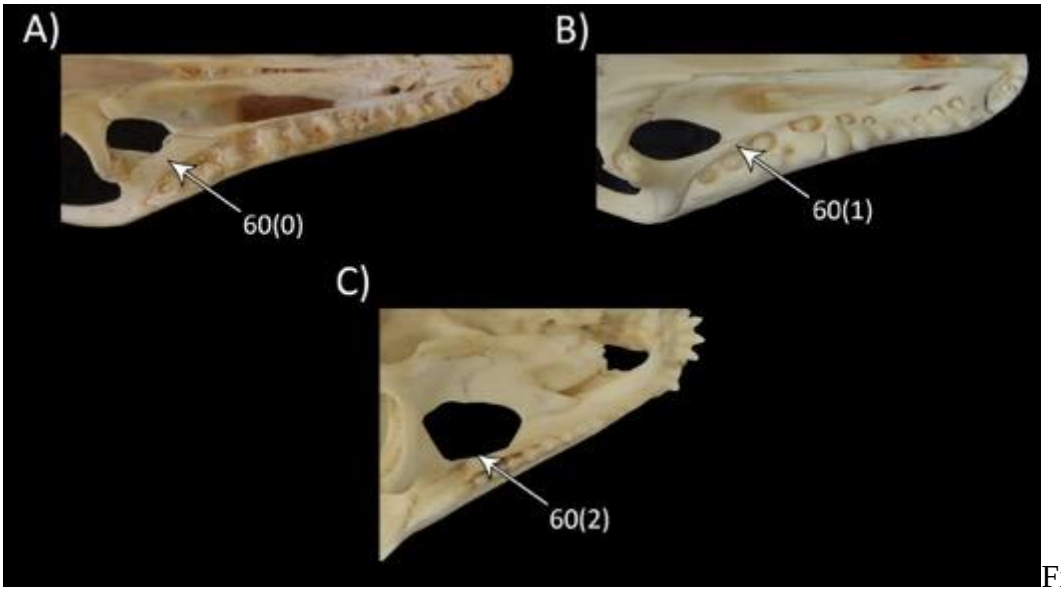


Figure 60S. A) *Ameiva ameiva* MZUSP 43047; B) *Salvator merianae* MZUSP 84998; C) *Pogona vitticeps* MZUSP 100553. Ventral views of the skulls, no scale bar.

(61) Ectopterygoid, size and restriction of the suborbital fenestra (Estes *et al*., 1988: 46; Gauthier *et al*., 2012: 271): (0) ectopterygoid relatively slender, fenestra widely open; (1) ectopterygoid enlarged medially, restricting suborbital fenestra; (2) ectopterygoid highly enlarged medially, closing suborbital fenestra.

Comments: We follow usage of this character according to Gauthier *et al*. (2012), that presented an additional state 2 (*ectopterygoid highly enlarged medially, closing suborbital fenestra*) to Estes *et al*.'s (1988) original description. Although similars, the character 60 describes the anteroposterior development of the ectopterygoid and its contribution on the external edge of the suborbital fenestra, while character 61 describes the medial development of the ectopterygoid when its contribution on the external edge of the suborbital fenestra is already present. Scoring in Gauthier *et al*. (2012) for *Tupinambis teguixin* was modified from state (1) to (0), given that the observed specimens present an ectopterygoid that is slender and the suborbital fenestra widely open.

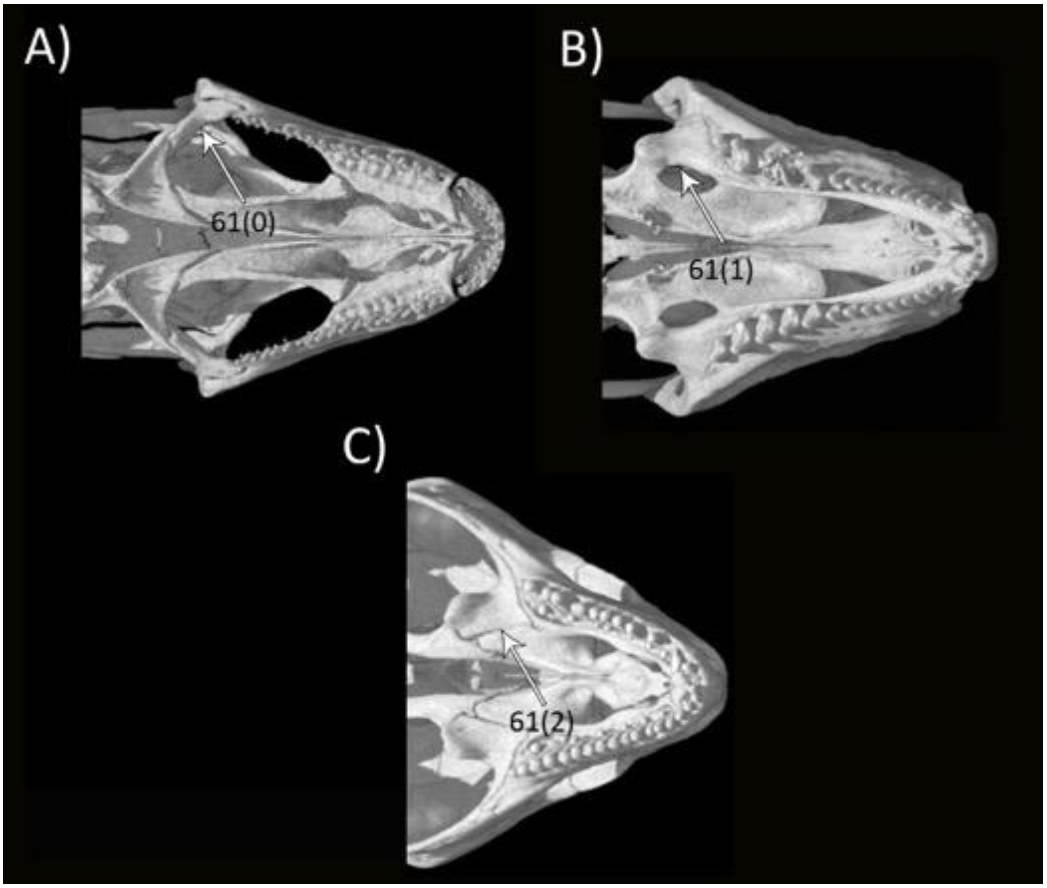
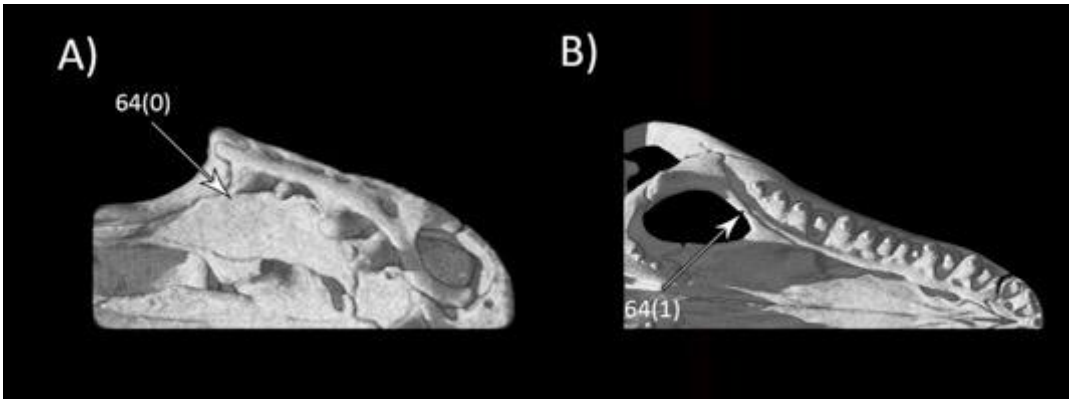


Figure 61S. A) *Colobosaura modesta* USNM 431978; B) *Teius teyou* FMNH 10873; C) *Lepidophyma flavimaculatum* LACM 128570. Ventral views of the skulls, no scale bar. Images derived from http://digimorph.org.



(62) Ectopterygoid, lateral exposure posterior to the maxilla (McDowell & Bogert, 1954; Conrad, 2008: 126): (0) absent; (1) present.

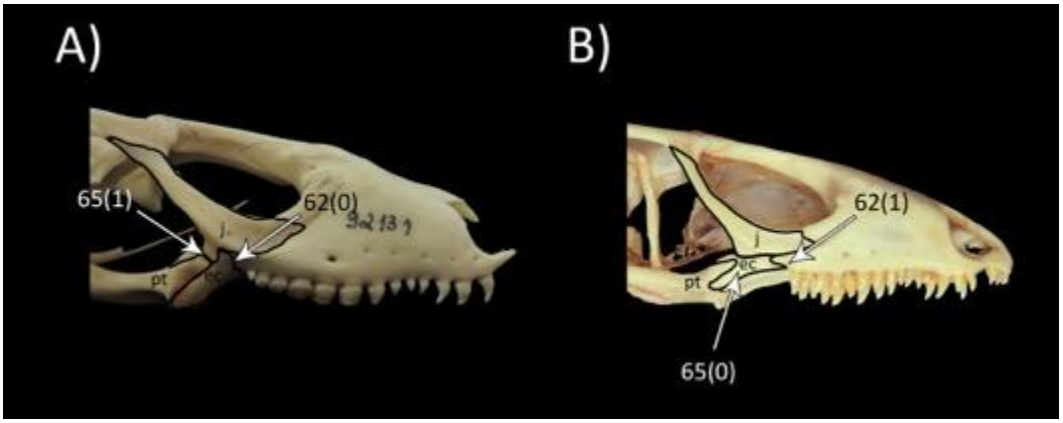


Figure 62S. A) *Salvator duseni* MZUSP 92131; B) *Callopistes maculatus* MZUSP 8037. Lateral views of the skulls, no scale bar. **Abbreviations**: **ec**, ectopterygoid; **j**, jugal; **pt**, pterygoid.

(63) Pterygoid, pyriform recess width (Estes *et al*., 1988: 48; Gauthier *et al*., 2012: 258): (0) narrow throughout most of its length; (1) broad.

Comments: We follow usage of this character according to Estes *et al*. (1988).

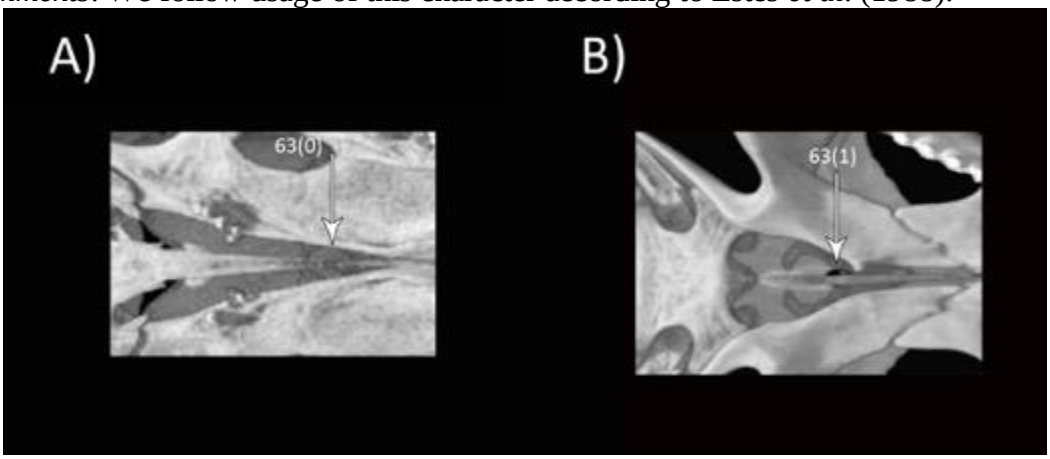


Figure 63S. A) *Teius teyou* FMNH 10873; B) *Pogona vitticeps* ROM 22699. Ventral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(64) Pterygoid, palatine ramus clasps pterygoid ramus of palatine (Wu *et al*., 1996: 93; Gauthier *et al*., 2012: 261): (0) absent; (1) present.

Comments: We follow usage of this character according to Gauthier *et al*. (2012).

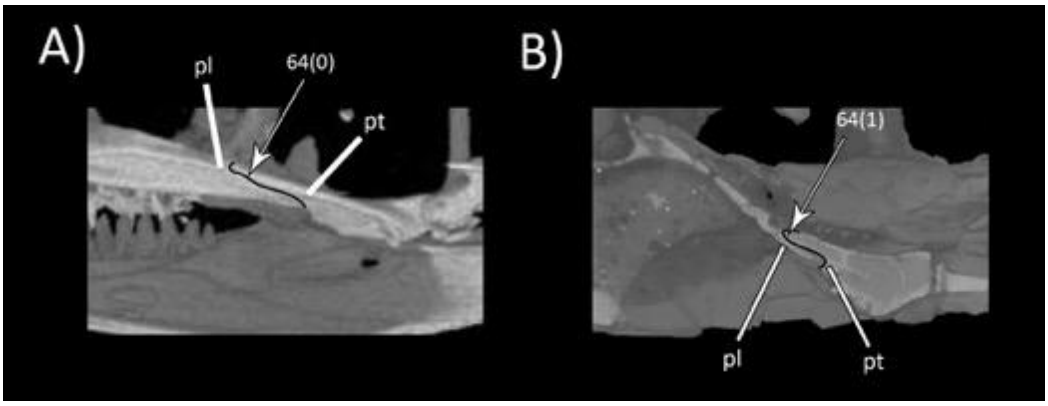


Figure 64S. A) *Colobosaura modesta* USNM 341978; B) MPCN PV-002. Close-up sagital cutaway views of the skulls, no scale bar. **Abbreviations**: **pl**, palatine; **pt**, pterygoid. Image (A) derived from http://digimorph.org.

(65) Pterygoid, contact with jugal (Gao & Norell, 1998; Conrad, 2008: 116): (0) absent, the ectopterygoid prevents the pterygoid-jugal contact (see Fig.62S:B); (1) present, the ectopterygoid is below the pterygoid-jugal contact (see Fig.62S:A). See illustration for this character under character 62.

Comments: We follow usage of this character according to Conrad (2008). Scorings were modified as follows: members of the subfamily Teiinae were scored as state (1) and of Tupinambinae as state (0), but in our study we actually observed the opposite condition, although, whithin Tupinambinae, *Callopistes maculatus* and *Tupinambis quadrilineatus* (polimorphic) do not present the contact (state 0).

(66) Pterygoid, transverse process with a well marked crest, in ventral view (modified from Brizuela, 2010: 79): (0) present; (1) absent.

Comments: Brizuela's (2010) original character states treated the presence/absence of a crest and development of the same as different states of homologies. We maintained here only presence/absence for this character.

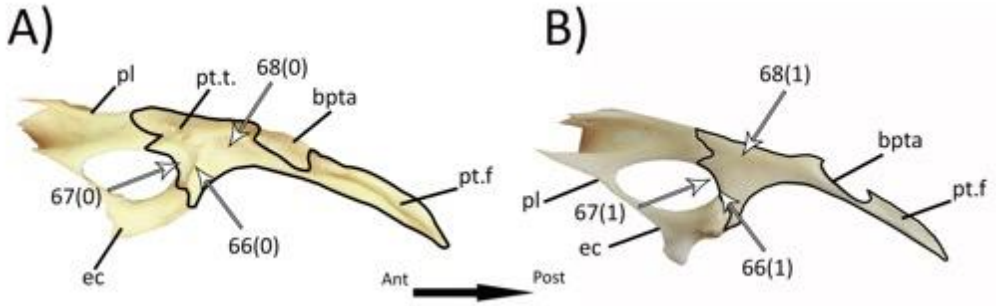


Figure 66S. A) Right pterygoid of *Callopistes maculatus* MZUSP 8037; B) right pterygoid of *Salvator merianae* MZUSP 85000. Ventral views of the pterygoids, no scale bar. **Abbreviations**: **bpta**, basipterygoid articulation; **ec**, ectopterygoid; **pl**, palatine; **pt**.**f**., pterygoid fossa; **pt**.**t**., pterygoid teeth.

(67) Pterygoid, anterior depression (modified from Brizuela, 2010: 82): (0) present (see Fig.66S:A); (1) absent (see Fig.66S:B). See illustration for this character under character 66.

Comments: The anterior depression is located between the transverse and palatine processes of the pterygoid, on the posterior margin of the suborbital fenestra.

(68) Pterygoid, ventral depression (Lee, 1997: 60, 1998: 106; Brizuela, 2010: 78): (0) present (see Fig.66S:A); (1) absent (see Fig.66S:B). See illustration for this character under character 66.

Comments: The ventral depression is a ventral groove developed on the posterolateral margins of the transverse and palatine processes of the pterygoid, extending from the suborbital fenestra to the basipterygoid articulation.

(69) Pterygoid, quadrate process (ramus) (pterygoid fossa) (modified from Brizuela, 2010: 80; Gauthier *et al*., 2012: 265): (0) without groove; (1) with a distinct longitudinal groove on the outer surface.

Comments: There may be some sort of confusion when scoring the pterygoid fossa on different Squamate families. Here, we follow usage of this character according to Gauthier *et al*. (2012), although in their matrix the original state 1 (*blade-like, with a distinct longitudinal groove on the outer surface*) is known mostly for Serpents, and so we modified this state for what we observed on the various lizard species present in our analysis (a pterygoid quadrate process round and with a distinct longitudinal groove on the ventral surface).

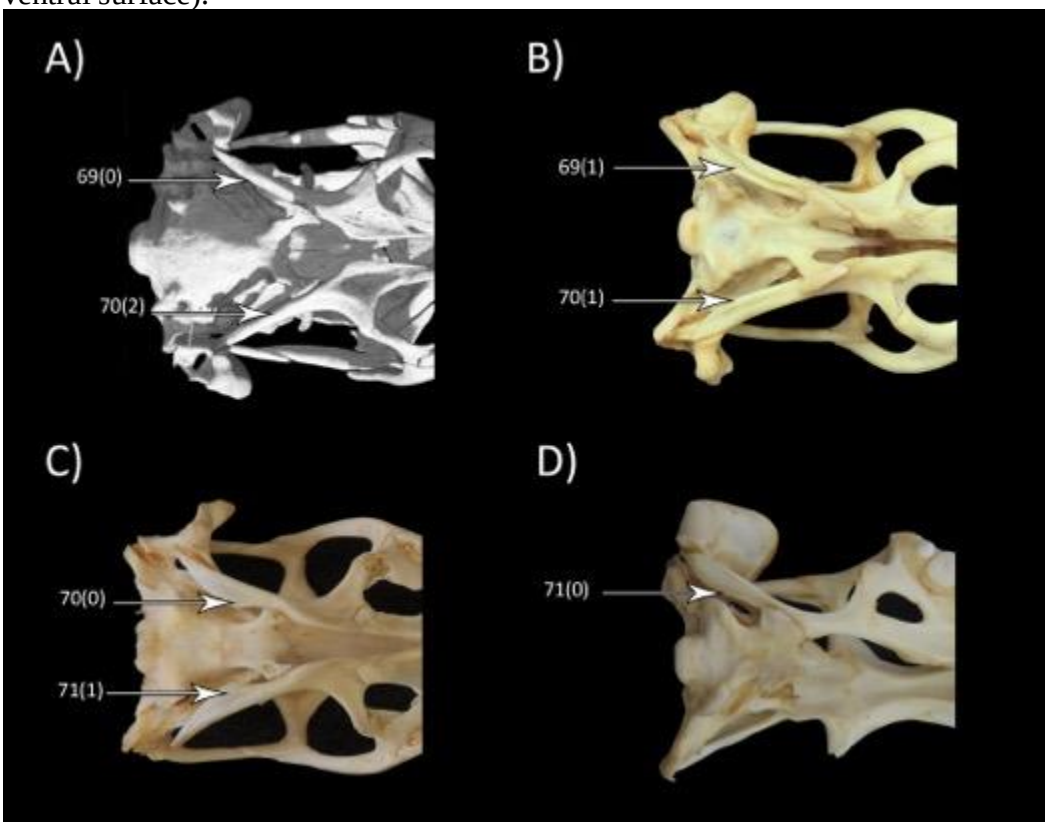


Figure 69S. A) *Pholidobolus montium* FMNH 197865; B) *Callopistes maculatus* MZUSP 8037; C) *Ameiva ameiva* MZUSP 43047; D) *Dracaena guianensis* MZUSP 40082. Ventral views of the skulls, no scale bar. Image (A) derived from http://digimorph.org.

(70) Pterygoid, medial expansion of the quadrate process, in ventral view (Presch, 1974a: 2; Sullivan & Estes, 1997: 2; Brizuela, 2010: 81): (0) well expanded, blade-like quadrate process (see Fig.69S:C); (1) lightly expanded, blade-like quadrate process (see Fig.69S:B); (2) absent, rod-like quadrate process (see Fig.69S:A). See illustration for this character under character 69.

Comments: Some taxa, like *Dracaena guianensis, D. paraguayensis* and *Pogona vitticeps*, present a quadrate process dorsoventrally expanded, but not medially. For this reason, we present here a new character (71 below).

(71) Pteryogoid, dorsoventral expansion of the quadrate process (New character): (0) present (see Fig.69S:D); (1) absent (see Fig.69S:C). See illustration for this character under character 69.

(72) Pterygoid dentition (Pregill *et al*., 1986: 35; Gauthier *et al*., 2012: 267): (0) present; (1) absent.

Comments: We modified scorings in Gauthier *et al.* (2012) as follows: *Corytophanes cristatus* actually retains pterygoid teeth so was scored as state (0).

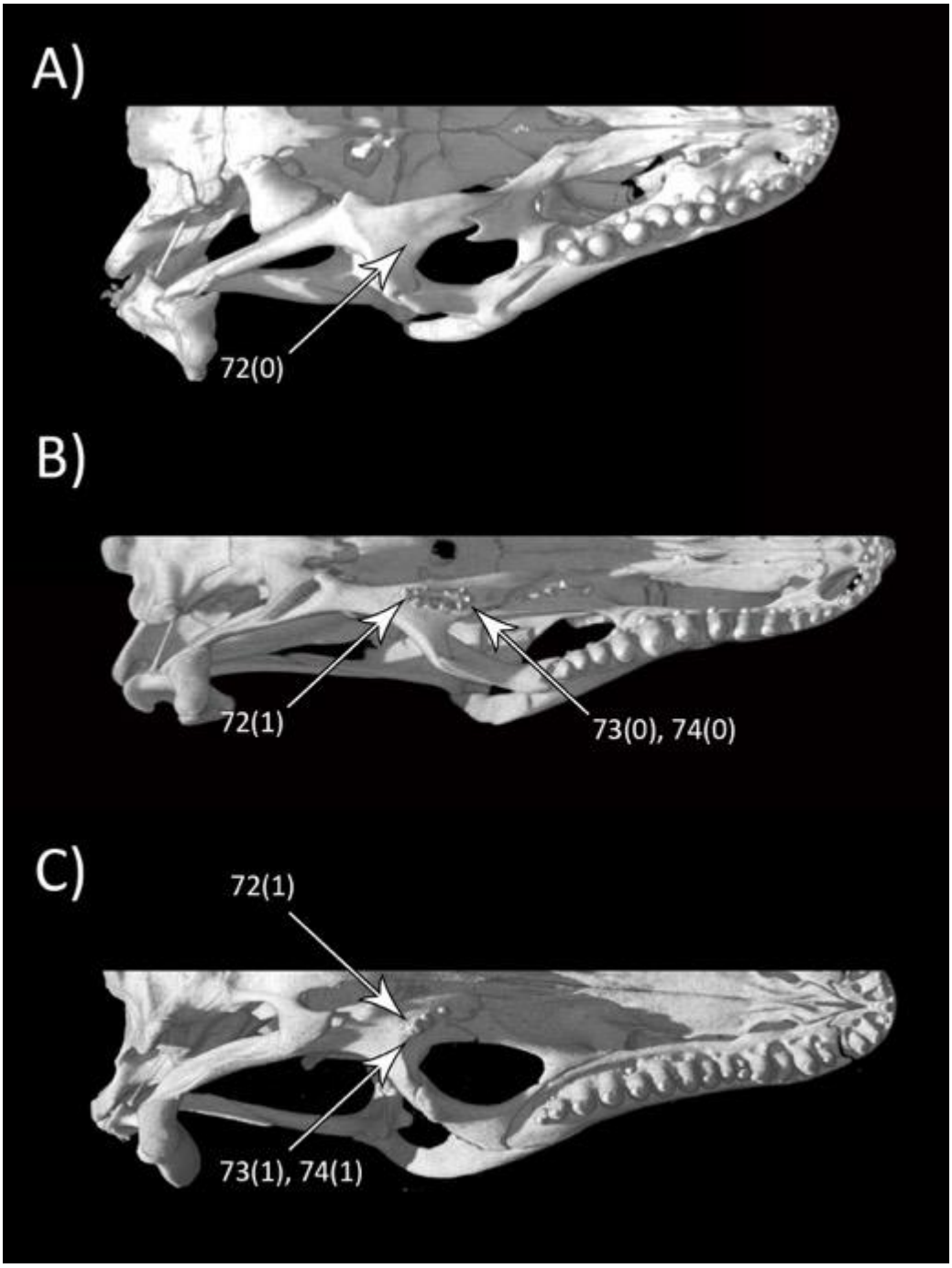


Figure 72S. A) *Varanus exanthematicus* FMNH 58299; B) *Pseudopus* (*Ophisaurus*) *apodus* YPM 12870; C) *Callopistes maculatus* FMNH 53726. Ventral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(73) Pterygoid teeth, size (Lee, 1998: 162; modified from Gauthier *et al*., 2012: 268): (0) small conical teeth (see Fig.72S:B); (1) enlarged, but smaller than marginal teeth (see Fig.72S:C). See illustration for this character under character 72.

Comments: We follow usage of this character according to Gauthier *et al*. (2012), except for their third state 2 (highly enlarged, similar to marginal teeth), which is non-informative and thus was excluded from our analysis.

(74) Pterygoid teeth (modified from Conrad, 2008: 118): (0) arranged in multiple rows or patches (see Fig.72S:B); (1) in a single line (see Fig.72S:C). See illustration for this character under character 72.

Comments: Conrad (2008) originally described this character conjoined with the presence/absence of pterygoid teeth, with the third state being 2 (*absent*). Here, we divided these characteres in presence/absence (character 72) and arrangement of pterygoid teeth (this character).

(75) Pterygoid teeth, count of tooth row (modified from Brizuela, 2010: 126): (0) up to four teeth; (1) five or more.

Comments: This character was modified from Brizuela (2010), who quantified the pterygoid tooth row count in three different states: 0 (*up to three*), 1 (*more than three*) and 2 (*absent*). Here, we adjusted the quantity of teeth to four, and divided Brizuela's states in two distinct characters: pterygoid teeth presence/absence (character 72) and pterygoid tooth row count (this character). The fossil under study present an autapomorphic condition of six to eight pterygoid teeth, a number not previously recorded in any known teiid.

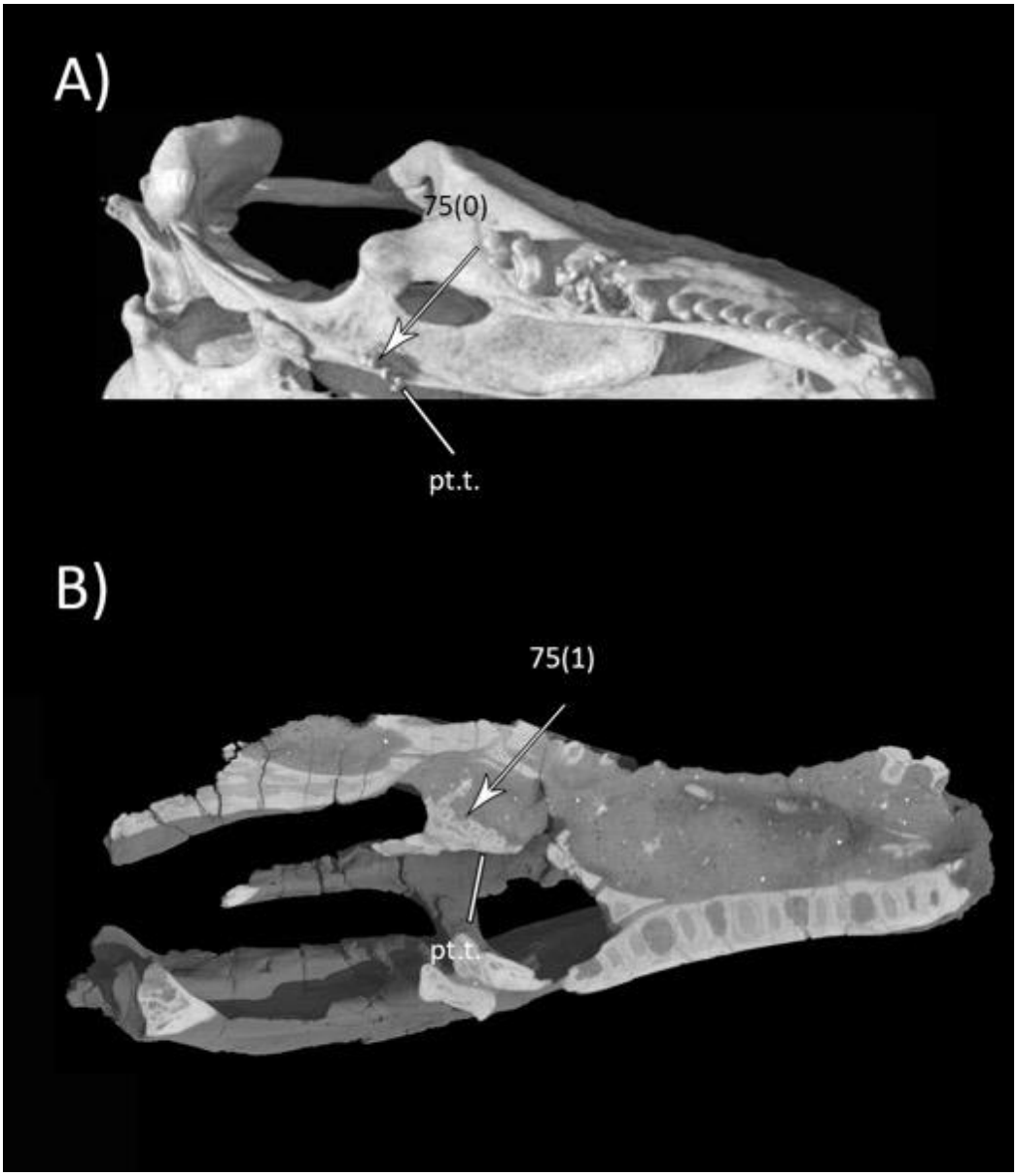


Figure 75S. A) *Teius teyou* FMNH 10873; B) MPCN PV-002. (A) ventral view of the right side of the skull and (B) dorsoventral horizontal cutaway of the skull. No scale bar. **Abbreviation**: **pt.t**., pterygoid teeth. Image (A) derived from http://digimorph.org.

