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Characters of external morphology used in *Anolis* taxonomy—Definition of terms, advice on usage, and illustrated examples

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Abstract

With the aim of establishing a reference for taxonomists, I describe and discuss characters of external morphology that have been used widely in descriptions of *Anolis* (sensu lato) species. For most characters, images are provided to illustrate the terms and definitions. Where appropriate, I give advice on how the counts and measurements should be done.

Key words: Reptilia, *Anolis*, external morphology, definition of terms

Resumen

Con la importancia de establecer una referencia para los taxonomistas, describo y discuto caracteres de morfología externa que han sido utilizados ampliamente en las descripciones de las especies de *Anolis* (sensu lato). Para la mayoría de los caracteres, proporciono imágenes para ilustrar los términos y definiciones. Según necesidad brindo asesoramiento sobre cómo se deben hacer los conteos y las mediciones.

Introduction

Anolis are important research organisms and many articles are published every year dealing with different aspects of the biology of these lizards. However, at this point we still lack detailed and standardized descriptions of all recognized species of *Anolis*. The species descriptions found in original descriptions, reviews of species groups, or faunal treatments are extremely heterogeneous in regard to content, usage of terms, semantic issues, and characters included. For example, some authors (e.g., Underwood & Williams 1959; Savage & Villa 1986; Köhler 2008) count the number of subdigital lamellae under Phalanges II–IV whereas others (e.g., Schwartz 1973; Williams 1995; Poe *et al.* 2012) report only the lamellae under Phalanges II and III. Even when the same characters are reported, often differences in definitions are evident with different authors scoring the same character differently, i.e., having different threshold levels for scoring qualitative characters (e.g., whether to consider a scale to be smooth, faintly, or weakly keeled, or not, slightly or distinctly enlarged relative to adjacent scales). Also, the way the data are generated can differ widely depending on the applied methodology.

In 1995, Williams provided definitions for 37 morphological characters intended for usage in a computerized key for anoles. Williams' (1995) approach aimed mostly to bring definitions and encodings of morphological characters usable in a computer program. Therefore, he was forced to simplify many of the included character states thereby masking the extent of variation actually observed in the genus *Anolis*.

This article aims to provide definitions of external morphological characters that are useful in *Anolis* taxonomy with the goal of establishing a reference for future taxonomic work with these lizards. I am confident that a description containing the set of characters defined here will be reasonably complete for the majority of species. In species that show special morphological differentiations (such as the rostral appendage in *A. proboscis*), these special features need to be addressed of course. I have included many images illustrating the variation in the

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characters discussed, although I do not attempt to provide a comprehensive review of the variation in external morphology in anoles.

Material and methods

A list of the specimens used for the illustrations is provided in the Appendix. Abbreviations for museum collections follow Sabaj Pérez (2010), except for MHCH (Museo Herpetológico de Chiriquí, the herpetological collection of the Universidad Autónoma de Chiriquí, Davíd, Chiriquí, Panama). Finally, for the purpose of this article I have adopted the single-genus concept of anoles (sensu Poe 2004, 2013).

Results

Morphometric Characters

It is recommended that snout-vent length and tail length are measured using a stiff ruler and rounded to the nearest 0.5 mm. All other measurements should be made using calipers and rounded to the nearest 0.1 mm.

Snout-vent length (SVL). Distance between tip of snout and the posteriormost point of the anterior margin of the cloacal opening. I suggest the following size categories: (1) small: <50 mm SVL; (2) moderate-sized: 50–60 mm SVL; (3) moderately large: 60–80 mm SVL; (4) large: 80–110 mm SVL; (5) giant: >110 mm SVL. Note that a species can be catagorized as pertaining to more than one category, such as e.g., being moderately large to large in case the majority of adults are in both respective ranges.

Tail length (TL). Distance between posteriormost point of the anterior margin of the cloacal opening and tip of tail. Make sure to measure only intact original tails; many individuals of anoles have incomplete or regenerated tails rendering their tail length useless for taxonomic purposes (Fig. 1).

Tail diameter. The horizontal (HDT) and vertical (VDT) diameters of the tail are measured at the point reached by the heel of the extended hind leg (Fig. 2A). In specimens that are too stiff to allow the hind limb to be adpressed to the tail, a string can be used to first determine the length from thigh insertion to heel and then use this measure to locate the point where the tail diameter is determined.

Shank length (ShL). Shank length is measured between level of knee and heel with the thigh and foot positioned at 90 degree angle in relation to shank (Fig. 2B). I recommend to place one point of the calipers at the heel without deforming it (no pressure), then bring the other point of the caliper into contact with the knee, again without putting much pressure on the shank. Use the broad tips of the calipers for this measurement.

Axilla-groin distance (AGD). Distance between levels of axilla and groin measured with limbs positioned at 90 degree angle in relation to body (Fig. 2C). Make sure to bring the body of the animal in a straight position for this measurement.

Diameter of external ear opening. The longitudinal (LDE) and vertical (VDE) diameters of the external ear opening are measured. In many species the external ear opening is oriented slightly to distinctly obliquely. In these cases, the longitudinal and vertical diameters are measured at the greatest length and width, respectively, even if this means tilting the measure plane obliquely. For our purposes, the size of the external ear opening is about equal with tympanum size.

Diameter of parietal scale. The longitudinal (LDP) and transverse (TDP) diameters of the parietal scale are measured. LDP and TDP both are measured at the greatest length and width, respectively. Slender projections of the parietal scale should be ignored in cases where these are beyond the normal concave or convex outline of the scale.

Head length (HL). Head length is measured from the tip of the snout to the anterior margin of the ear opening (Figs. 3A, B). Keep calipers in a vertical position relative to the head of the animal because this seems to yield more reliable measurements as compared to a horizontal caliper position due to a "stabilizing" effect of the caliper leg aligned with the anterior margin of ear opening.

Head width (HW). Head width is determined with the broad tips of the calipers aligned with the levels of posterior margin of eye and supralabial scales, respectively, with the calipers held in a vertical position relative to the head (Figs. 3C, D).

Snout length (SL). Snout length is measured from the tip of the snout to the anterior border of the orbit, with the calipers held in a horizontal position relative to the head (Figs. 3E, F).