(76) Quadrate, suprastapedial process (Lee, 1997: 30; Conrad, 2008: 163; Gauthier *et al*., 2012: 179): (0) absent; (1) present.

Comments: We follow usage of this character according to Conrad (2008) and Gauthier *et al*. (2012). Lee (1997) describes this character as 0 (*quadrate 'normal', i.e., without elaborated suprastapedial process*); and 1 (*quadrate 'circular', i. e., with enlarged, curved, posteroventrally directed suprastapedial process*). The decision to follow usage according to Conrad's (2008) and Gauthier *et al*.'s (2012) is simply because it is easier to score and we follow these authors scorings as well.

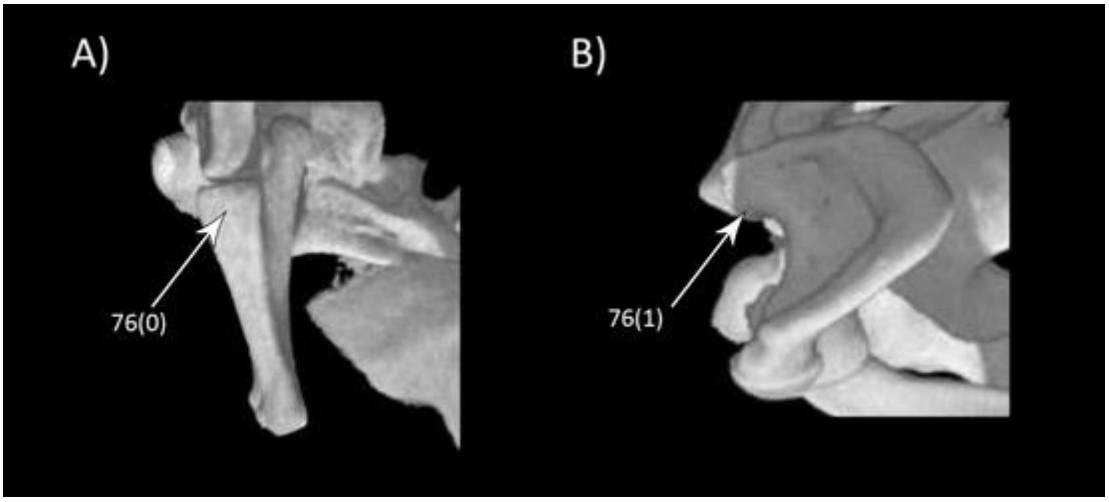


Figure 76S. A) *Chamaeleo laevigatus* FMNH 47572; B) *Tupinambis teguixin* FMNH 22416. Lateral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(77) Quadrate, tympanic crest (Lee, 1997: 31; Lee, 1998: 51; Rieppel & Zaher, 2000a: 51; Conrad, 2008: 162): (0) tympanic crest on quadrate well developed; (1) tympanic crest on quadrate weakly developed; (2) tympanic crest absent.

Comments: Rieppel and Zaher (2000a) modified Lee's (1997, 1998) character description and, later, Conrad (2008) modified Rieppel and Zaher's (2000a) description of this character. Here, we follow Rieppel and Zaher (2000a) and Conrad (2008) for the character description and scorings, respectively, except for *Chamaeleo laevigatus* that was scored as state 1 (differently to Conrad's scoring as 0).

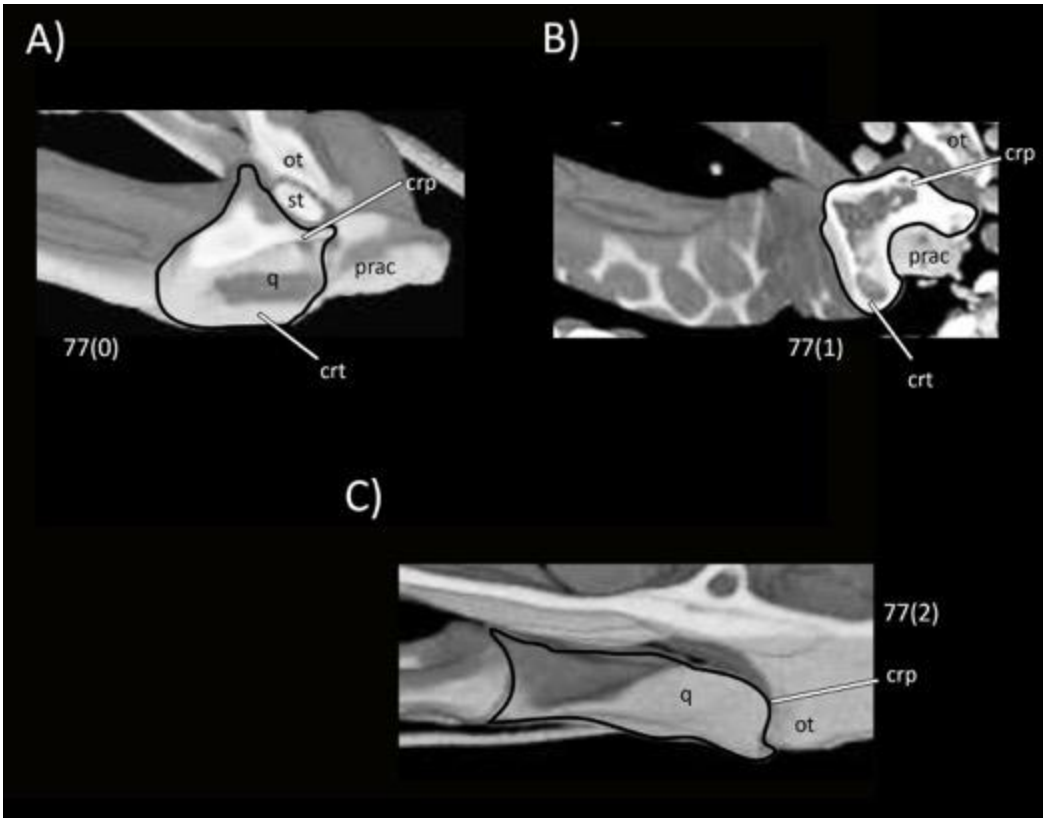


Figure 77S. A) *Tupinambis teguixin* FMNH 22416; B) *Heloderma suspectum* TNHC 62766; C) *Amphisbaena fuliginosa* FMNH 22847. Horizontal cutaways close-ups of the skulls, no scale bar. **Abbreviations**: **crp**, posterior crest; **crt**, tympanic crest; **ot**, otoccipital; **prac**, retroarticular process; **q**, quadrate; **st**, supratemporal. Images derived from http://digimorph.org.

(78) Quadrate, tympanic crest shape (extensively modified from Brizuela, 2010: 63): (0) tympanic crest straight or vertically developed; (1) tympanic crest forming a close-angled "C", with greater development of the anterodorsal portion, or obliquely developed; (2) tympanic crest forming a high-angle "C", posteriorly directed.

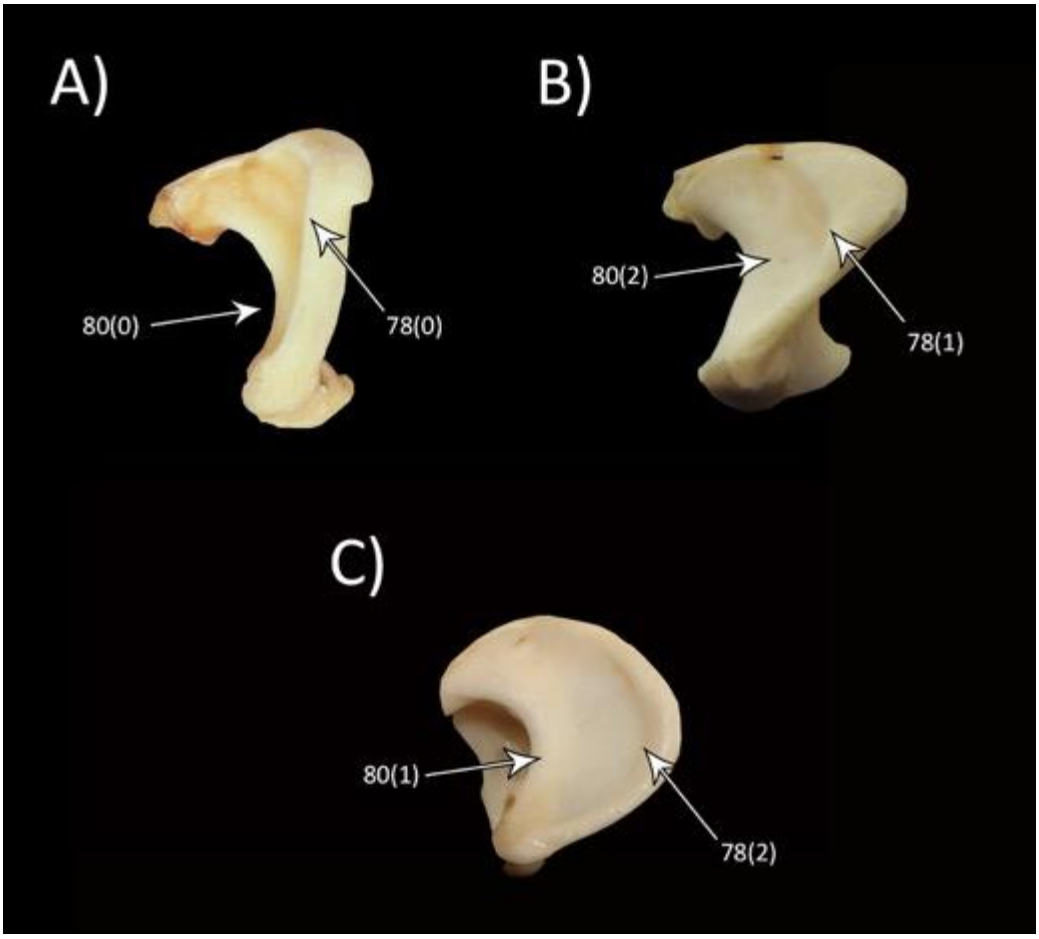


Figure 78S. Right quadrates of A) *Callopistes maculatus* MZUSP 8037; B) *Salvator merianae* MZUSP 84998; C) *Crocodilurus amazonicus* MZUSP 92090. Lateral views of the quadrates, no scale bar.

(79) Quadrate, lateral conch (Gauthier *et al.*, 2012: 180): (0) present; (1) absent.

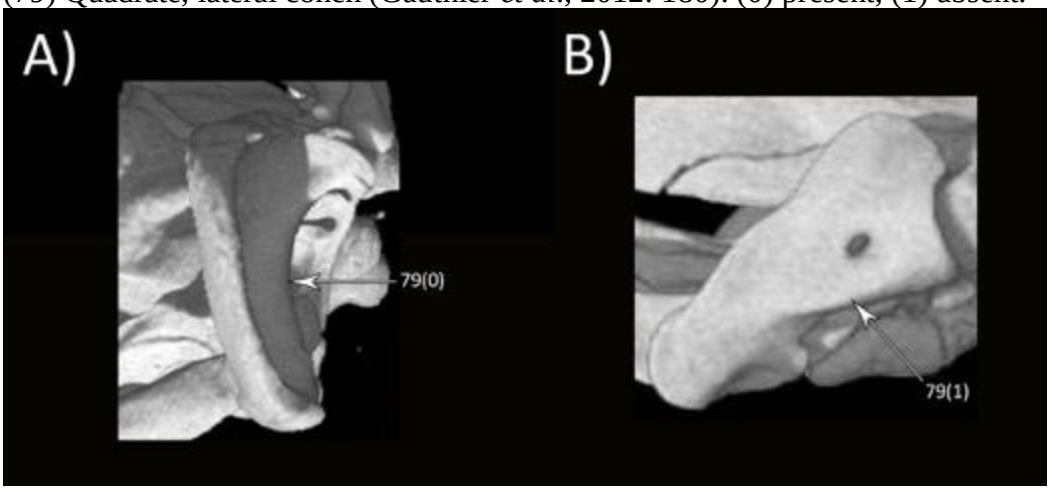


Figure 79S. A) *Callopistes maculatus* FMNH 53726; B) *Amphisbaena fuliginosa* FMNH 22847. Lateral views of the skulls, no scale bar. Images derived from http://digimorph.org.

(80) Quadrate anteroposteriorly expanded (Presch, 1974a: 5; modified in Brizuela, 2010: 60): (0) absent (see Fig.78S:A); (1) present, horizontal development (see Fig.78S:C); (2) present, oblique development (see Fig.78S:B). See illustration for this character under character 78.

Comments: This character was redefined by Brizuela (2010) from Presch's (1974) original description. Here, we follow Brizuela (2010), with scorings modified in the following taxa: members of the *Ameivula nigrigula*, *Cnemidophorus lemniscatus* and *Kentropyx calcarata* were scored as state 1.

(81) Medially expanded quadrate (Denton & O'Neill, 1995: 12; Brizuela, 2010: 61): (0) present; (1) absent.

Comments: According to Brizuela (2010), "*it* (the medial expansion) *refers to expansion (in posterior view) of the quadrate between the posterior crest and the medial border*". Thus, a medially expanded quadrate is present when development of the quadrate is present in both sides. For Brizuela (2010), the primitive state is 0 (*absent*) and the derived state is 1 (*present*). We follow here the original character description and scorings as in Denton and O'Neill (1995), in order to avoid confusion with scorings of this character in previous works (Nydam and Cifelli, 2002; Nydam *et al*., 2007).

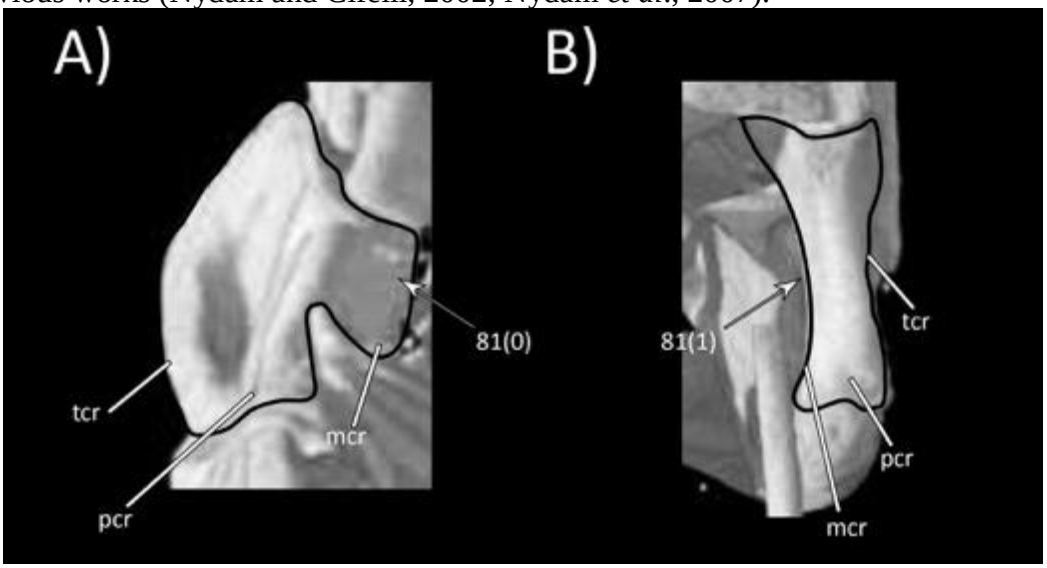


Figure 81S. A) *Tupinambis teguixin* FMNH 22416; B) *Chamaeleo laevigatus* FMNH 47572. Posterior views of the skulls, no scale bar. **Abbreviations**: **mcr**, medial crest; **pcr**, posterior crest; **tcr**, tympanic crest. Images derived from http://digimorph.org.

(82) Quadrate, pterygoid lappet (Estes *et al*., 1988: 37; Conrad, 2008: 160): (0) present; (1) absent.

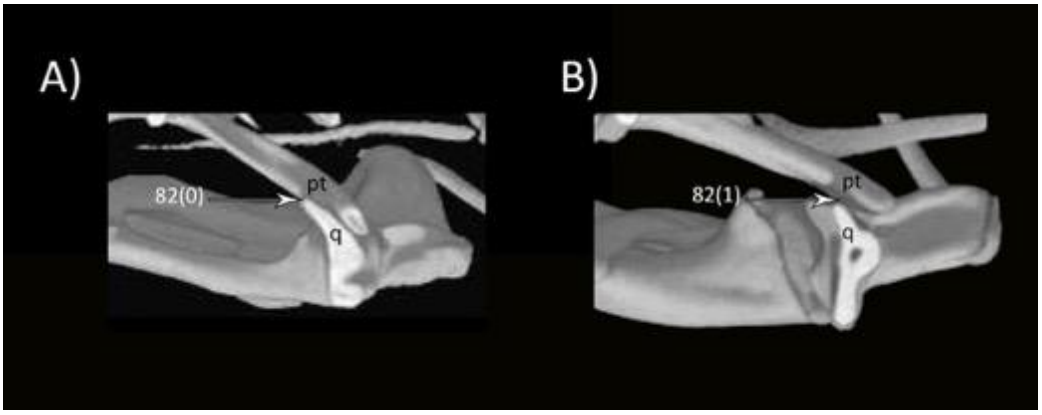


Figure 82S. A) *Tupinambis teguixin* FMNH 22416; B) *Varanus exanthematicus* FMNH 58299. Horizontal cutaways of the skulls in dorsal views, no scale bar. **Abbreviations**: **pt**, pterygoid; **q**, quadrate. Images derived from http://digimorph.org.

(83) Epipterygoid, in resting position (Gauthier *et al*., 2012: 291): (0) located lateral to prootic (even if only narrowly so); (1) located entirely anterior to prootic.

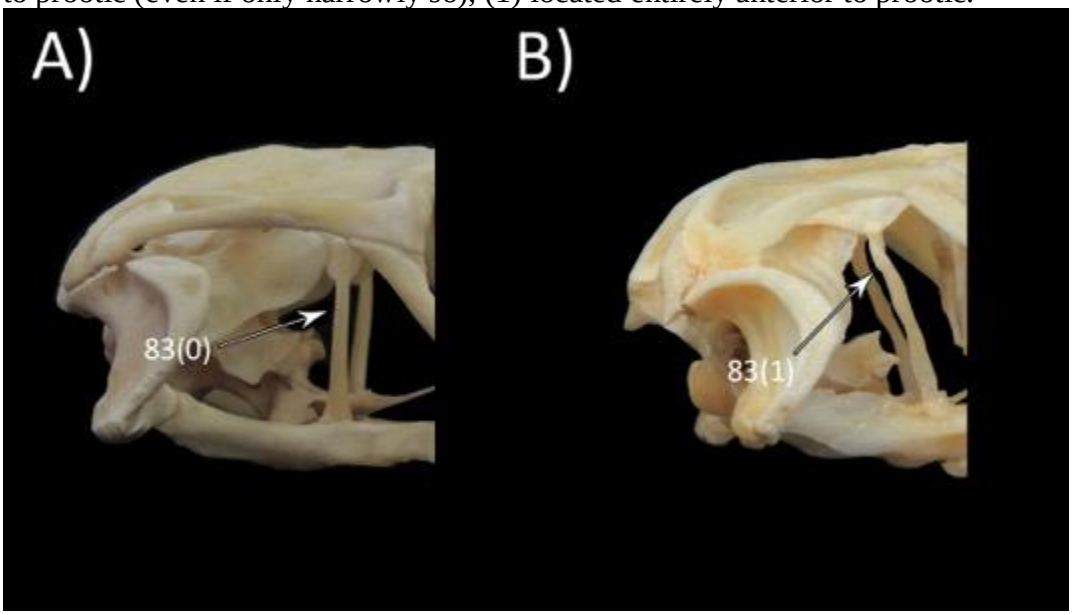


Figure 83S. A) *Salvator rufescens* MZUSP 93083; B) *Dicrodon guttulatum* MZUSP 19384. Lateral views of the skulls, no scale bar.

(84) Epipterygoid-parietal contact (Gauthier *et al*., 2012: 294): (0) absent; (1) overlaps parietal temporal muscle origin (parietal downgrowths).

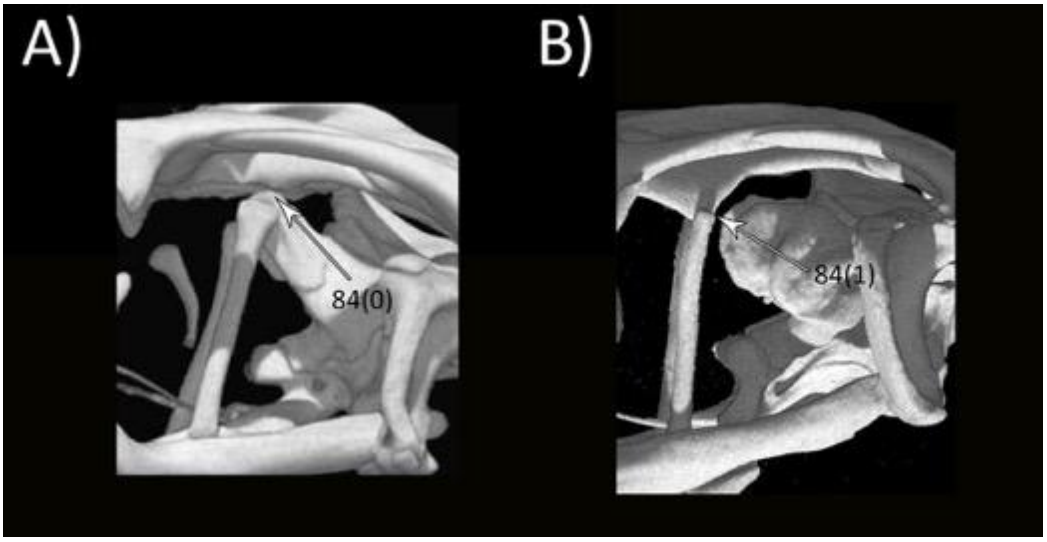


Figure 84S. A) *Varanus exanthematicus* FMNH 58299; B) *Callopistes maculatus* FMNH 53726. Lateral views of the posterior portions of the skulls, no scale bar. Images derived from http://digimorph.org.

BRAINCASE

(85) Braincase, ventral sagittal ridge or crest on the sphenoid and basioccipital (Tchernov *et al*., 2000: 77; Conrad, 2008: 127): (0) absent; (1) present.

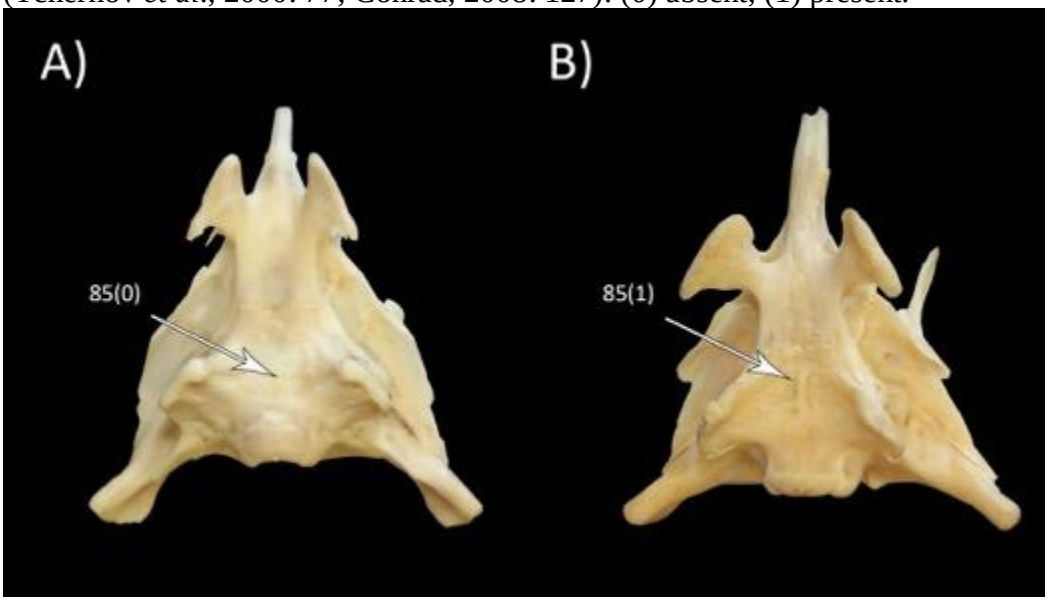


Figure 85S. A) *Ameiva ameiva* MZUSP 2295; B) *Tupinambis teguixin* MZUSP 92087. Ventral views of the isolated braincases, no scale bar.

(86) Parietal-supraoccipital contact (Lee & Scanlon, 2002: 136; modified from Gauthier *et al*., 2012: 96): (0) absent; (1) dorsoventral parasagittal abutment. *Comments*: We follow usage of this character according to Gauthier *et al*. (2012). Gauthier *et al*.'s (2012) matrix presented three additional characters that were excluded because they were non-informative in our dataset: states 1 (*parietal overlaps*

supraoccipital on midline), 2 ([parietal] *abuts supraoccipital on midline*) and 4 (*supraoccipital around processus ascendens tectum synoticum forms stout, flat-topped pedicle that abuts parietal posteroventromedially*). We also modified Gauthier *et al*.'s (2012) scorings for *Callopistes maculatus* and *Tupinambis teguixin*, given that both taxa retain a parietal-supraoccipital contact (state 1).

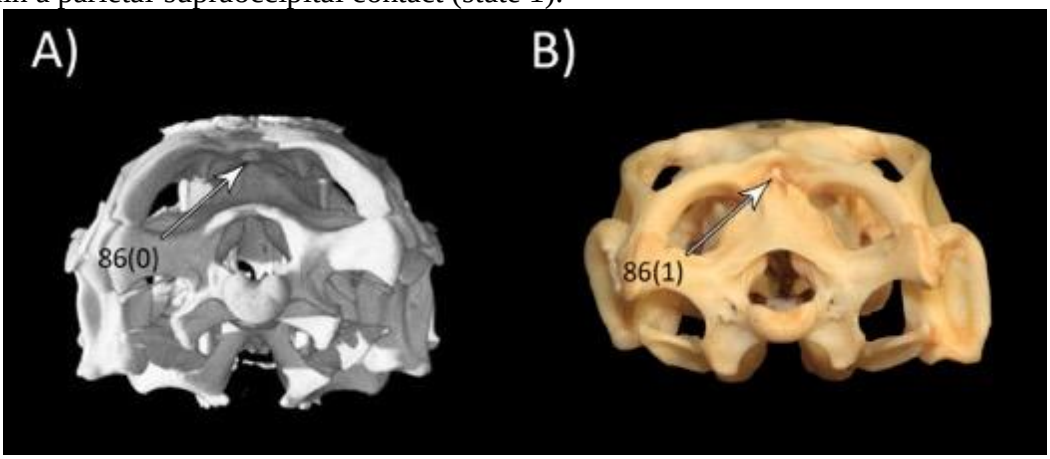


Figure 86S. A) *Pseudopus* (*Ophisaurus*) *apodus* YPM 12870; B) *Callopistes maculatus* MZUSP 8037. Posterior views of the skulls, no scale bar. Image (A) derived from http://digimorph.org.

(87) Crista prootica (Rieppel & Zaher, 2000a: 66; Conrad, 2008: 138; Gauthier *et al*., 2012: 307): (0) well-developed lateral flange; (1) reduced to weak ridge; (2) absent. *Comments*: We follow usage of this character according to Gauthier *et al*. (2012). Conrad's (2008) matrix also presented state 2 (*absent*), but the author did not code any taxa for this state, which made it non-informative. According to Rieppel and Zaher (2000), the *crista prootica* of some taxa of the clade Varanoidea, such as *Heloderma* and *Lanthanotus*, may be considered as state 0 (*well-developed*) when compared to snakes, but when compared to other lizard families, the authors scored these taxa as state 1 (*reduced*), and Serpentes, Amphisbaenidae and Dibamidae as state 2 (*absent*). On the other hand, Gauthier *et al*. (2012) scored *Heloderma suspectum* as state 1 (*reduced*), but analyzing the preserved specimen in our collection we observed it as state 2 (*absent*). Also, the authors scored *Pholidobolus montium* as state 0, but we consider it as state 1.

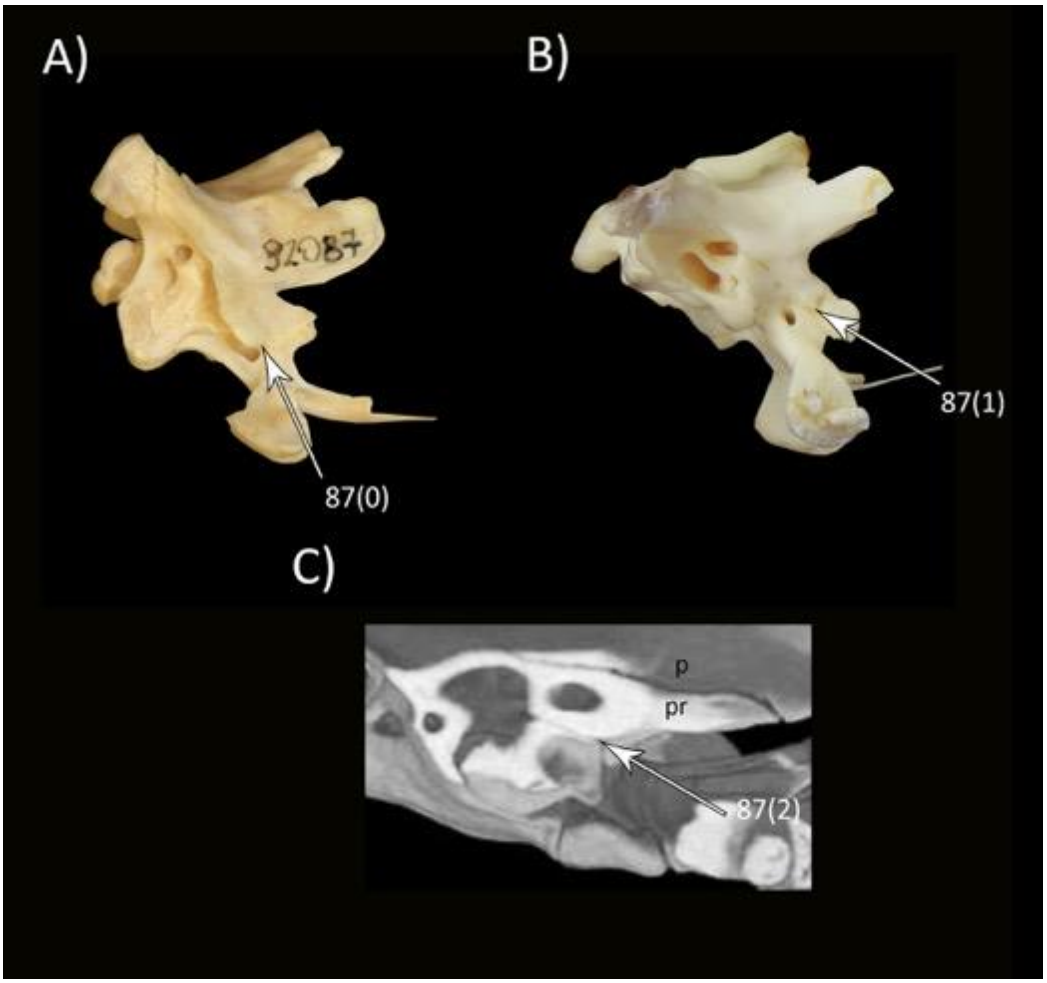


Figure 87S. A) *Tupinambis teguixin* MZUSP 92087; B) *Varanus exanthematicus* MZUSP 101252; C) *Amphisbaena fuliginosa* FMNH 22847. (A) and (B) right lateral views of the isolated braincases; (C) sagittal close-up cutaway view of the braincase, no scale bar. **Abbreviations**: **p**, parietal; **pr**, prootic. Image (C) derived from http://digimorph.org.

(88) Parietal-prootic contact (modified from Gauthier *et al*., 2012: 109): (0) absent; (1) contact at apex of alar process; (2) extensive conformable contact, with parietal overlapping prootic laterally throughout length.

Comments: Gauthier *et al*.'s (2012) matrix presented four different states for this character. We excluded the fourth state 3 (*discrete ventral process of parietal overlaps prootic alar process laterally*) from Gauthier *et al.*'s (2012) original character description, given that it was non-informative in our dataset. Also, we disagree with the authors' scoring for *Callopistes maculatus* as state 0, given that this taxon actually retains the parietal-prootic contact, and thus is considered as state 1 (observed in the dry specimen).

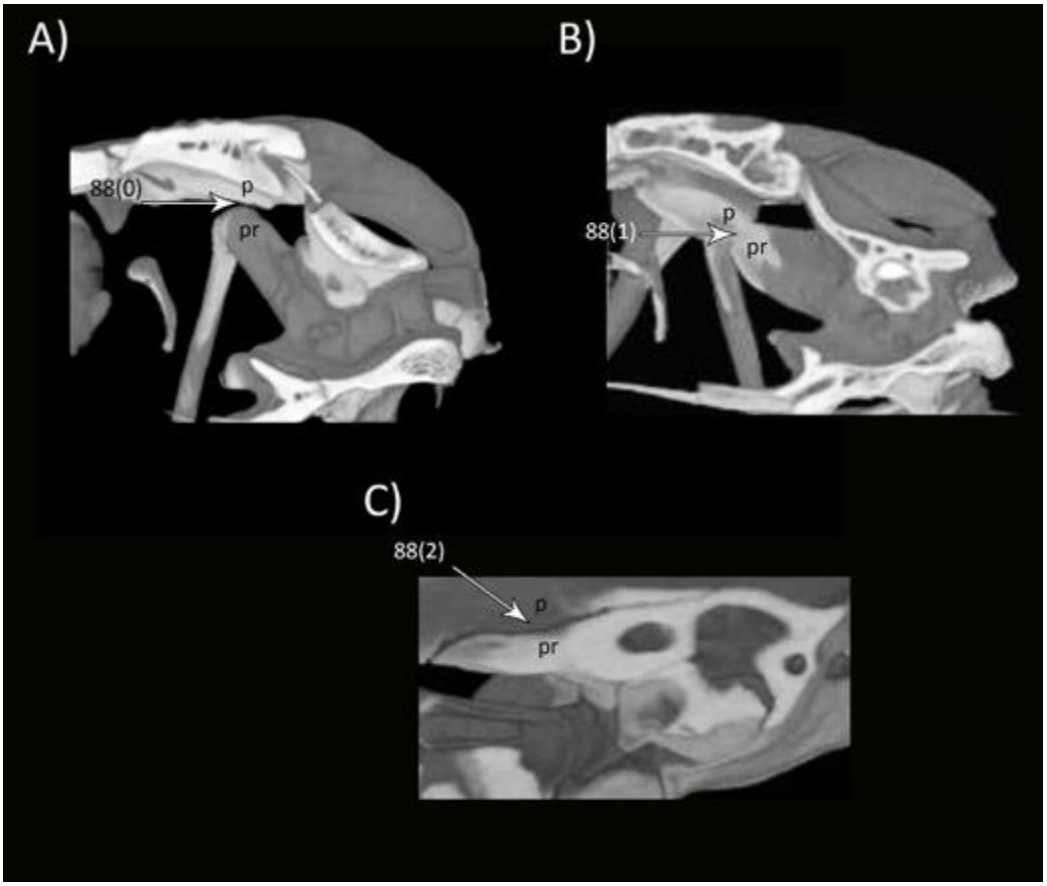


Figure 88S. A) *Varanus exanthematicus* FMNH 58299; B) *Tupinambis teguixin* FMNH 22416; C) *Amphisbaena fuliginosa* FMNH 22847. Sagittal close-up cutaway views of the skulls, no scale bar. **Abbreviations**: **p**, parietal; **pr**, prootic. Images derived from http://digimorph.org.

(89) Orbitosphenoid (Gauthier *et al*., 2012: 317): (0) well-developed; (1) reduced.

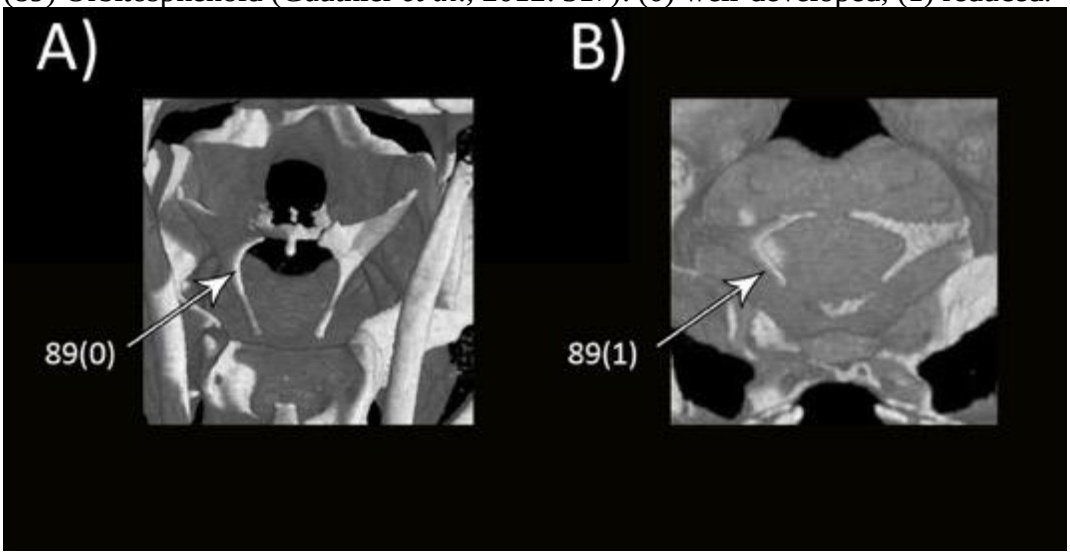


Figure 89S. A) *Callopistes maculatus* FMNH 53726; B) *Colobosaura modesta* USNM 341978. Anterior coronal close-up cutaways, no scale bar. Images derived from http://digimorph.org.

(90) Occipital condyle (Modified - Lee, 1998: 83; Gauthier *et al*., 2012: 341): (0) single continuous convex projection, posterior surface of condyle straight in ventral view; (1) two discrete convex projections arranged horizontally, posterior surface of condyle concave in ventral view.

Comments: We combined the characters' description in both Lee's (1998) and Gauthier *et al*.'s (2012) matrices. We follow scoring of this character according to Gauthier *et al*. (2012).

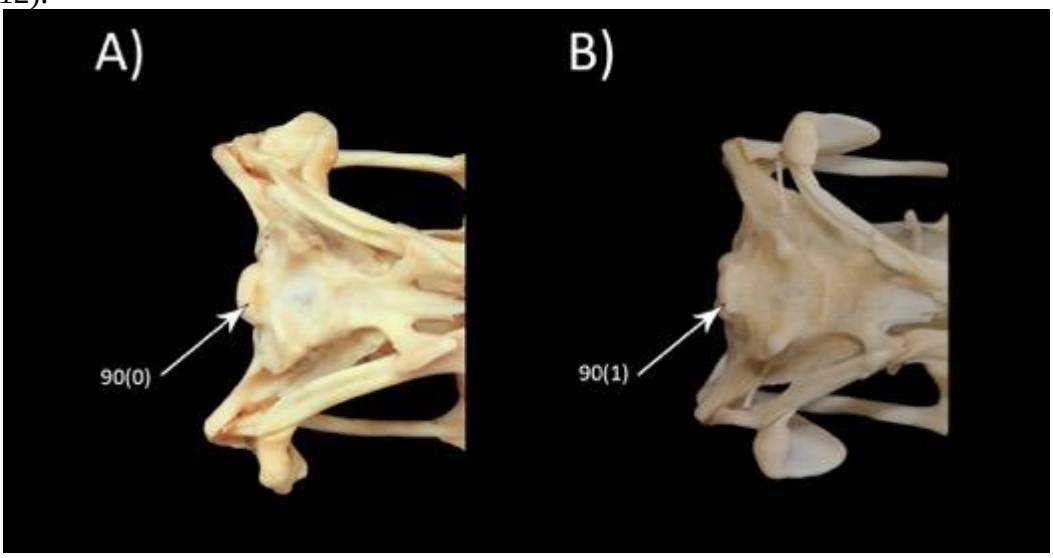


Figure 90S. A) *Callopistes maculatus* MZUSP 8037; B) *Crocodilurus amazonicus* MZUSP 92090. Ventral views of the skulls, no scale bar.

(91) Vidian canal caudal opening (Estes *et al*., 1988: 53; Lee, 1997: 38; Conrad, 2008: 146; Brizuela, 2010: 70; modified from Gauthier *et al.*, 2012: 337): (0) within basisphenoid; (1) anterior margin at basisphenoid-prootic suture; (2) the dibamid-amphisbaenian condition.

Comments: We follow usage and scorings of this character according to Gauthier *et al.* (2012). In their matrix, the authors presented a third state 2 (*entirely within prootic*), which was excluded from our analysis given that it was non-informative in our dataset.

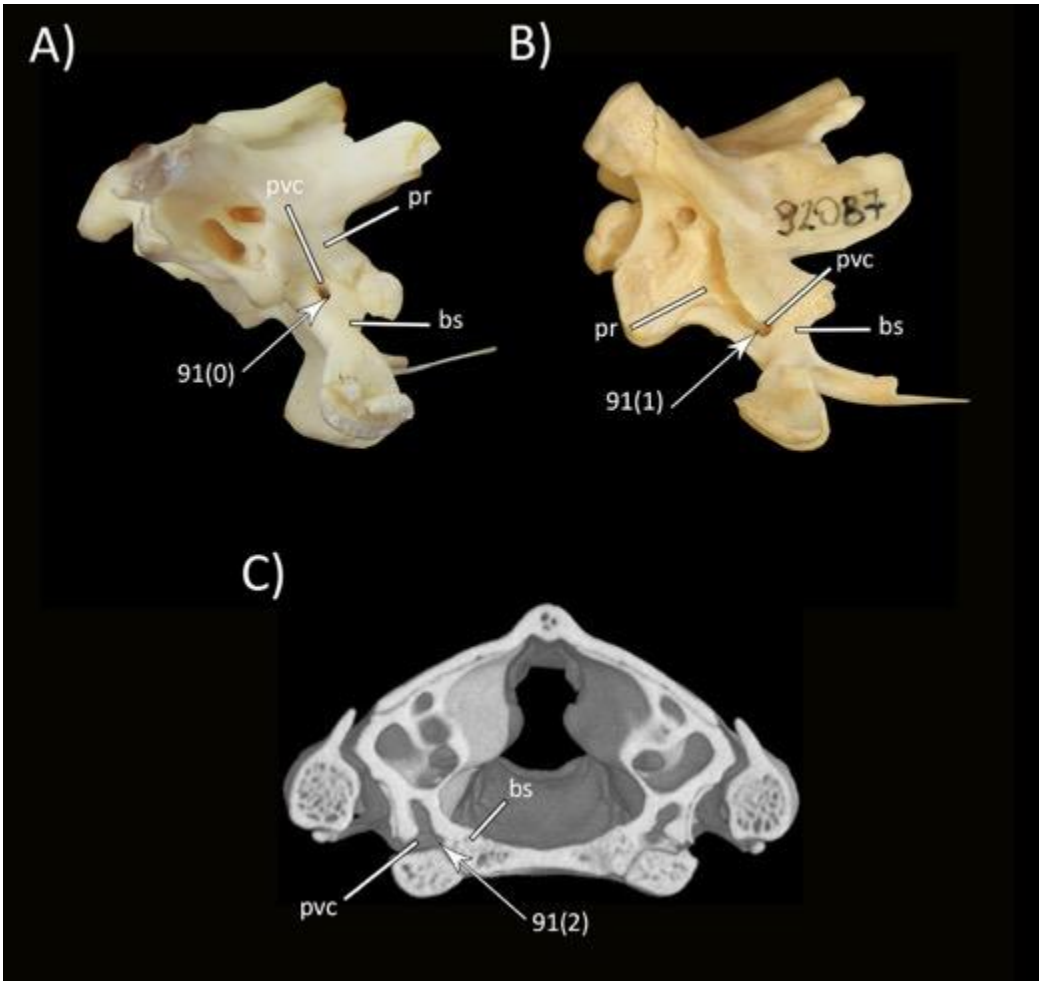


Figure 91S. A) *Varanus exanthematicus* MZUSP 101252; B) *Tupinambis teguixin* MZUSP 92087; C) *Amphisbaena fuliginosa* FMNH 22847. (A) and (B) right lateral views of the isolated braincases, and (C) anterior coronal close-up cutaway view of the skull, no scale bar. **Abbreviations**: **bs**, basisphenoid; **pr**, prootic; **pvc**, posterior opening of the Vidian canal. Image (C) derived from http://digimorph.org.

(92) Medial aperture of the recessus scala tympani (MARST) (Gauthier *et al*., 2012: 344): (0) between basioccipital and otoccipital (opisthotic); (1) entirely in otoccipital (opisthotic).

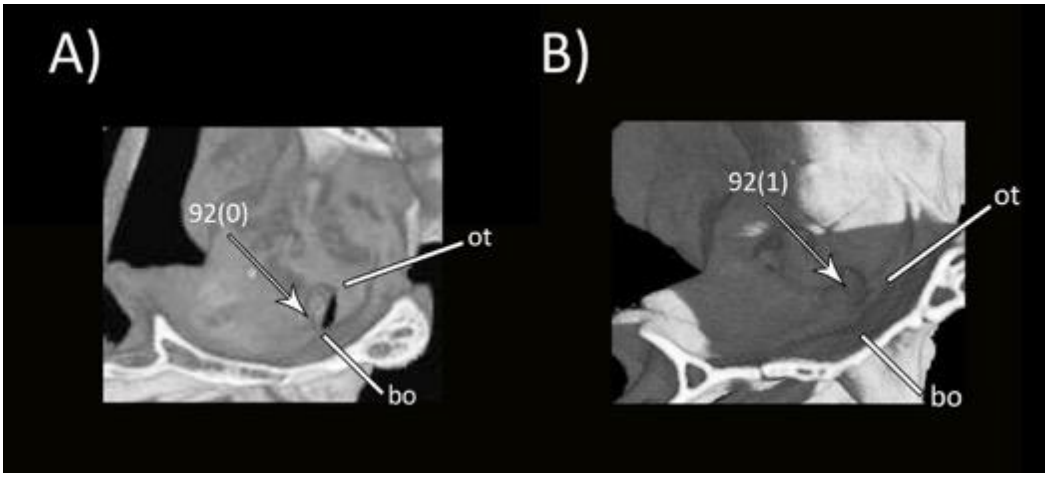


Figure 92S. A) *Teius teyou* FMNH 10873; B) *Callopistes maculatus* FMNH 53726. Sagittal close-up cutaway views of the skulls, no scale bar. **Abbreviations**: **bo**, basioccipital; **ot**, otoccipital. Images derived from http://digimorph.org.

(93) Hypoglossal (XII) foramina exit(s) relative to vagus (X-XI) foramen on external surface of braincase (Lee, 1998: 69; Conrad, 2008: 153; Gauthier *et al*., 2012: 349): (0) hypoglossal foramina separated from vagus (=jugular) foramen (Conrad, 2008); (1) at least one hypoglossal foramen emerges from the same fossa as the vagus foramen; (2) only one hypoglossal foramen still exits separately from the vagus foramen fossa; (3) all three hypoglossals emerge from the same fossa as the vagus foramen.

Comments: We follow usage and scorings of this character according to Gauthier *et al*. (2012).

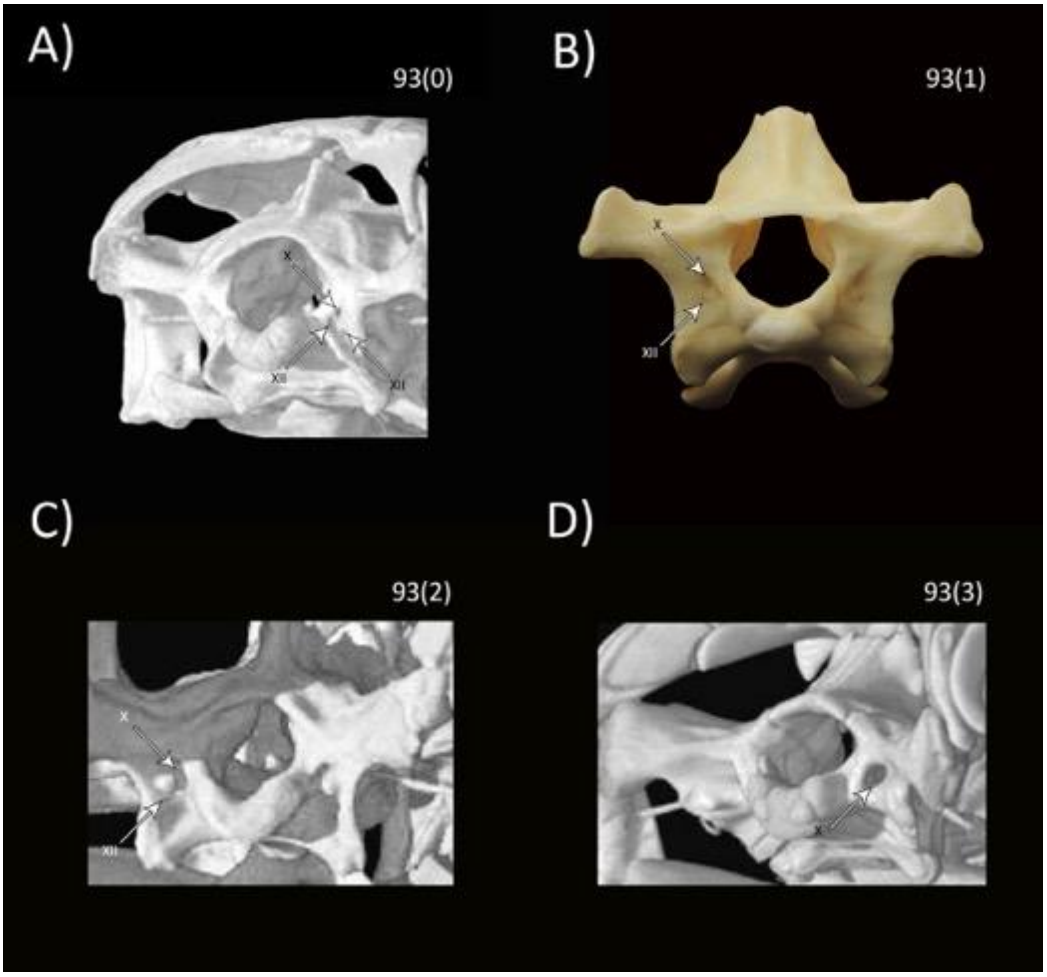


Figure 93S. A) *Lacerta viridis* YPM 12858; B) *Salvator merianae* MZUSP 85000; C) *Tiliqua scincoides* FMNH 57518; D) *Varanus exanthematicus* FMNH 58299. Posterior views of the braincases, no scale bar. **Abbreviations**: **X**, vagus (jugal) nerve foramen; **XII**, hypoglossal nerve foramen. Images (A, C and D) derived from http://digimorph.org.

MANDIBLE

(94) Dentary anterodorsal edge of dental parapet at tip (Gauthier *et al*., 2012: 356): (0) straight; (1) tipped down (and medially).

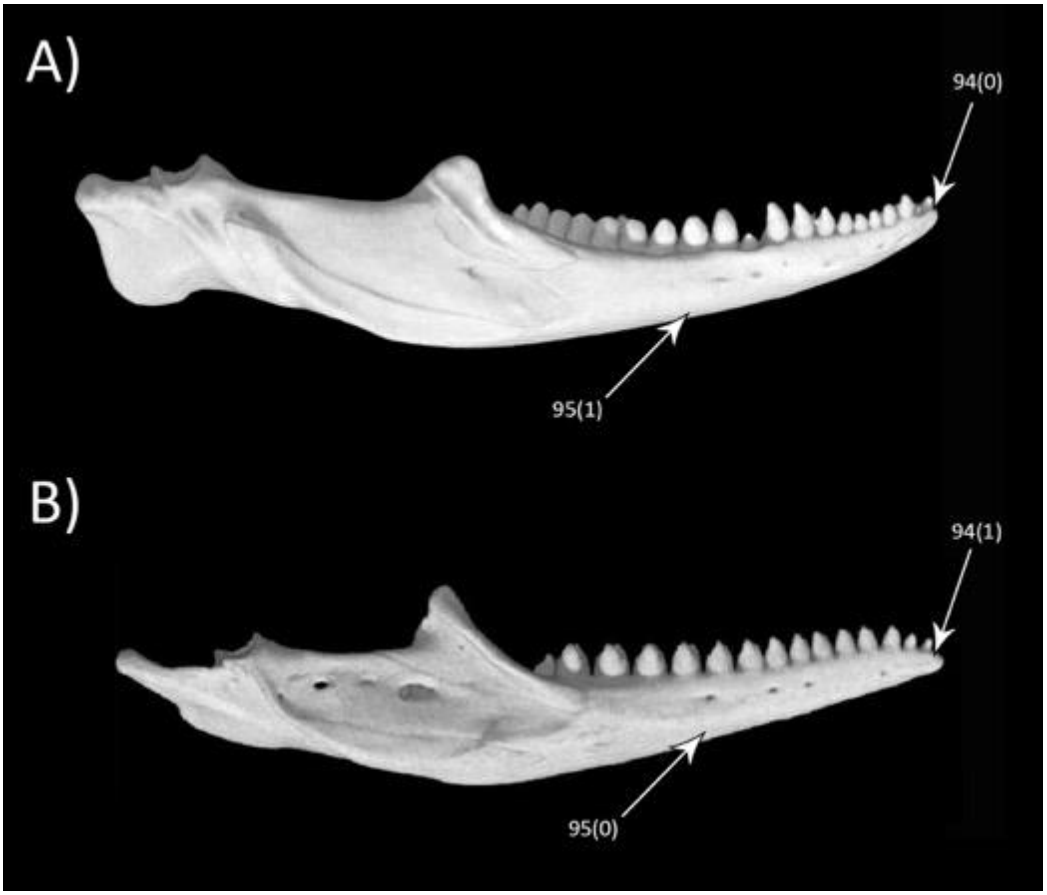


Figure 94S. A) *Tupinambis teguixin* FMNH 22416; B) *Teius teyou* FMNH 10873. Labial views of the jaws, no scale bar. Images derived from http://digimorph.org.

(95) Dentary bowed ventrally along long axis (Conrad, 2008: 178; modified in Gauthier *et al*., 2012: 357): (0) straight to slightly bowed (see Fig.94S:B); (1) distinctly bowed ventrally (see Fig.94S:A). See illustration for this character under character 94.

Comments: We follow usage and scorings of this character according to Gauthier *et al.* (2012).

(96) Dentary subdental shelf/gutter development in anterior part of dentary (Estes *et al.*, 1988: 58, 59; Lee, 1998: 117; Conrad, 2008: 182; Gauthier *et al*., 2012: 360): (0) absent; (1) present, weakly developed; (2) present, pronounced subdental gutter.

Comments: We present here a combination of character states following Estes *et al*. (1988), Conrad (2008) and Gauthier *et al*. (2012). Many previous studies have already shown that teiids retain a well-developed subdental shelf, often with an extensive *cementum* (interdental tissue) deposit. Nevertheless, according to Gauthier *et al*.'s (2012) scorings, teiids' subdental shelves are not as highly developed as in other taxa, differing, for example, from *Amphiglossus splendidus* in the amount of interdental tissue (*cementum*) filling the subdental shelf (R. Nydam pers. comm.), even though this character varies greatly among the Teiidae genera. Here, we follow Conrad (2008) and Estes *et al*. (1988) scorings for teiids.