Postcloacal scale width (PCW). In males of many *Anolis* species one or two pairs of slightly to greatly enlarged postcloacal scales are observed a few scale rows posterior to the cloacal opening. These scales have also been termed "postanals" (e.g., Smith *et al.* 1968; Savage & Villa 1986; McCranie *et al.* 1993; Williams 1995) but should properly be referred to as postcloacals (Savage 2002). Since in females postcloacal scales are never enlarged, in those species with distinctly (and reliably!) enlarged postcloacal scales, this condition can be used to determine the sex even in hatchlings. I suggest to measure the width of the largest postcloacal scale and note whether this scale is slightly or greatly enlarged relative to the adjacent scales posterior to it. Greatly enlarged postcloacal scales are at least four times the width of the adjacent scales posterior to them whereas moderately enlarged postcloacal scales are at least twice the width of the adjacent scales posterior to them. Slightly enlarged postcloacals are discernably larger than the adjacent scales posterior to them but not twice their size. Examples are given in Fig. 4.

Subdigital pad width (SPW). In most species of *Anolis* the subdigital pads are distinctly dilated. SPW is measured at the broadest portion of the pad of Toe 4 (Fig. 5). Any projecting scales on the lateral or dorsal surface of the toe are ignored. The width of the non-dilated subdigital scales (DPW) on the distal phalanx is measured as a reference.

Relative hind limb length (RHLL). Relative hind limb length is determined by recording the point reached by the tip of the fourth toe when the extended hind limb is adpressed along the body of the straightened specimen (Fig. 6). This character is most easily done in living and freshly killed individuals but usually difficult in preserved specimens. Care has to be taken not to break bones (the femur is easily broken) while attempting to extend and adpress the hind leg. In my experience it is better to first straighten the knee joint and then adpress the straightened leg instead of first bending the femur-pelvic joint in order to reduce the risk of fractures.

Scalation Characters

Number of fourth toe lamellae (ToeLam). Subdigital lamellae are the widened, overlapping scales characteristic of the adhesive toe pads in anoles. Two counts are suggested here; one involving the lamellae under Phalanges II–IV, and another of the lamellae under the distal phalanx (Phalanx I). The proximal starting point is the lamella situated at the level of the basal joint of Toes III and IV (Fig. 7). I suggest to include in this count the terminal, usually smaller, scale at the end of the pad of widened lamellae. For the proximal starting point the lowest level of the skin web between the toes is determined. Although this point does not necessarily correspond with the position of the joint, I find it to constitute a straight forward and easy to use reference. Other authors have suggested counting only the lamellae under Phalanges II and III but I see no benefit of doing so. Also, the starting point below the joint between Phalanges III and IV is sometimes difficult to determine. For the distal lamellae (Phalanx I), the starting point is the first complete subdigital scale, ignoring two or more small, fragmented scales present in this region in some individuals. The first (= most proximal) distal lamella should agree in shape and coloration with the remaining distal lamellae. In case the remaining distal lamellae include a fragmented subdigital scale—usually split into two scales—then this is counted as a single lamella rather than two. The terminal scale enveloping the claw should be included in the count.

Condition of supradigital scales (CSD). These scales can be smooth or keeled (uni- or multicarinate). Examples are given in Fig. 8.

Number of scales between first canthals (1Canths). A transverse count across the dorsal surface of head between posteriormost canthal scales (Fig. 9). The first (i.e., posteriormost) canthal is situated anterior to the (largest) superciliary, often in the upper anterior corner of the orbita. It can be differentiated from the superciliary by its position (the superciliary does not extend beyond the orbit at all), shape (the canthal has portions on both the dorsal and the lateral aspects of the canthus rostralis), and orientation (because of having both lateral and dorsal components, the canthal usually is oriented somewhat obliquely). The count should be done along a straight line between the centers of the first canthals, respectively. This character is aimed to be a measure for the relative scale size in that region. Occasionally, at the position of the first canthal, instead of a single large scale, two small scale are present (see Fig. 21B); this condition is here interpreted as a divided first canthal. In specimens with this condition, the two posterior small canthals are considered to collectively represent the first canthal. The starting point for the count should then be at the level of the suture between the two scales.

Number of scales between second canthals (2Canths). A transverse count across the dorsal surface of head between second canthal scales (Fig. 9). The second canthal is situated directly anterior to the posteriormost canthal. In case of a divided first canthal, the second canthal is the third scale posterior to the anteriormost superciliary. In specimens with a divided anterior canthal, the adjacent large scale is then considered to be the second canthal even if this actually is the third scale in this series. The count should be done along a straight line between the centers of the second canthals, respectively. For both canthal counts it is important to maintain the head in a position so that the dorsal surface is perpendicular to the optical axis of the microscope.

Circumnasal condition. In anoles, the nostril is situated in a single scale, the circumnasal. The circumnasal can be broadly in contact with both the rostral and the first supralabial scales, or exclusively with one of these scales (CNC). Alternatively, the circumnasal can be separated from the rostral scale by one or more scales (CNS). Examples are given in Fig. 10.

Prenasal condition. The scales in the nasal region show considerable variation among the many species of *Anolis*. I consider the scale(s) anterior to the circumnasal scale to be a prenasal scale or scales. The following conditions are observed most frequently: (1) a single large, elongate prenasal scale (PNE), reaching the upper level of the nostril, in contact with both the rostral and the first supralabial scales, or exclusively with either of these scales. (2) two prenasal scales in a vertical series (PNM) with the lower scale not reaching the upper level of the nostril and in contact with both the rostral and the first supralabial scales, or exclusively with the rostral scale or the first supralabial. (3) two prenasal scales in a vertical series (PNS), separated from rostral and supralabials by one or more scales; unlike the lower prenasal, these scales are positioned below the circumnasal. However, numerous—more subtle—deviations from these main categories have been documented in various species of *Anolis* (e.g., Köhler & Vesely 2003, Köhler *et al.* 2010). Examples are given in Fig. 10.

Condition of superciliary scales. The following superciliary conditions are most prevalent in *Anolis*: (1) a single large, elongate superciliary scale (SSS) present along anterior portion of upper orbita region; those scales along the posterior portion being small and granular. (2) multiple (two or three) elongate, strongly overlapping superciliary scales (MSS) present along anterior portion of upper orbita region, the anteriormost one of these scales usually being the largest; those scales along posterior portion being small and granular. (3) a series of moderate-sized to large, squarish to variably shaped superciliary scales present along whole upper margin of orbita. (4) two or three only slightly elongate, keeled anterior superciliary scales, none reaching a length of one-fourth of horizontal eye diameter. (5) in a few species there are no enlarged superciliaries at all and all scales in this region are granular. Examples are given in Fig. 11.