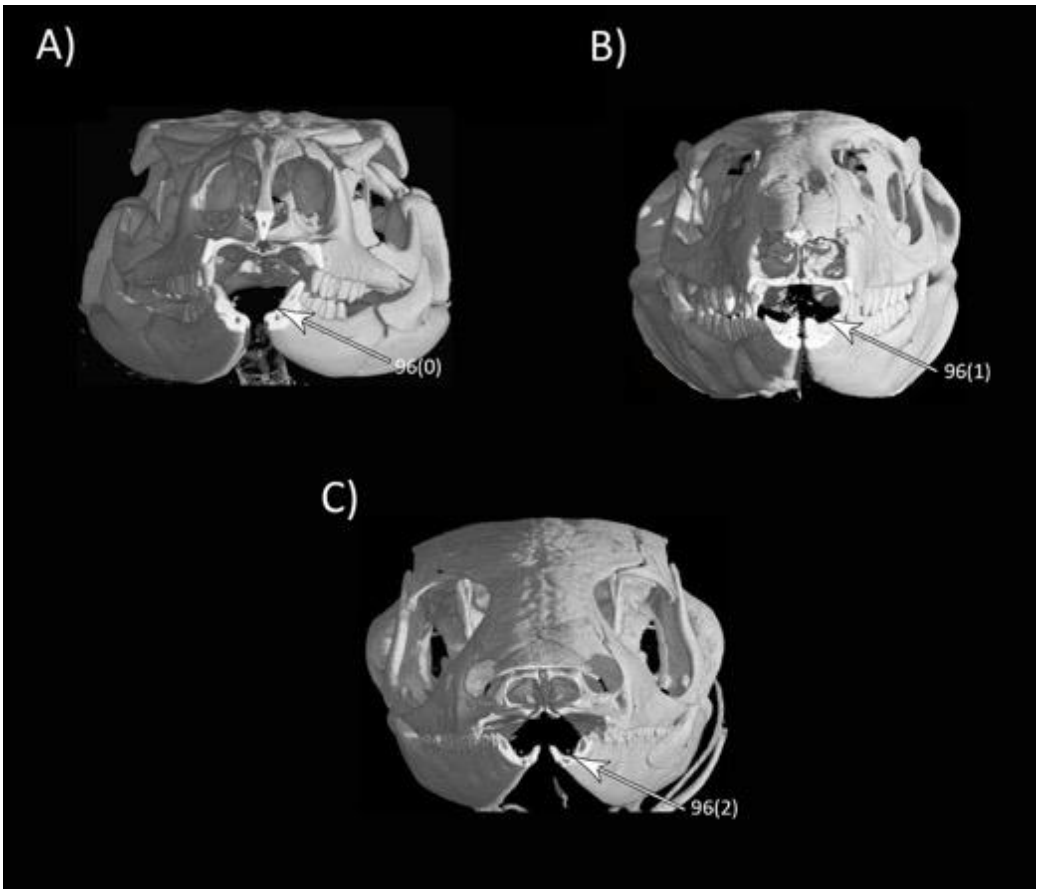


Figure 96S. A) *Varanus exanthematicus* FMNH 58299; B) *Tupinambis teguixin* FMNH 22416; C) *Pholidobolus montium* FMNH 197865. Anterior coronal cutaways of the skulls, no scale bar. Images derived from http://digimorph.org.

(97) Dentary, number of mental foramina on lateral surface (Lee, 1998: 111; Brizuela, 2010: 84; modified from Gauthier *et al*., 2012: 361): (0) up to six; (1) more than seven.

Comments: According to the different character states observed in the analysed taxa, we follow usage of this character according to Brizuela (2010). For this reason, the taxa *Chamaeleo laevigatus*, *Rhineura floridana* and *Tiliqua scincoides*, which present mental foramina lower than four or none, were scored as (?).

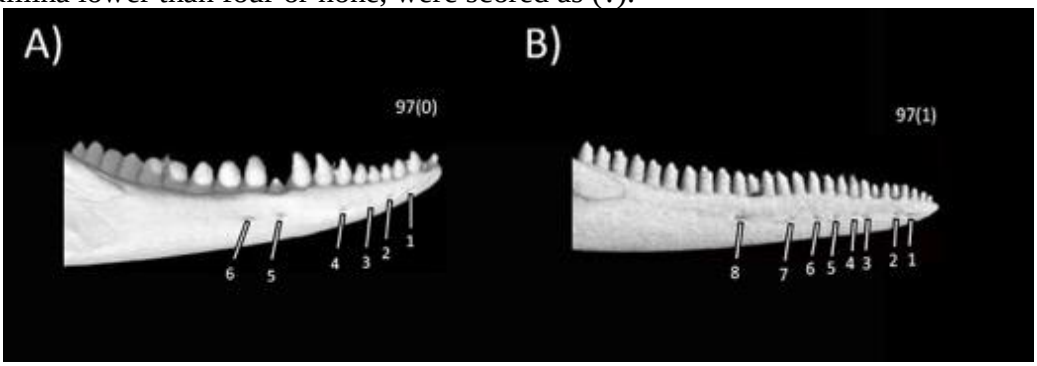


Figure 97S. A) *Tupinambis teguixin* FMNH 22416; B) *Aspidoscelis tigris* FMNH 161622. Labial views of the anterior portions of the mandibles, no scale bar. Images derived from http://digimorph.org.

(98) Dentary, dorsal edge shape in lateral view (Lee, 1998: 112; Brizuela, 2010: 85): (0) straight or slightly concave posteriorly; (1) distinctly concave throughout the dorsal edge.

Comments: Brizuela's (2010) state 2 (*distinctly concave*) characterizes a reduced (shorter) dentary with enlarged, molariform-like posterior teeth, present in species of the genus *Dracaena*, that tend to bow the dorsal edge of the dentary. We have modified this character to only two states, and the state (1) is characteristic of *Dracaena* and large *Tupinambis* species.

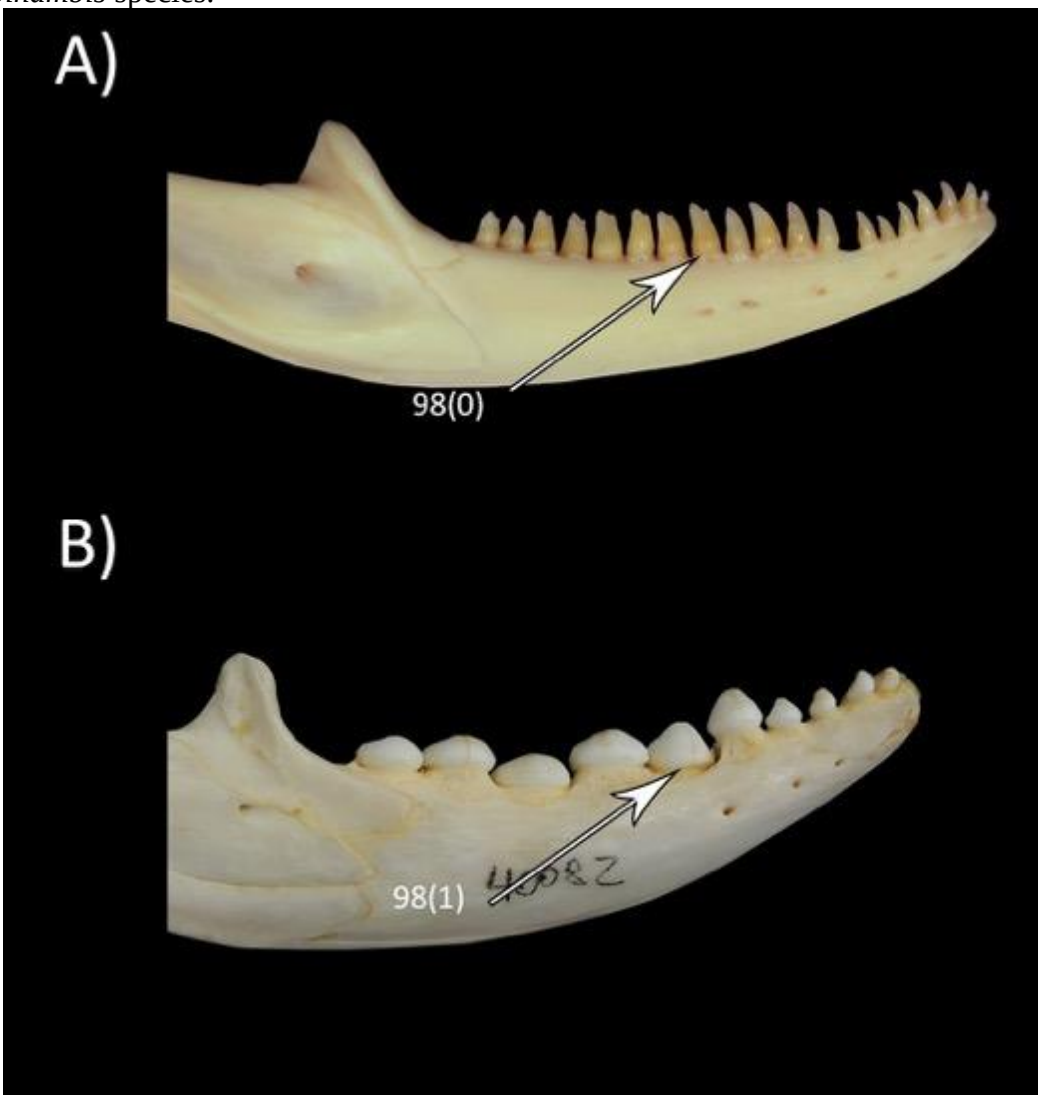


Figure 98S. A) *Callopistes maculatus* MZUSP 8037; B) *Dracaena guianensis* MZUSP 40082. Labial views of the anterior portions of the mandibles, no scale bar.

(99) Dentary, angular and surangular processes (Estes *et al.*, 1988: 63, 64; Conrad, 2008: 185): (0) absent; (1) present.

Comments: We follow usage of this character according to Conrad (2008). In his matrix, Conrad scored the members of the subfamily Teiinae as state 0 (*absent*), which, according to our analysis, is equivocal, given that these taxa present these processes distinct, and thus are scored as state 1. The same is observed for *Lacerta viridis*.

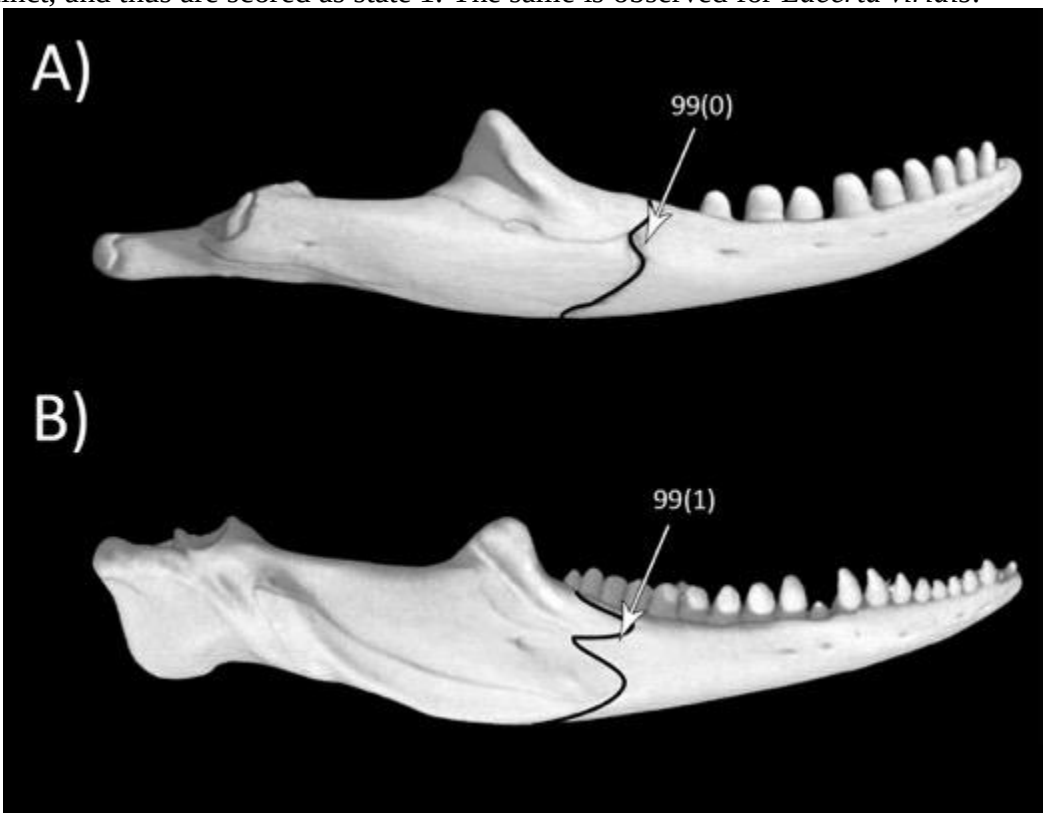


Figure 99S. A) *Varanus exanthematicus* FMNH 58299; B) *Tupinambis teguixin* FMNH 22416. Labial views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(100) Dentary angular process termination (Gauthier *et al*., 2012: 368): (0) angular process extends to or past coronoid apex; (1) anterior to coronoid apex; (2) anterior to level of coronoid bone.

Comments: Gauthier *et al*. (2012) scorings for taxa where the angular and surangular processes are not present (state 0 of the character 102 above) were modified to (?). In our matrix, state 2 is present only in *Pseudopus apodus*, thus being autapomorphic for this taxon.

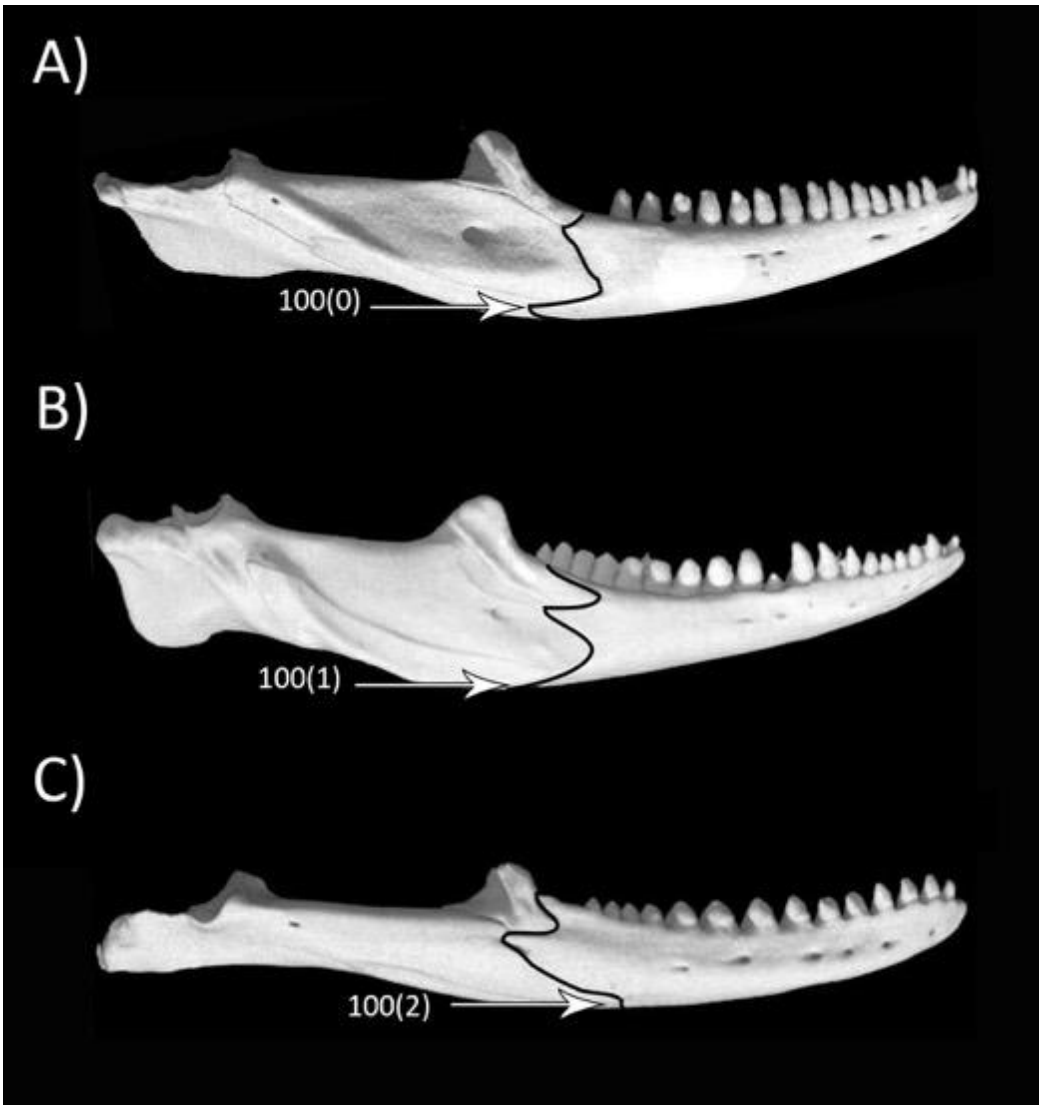


Figure 100S. A) *Callopistes maculatus* FMNH 53726; B) *Tupinambis teguixin* FMNH 22416; C) *Pseudopus (Ophisaurus) apodus* YPM 12870. Labial views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(101) Dentary posterior termination on lateral face of mandible (Gauthier *et al*., 2012: 369): (0) below (or anterior to) level of coronoid apex; (1) just posterior to coronoid apex; (2) well posterior to level of coronoid apex.

Comments: Gauthier *et al*. (2012) scorings for *Corytophanes cristatus* and *Enyalioides laticeps* were modified from state 0 to state 1 for *E. laticeps* and from state 0 to state 2 for *C. cristatus*.

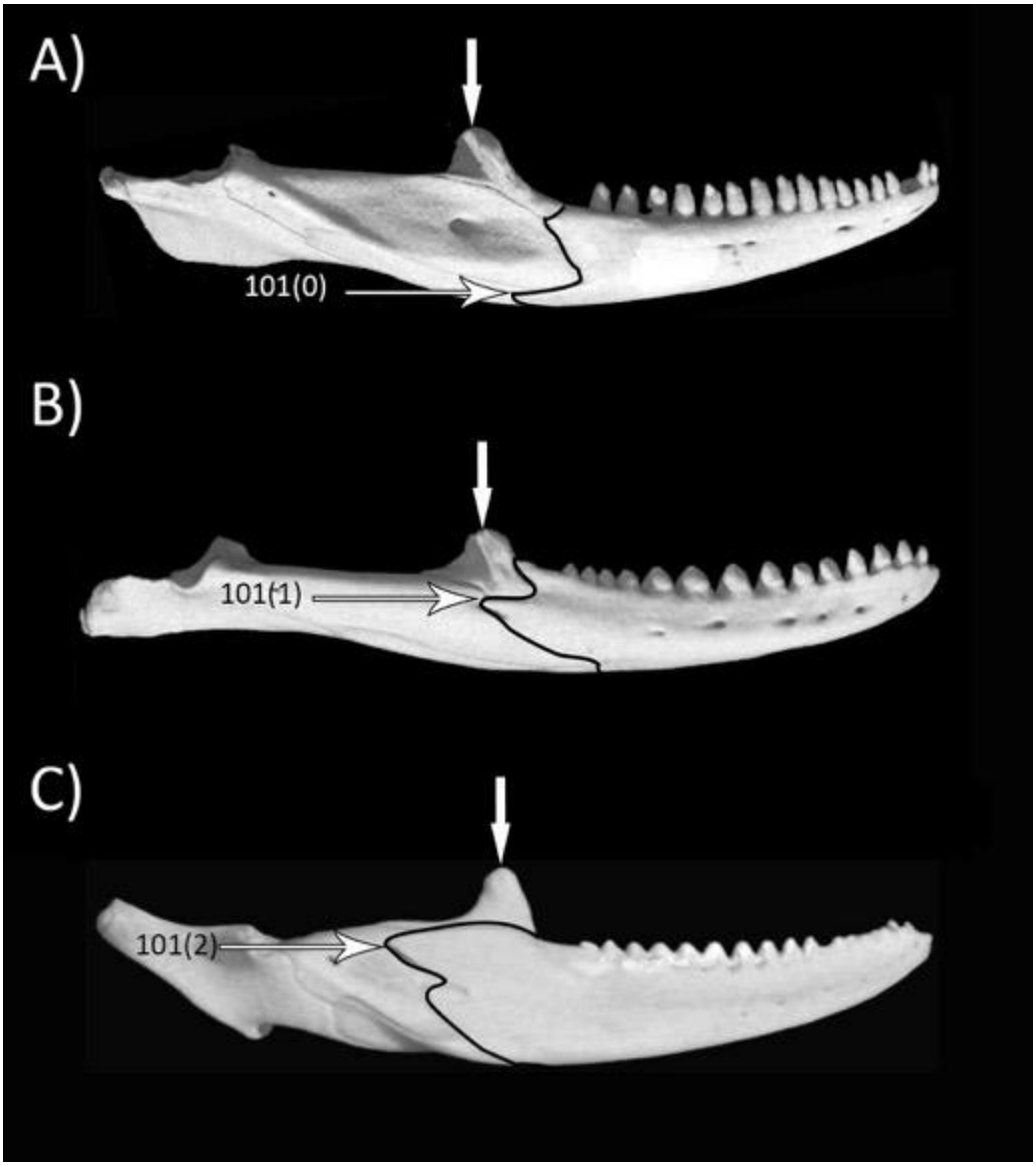


Figure 101S. A) *Callopistes maculatus* FMNH 53726; B) *Ophisaurus (Pseudopus) apodus* YPM 12870; C) *Pogona vitticeps* ROM 22699. The white vertical arrows indicate the coronoid apex; the white horizontal arrows indicate the posterior termination of the dentary. Labial views of the mandibles, no scale bar. **Abbreviation**: **psaf**, posterior surangular foramen. Images derived from http://digimorph.org.

(102) Meckel's canal (Estes *et al*. 1988: 57; Evans & Chure, 1998: 49; Gauthier *et al*., 2012: 371): (0) opens medially for most of length; (1) opens ventrally anterior to anterior inferior alveolar foramen.

Comments: Gauthier *et al*. (2012) scored this character for taxa that present fused Meckel's canal. We refrain these scorings and instead score these taxa as (?).

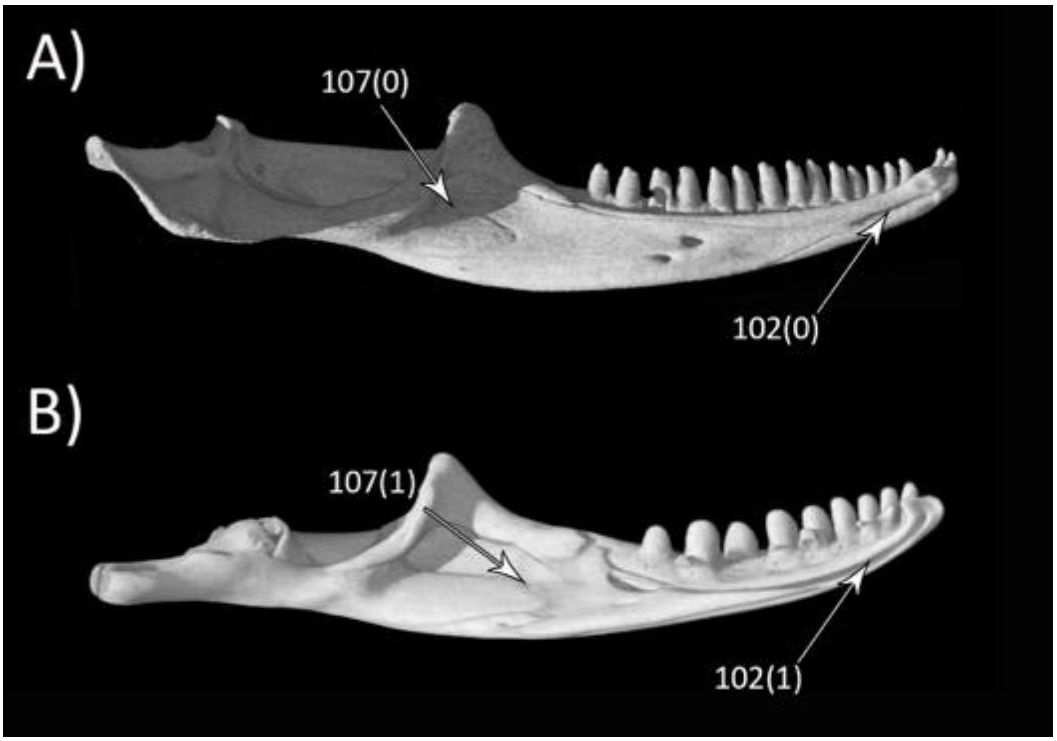


Figure 102S. A) *Callopistes maculatus* FMNH 53726; B) *Varanus exanthematicus* FMNH 58299. Lingual views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(103) Dentary restricts Meckel's canal (Estes *et al*., 1988: 55; modified from Gauthier *et al*., 2012: 372): (0) does not restrict or enclose Meckel's canal (Meckel's canal open); (1) lower dentary border of Meckel's canal folds up to approach closely upper border to restrict canal; (2) Meckel's canal closed and fused anterior to splenial.

Comments: We excluded Gauthier *et al*.'s (2012) character state 2 (*upper and lower borders form sutural contact anterior to splenial*), given that it was non-informative in our analysis. Our state 2 (*Meckel's canal closed and fused anterior to splenial*) corresponds to their state 3.

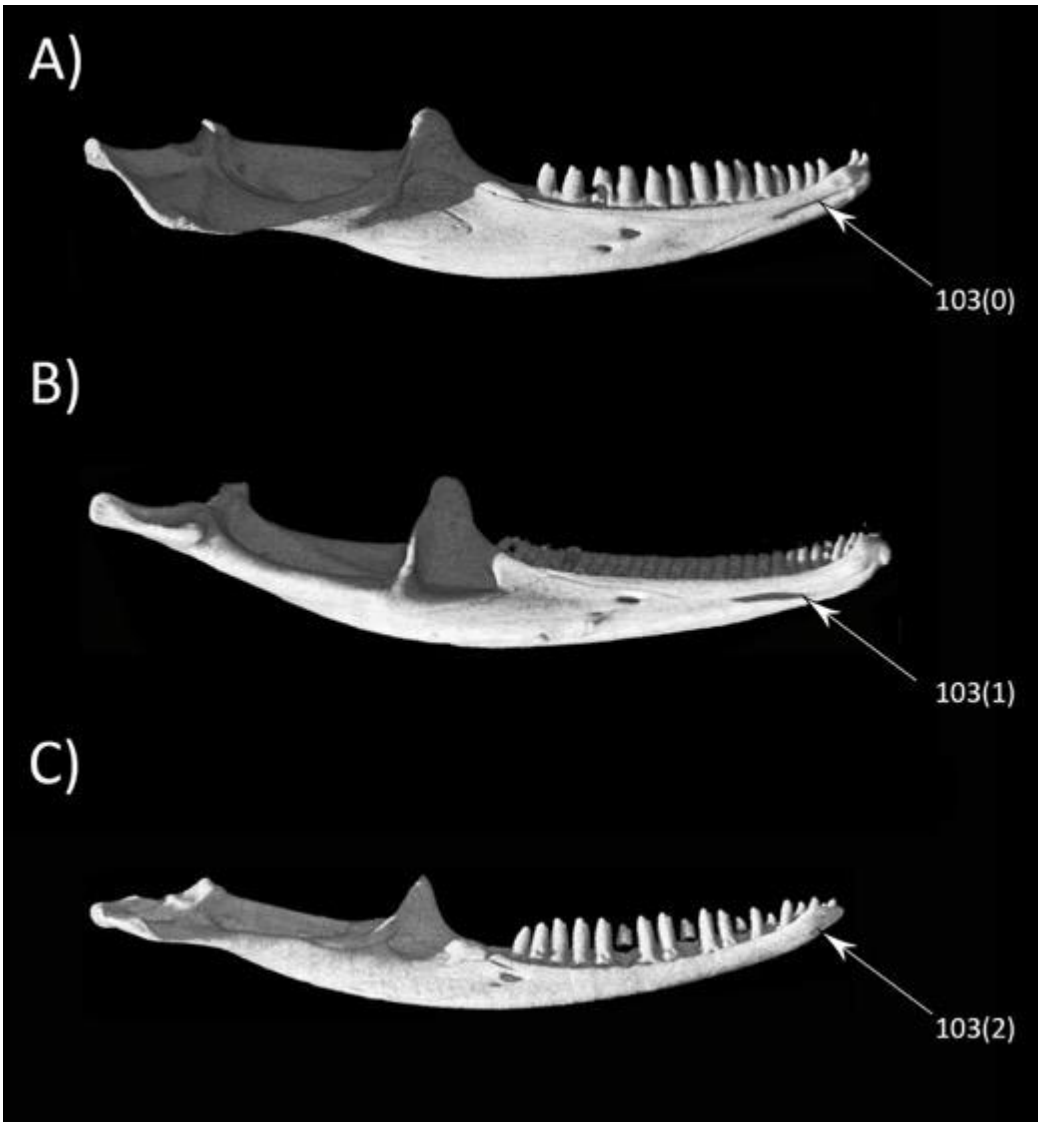


Figure 103S. A) *Callopistes maculatus* FMNH 53726; B) *Enyalioides laticeps* FMNH 206132; C) *Pholidobolus montium* FMNH 197865. Lingual views of the madibles, no scale bar. Images derived from http://digimorph.org.