Number of enlarged supraocular scales (ESO). The scales in the region of the upper ocular disc can vary considerable in the species of *Anolis* ranging from not enlarged at all to two or three greatly enlarged supraocular scales. The determination which scales should be considered to be enlarged has always been difficult and subjective – thus, this judgment differed between investigators. I here propose two categories of enlarged supraocular scales and utilize the size of the infralabials of the same individual as a reference for the relative size of the supraocular scales as follows: Moderately enlarged supraocular scales (MESO) are those that have a diameter (either longitudinal, transverse, or oblique) of at least 50 percent of the length of an average infralabial scale in the central portion between levels of rostral and center of eye; greatly enlarged supraocular scales (GESO) have a diameter of at least 100% of an average infralabial scale. These counts do not include elongated scales in the periphery of the supraocular disc (e.g., those of the circumorbital scales). Examples are given in Fig. 12.

Condition of supraocular scales (CSO). These vary from smooth or rugose to weakly or strongly keeled; keeling can be uni- or multicarinate. Examples are given in Fig. 12.

Condition of circumorbital scales (COS). In many species of anoles, a row of small scales separates the enlarged supraocular scales from the scales of the supraorbital semicircles. Thus, this character refers basically to the scales situated medially to the enlarged supraocular scales; laterally to the enlarged supraocular scales usually numerous small scales are present without differentiated scales that can be identified as circumorbitals. Considerable intra- and interspecific variation can be observed in this character as exemplified in *Anolis dunni* (Fig. 13) with the circumorbital series varying from complete (one or more rows of scales) to incomplete or absent. Whenever one or more enlarged supraocular scales are in contact with scales of the supraorbital semicircles, the circumorbital series are incomplete or absent.

Number of supralabial scales to level below center of eye (SPLeye). A longitudinal count of the supralabial scales starting with the scale contacting rostral to the supralabial scale whose posterior to central portions are below center of eye (Fig. 14). When only the anterior portion of a supralabial scale in question is below level of center of eye, then this scale is not included in the count. In cases where the eye seems to be altered due to preservation artefacts, the center of the orbita is used as the reference. Fused scales (i.e., supralabials that are about twice the length of an average scale) are counted as such (e.g., if there appears to be a fusion of two scales into one large scale, it is counted as a single scale and not as the two scales it supposedly originated from).

Number of infralabial scales to level below center of eye (IFLeye). A longitudinal count of the infralabial scales starting with the scale contacting the mental to the infralabial scale whose posterior to central portions are below center of eye (Fig. 14). When only the anterior portion of an infralabial scale in question is below level of center of eye, then this scale is not included in the count. In cases where the eye seems to be altered due to preservation artefacts, the center of the orbita is used as the reference. See SPL for supposedly fused scales.

Number of postmental scales (PM). A transverse count of scales bordering the mental scale, excluding the infralabial scales. It is useful to note whether the outer postmental scales are slightly, moderately, or greatly enlarged relative to the adjacent median postmental scales. Greatly enlarged outer postmental scales are at least four times the width of the adjacent median postmental scales whereas moderately enlarged outer postmental scales are at least twice times the width of the adjacent median postmental scales. Slightly enlarged outer postmental scales are less than twice the size of the median postmental scales. Examples are given in Fig. 15.

Number of sublabial scales (SubL). In a large portion of anole species one to several abruptly greatly enlarged scales are present in the lateral chin region, usually paralleling the infralabial scales. If this is the case, then the first pair of sublabials is identical with the outer pair of postmentals. I consider sublabials to be differentiated (i.e., greatly enlarged) only if they are at least four times the size of the adjacent median postmental scales, and when they are in contact with infralabials. Occasionally, a small scale is interspersed between the sublabial and infralabials series; as long as a given sublabial scale has contact with one of the infralabials scales, it is included in the count. Any scale posterior to the anteriormost sublabial (if present) also has to be at least four times the size of the median postmental scales adjacent to anteriormost sublabial (Fig. 16).

Number of postrostral scales (PR). A transverse count of scales bordering the rostral scale, excluding the supralabial scales; note that this count can include the (lower) prenasal and/or circumnasal scales in some species that have these scales in contact with the rostral scale. Examples are given in Fig. 17.

Number of internasal scales (IN). A transverse count of scales between the circumnasal scales, but excluding these. The count should be done along a straight line between the centers of the nostrils, respectively. For this count it is important to maintain the head in a position so that the dorsal surface is perpendicular to the optical axis of the microscope. Examples are given in Fig. 17.

Condition of snout scales (CSS). These vary from smooth or rugose to weakly or strongly keeled; keeling can be uni- or multicarinate. Examples are given in Fig. 18.

Condition of prefrontal depression (PFDep). The prefrontal depression varies from ill-defined to deep. The scales in this depression can be smooth, rugose, or keeled. If keeling is present, it is worth noting whether it is uni- or multicarinate, and also the orientation of the keels (e.g., all more or less parallel or radiating out). Examples are given in Fig. 19.

Condition of parietal depression (PDep). The parietal depression varies from ill-defined to deep. Examples are given in Fig. 20.

Condition of canthal ridge (CR). The canthal ridge can be distinct or weak (Fig. 21). A weak *canthus rostralis* is usually composed of two parallel rows of scales whereas a distinct one is formed by a single row of scales, which are usually strongly keeled. In some species, and then especially in large males, the *canthus rostralis* can form a vertically elevated ridge composed of numerous small scales (Fig. 21E, F).

Number of scales between supraorbital semicircles (IO). In most species of anoles a pair of semicircular series of enlarged scales is present in the frontal region between the supraocular discs. The minimum number of scales between the supraorbital semicircles is determined (i.e., usually at the narrowest point; Fig. 22).

Number of scales between supraorbital semicircles and interparietal plate (IP/IO). The minimum number of scales between the supraorbital semicircles and the interparietal plate is determined (Fig. 22). This character obviously is ignored in species that lack a differentiated interparietal plate (e.g., Fig. 22B).

Size of scales adjacent to interparietal plate (ScIP). The relative size of the scales surrounding the interparietal plate is noted. In some species the size of the scales anterior to the interparietal plate differs from those situated posteriorly to it. See examples in Fig. 22.

Total number of loreal scales (LST). The loreal scales are bordered below by the supralabials, above by the canthals, and posteriorly usually by the for- and upward extension of the subocular series (Fig. 23). The latter series is poorly differentiated in some species making it somewhat difficult to determine the posterior limit of the loreals, although in most cases it helps to follow the direction of the subocular series. In individuals that have the suboculars and supralabials series separated by one or more scale rows, the loreal scales are counted to level below anterior border of eye (Fig. 23F). In cases where the uppermost scale of the extended subocular series is very large and elongate, thereby occupying the space normally taken by the uppermost and posteriormost loreal scale, this scale is judged as a fused loreal-preocular scale and included in the loreal count (Fig. 23G). However, I exclude any scale that is above the level of the uppermost loreal scale row (Fig. 23H). I recommend to make a drawing of the loreal region with the aid of a drawing tube (*camera lucida*) attached to a dissecting microscope in order to determine the number of loreal scales. These can be readily counted and marked in the drawing to assure an accurate count.

Number of loreal scale rows (LSR). The maximum number of horizontal loreal scale rows is counted (Fig. 23). Usually, the loreal scales are not arranged in regular rows and therefore this is rather a vertical – not oblique – maximum count of loreal scales. I suggest to exclude the single scale often found in front of the upper corner of eye when this scale is situated above the uppermost loreal scale row (Fig. 23H).

Number of scale rows between suboculars and supralabials (SO/SPL). The number of complete scale rows between the series of suboculars and supralabials, respectively, is determined (Fig. 24). In many species, the suboculars and supralabials are in contact and thus, the number of rows between these series is zero. If this is the case, I suggest to use the SO/SPL formula to denote how many subocular scales are in contact with how many supralabial scales: the number before the forward slash indicates how many subocular scales are in contact with supralabial scales and the number after the forward slash indicates how many supralabial scales are in contact with subocular scales; therefore, 3/4 would indicate that three subocular scales are in contact with four supralabial scales. In case the suboculars and the supralabials are separated by one or more scale rows, the number of these separating scales is noted with a simple number (e.g., “2” would indicate two complete scale rows between suboculars and the supralabials).

Relative size and condition of scales anterior and posterior, respectively, to ear opening. In most species of anoles, the scales anterior to ear opening are slightly to distinctly larger than those posterior to ear opening. Often in these species, the scales anterior to ear opening are flat (smooth or keeled) and those posterior to ear opening are granular. In a few species, the scales anterior to ear opening are about same size as scales posterior to ear opening, all being granular. Examples are given in Fig. 25.

Number of ventral scales in one head length (ventrHL). Number of midventral (i.e., at midbody along the midline) scales counted in the distance that equals one head length. I suggest to count the scales in the distance that equals half the head length and then multiply the resulting count by two. Doing so helps to avoid the more irregular scales on anterior and posterior venter, respectively, restricting the count to the more representative central area of the venter in the median region between levels of axilla and groin. In individuals with somewhat irregular scales along the ventral midline, a more representative count is achieved by counting the rows of ventral scale rows – which are running transversely or slightly obliquely – just adjacent to the ventral midline.

Number of dorsal scales in one head length (dorsHL). Number of middorsal (i.e., along vertebral line at midbody) scales counted in the distance that equals one head length. I suggest to count the scales in the distance that equals half the head length and then multiply the resulting count by two. See also comments under ventrHL Other researchers (e.g., Lazell 1972) suggested to use the straight line distance from center of eye to tip of snout as a reference for counting dorsal scales. However, fixation artefacts can alter the position of the lizard’s eye. In species with a middorsal crest of enlarged scales, I recommend to do two counts, one for the crest scales and one for the paravertebral dorsal scales.

Number of ventral scales between levels of axilla and groin (ventrAG). A longitudinal count of the midventral scales; the start and ending points for the count (levels of axilla and groin, respectively) are best marked with the aid of a fine string (Fig. 26). Since the string may cover a few scales on smaller anoles, I recommend to place the string in a way that its “inner” edge mark the levels of axilla and groin, respectively (as opposed to the center of the string). In case the posterior insertion of the dewlap is in the belly area, I recommend to first count the ventrals that borders to the dewlap, and then, once the dewlap area has been passed, move inward towards the midventral line.

Number of dorsal scales between levels of axilla and groin (dorsAG). A longitudinal count of the middorsal scales along the vertebral line; the start and ending points for the count (levels of axilla and groin, respectively) are best marked with the aid of a fine string. See also comments under ventrAG. In species with a middorsal crest of enlarged scales, I recommend to do two counts, one for the crest scales and one for the paravertebral dorsal scales.

Number of rows of enlarged dorsal scales (RED). Many species of anoles have two or several rows of dorsal scales slightly to greatly enlarged relative to the remaining dorsal scales. These rows can be gradually enlarged, i.e., over the course of three or more scale rows; or these can be abruptly enlarged, i.e., over the course of no more than one scale row. It has to be noted that in most species the dorsal scales are not arranged in neat, regular, longitudinal series but are rather somewhat irregular in size and position of scales. Therefore, RED is actually a transverse count of enlarged scales across dorsum rather than the identification of "rows". I propose the following three categories for RED: (1) slightly enlarged: about 1.5 times the size of an average flank scale; (2) moderately enlarged: two or more times the size of an average flank scale, but smaller than ventral scales; (3) greatly enlarged: two or more times the size of an average flank scale and larger than ventral scales. In practice, I found it useful to first evaluate the scales in the vertebral region where usually the largest scales are located, and then try to decide which of the adjacent rows belong to the same "size class" as the vertebral rows. Then I conduct a transverse count across this size class. It is important not to get distracted by color pattern, especially in specimens that exhibit a pale broad middorsal longitudinal band. In cases where a few smaller scales are scattered among the class of enlarged scales, I do include these in the transverse count.

Condition of dorsal scales (CDS). Size, shape, ornamentation, and degree of overlap (if any) of the dorsal scales vary greatly among the species of anoles. See Fig. 27 for variation in dorsal scales and used terminology.

Condition of lateral body scales (LBS). In the majority of anole species the lateral body or flank scales are more or less homogeneous small and granular. However, in some species the flank scales are heterogeneous with enlarged, either flat or conical, scales scattered among smaller granular scales, or these scales are relatively large and separated from each other by small granular scales, or the flank scales being mosaic of scales of different sizes and shapes (Fig. 28).

Condition of ventral scales (CVS). Size, shape, ornamentation, and degree of overlap (if any) of the ventral scales vary greatly among the species of anoles. See Fig. 29 for variation in ventral scales and used terminology.

Size of dorsal, lateral, and ventral scales. The actual length in mm of an average dorsal, lateral, and ventral scale is measured, either with calipers or with the aid of an ocular micrometer. This also helps to determine the relative sizes of these scales.

Number of scales around midbody (SAM). A transverse count of body scales around midbody. I recommend to start at midbelly and do a transverse count to the middorsal region, and then multiply the resulting count by two to account for the other side of the lizard's body. Usually, the starting point can be readily determined in the area of the umbilical region (often indicated by 2–4 pairs of enlarged scales); the end point of the count is just above the center of the vertebral column. Because of the irregular arrangement of the body scales in anoles, it is often impossible to follow an exact straight line when doing this count. However, this count should be done in as linear a manner as possible.