(104) Meckel's canal, anterior extension (Brizuela, 2010: 89): (0) anterior extension ends at mandibular symphysis; (1) extends anteriorly below mandible symphysis.

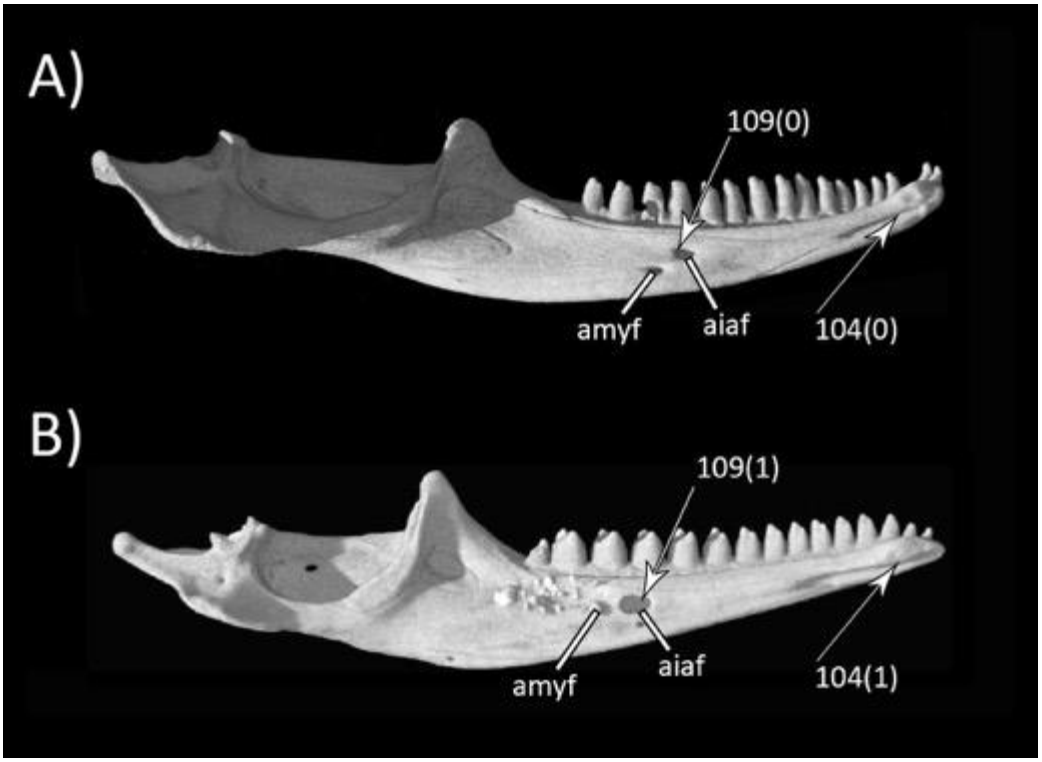


Figure 104S. A) *Callopistes maculatus* FMNH 53726; B) *Teius teyou* FMNH 10873. Lingual views of the mandibles, no scale bar. **Abbreviations**: **aiaf**, anterior inferior alveolar foramen; **amyf**, anterior mylohyoid foramen. Images derived from http://digimorph.org.

(105) Mandibular Symphysis (Holliday *et al*., 2010): (0) primarily composed of dense, woven fibers; (1) loosely built, with large domains of parallel-oriented fibers.

(106) Splenial anterior extent (Estes *et al*., 1988: 65; Gauthier *et al*., 2012: 375): (0) around one-third (or less) length relative to dentary tooth row; (1) about one-half; (2) about two-thirds; (3) three-fourths (or more).

Comments: We follow usage of this character according to Gauthier *et al*. (2012), that presented new states for Estes *et al*.'s (1988) original description. This character, as proposed by the authors, quantifies a hypertrofied splenial, a character that, according to Estes *et al*. (1988), is unique (synapomorphic) to the teiids.

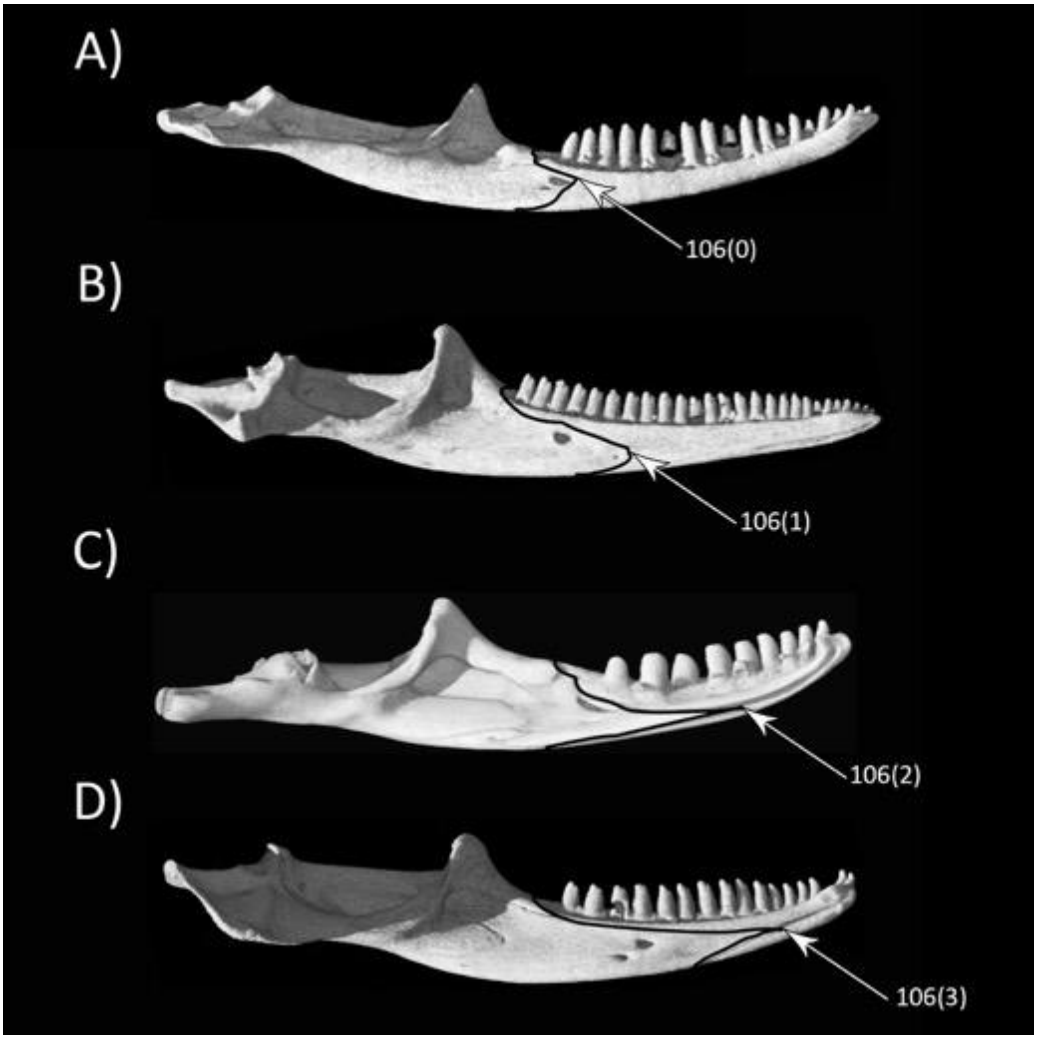


Figure 106S. A) *Pholidobolus montium* FMNH 197865; B) *Aspidoscelis tigris* FMNH 161622; C) *Pseudopus* (*Ophisaurus*) *apodus* YPM 12870; D) *Callopistes maculatus* FMNH 53726. Lingual views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(107) Splenial posterior extent (Estes *et al*., 1988: 66; Conrad, 2008: 190; Gauthier *et al*., 2012: 376): (0) extends posteriorly to or below apex of coronoid (see Fig.102S:A); (1) does not extend posteriorly to apex of coronoid (see Fig.102S:B). See illustration for this character under character 102.

Comments: We modified Gauthier *et al*.'s (2012) scoring for *Corytophanes cristatus* from (?) to state (1), as observed in the prepared skull in our collection.

(108) Splenial, medial depression (Sullivan & Estes, 1997: 20; Brizuela, 2010: 97): (0) absent, medial surface of splenial flat; (1) lower medial depression developed anteroposteriorly on splenial's anterior portion, anterior to foramina; (2) well-marked and continuous, splenial medial surface concave.

Comments: We follow usage of this character according to Brizuela (2010), where the author added a new state 1 (*lower medial depression developed anteroposteriorly on*

splenial's anterior portion, anterior to foramina) to Sullivan and Estes' (1997) original character description.

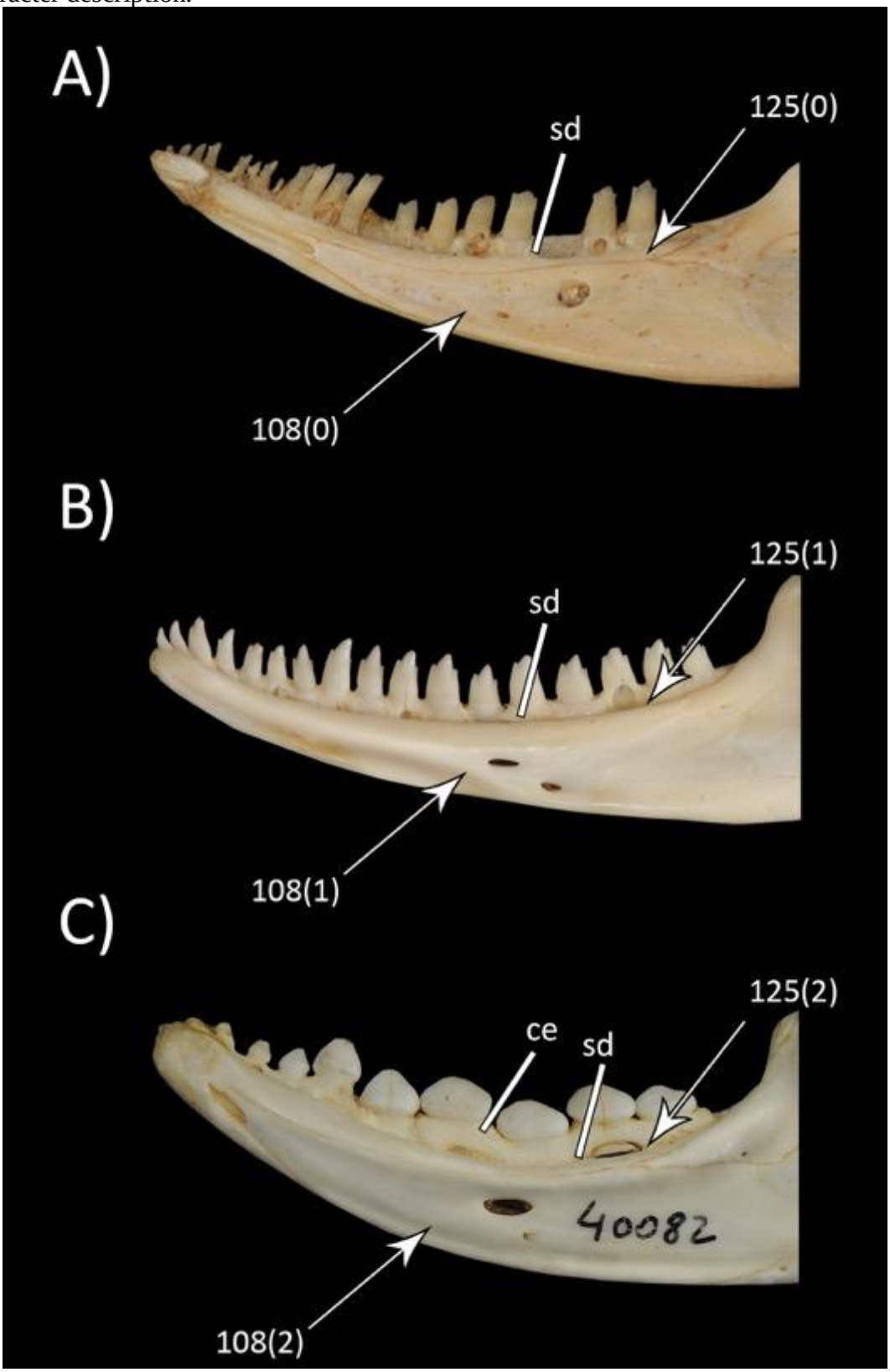


Figure 108S. A) *Ameiva ameiva* MZUSP 43047; B) *Crocodilurus amazonicus* MZUSP 92090; C) *Dracaena guianensis* MZUSP 40082. Lingual views of the anterior portions of the mandibles, no scale bar. **Abbreviations**: **ce**, cementum; **sd**, *sulcus dentalis*.

(109) Splenial anterior inferior alveolar foramen position relative to anterior mylohyoid foramen (Gauthier *et al*., 2012: 379): (0) anterodorsal (see Fig.104S:A); (1) dorsal to posterodorsal (see Fig.104SB). See illustration for this character under character 104.

(110) Coronoid anteromedial process fits into sulcus beneath tooth-bearing border of dentary (at or behind end of tooth row) (Gauthier *et al*., 2012: 388): (0) absent; (1) present; (2) present and wraps around ventral margin of dentary tooth-bearing border at apex posteriorly.

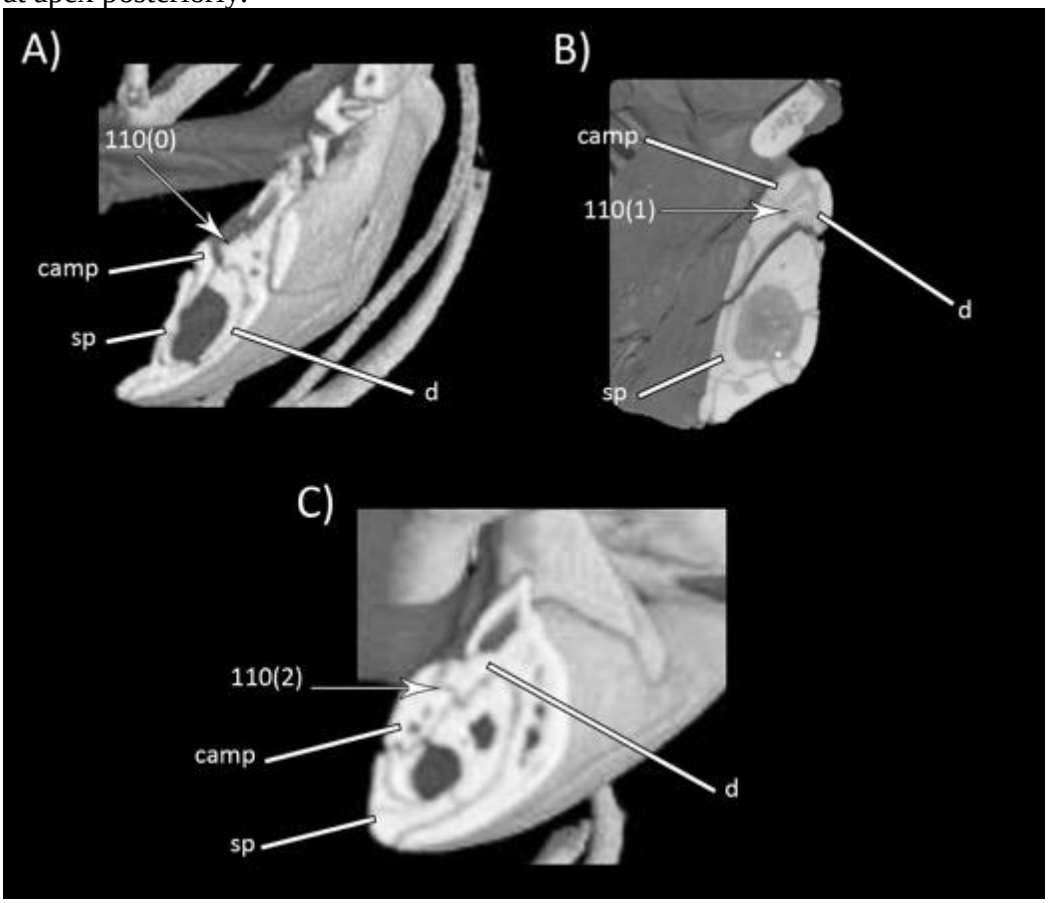


Figure 110S. A) *Colobosaura modesta* USNM 341978; B) MPCN PV-002; C) *Enyalioides laticeps* FMNH 206132. Anterior coronal close-up cutaway views of the mandibles, no scale bar. **Abbreviations**: **camp**, coronoid anteromedial process; **d**, dentary; **sp**, splenial. Images (A and C) derived from http://digimorph.org.

(111) Coronoid, anterolateral dentary process (Gauthier *et al*., 2012: 394): (0) absent; (1) present; (2) overlaps dentary past level of tooth row.

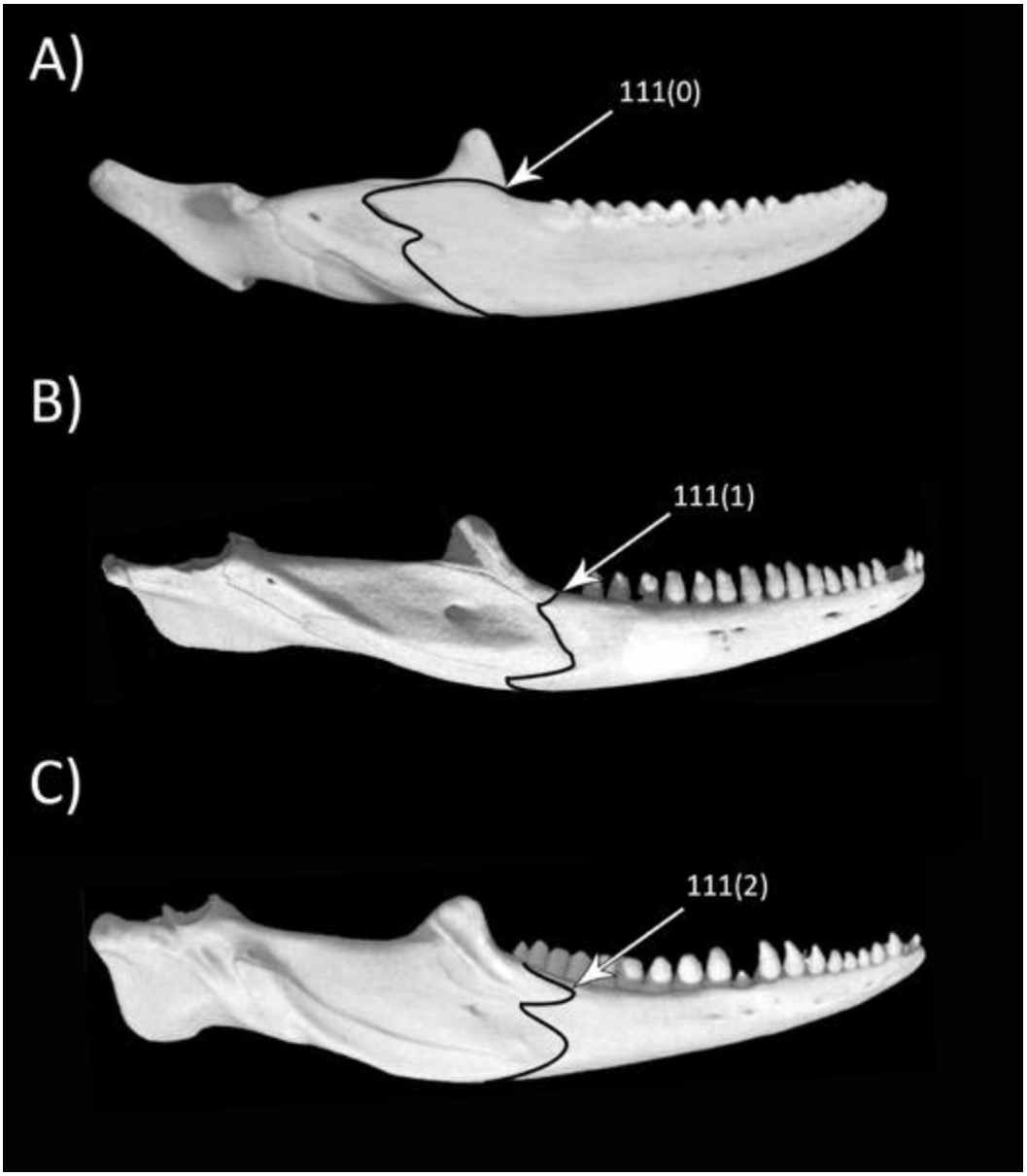


Figure 111S. A) *Pogona vitticeps* ROM 22699; B) *Callopistes maculatus* FMNH 53726; C) *Tupinambis teguixin* FMNH 22416. Labial views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(112) Coronoid, subcoronoid fenestra on medial surface of the mandible (Presch, 1974: 18; Sullivan & Estes, 1997: 15; Lee, 1998: 129; Brizuela, 2010: 100): (0) absent by development of the coronoid ventral edge; (1) present, exposing surangular below coronoid, ventrally limited by prearticular; (2) present, with the splenial forming part of the anteroventral border of the fenestra; (3) present, with the splenial distinctly forming the anterior edge of the fenestra.

Comments: We follow usage of this character according to Brizuela (2010). In previous works, this structure has received different nomenclatures, being addressed as *surangular window* (Presch, 1974) and as *surangular fenestra* (Sullivan and Estes, 1997). In both Lee's (1998) and Brizuela's (2010) analysis, the authors refer to it as *subcoronoid*

fenestra, and so we follow here this nomenclature. We modified the original states of Brizuela (2010), excluding the state 0 (*absent, the articular (or prearticular) expands dorsally obstructing the fenestra*), which is known only to be retained in Serpents and some Anguimorpha.

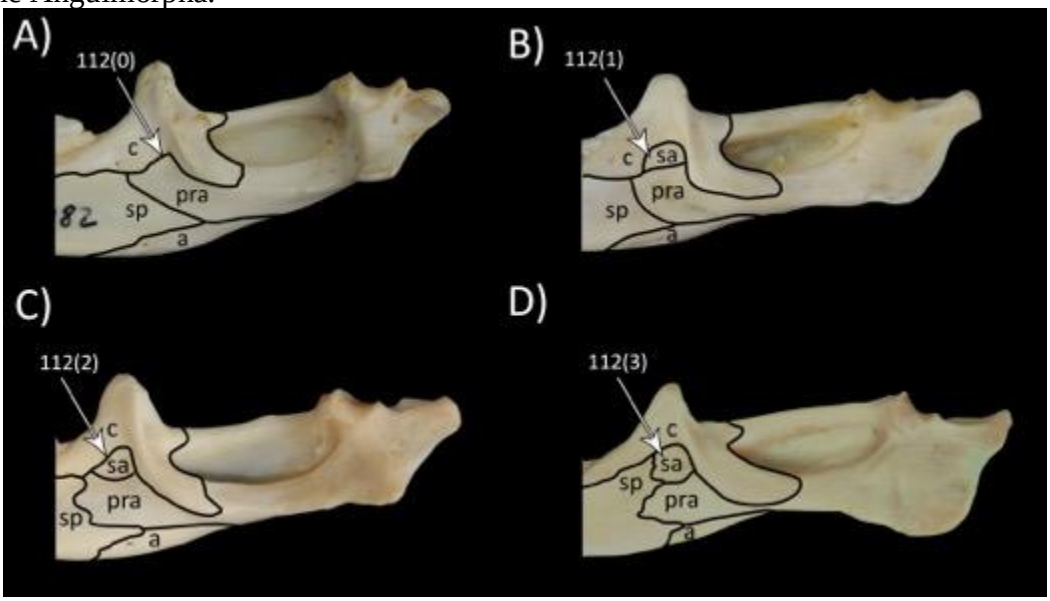


Figure 112S. A) *Dracaena guianensis* MZUSP 40082; B) *Salvator merianae* MZUSP 84998; C) *Crocodilurus amazonicus* MZUSP 92090; D) *Callopistes maculatus* MZUSP 8037. Lingual views of the posterior portions of the mandibles, no scale bar. **Abbreviations**: **a**, angular; **c**, coronoid; **pra**, prearticular; **sa**, surangular; **sp**, splenial.

(113) Coronoid-surangular articulation (Gauthier *et al*., 2012: 390): (0) coronoid restricted to medial aspect of mandible; (1) coronoid extends onto dorsal surface of surangular; (2) coronoid arches over dorsal margin of mandible to reach lateral surface of surangular.

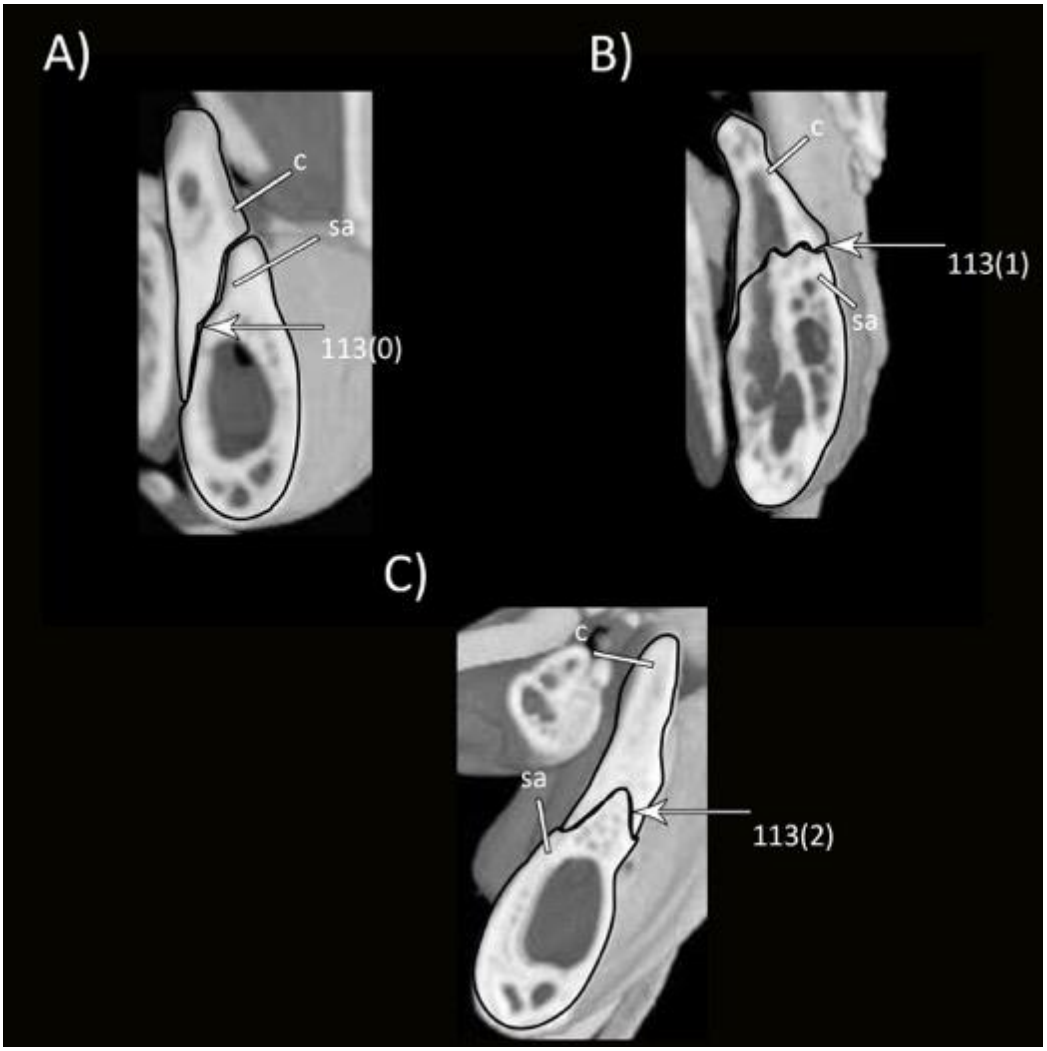


Figure 113S. A) *Pogona vitticeps* ROM 22699; B) *Chamaeleo laevigatus* FMNH 47572; C) *Tupinambis teguixin* FMNH 22416. Anterior coronal close-up cutaway views of the mandibles, no scale bar. **Abbreviations**: **c**, coronoid; **sa**, surangular. Images derived from http://digimorph.org.

(114) Angular medial exposure (relative degree of medial exposure scored with the teeth pointing straight up) (Gauthier *et al*., 2012: 383): (0) broad; (1) reduced; (2) narrow.

Comments: We modified scorings in Gauthier *et al*.'s (2012) as follows: *Corytophanes cristatus* from (?) to state (1) and *Heloderma suspectum* from state (0) to state (1).