Condition of dorsal caudal scales (DCS). The scales (supracaudals) along the dorsal midline of the tail can be undifferentiated from the adjacent scales or can be enlarged and keeled, forming a serrated crest. In adult males of several species, enormous dorsal tail crests and fins can be observed (Figs. 30 and 31). Also, the number of supracaudals per caudal segment can be of taxonomic value and should be recorded. Usually, the number of supracaudals per caudal segment is greater on the proximal than on the distal portion of tail.

Condition of lateral caudal scales (LCS). The lateral caudal scales can be homogeneously undifferentiated or a division in segments is discernible that – depending on species – varies from indistinct to distinct (Fig. 31).

Condition of ventral caudal scales (VCS). The ventral caudal scales can be smooth or keeled; also, the number of ventral scales per segment varies among species (Fig. 31).

Condition of terminal phalanx (CTP). In most species of anoles the distal phalanx is raised above the proximal phalanges and the subdigital lamellae of the adhesive pad project distally under the subdigital lamellae of the terminal phalanx (Fig. 32A–D). However, in some species the distal end of the adhesive pad is indistinct and gradually continues onto the terminal phalanx (Fig. 32E–F).

Condition of axillary region. Some species of anoles have tube-like axillary pockets whereas in the majority of species there is only a slight or no axillary depression at all (see Fig. 33).

Dewlap size (DS). Dewlap size is best evaluated based on photographic images of individuals in life with their dewlaps artificially extended using small forceps. With the actual head length known (measured on the same individual), the actual dewlap size (ADS) can be determined as follows: The head portion is magnified and printed and then superimposed on millimetric paper; a straight line is drawn between both the anterior and posterior insertions of the dewlap and then the total number of millimeter squares contained in the extended dewlap is counted. The HL on the printout is determined. Then the following equation can be used to convert the magnified dewlap area to the real size: $\mathbf{X} = [(\sqrt{Y}/A)B]^2$, where X is the real area of the dewlap in square millimeters, Y is the total area (square millimeters) of the dewlap at a magnified scale, A is the HL measure (millimeters) of the anole at a magnified scale, and B is the HL measure (millimeters) of the anole at the real size. Also, it is useful to note the anterior and posterior, respectively, insertions of the dewlap. The anterior insertion is below level of eye in most species whereas the posterior insertion can vary from level of anterior border of forelimb insertion to midbelly. I suggest the following size categories for the anole dewlap using the relative dewlap size (RDS) and the posterior insertion of dewlap (PID) as the principal criteria. RDS is here defined as the ratio ADS / SVL. (1) very small: RDS<1.0, PID at level of shoulder or anterior to that; (2) small: RDS 1.0–2.5, PID at level of axilla or slightly beyond; (3) moderate-sized: RDS 2.5–4.0, PID onto chest; (4) large: RDS 4.0–8.0, PID onto chest; (5) very large: RDS >8.0, PID well onto venter.

The terminology of dewlap scalation follows Fitch & Hillis (1984), although somewhat simplified. The scales along the margin of the dewlap are the marginals; the scales on the dewlap, usually organized in rows, are the gorgetals. The differentiation into posterior marginals, distomarginals, and anterior marginals, respectively, seems arbitrary because the scales along the dewlap margin form a continuous series. Instead of differentiating between these three terms, I suggest to call them all marginals and specify the region of the dewlap if needed (e.g., marginals along the distal portion). The same is true for gorgetals versus sternals since in most species these scales either form a rather homogeneous class of scales or grade from the anterior into the posterior region without any abrupt change in size, shape, or density. The gorgetals can vary from small and granular to large and keeled. The skin between the rows of gorgetals is usually scale-less. Examples of dewlaps are shown in Fig. 34.

Discussion

In the past 20 years I have published 40 articles – the majority together with colleagues – that contain descriptions of anoles (see Köhler 2008, 2011, 2012; Lotzkat *et al.* 2013, and references in these publications). This article will help to understand how I generated the data used in these descriptions and how I understood the used terms. Thus, even if all my colleagues decide to ignore this paper, it was not completely useless. However, I hope that this article will help to establish a common basis for future anole descriptions in order to have a comparable standard and common understanding of the included characters.

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References

Fitch, H.S. & Hillis, D.M. (1984) The *Anolis* dewlap: Interspecific variability and morphological associations with habitat. *Copeia*, 1984, 315–323.
http://dx.doi.org/10.2307/1445187

Köhler, G. (2008) *Reptiles of Central America.* Second edition. Herpeton, Offenbach, 400 pp.

Köhler, G. (2011) A new species of anole related to *Anolis altae* from Volcán Tenorio, Costa Rica (Reptilia, Squamata, Polychrotidae). *Zootaxa*, 3120, 29–42.

Köhler, G. (2012) Taxonomic status of two enigmatic Mexican anoles: *Anolis cumingii* Peters 1863 and *Anolis guentherii* Bocourt 1873 (Reptilia, Squamata, Dactyloidae). *Zootaxa*, 3551, 82–88.

Köhler, G., Dehling, M. & Köhler, J. (2010) Cryptic species and hybridization in the *Anolis polylepis* complex, with the description of a new species from the Osa Peninsula, Costa Rica (Squamata: Polychrotidae). *Zootaxa*, 2718, 23–38.

Köhler, G. & Vesely, M. (2003) A comparison of *Norops petersii* (Bocourt) and Central American *N. biporcatus* (Wiegmann), with notes on the holotype of *D.*[*actyloa*] *biporcata* Wiegmann (Reptilia, Squamata: Polychrotidae). *Senckenbergiana Biologica*, 82, 223–233.

Lazell, J.D. (1972) The anoles (Sauria, Iguanidae) of the Lesser Antilles. *Bulletin of the Museum of Comparative Zoology*, 143, 1–115.

Lotzkat, S., Hertz, A., Bienentreu, J.-F. & Köhler, G. (2013) Distribution and variation of the giant alpha anoles (Squamata: Dactyloidae) of the genus *Dactyloa* in the highlands of western Panama, with the description of a new species formerly referred to as *D. microtus. Zootaxa,* 3626 (1), 1–54.
http://dx.doi.org/10.11646/zootaxa.3626.1.1

McCranie, J.R., Cruz, G.A. & Holm, P.A. (1993) A new species of cloud forest lizard of the *Norops schiedei* group (Sauria: Polychrotidae) from northern Honduras. *Journal of Herpetology*, 27, 386–392.
http://dx.doi.org/10.2307/1564824

Poe, S. (2004) Phylogeny of anoles. *Herpetological Monographs*, 18, 37–89.
http://dx.doi.org/10.1655/0733-1347(2004)018[0037:poa]2.0.co;2

Poe, S. (2013) 1986 Redux: New genera of *anoles* (Squamata: Dactyloidae) are unwarranted. *Zootaxa*, 3626 (2), 295–299.
http://dx.doi.org/10.11646/zootaxa.3626.2.7

Poe, S., Ayala, F., Latella, I.M., Kennedy, T.L., Christensen, J.A., Gray, L.N., Blea, N.J, Armijo, B.M. & Schaad, E.W. (2012) Morphology, phylogeny, and behavior of *Anolis proboscis*. *Breviora*, 530, 1–11.
http://dx.doi.org/10.3099/530.1

Sabaj Pérez, M.H. (2010) Standard symbolic codes for institutional resource collections in herpetology and ichthyology. an online reference. Version 1.5 (4 Oct 2010). Available from: http://www.asih.org/ (accessed 07 June 2013)

Savage, J.M. (2002) *The amphibians and reptiles of Costa Rica. A herpetofauna between two continents, between two seas.* University of Chicago Press, Chicago, xx + 934 pp.

Savage, J.M., & Villa, J. (1986) Introduction to the Herpetofauna of Costa Rica. Society for the Study of Amphibians and Reptiles, *Contributions to Herpetology*, 3, 1–207.

Schwartz, A. (1973) A new species of montane *Anolis* (Sauria, Iguanidae) from Hispaniola. *Annals of Carnegie Museum*, 44, 183–195.

Smith, H.M., Burley, E, & Fritts, T. (1968) A new anisolepid *Anolis* (Reptilia: Lacertilia) from México. *Journal of Herpetology*, 2, 147–151.
http://dx.doi.org/10.2307/1563115

Underwood, G. & Williams, E.E. (1959) The anoline lizards of Jamaica. *Bulletin of the Institute of Jamaica, Science Series*, 9, 1–48.

Williams, E.E. (1995) A computer approach to the comparison and identification of species in difficult taxonomic groups. IV. The morphological characters used in the Anolekey described, defined, and illustrated. *Breviora*, 502, 15–37.

APPENDIX. Specimens used in illustrations.