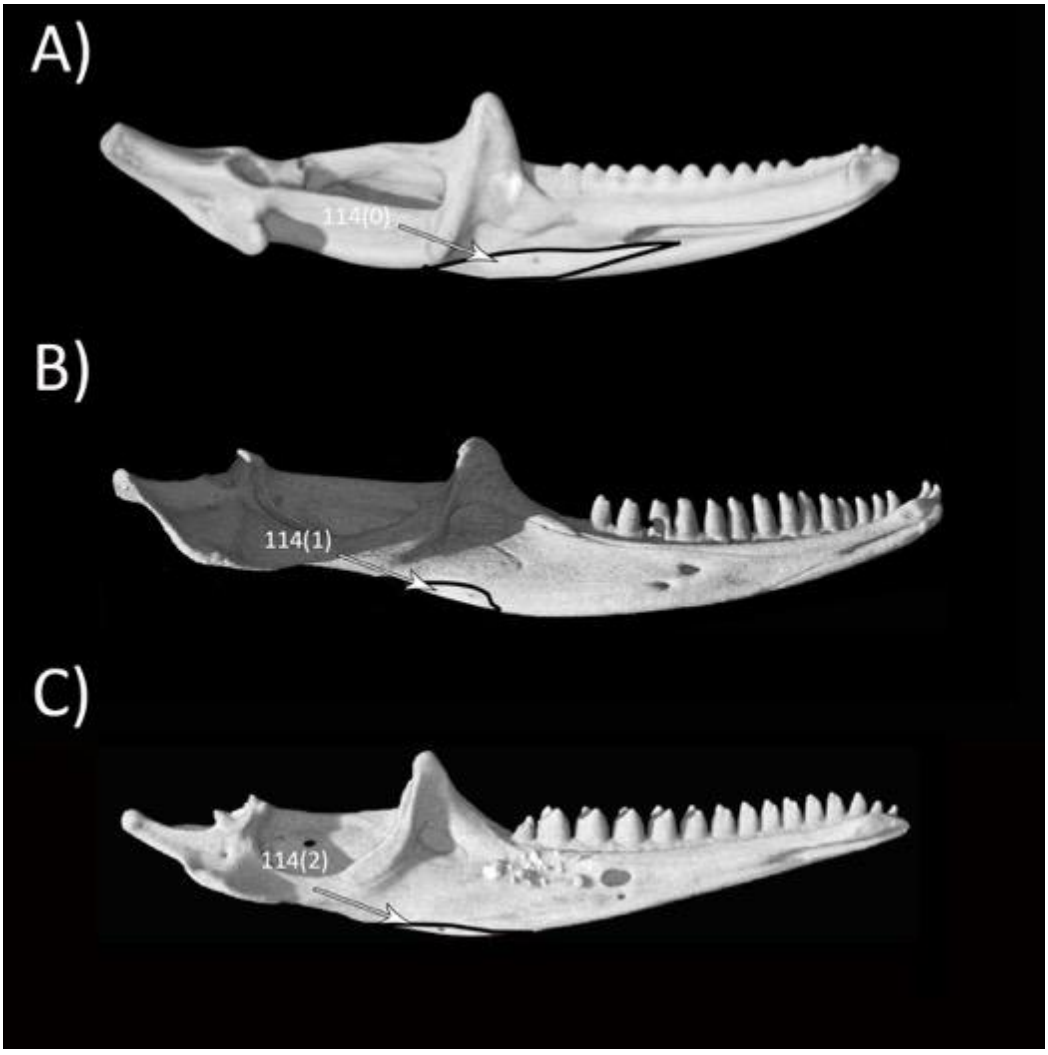


Figure 114S. A) *Pogona vitticeps* ROM 22699; B) *Callopistes maculatus* FMNH 53726; C) *Teius teyou* FMNH 10873. Lingual views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(115) Prearticular and surangular fusion in adult (Gauthier *et al*., 2012: 401): (0) separate; (1) fused.

Comments: This character may be difficult to observe in specimens where the bones sutures are subtle. Due to that, we have noticed some scorings in Gauthier *et al*.'s (2012) matrix to be equivocal. For instance, the authors scored *Tupinambis teguixin* as (1), but in all *Tupinambis teguixin* specimens analysed in our collection these bones are separate. The authors also scored *Chamaeleo laevigatus* and *Corytophanes cristatus* as (?), but looking at these species under a stereoscopic magnifying glass these elements are clearly separate, not fused. On the other hand, *Heloderma suspectum* was scored as (0), but we observed prearticular and surangular fused on the osteological specimen. All these changes were added to our matrix.

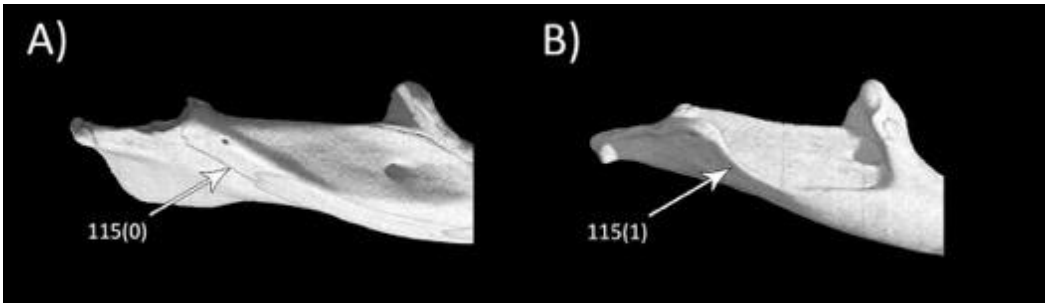


Figure 115S. A) *Callopistes maculatus* FMNH 53726; B) *Lepidophyma flavimaculatum* LACM 128570. Labial views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(116) Mandible, groove associated with anterior surangular foramen (Conrad & Norell, 2006: 111; Conrad, 2008: 174): (0) absent; (1) present.

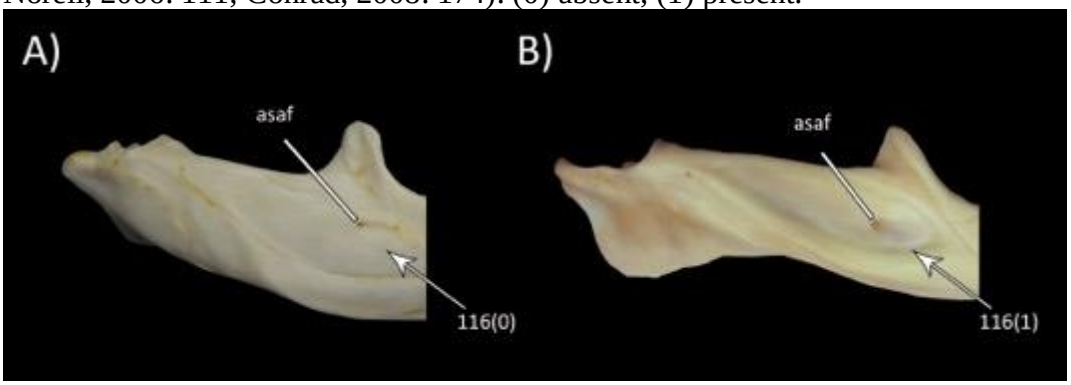


Figure 116S. A) *Dracaena guianensis* MZUSP 40082; B) *Callopistes maculatus* MZUSP 8037. Labial views of the mandibles, no scale bar. **Abbreviation**: **asaf**, anterior surangular foramen.

(117) Surangular lateral crest (adductor crest of Hsiou *et al*. 2007) (extensively modified from Brizuela, 2010: 105): (0) surangular lateral crest well-developed, laterally projected, extending from the anteroventral margin of the articular to the dentary posteroventral edge; (1) surangular lateral crest well-developed, extending from the anteroventral margin of the articular to the dentary posteroventral edge, but not laterally projected; (2) surangular lateral crest poorly developed; (3) absent.

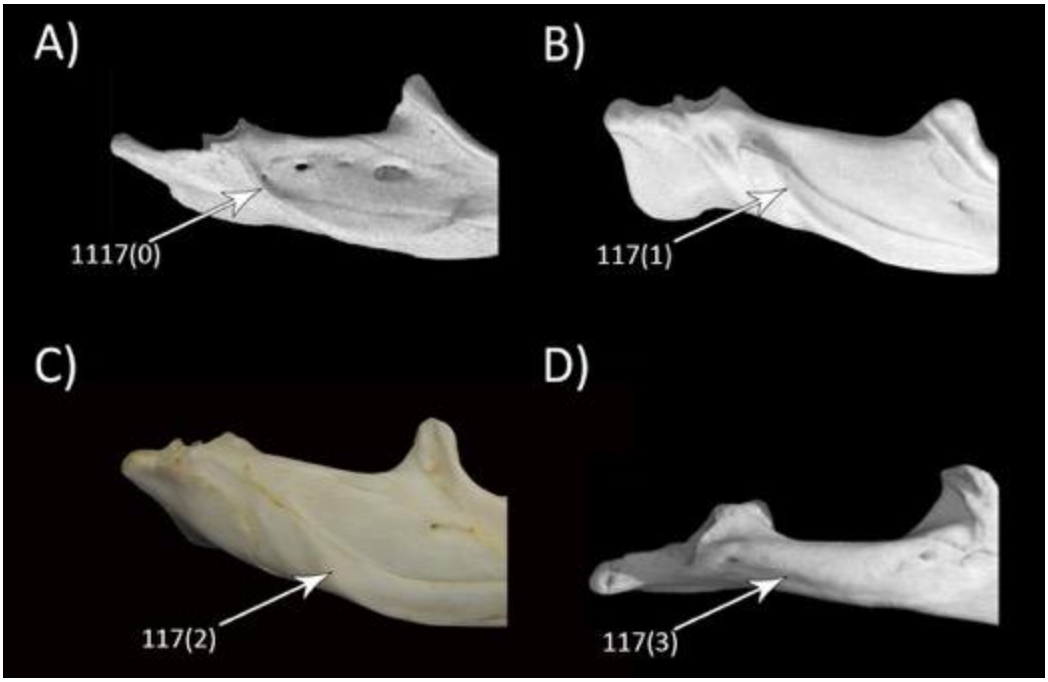


Figure 117S. A) *Teius teyou* FMNH 10873; B) *Tupinambis teguixin* FMNH 22416; C) *Dracaena guianensis* MZUSP 40082; D) *Heloderma suspectum* TNHC 62766. Labial views of the mandibles, no scale bar. Images (A) and (B) derived from http://digimorph.org.

(118) Surangular lateral crest, contact with angular (extensively modified from Brizuela, 2010: 106, 107): (0) angular contacts surangular lateral crest on its ventral edge; (1) angular contacts surangular lateral crest on its posterior/dorsal edge; (2) angular is transversely cut through surangular lateral crest.

Comments: The previous character defines the development of the surangular lateral crest, while this character defines its (the surangular lateral crest) relation with the angular. Brizuela's (2010) matrix presents this character based on the development of the angular process, but not the surangular lateral crest relation to the angular. Here, we redefined the author's states. Our scorings for *Lepidophyma flavimaculatum*, *Tiliqua scincoides* and *Smaug mossambicus* are (?) beucase, although these taxa present a well-developed surangular lateral crest, they do not present a contact between the surangular crest and the angular.

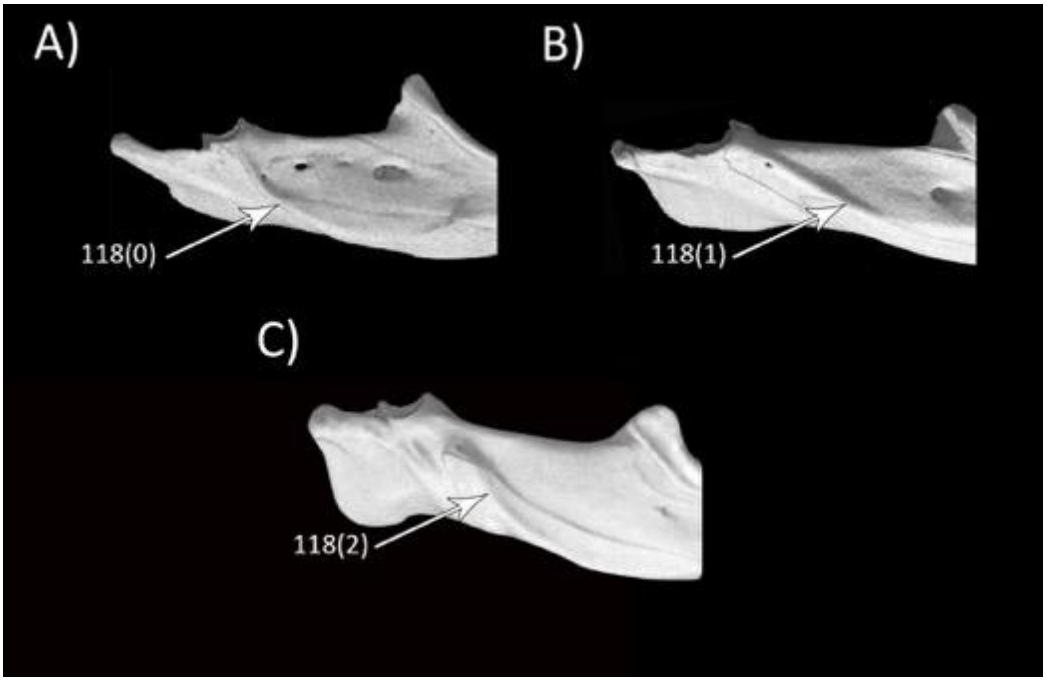


Figure 118S. A) *Teius teyou* FMNH 10873; B) *Callopistes maculatus* FMNH 53726; C) *Tupinambis teguixin* FMNH 22416. Labial views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(119) Prearticular crest (Estes *et al*., 1988: 73; Lee, 1998: 136; Conrad, 2008: 203; Gauthier *et al*., 2012: 403): (0) absent; (1) present.

Comments: Estes *et al.* (1988) presented a third state 2 (*prominent, with an embedded finger-like angular process*). This state was considered by the authors to be synapomorphic of Teiioidea (Gymnophthalmidae + Teiidae), which, according to the authors, passed through state (1) ontogenetically. However, this state (2) is lacking in recent studies. Here, we follow usage and scorings of this character according to Conrad (2008) and Gauthier *et al*. (2012) and retain only states absent/present.

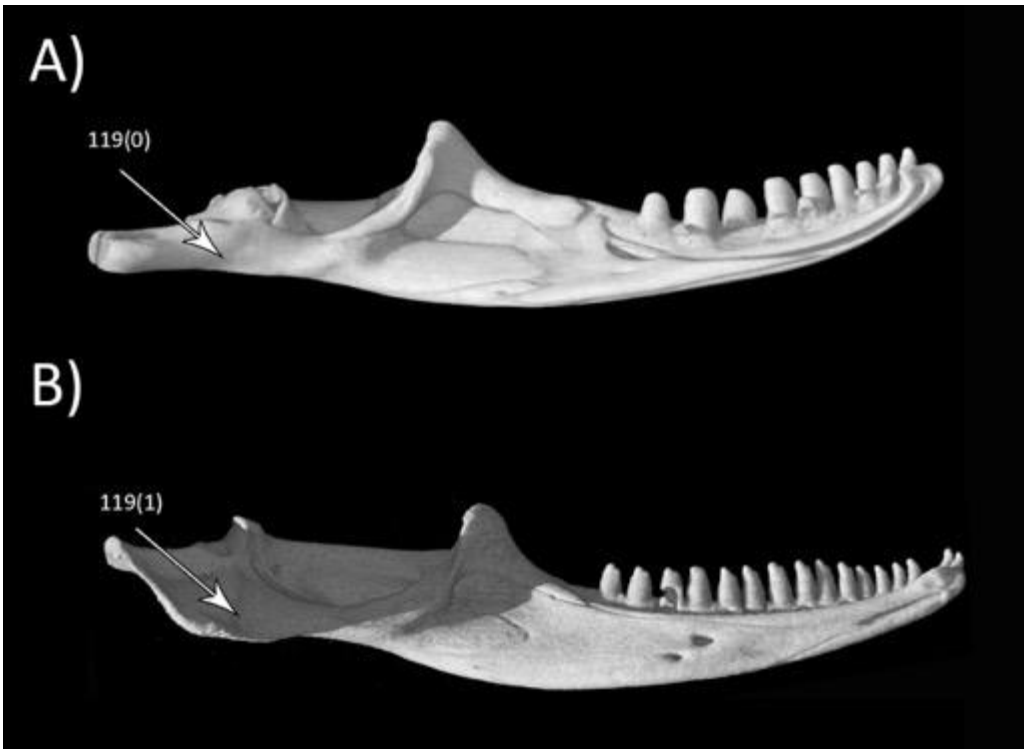


Figure 119S. A) *Varanus exanthematicus* FMNH 58299; B) *Callopistes maculatus* FMNH 53726. Lingual views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(120) Retroarticular process (Gauthier *et al.*, 2012: 404): (0) present; (1) absent.

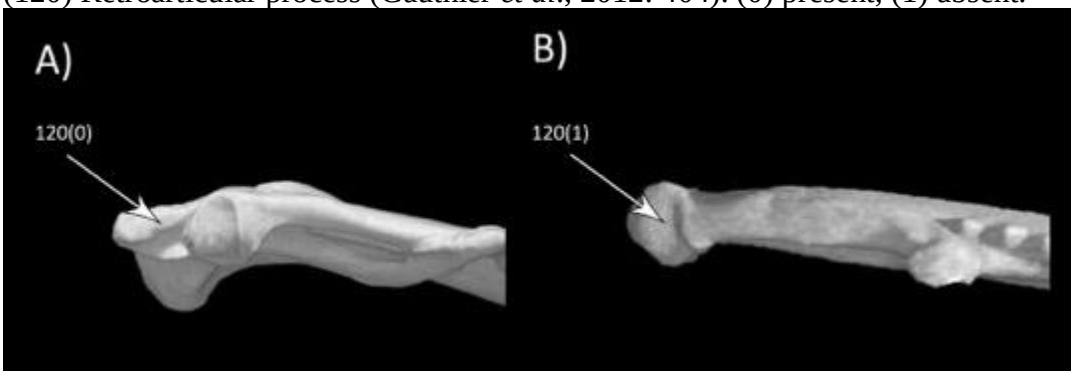


Figure 120S. A) *Tupinambis teguixin* FMNH 22416; B) *Chamaeleo laevigatus* FMNH 47572. Dorsal views of of the mandibles, no scale bar. Images derived from http://digimorph.org.

(121) Retroarticular process dorsal surface (modified from: Estes *et al*., 1988: 74; Denton & O'Neill, 1995: 24; Lee, 1998: 142; Nydam & Cifelli, 2002: 24; Nydam *et al*., 2007: 24; Brizuela, 2010: 110): (0) narrow surface, without medial development, sulcus or pit absent; (1) medial margin or crest developed, well-marked sulcus or pit present.

Comments: We redefined this character based on all the previous descriptions.

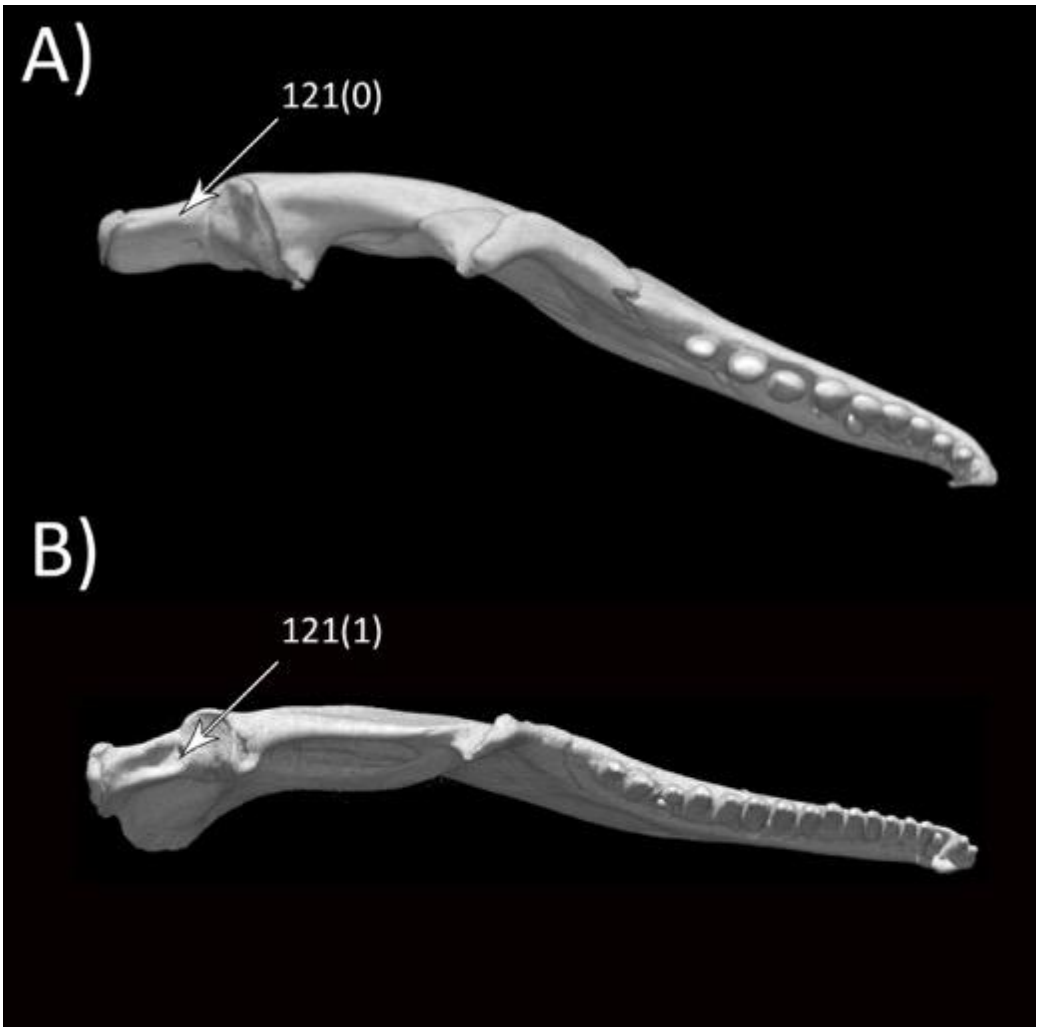


Figure 121S. A) *Varanus exanthematicus* FMNH 58299; B) *Callopistes maculatus* FMNH 53726. Dorsal views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(122) Retroarticular process orientation (scored with teeth pointing straight up) (Estes *et al*., 1988: 75; Gauthier *et al*., 2012: 405): (0) not inflected medially; (1) inflected medially.

Figure 122S. A) *Callopistes maculatus* MZUSP 8037; B) *Ameiva ameiva* MZUSP 14465. Ventral views of the mandibles, no scale bar.

(123) Retroarticular process, lateral notch forming waist proximally (Estes *et al*., 1988: 77; Gauthier *et al*., 2012: 409): (0) absent; (1) present.

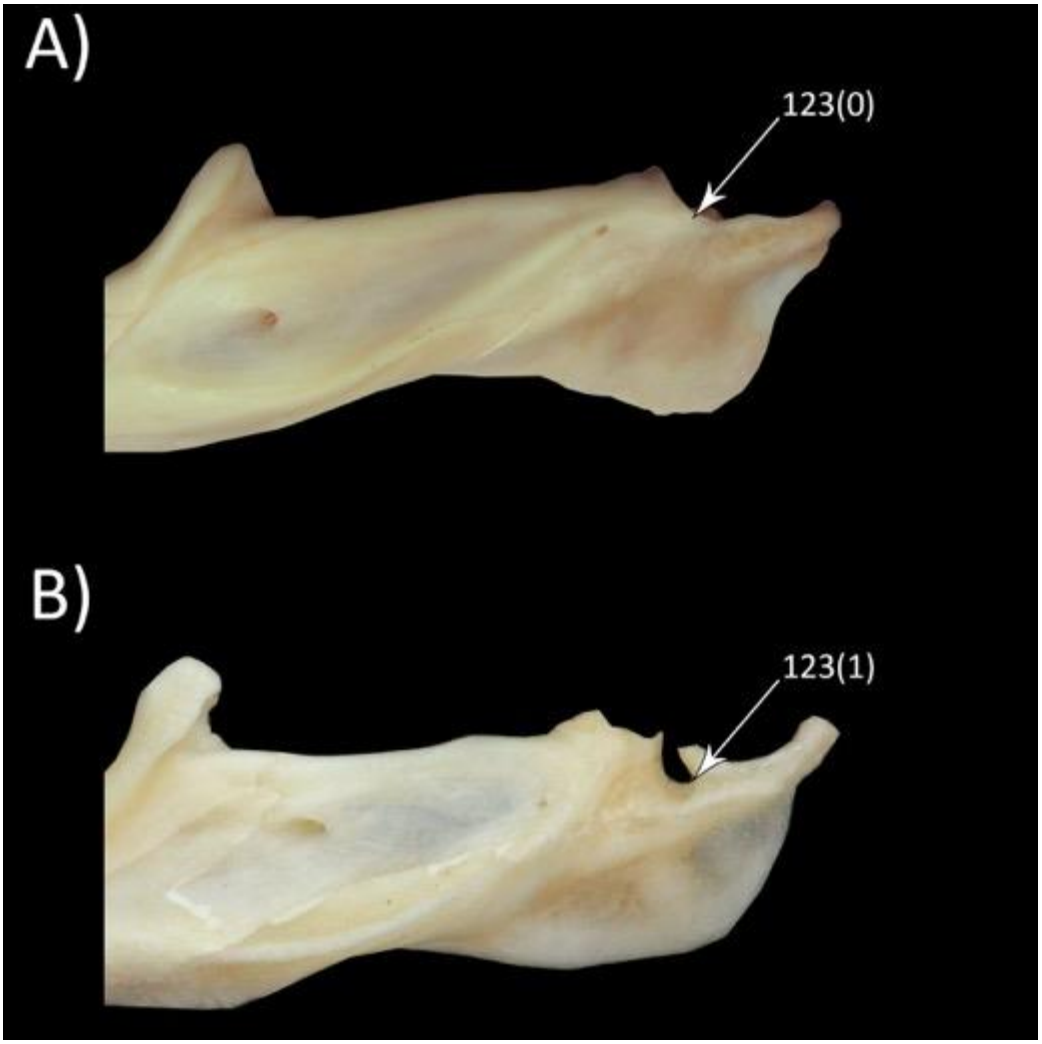


Figure 123S. A) *Callopistes maculatus* MZUSP 8037; B) *Dicrodon guttulatum* MZUSP 19384. Labial views of the mandibles, no scale bar.

(124) Dentition, marginal tooth implantation (Rieppel & Zaher, 2000a: 146; modified from Conrad, 2008: 214): (0) labially pleurodont; (1) acrodont; (2) modified (fully) pleurodont.

Comments: We follow usage of this character according to Rieppel and Zaher (2000) and scorings according to Conrad (2008). We consider Rieppel and Zaher's (2000) character state 3 (*teeth ankylosed to the rim of a shallow socket that is homologous to the interdental ridge*) and Conrad's (2008) character state 4 (*subacrodont*) to be non-informative in our dataset, and thus they were excluded from our analysis.

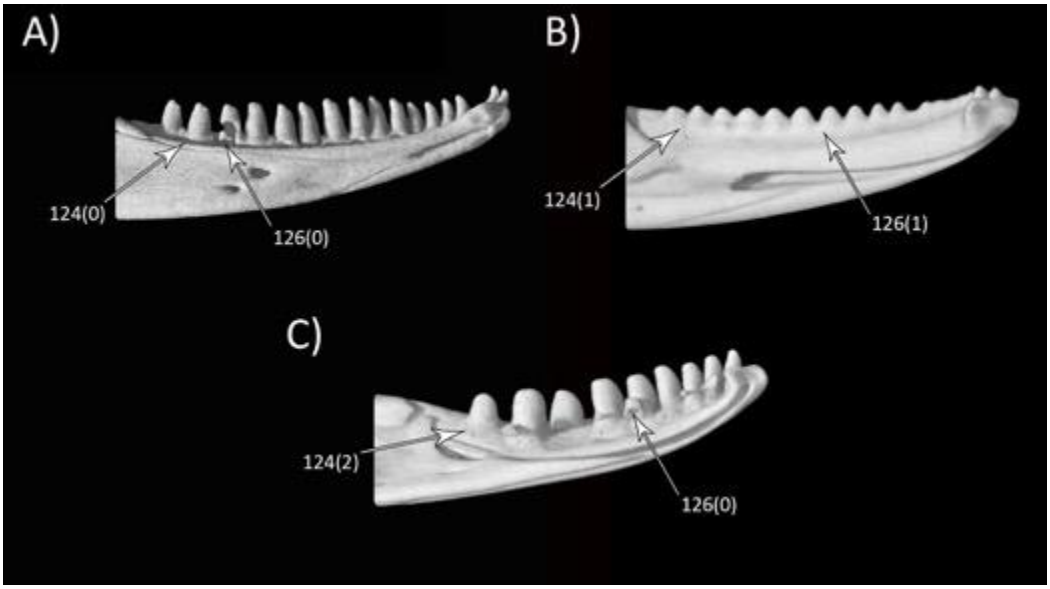


Figure 124S. A) *Callopistes maculatus* FMNH 53726; B) *Pogona vitticeps* ROM 22699; C) *Varanus exanthematicus* FMNH 58299. Lingual views of the anterior portions of the mandibles, no scale bar. Images derived from http://digimorph.org.

(125) Pleurodont dentition implantation, interdental tissue deposit (*cementum*) (modified from: Estes *et al*., 1988: 84; Denton & O'Neill, 1995: 26; Nydam & Cifelli, 2002a: 26; Nydam *et al*., 2007: 26): (0) absent, tooth attachment to base and parapet, shallow *sulcus dentalis* (=subdental gutter) (see Fig.108S:A); (1) well developed *sulcus dentalis*, tooth attachment predominantly basal with extensive deposits of *cementum* (see Fig.108S:B); (2) *cementum* completely surrounding tooth bases and filling *sulcus dentalis*, producing "pseudothecodont" condition (see Fig.108S:C). See illustrations for this character under character 108.

Comments: This character was redefined from Estes *et al*. (1988) by previous authors, and so we follow usage of this character according to new character definitions (Denton and O'Neill, 1995; Nydam and Cifelli, 2002; Nydam *et al*., 2007). In our analysis, scoring for this character was only possible in species that present pleurodont or modified pleurodont implantation (see character 124 above), and so taxa with different tooth implatation were scored (?).

(126) Dentition, tooth replacement (Gauthier *et al*., 2012: 430): (0) present (see Fig.124S:A,C); (1) absent (see Fig.124S:B). See illustration for this character under character 124.

(127) Dentition, tooth replacement development (Estes *et al*., 1988: 85; Conrad, 2008: 221): (0) replacement tooth develops lingually, large resorption pits present ("iguanid" type); (1) replacement tooth develops posterolingually, small resorption pits present (intermediate type); (2) replacement tooth develops posterolingually, no resorption pits present ("varanid" type).

Comments: We follow usage of this character according to Estes *et al*. (1988). Scorings for *Amphisbaena fuliginosa* and *Rhineura floridana* follow Kearney (2003), as in Gauthier *et al*. (2012).

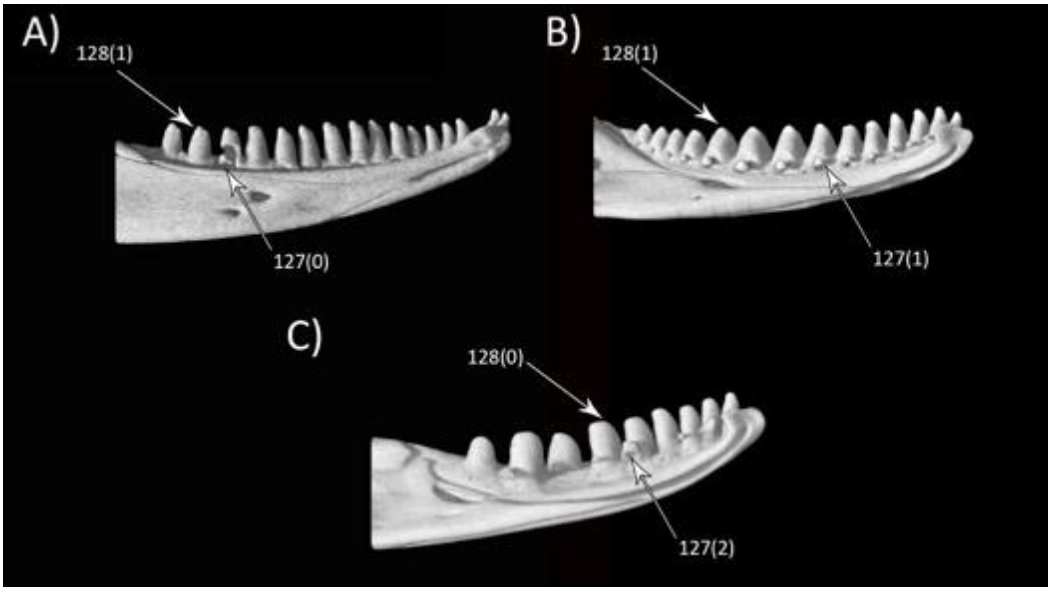


Figure 127S. A) *Callopistes maculatus* FMNH 53726; B) *Pseudopus* (*Ophisaurus*) *apodus* YPM 12870; C) *Varanus exanthematicus* FMNH 58299. Lingual views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(128) Dentition heterodont with tooth differentiation along tooth row (Gauthier, 1984): (0) absent (see Fig.127S:C); (1) present (see Fig.127S:A, B). See illustration for this character under character 127.

(129) Dentition, premaxillary teeth compared to maxillary teeth (Rieppel & Zaher, 2000a: 156; modified from Conrad, 2008: 223; Gauthier *et al.*, 2012: 412): (0) similar; (1) markedly smaller.

Comments: We follow usage of this character according to Conrad (2008: 223). The third state of the author's description 2 (*absent*) is non-informative in our dataset and thus was excluded from our analysis.

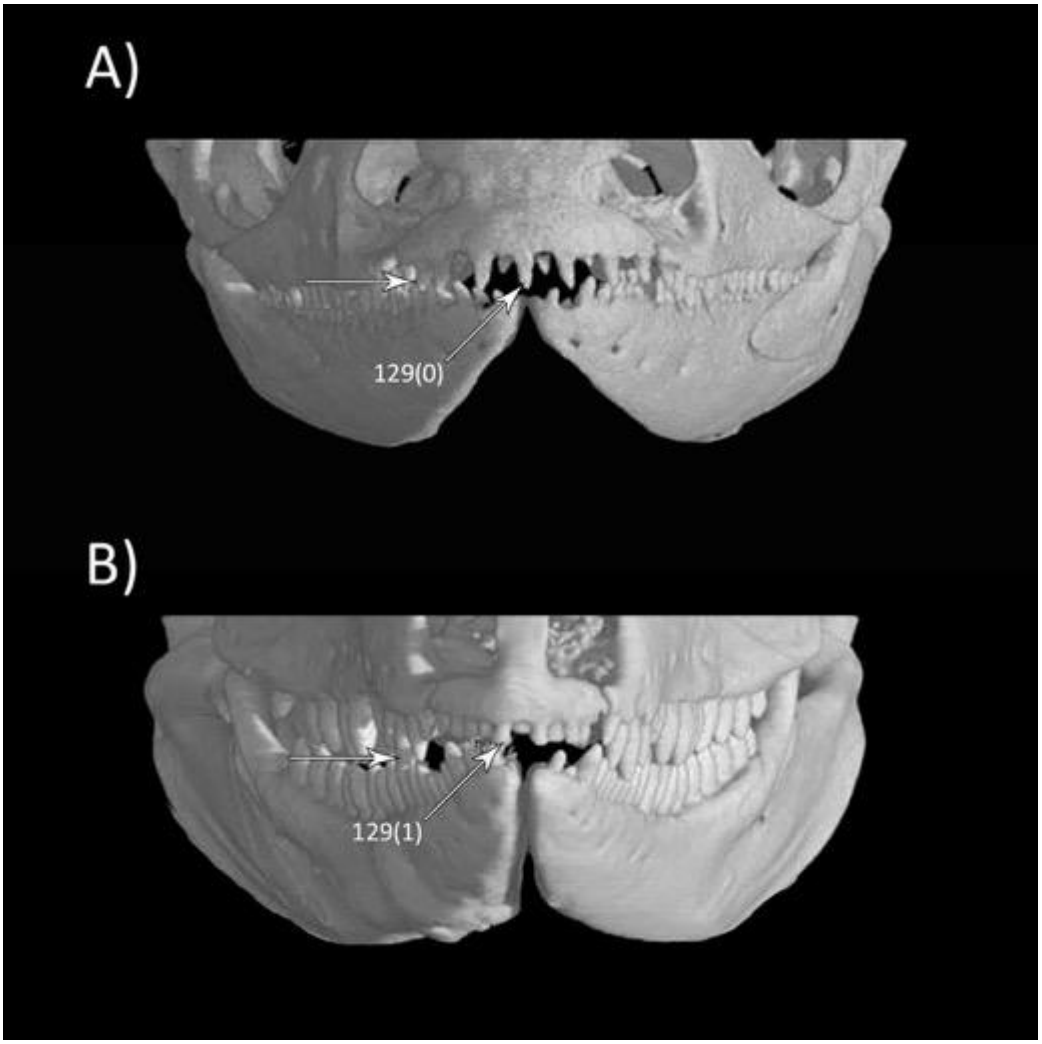


Figure 129S. A) *Colobosaura modesta* USNM 341978; B) *Tupinambis teguixin* FMNH 22416. Anterior views of the skulls, no scale bar. Images derived from http://digimorph.org.

(130) Median premaxillary tooth (Gauthier *et al*., 2012: 413): (0) absent; (1) present.

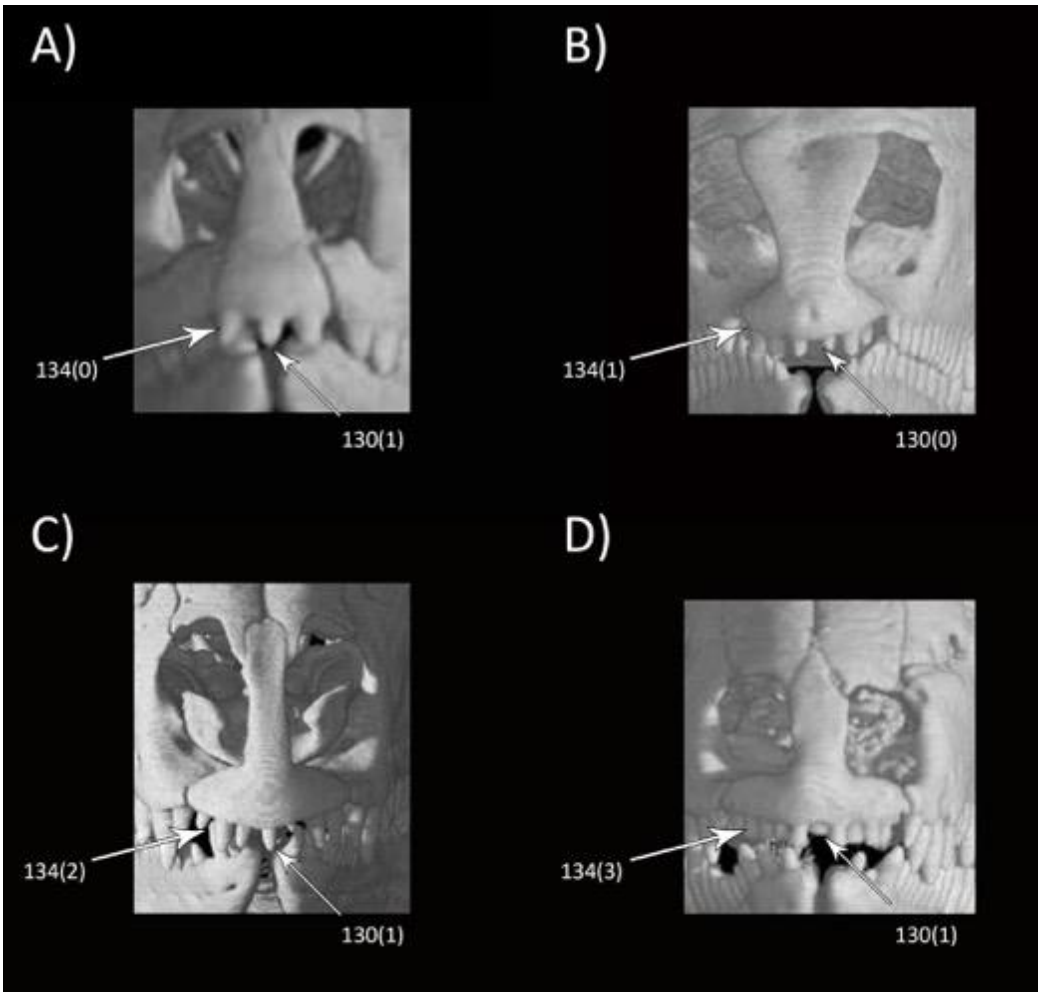


Figure 130S. A) *Pogona vitticeps* ROM 22699; B) *Teius teyou* FMNH 10873; C) *Callopistes maculatus* FMNH 53726; D) *Tupinambis teguixin* FMNH 22416. Anterior views of the skulls, no scale bar. Images derived from http://digimorph.org.

(131) Premaxillary teeth, cusps (Denton & O'Neill, 1995: 28; Nydam & Cifelli, 2002a: 28; Nydam *et al.*, 2007: 28): (0) simple, unicuspid; (1) complex, bicuspid, tricuspid.

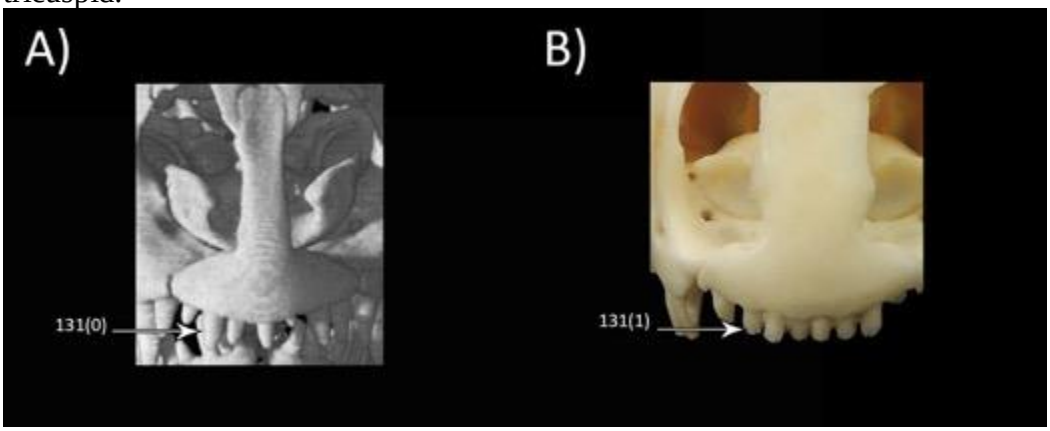


Figure 131S. A) *Callopistes maculatus* FMNH 53726; B) *Salvator merianae* MZUSP 85000. Anterior views of the skulls, no scale bar. Image (A) derived from http://digimorph.org.

(132) Maxillary tooth crown height (modified from Gauthier *et al*., 2012: 416): (0) constant throughout tooth row; (1) length varies, resulting in sinuous occlusal surface; (2) lenght varies, resulting in convex occlusal surface.

Comments: Gauthier *et al*. (2012) presented five different states for this character. We excluded states 3 (*length decreases posteriorly*) and 4 (*length increases posteriorly*) for being non-informative in our dataset.

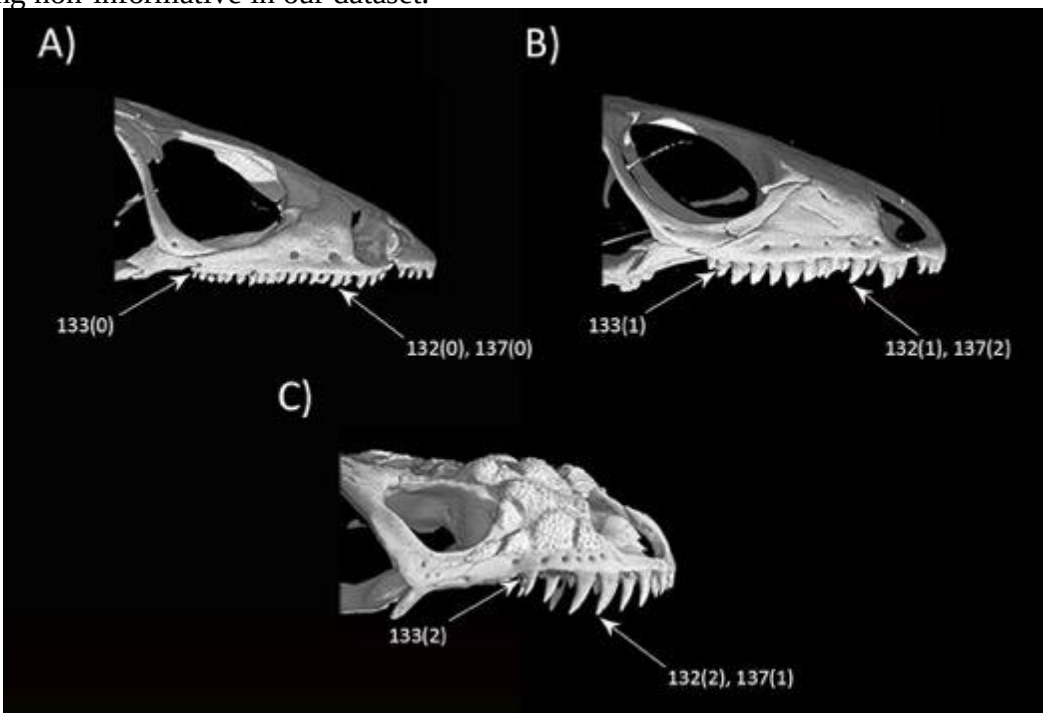


Figure 132S. A) *Colobosaura modesta* USNM 341978; B) *Callopistes maculatus* FMNH 53726; C) *Heloderma suspectum* TNHC 62766. Labial views of the anterior portions of the skulls, no scale bar. Images derived from http://digimorph.org.

(133) Maxillary tooth row length (Gauthier *et al*., 2012: 418): (0) to or behind midorbit (see Fig.132S:A); (1) anterior to midorbit (see Fig.132S:B); (2) anterior to orbit (see Fig.132S:C). See illustration for this character under character 132.

(134) Premaxillary tooth count (modified from Gauthier *et al*., 2012: 419): (0) one to three (see Fig.130S:A); (1) four to six (see Fig.130S:B); (2) seven to nine (see Fig.130S:C); (3) 10 or more (see Fig.130S:D). See illustration for this character under character 130.

Comments: Gauthier *et al*. (2012) presented five different states for this character. We excluded state 0 (*none*) given that it was non-informative in our dataset.

(135) Maxillary tooth count (modified from Gauthier *et al*., 2012: 420): (0) 2-5; (1) 7-15; (2) 16-27; (3) 31 or more.

Comments: Gauthier *et al*. (2012) presented five different states for this character. We excluded state 0 (*none*) given that it was non-informative in our dataset.

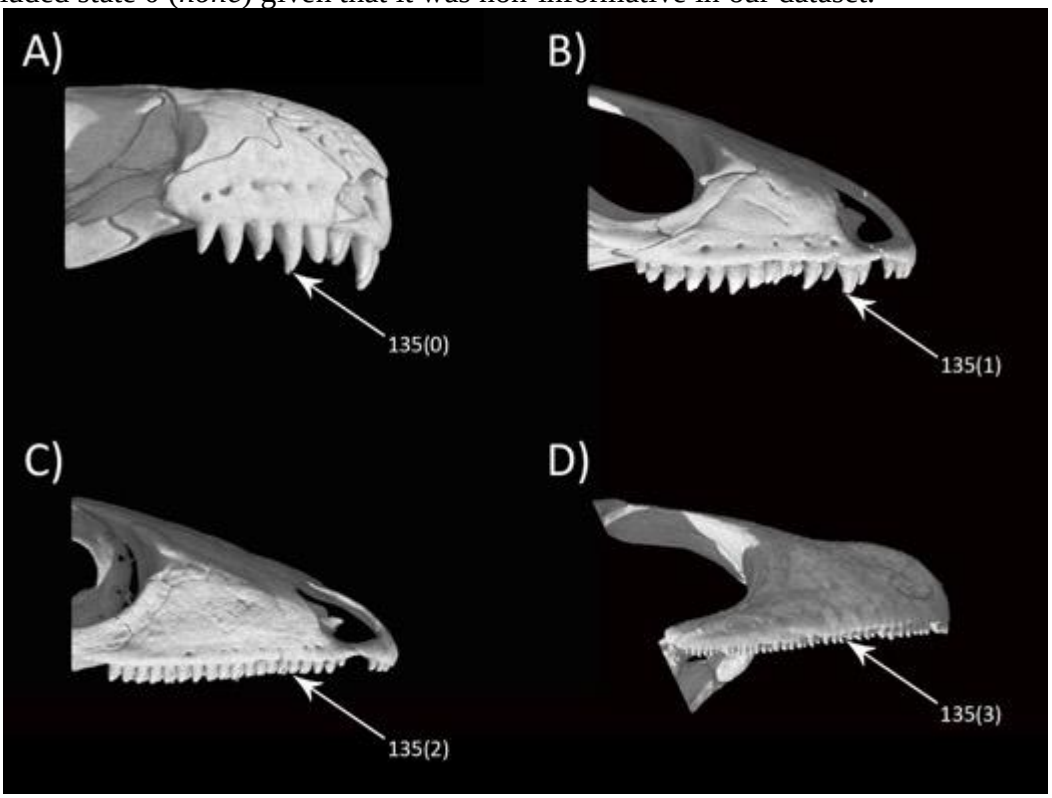


Figure 135S. A) *Amphisbaena fuliginosa* FMNH 22847; B) *Callopistes maculatus* FMNH 53726; C) *Aspidoscelis tigris* FMNH 161622; D) *Gekko gecko* FMNH 186818. Labial views of the skulls, no scale bar. Images derived from http://digimorph.org.

(136) Dentary tooth count (modified from Gauthier *et al*., 2012: 421): (0) 4-9; (1) 10-20; (2) 21-35; (3) 36 or more.

Comments: Gauthier *et al*. (2012) presented five different states for this character. We excluded state 0 (*none*) given that it was non-informative in our dataset. We also modified the author's scorings for *Callopistes maculatus* (scored as state 2) and *Tupinambis teguixin* (scored as state 1), given that both taxa retain both states 1 and 2.

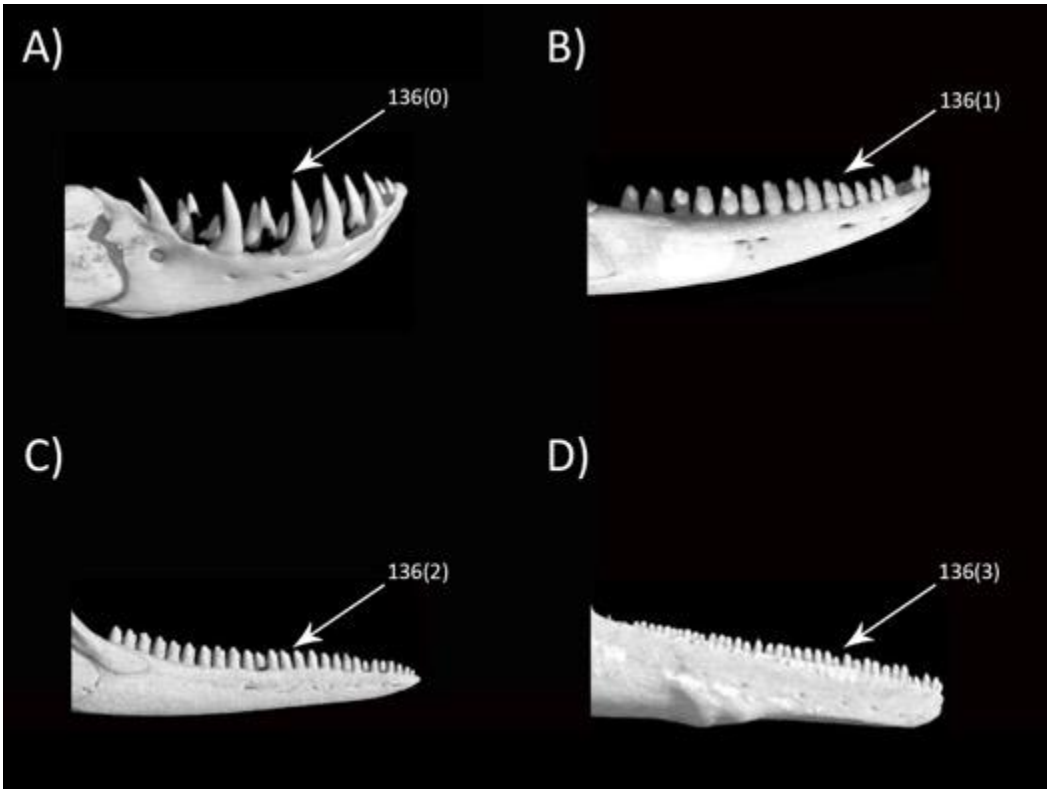


Figure 136S. A) *Heloderma suspectum* TNHC 62766; B) *Callopistes maculatus* FMNH 53726; C) *Aspidoscelis tigris* FMNH 161622; D) *Gekko gecko* FMNH 186818. Labial views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(137) Marginal teeth (Gauthier *et al*., 2012: 422): (0) all vertical (see Fig.132S:A); (1) all recurved (see Fig.132S:C); (2) anterior teeth recurved and posterior teeth vertical (see Fig.132S:B). See illustration for this character under character 132.

Comments: We modified Gauthier *et al*.'s (2012) scoring for *Callopistes maculatus* from as state 0 to as state 2.

(138) Anterior maxillary teeth (Denton & O'Neill, 1995: 29; Nydam & Cifelli, 2002a: 29; Nydam *et al*., 2007: 29; Brizuela, 2010: 122): (0) simple, unicuspid; (1) complex, bicuspid, tricuspid.

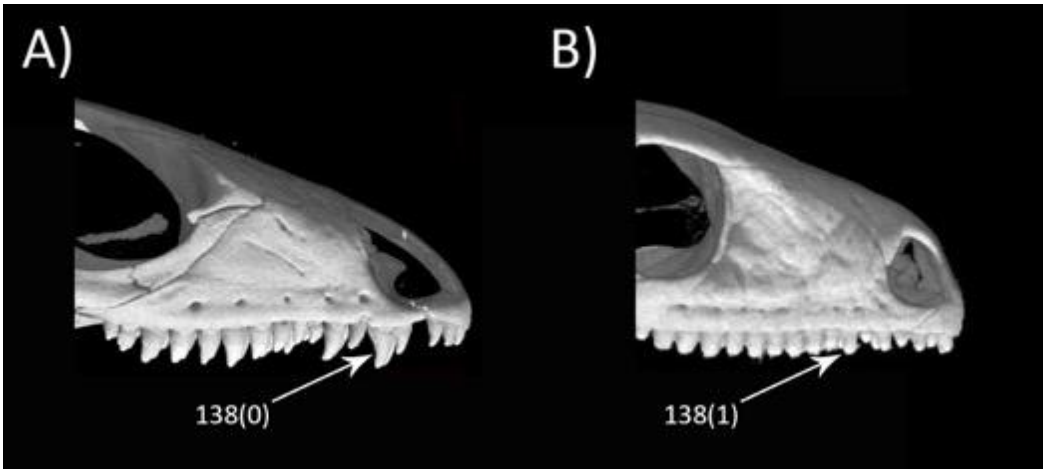


Figure 138S. A) *Callopistes maculatus* FMNH 53726; B) *Lepidophyma flavimaculatum* LACM 128570. Labial views of the skulls, no scale bar. Images derived from http://digimorph.org.

(139) Posterior teeth (NEW CHARACTER): (0) without cusps; (1) with cusps.

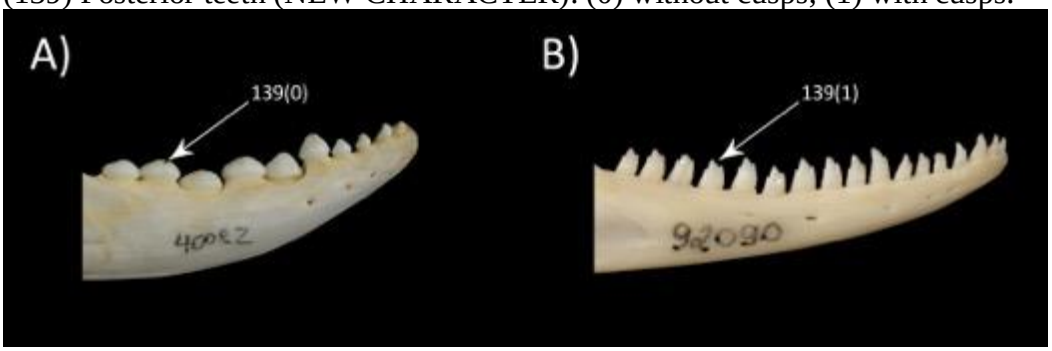


Figure 139S. A) *Dracaena guianensis* MZUSP 40082; B) *Crocodilurus amazonicus* MZUSP 92090. Labial views of the mandibles, no scale bar.

(140) Cusps on posterior teeth (Gauthier *et al*., 2012: 434): (0) unicuspid; (1) bicuspid; (2) tricuspid.