Anolis aliniger: Dominican Republic: near Constanza, 1200 m: SMF 90481. *Anolis allogus*: Cuba: Sierra Maestra, Cruce de los Baños, 500 m: SMF 77249. *Anolis amplisquamosus*: Honduras: Cortés: Parque Nacional Cusuco, Sendero El Danto, 1580 m: SMF 77747. *Anolis angusticeps*: Cuba: western portion of Cuba: SMF 78341. *Anolis aquaticus*: Panama: Chiriquí: Santa Clara, Finca Ecológica, 1090 m: SMF 89667; Chorogo, 380 m: SMF 92190. *Anolis auratus*: Panama: Chiriquí: 5 airline km ESE from David, 40 m: SMF 91940. *Anolis bahorucoensis*: Dominican Republic: Sierra de Baoruco: SMF 77248, 77251. *Anolis baleatus*: Dominican Republic: Santo Domingo: SMF 10446. *Anolis barbatus*: Cuba: Pinar del Río: Cinco Pesos: SMF 77959; Las Terrazas: SMF 93915. *Anolis barbouri*: Dominican Republic: Sierra de Baoruco: SMF 90495, 90497. *Anolis biporcatus*: Nicaragua: Granada: Volcán Mombacho, 1150 m: SMF 78269; Panama: Chiriquí: Los Algarrobos, 147 m: SMF 89671; Comarca Ngöbe-Buglé: Buapiti, Alto Tugrí, 1240 m: SMF 89669; Veraguas: Cerro Negro: SMF 89670; Sitio Ramsar, 20 m: SMF 91934. *Anolis capito*: Costa Rica: SMF 96357; Honduras: Santa Bárbara: La Cafetalera, 650 m: SMF 91252; Panama: Chiriquí: Reserva Forestal Fortuna, 1377 m: MHCH 2119; Comarca Ngöbe-Buglé: above El Paredón, 790 m: SMF 91451. *Anolis coelestinus*: Dominican Republic: Pedernales: Pedernales, 10 m: SMF 97857. *Anolis crassulus*: Honduras: Olancho: Pico La Picucha, 1840 m: SMF 78799. *Anolis cupreus*: Costa Rica: Zona Protectora El Rodeo, 940 m: SMF 93908. *Anolis cybotes*: Dominican Republic: Consuelo: SMF 25721. *Anolis datzorum*: Panama: Comarca Ngöbe-Buglé: above Quebrada Juglí, 2033 m: SMF 91456. *Anolis desiradei*: Lesser Antilles: Guadeloupe: île La Désirade: SMF 94734. *Anolis distichus*: Dominican Republic: Monte Cristi: SMF 25843; Boca Chica, Santo Domingo, 10 m: SMF 90420. *Anolis dunni*: Mexico, Guerrero: Presa El Molino near Tixtla, 1540 m: IBH 26594; Petaquillas near Chilpancingo, 1250 m: SMF 96254. *Anolis evermanni*: Puerto Rico: SMF 22996. *Anolis extremus*: Lesser Antilles: Barbados: SMF 60827, 95871. *Anolis frenatus*: Panama: Darién: Burbayar: SMF 96579; Amborlla, Cerro la Javillosa: SMF 96578. *Anolis gadovii*: Mexico: Guerrero: near Palo Gordo, 290 m: SMF 96195–96. *Anolis gingivinus*: Lesser Antilles: Saint Martin: Great Bay: SMF 55769. *Anolis heteropholidotus*: Honduras: Ocotepeque: El Pital, 2200 m: SMF 78027. *Anolis hobartsmithi*: Mexico: Chiapas: south of Tapilula: SMF 83107. *Anolis insignis*: Panama: Comarca Ngöbe-Buglé: Willie Mazú, 748 m: SMF 91477; Veraguas: Alto de Piedra, 883 m: SMF 89482. *Anolis isthmicus*: Mexico: Oaxaca: Santa Cruz Bamba: SMF 96279. *Anolis johnmeyeri*: Honduras: Cortés: Parque Nacional Cusuco, 1550 m: SMF 77756. *Anolis latifrons*: Panama: Darién: Serrania de Pirre: SMF 96574-75. *Anolis leachii*: Lesser Antilles: Antigua: SMF 62478. *Anolis lemurinus*: Honduras: Gracias a Dios: Raudal Kiplatara, 110 m: SMF 85885; Río Cuyamel: SMF 85887; Panama: Bocas del Toro: San San Pond Sak, Río Negro, 10 m: SMF 90115. *Anolis lineatus*: Lesser Antilles: Curacao: SMF 22979. *Anolis liogaster*: Mexico: Guerrero: Omiltemi, 2175 m: SMF 96199, 96200, 96202. *Anolis loveridgei*: Honduras: Atlántida: Quebrada de Oro: SMF 86951. *Anolis macrinii*: Mexico: Oaxaca: Taquería Santiaguita, 1255 m: SMF 96208; Santiago la Galera, 1160 m: SMF 96210. *Anolis microtus*: Panama: Bocas del Toro: Río Changena, 1640 m: SMF 91499–91500. *Anolis muralla*: Honduras: Olancho: Monte Escondido, Campground and along trail to Cerro de Enmedio: SMF 78378. *Anolis nebuloides*: Mexico: Oaxaca: Santiago la Galera, 1160 m: SMF 96248; near Pluma Hidalgo, 1348 m: SMF 96425. *Anolis nebulosus*: Mexico: Guerrero: Agua de Obispo, 960 m: IBH 26551. *Anolis nebulosus*: Mexico: Michoacán: Uruapán: MCZ 154476. *Anolis nebulosus*: Mexico: Jalisco: Rancho Primavera near Guadalajara: UIMNH 47862. *Anolis noblei*: Cuba: Oriente: Bahía de Nipe: SMF 79971. *Anolis omiltemanus*: Mexico: Guerrero: La Laguna near Omiltemi, 1920 m: SMF 96226–27, 96229; 15 mi W Asoleadero, 2000 m: UMMZ 130985. *Anolis onca*: Venezuela: Nueva Esparta: Isla Margarita, Playa El Agua: SMF 93909. *Anolis oxylophus*: Costa Rica: Alajuela: Laguna del Lagarto Lodge, 20 m: SMF 96570; Honduras: Olancho: Matamoros, 150 m: SMF 88677. *Anolis petersii*: Guatemala: Baja Verapaz: La Unión Barrios, Posada del Quetzal: SMF 86943. *Anolis peucephilus*: Mexico: Oaxaca: ca. 27 km on road N San Gabriel Mixtepec: SMF 96368. *Anolis poecilopus*: Panama: San Blas: Nusagandi, 200 m: SMF 80774. *Anolis porcatus*: Dominican Republic: Santo Domingo: Boca Chica, 10 m: SMF 90415. *Anolis quercorum*: Mexico: Oaxaca: 26 km SE Nochistlan, 2.5 km NW Cuesta Blanca: KU 176051. *Anolis rejectus*: Cuba: Sierra de la Gran Piedra: SMF 90477. *Anolis richardi*: Tobago: Scarborough: SMF 65825, 66836. *Anolis rodriguezii*: Honduras: Cortés: about 1 km SSE of Tegucigalpita: SMF 79087. *Anolis sabanus*: Lesser Antilles: Saba: SMF 55758. *Anolis salvini*: Panama: Comarca Ngöbe-Buglé: Quebrada Juglí, 1708 m: SMF 91527. *Anolis semilineatus*: Dominican Republic: Samaná: SMF 26063. *Anolis singularis*: Dominican Republic: Pedernales: Los Arroyos, 1265 m: SMF 97971; Barahona: near Cortíco, 1410 m: SMF 97978. *Anolis sminthus*: Honduras: Francisco Morazán: Cerro La Tigra NNE of El Hatillo: SMF 77181. *Anolis stratulus*: Lesser Antilles: St. Thomas: SMF 10798. *Anolis subocularis*: Mexico: Guerrero: Road to sitio arqueologico Tehuacalco, 470 m: SMF 96259. *Anolis taylori*: Mexico: Guerrero: Acapulco, Jardin Botanico: IBH 26603. *Anolis tropidolepis*: Costa Rica: Alajuela: road to Volcán Poas, 2370 m: SMF 93654. *Anolis tropidonotus*: Honduras: Atlántida: Parque Nacional Pico Bonito, Cerro de Bufalo: SMF 79058; Francisco Morazán: Cerro Uyuca, 1400 m: SMF 79059. *Anolis uniformis*: Belize: Stann Creek: Cockscomb Basin Wildlife Sanctuary, 80 m: SMF 83331. *Anolis unilobatus*: Mexico: Oaxaca: Chimalapa, 650 m: SMF 96275. *Anolis utilensis*: Honduras: Isla de la Bahia: Isla de Utila, 2 km NNE of Utila: SMF 79866. *Anolis valencienni*: Jamaica: SMF 10442. *Anolis vermiculatus*: Cuba: Sierra Rosario: SMF 30008. *Anolis vittigerus*: Panama: Veraguas: Río Chilagres, 476 m: SMF 89528. *Anolis wellbornae*: Guatemala: Suchitepéquez: Finca San Julián, 480 m: SMF 82668. *Anolis yoroensis*: Honduras: Yoro: Cerro de Pajarillos, 1180 m: SMF 80768. *Anolis* sp.: "Cuba?": SMF 10946.