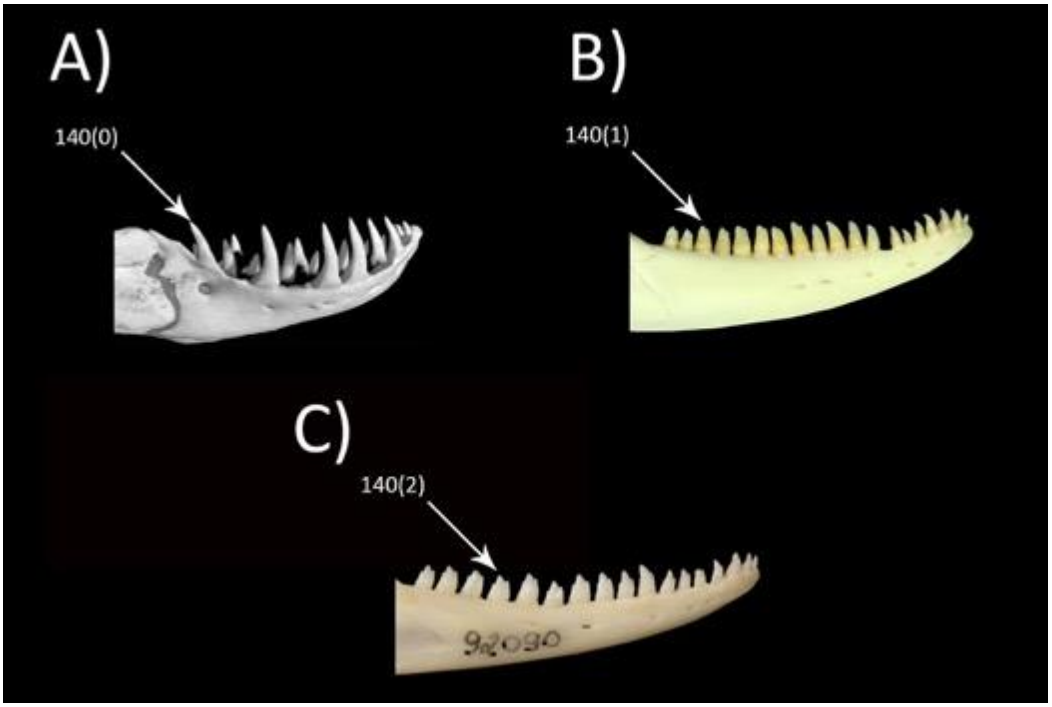


Figure 140S. A) *Heloderma suspectum* TNHC 62766; B) *Callopistes maculatus* MZUSP 8037; C) *Crocodilurus amazonicus* MZUSP 92090. Labial views of the mandibles, no scale bar. Image (A) derived from http://digimorph.org.

(141) Posterior teeth, type of expansion (modified from: Denton & O'Neill, 1995: 19; Nydam & Cifelli, 2002a: 19; Nydam *et al*., 2007: 19; Brizuela, 2010: 121): (0) absent; (1) transverse; (2) oblique, longitudinally developed; (3) oblique, medially developed.

Comments: We modified the character states of Denton and O'Neill (1995) 1 (*present*) and of Brizuela (2010) 1 (*transverse, labiolingual*); 2 (*longitudinal, mesodistal, cross-section oval*); and 3 (*longitudinal and transverse, cross-section round or quadrate*), unifying them into a single character description.

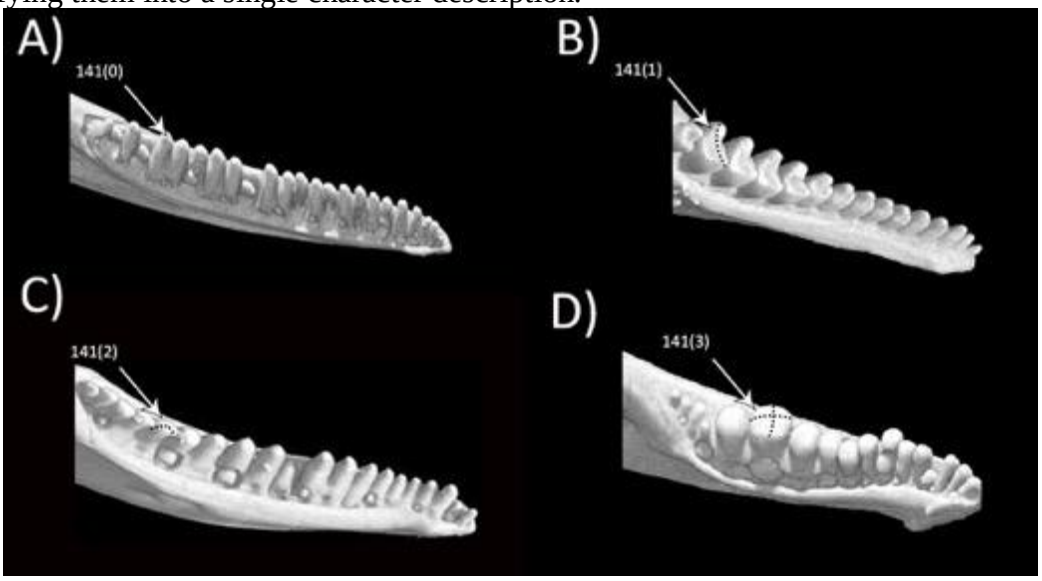


Figure 141S. A) *Lacerta viridis* YPM 12858; B) *Teius teyou* FMNH 10873; C) *Tupinambis teguixin* FMNH 22416; D) *Tiliqua scincoides* FMNH 57518. Dorsal views of the mandibles, no scale bar. Images derived from http://digimorph.org.

(142) Longitudinally striate posterior teeth (Denton & O'Neill, 1995: 30; Nydam & Cifelli, 2002a: 30; Nydam *et al*., 2007: 30; Conrad, 2008: 219; Brizuela, 2010: 124): (0) absent; (1) present.

Comments: We follow usage of this character according to Denton and O'Neill (1995: 30).

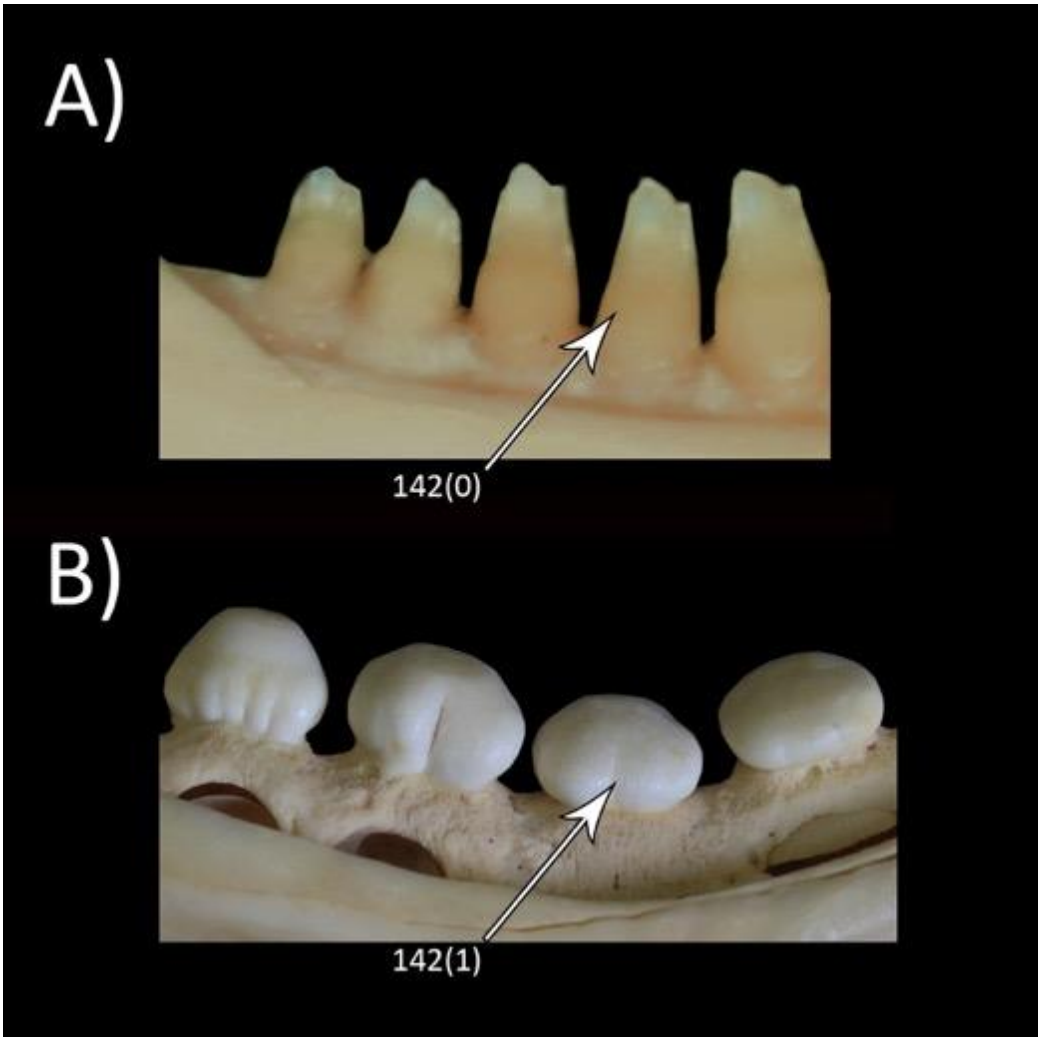


Figure 142S. A) *Callopistes maculatus* MZUSP 8037; B) *Dracaena paraguayensis* MZUSP 62849. Close-up of the dentary posterior teeth, in lingual view. No scale bar.

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DATA MATRIX IN TNT FORMAT

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APOMORPHY LIST OUTPUT FROM TNT

Log file: apolist.txt

Synapomorphies common to 1 trees
(Node numbers refer to nodes in consensus)

Sphenodon_punctatus :
All trees:
No autapomorphies:

Pogona_vitticeps :
All trees:
Char. 17: 2 --> 1
Char. 23: 2 --> 1
Char. 26: 0 --> 3
Char. 40: 0 --> 1
Char. 43: 01 --> 2
Char. 78: 0 --> 1
Char. 80: 0 --> 1
Char. 81: 1 --> 0
Char. 95: 0 --> 1

Chamaeleo_laevigatus :
All trees:
Char. 2: 0 --> 1
Char. 3: 0 --> 1
Char. 10: 1 --> 0
Char. 53: 0 --> 1
Char. 58: 0 --> 1

```
    Char. 66: 0 --> 1
    Char. 90: 0 --> 1

Iguana_iguana :
  All trees:
    Char. 17: 2 --> 1
    Char. 47: 0 --> 1
    Char. 48: 0 --> 1
    Char. 50: 0 --> 1
    Char. 78: 0 --> 1
    Char. 80: 0 --> 1
    Char. 82: 1 --> 0
    Char. 109: 0 --> 1
    Char. 110: 2 --> 1

Corytophanes_cristatus :
  All trees:
    Char. 26: 0 --> 2
    Char. 77: 0 --> 1
    Char. 83: 1 --> 0
    Char. 87: 0 --> 1
    Char. 99: 1 --> 0

Enyalioides_laticeps :
  All trees:
    Char. 2: 0 --> 1
    Char. 3: 0 --> 1
    Char. 4: 0 --> 1
    Char. 16: 1 --> 0
    Char. 22: 1 --> 0
    Char. 84: 0 --> 1
    Char. 103: 2 --> 1
    Char. 106: 0 --> 1
    Char. 113: 1 --> 2
    Char. 134: 2 --> 3

Lialis_burtonis :
  All trees:
    Char. 3: 0 --> 1
    Char. 5: 0 --> 1
    Char. 9: 0 --> 1
    Char. 16: 1 --> 0
    Char. 49: 0 --> 1
    Char. 65: 0 --> 1
    Char. 94: 0 --> 1
    Char. 108: 0 --> 1
    Char. 137: 0 --> 1

Gekko_gecko :
  All trees:
    Char. 19: 1 --> 0
    Char. 53: 0 --> 2
    Char. 59: 0 --> 1
    Char. 90: 0 --> 1
    Char. 99: 1 --> 0
    Char. 123: 0 --> 1
```

```
Pseudopus_apodus :
  All trees:
    Char. 2: 0 --> 1
    Char. 6: 2 --> 0
    Char. 20: 1 --> 2
    Char. 21: 0 --> 1
    Char. 23: 0 --> 1
    Char. 34: 2 --> 0
    Char. 45: 0 --> 1
    Char. 69: 0 --> 1
    Char. 70: 2 --> 1
    Char. 72: 1 --> 0
    Char. 93: 3 --> 1
    Char. 128: 0 --> 1
    Char. 133: 2 --> 0
    Char. 141: 0 --> 2

Heloderma_suspectum :
  All trees:
    Char. 10: 1 --> 3
    Char. 42: 2 --> 1
    Char. 61: 0 --> 1
    Char. 65: 0 --> 1
    Char. 82: 1 --> 0
    Char. 130: 1 --> 0
    Char. 132: 0 --> 2
    Char. 137: 0 --> 1

Varanus_exanthematicus :
  All trees:
    Char. 3: 0 --> 2
    Char. 5: 0 --> 1
    Char. 9: 0 --> 1
    Char. 10: 1 --> 0
    Char. 12: 0 --> 1
    Char. 16: 1 --> 0
    Char. 17: 2 --> 1
    Char. 26: 0 --> 2
    Char. 29: 0 --> 1
    Char. 41: 0 --> 1
    Char. 83: 1 --> 0
    Char. 98: 0 --> 1
    Char. 112: 1 --> 2
    Char. 139: 1 --> 0

Amphisbaena_fuliginosa :
  All trees:
    Char. 17: 2 --> 0
    Char. 38: 0 --> 1
    Char. 49: 0 --> 1
    Char. 76: 1 --> 0
    Char. 111: 1 --> 0
    Char. 113: 2 --> 1
    Char. 114: 1 --> 0
    Char. 120: 0 --> 1

Rhineura_floridana :
```

```
  All trees:
    Char. 9: 0 --> 1
    Char. 12: 0 --> 1
    Char. 15: 0 --> 1
    Char. 19: 1 --> 0
    Char. 20: 1 --> 2

Lepidophyma_flavimaculatum :
  All trees:
    Char. 17: 3 --> 0
    Char. 18: 1 --> 0
    Char. 78: 0 --> 1
    Char. 82: 1 --> 0
    Char. 87: 0 --> 1
    Char. 107: 0 --> 1
    Char. 109: 0 --> 1
    Char. 116: 0 --> 1
    Char. 119: 0 --> 1
    Char. 121: 1 --> 0

Tiliqua_scincoides :
  All trees:
    Char. 6: 2 --> 0
    Char. 8: 1 --> 0
    Char. 10: 1 --> 3
    Char. 19: 1 --> 0
    Char. 25: 3 --> 0
    Char. 30: 0 --> 1
    Char. 43: 1 --> 0
    Char. 63: 1 --> 0
    Char. 64: 0 --> 1
    Char. 90: 0 --> 1
    Char. 93: 0 --> 2
    Char. 110: 0 --> 1
    Char. 113: 2 --> 1
    Char. 128: 0 --> 1
    Char. 139: 1 --> 0
    Char. 141: 0 --> 3

Cordylus_mossambicus :
  All trees:
    Char. 3: 0 --> 1
    Char. 13: 0 --> 1
    Char. 59: 0 --> 1
    Char. 122: 0 --> 1

Lacerta_viridis :
  All trees:
    Char. 7: 1 --> 2
    Char. 77: 0 --> 1
    Char. 129: 0 --> 1

Takydromus_ocellatus :
  All trees:
    Char. 17: 3 --> 1
    Char. 69: 1 --> 0
    Char. 80: 0 --> 1
```

```
    Char. 87: 0 --> 1
    Char. 97: 0 --> 1
    Char. 100: 0 --> 1
    Char. 130: 1 --> 0
    Char. 131: 0 --> 1
    Char. 134: 2 --> 3

Colobosaura_modesta :
  All trees:
    Char. 10: 3 --> 2
    Char. 67: 1 --> 0
    Char. 83: 1 --> 0
    Char. 110: 1 --> 0
    Char. 116: 0 --> 1

Pholidobolus_montium :
  All trees:
    Char. 69: 1 --> 0
    Char. 72: 0 --> 1
    Char. 103: 0 --> 2
    Char. 108: 1 --> 0
    Char. 132: 0 --> 1
    Char. 135: 2 --> 1
    Char. 136: 2 --> 1

Ameiva_ameiva :
  All trees:
    Char. 23: 0 --> 2
    Char. 42: 1 --> 2
    Char. 91: 0 --> 1
    Char. 97: 0 --> 1
    Char. 131: 0 --> 1
    Char. 138: 0 --> 1

Ameivula_nigrigula :
  All trees:
    Char. 23: 0 --> 2
    Char. 24: 2 --> 1
    Char. 32: 0 --> 1
    Char. 53: 0 --> 1
    Char. 91: 0 --> 1
    Char. 103: 0 --> 1

Aspidoscelis_tigris :
  All trees:
    Char. 57: 0 --> 1
    Char. 97: 0 --> 1
    Char. 108: 1 --> 0
    Char. 115: 0 --> 1

Cnemidophorus_lemniscatus :
  All trees:
    Char. 6: 1 --> 0
    Char. 59: 2 --> 1
    Char. 97: 0 --> 1
    Char. 107: 0 --> 1
    Char. 108: 1 --> 0
```

```
    Char. 138: 0 --> 1

Dicrodon_guttulatum :
  All trees:
    Char. 11: 1 --> 0
    Char. 19: 0 --> 2
    Char. 20: 1 --> 2
    Char. 22: 0 --> 1
    Char. 66: 1 --> 0
    Char. 90: 1 --> 0
    Char. 100: 1 --> 0
    Char. 103: 0 --> 1
    Char. 137: 0 --> 2

Kentropyx_calcarata :
  All trees:
    Char. 10: 2 --> 0
    Char. 19: 0 --> 2
    Char. 51: 0 --> 1
    Char. 66: 1 --> 0
    Char. 67: 1 --> 0
    Char. 68: 0 --> 1
    Char. 102: 0 --> 1
    Char. 108: 1 --> 2
    Char. 133: 0 --> 1
    Char. 137: 0 --> 2

Teius_teyou :
  All trees:
    Char. 3: 0 --> 1
    Char. 17: 2 --> 1
    Char. 59: 2 --> 1
    Char. 65: 0 --> 1
    Char. 135: 2 --> 1

Callopistes_flavipunctatus :
  All trees:
    Char. 3: 0 --> 2
    Char. 22: 1 --> 0
    Char. 114: 1 --> 2

Callopistes_maculatus :
  All trees:
    Char. 9: 1 --> 0
    Char. 36: 1 --> 2
    Char. 135: 1 --> 2

Crocodilurus_amazonicus :
  All trees:
    Char. 24: 2 --> 1
    Char. 90: 0 --> 1
    Char. 112: 1 --> 2
    Char. 131: 0 --> 1
    Char. 138: 0 --> 1

Dracaena_guianensis :
  All trees:
```

```
    Char. 9: 1 --> 0
    Char. 134: 2 --> 3

Dracaena_paraguayensis :
  All trees:
    No autapomorphies:

Tupinambis_duseni :
  All trees:
    Char. 19: 0 --> 1
    Char. 34: 2 --> 1
    Char. 36: 1 --> 2
    Char. 93: 1 --> 0

Tupinambis_merianae :
  All trees:
    Char. 68: 0 --> 1
    Char. 98: 0 --> 1
    Char. 100: 1 --> 0

Tupinambis_quadrilineatus :
  All trees:
    Char. 2: 0 --> 1
    Char. 6: 0 --> 1
    Char. 20: 1 --> 2
    Char. 23: 2 --> 01
    Char. 68: 0 --> 1
    Char. 98: 0 --> 1
    Char. 114: 1 --> 2
    Char. 117: 1 --> 2
    Char. 121: 1 --> 0
    Char. 134: 2 --> 3
    Char. 141: 2 --> 0
    Char. 142: 1 --> 0

Tupinambis_rufescens :
  All trees:
    No autapomorphies:

Tupinambis_teguixin :
  All trees:
    No autapomorphies:

Tupinambis_uruguaianensis :
  All trees:
    Char. 100: 1 --> 0
    Char. 116: 0 --> 1

Callopistes_bicuspidatus :
  All trees:
    No autapomorphies:

MPCNPV_002 :
  All trees:
    No autapomorphies:

Node 41 :
```

```
  All trees:
    Char. 76: 0 --> 1
    Char. 79: 1 --> 0
    Char. 117: 3 --> 2
    Char. 120: 1 --> 0

Node 42 :
  All trees:
    No synapomorphies

Node 43 :
  All trees:
    Char. 29: 0 --> 1
    Char. 72: 1 --> 0
    Char. 81: 1 --> 0
    Char. 111: 0 --> 2
    Char. 131: 0 --> 1

Node 44 :
  All trees:
    Char. 10: 1 --> 0
    Char. 15: 0 --> 1
    Char. 37: 1 --> 0
    Char. 110: 0 --> 2

Node 45 :
  All trees:
    Char. 16: 0 --> 1
    Char. 35: 3 --> 1
    Char. 48: 1 --> 0
    Char. 104: 0 --> 1
    Char. 112: 0 --> 1
    Char. 124: 1 --> 0
    Char. 126: 1 --> 0
    Char. 136: 1 --> 2

Node 46 :
  All trees:
    Char. 12: 0 --> 1
    Char. 17: 2 --> 0
    Char. 41: 0 --> 2
    Char. 68: 1 --> 0
    Char. 83: 1 --> 0

Node 47 :
  All trees:
    Char. 30: 0 --> 1
    Char. 31: 0 --> 1
    Char. 44: 0 --> 1
    Char. 111: 0 --> 1
    Char. 117: 2 --> 3
    Char. 121: 1 --> 0
    Char. 140: 2 --> 0

Node 48 :
  All trees:
    Char. 6: 0 --> 2
```

```
    Char. 19: 2 --> 1
    Char. 22: 1 --> 0
    Char. 23: 2 --> 0
    Char. 46: 0 --> 1
    Char. 47: 0 --> 1
    Char. 51: 1 --> 0
    Char. 54: 0 --> 1
    Char. 71: 0 --> 1
    Char. 92: 1 --> 0
    Char. 105: 0 --> 1
    Char. 113: 1 --> 2

Node 49 :
  All trees:
    Char. 25: 3 --> 0
    Char. 31: 1 --> 0
    Char. 44: 1 --> 0
    Char. 52: 0 --> 1
    Char. 115: 1 --> 0
    Char. 136: 0 --> 1
    Char. 142: 0 --> 1

Node 50 :
  All trees:
    Char. 7: 0 --> 1
    Char. 37: 1 --> 0
    Char. 55: 0 --> 1
    Char. 99: 1 --> 0

Node 51 :
  All trees:
    Char. 18: 1 --> 0
    Char. 62: 0 --> 1
    Char. 93: 0 --> 3
    Char. 133: 0 --> 2

Node 52 :
  All trees:
    Char. 21: 0 --> 1
    Char. 26: 0 --> 1
    Char. 56: 0 --> 1
    Char. 57: 0 --> 1
    Char. 61: 0 --> 2
    Char. 64: 0 --> 1
    Char. 79: 0 --> 1
    Char. 80: 0 --> 1
    Char. 88: 0 --> 2
    Char. 90: 0 --> 1
    Char. 94: 0 --> 1
    Char. 110: 0 --> 1
    Char. 112: 1 --> 0

Node 53 :
  All trees:
    Char. 26: 0 --> 2
    Char. 53: 0 --> 2
    Char. 54: 1 --> 0
```

```
    Char. 60: 2 --> 0
    Char. 81: 1 --> 0
    Char. 112: 1 --> 0
    Char. 135: 2 --> 1
    Char. 136: 2 --> 1

Node 54 :
  All trees:
    Char. 45: 0 --> 1
    Char. 48: 0 --> 1
    Char. 50: 0 --> 1
    Char. 83: 1 --> 0
    Char. 99: 1 --> 0
    Char. 117: 2 --> 0
    Char. 131: 0 --> 1

Node 55 :
  All trees:
    Char. 7: 0 --> 1
    Char. 17: 2 --> 3
    Char. 21: 0 --> 2
    Char. 56: 0 --> 1
    Char. 69: 0 --> 1

Node 56 :
  All trees:
    Char. 18: 1 --> 0
    Char. 25: 3 --> 0
    Char. 26: 0 --> 2
    Char. 52: 0 --> 1
    Char. 59: 0 --> 1
    Char. 67: 1 --> 0
    Char. 116: 0 --> 1

Node 57 :
  All trees:
    Char. 1: 1 --> 0
    Char. 10: 1 --> 3
    Char. 19: 1 --> 0
    Char. 72: 1 --> 0
    Char. 78: 0 --> 1
    Char. 82: 1 --> 0
    Char. 108: 0 --> 1
    Char. 110: 0 --> 1
    Char. 111: 0 --> 2

Node 58 :
  All trees:
    Char. 2: 0 --> 1
    Char. 3: 0 --> 1
    Char. 4: 0 --> 1
    Char. 23: 0 --> 1
    Char. 34: 2 --> 0
    Char. 121: 1 --> 0
    Char. 134: 2 --> 3

Node 59 :
```

```
  All trees:
    Char. 14: 0 --> 1
    Char. 17: 3 --> 0
    Char. 30: 0 --> 1
    Char. 58: 0 --> 1
    Char. 117: 2 --> 1
    Char. 119: 0 --> 1
    Char. 128: 0 --> 1

Node 60 :
  All trees:
    Char. 53: 0 --> 1
    Char. 122: 0 --> 1

Node 61 :
  All trees:
    Char. 57: 0 --> 1
    Char. 90: 0 --> 1
    Char. 130: 1 --> 0
    Char. 134: 2 --> 3

Node 62 :
  All trees:
    Char. 42: 2 --> 1

Node 63 :
  All trees:
    Char. 9: 1 --> 0
    Char. 10: 3 --> 2
    Char. 11: 2 --> 1
    Char. 17: 0 --> 2
    Char. 26: 0 --> 2
    Char. 46: 1 --> 0
    Char. 47: 1 --> 0
    Char. 61: 0 --> 1
    Char. 117: 1 --> 0
    Char. 118: 1 --> 0

Node 64 :
  All trees:
    Char. 15: 0 --> 1
    Char. 35: 1 --> 2
    Char. 59: 0 --> 2
    Char. 63: 1 --> 0
    Char. 64: 0 --> 1
    Char. 73: 0 --> 1
    Char. 78: 1 --> 2
    Char. 80: 0 --> 1
    Char. 84: 0 --> 1
    Char. 86: 0 --> 1
    Char. 88: 0 --> 1
    Char. 89: 1 --> 0
    Char. 96: 2 --> 1
    Char. 101: 1 --> 0
    Char. 125: 0 --> 1
    Char. 138: 1 --> 0
```

```
Node 65 :
  All trees:
    Char. 2: 0 --> 1
    Char. 133: 0 --> 1

Node 66 :
  All trees:
    Char. 2: 0 --> 1
    Char. 6: 1 --> 0
    Char. 13: 1 --> 0
    Char. 32: 0 --> 1
    Char. 39: 0 --> 1
    Char. 125: 1 --> 2
    Char. 134: 3 --> 1
    Char. 136: 2 --> 1
    Char. 141: 0 --> 1

Node 67 :
  All trees:
    Char. 78: 2 --> 0
    Char. 80: 1 --> 0
    Char. 104: 1 --> 0
    Char. 107: 0 --> 1

Node 68 :
  All trees:
    Char. 19: 0 --> 1
    Char. 29: 0 --> 1
    Char. 67: 1 --> 0
    Char. 111: 2 --> 1
    Char. 116: 0 --> 1
    Char. 133: 0 --> 1

Node 69 :
  All trees:
    Char. 22: 0 --> 1
    Char. 23: 0 --> 2
    Char. 27: 0 --> 2
    Char. 39: 0 --> 1
    Char. 51: 0 --> 1
    Char. 91: 0 --> 1
    Char. 129: 0 --> 1
    Char. 132: 0 --> 1
    Char. 135: 2 --> 1
    Char. 136: 2 --> 1
    Char. 137: 0 --> 2

Node 70 :
  All trees:
    Char. 1: 0 --> 1
    Char. 59: 2 --> 1
    Char. 72: 0 --> 1
    Char. 81: 1 --> 0
    Char. 83: 1 --> 0
    Char. 118: 1 --> 2

Node 71 :
```

```
  All trees:
    Char. 94: 0 --> 1
    Char. 117: 1 --> 2
    Char. 120: 0 --> 1

Node 72 :
  All trees:
    Char. 98: 0 --> 1
    Char. 108: 1 --> 2
    Char. 112: 1 --> 0
    Char. 125: 1 --> 2
    Char. 139: 1 --> 0

Node 73 :
  All trees:
    Char. 65: 0 --> 1
    Char. 78: 2 --> 1
    Char. 104: 1 --> 0
    Char. 142: 0 --> 1

Node 74 :
  All trees:
    Char. 58: 1 --> 0
    Char. 94: 0 --> 1

Node 75 :
  All trees:
    Char. 7: 1 --> 0
    Char. 29: 0 --> 1
    Char. 133: 0 --> 1

Node 76 :
  All trees:
    Char. 6: 1 --> 0

Node 77 :
  All trees:
    Char. 4: 0 --> 1
    Char. 70: 1 --> 2
    Char. 80: 1 --> 2
    Char. 85: 0 --> 1
```