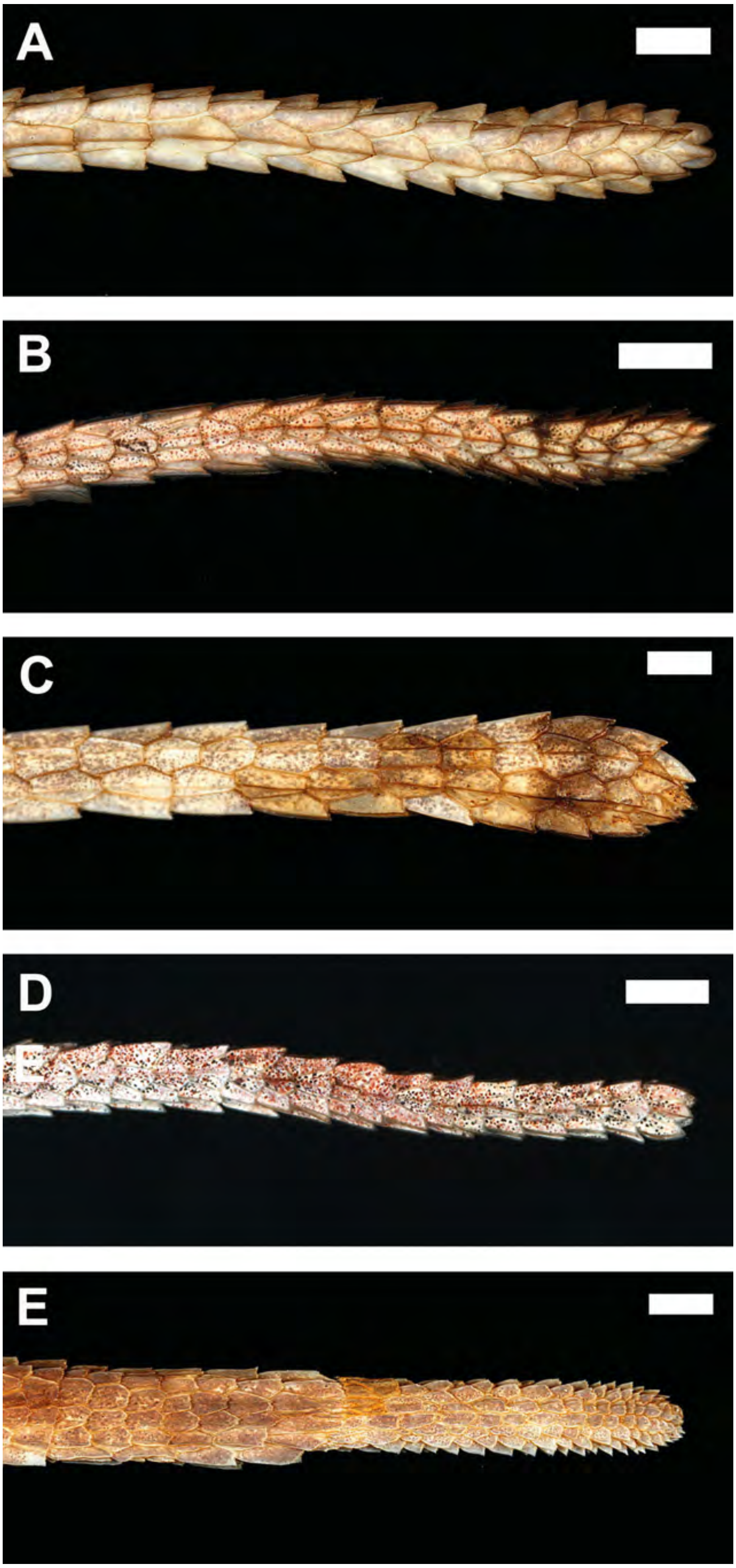

FIGURE 1. Tip of tail: (A) *Anolis biporcatus* (SMF 89669); (B) *A. nebuloides* (SMF 96425); (C) *A. capito* (SMF 91451), the slightly swollen tip is normal in this species; (D) *A. peucephilus* (SMF 96368) with incomplete tip of tail; (E) *A. oxylophus* (SMF 96570) with regenerated tip of tail. The tails in A,B, and C are complete. Scale bar equals 1 mm.

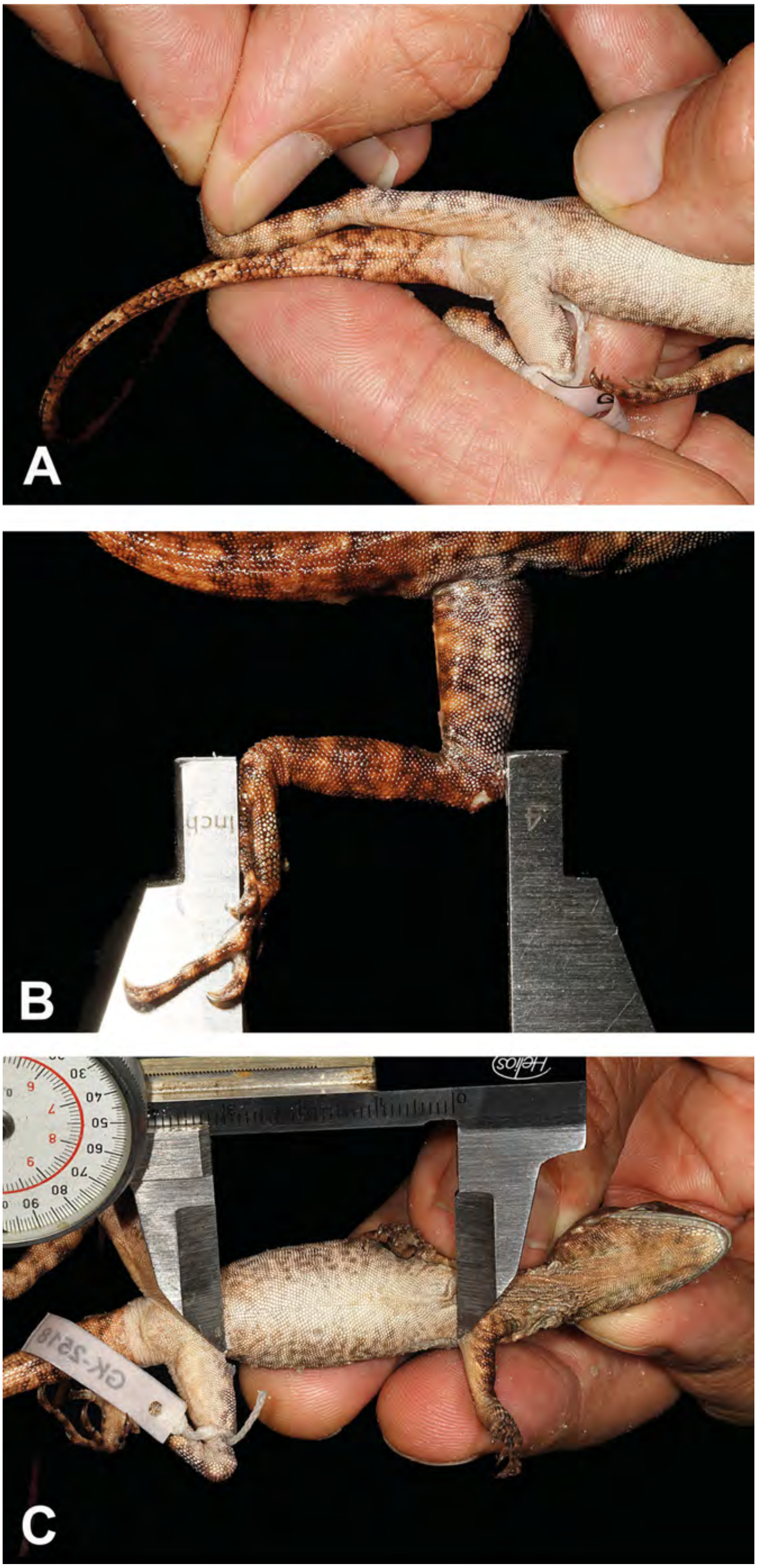

FIGURE 2. Morphometric measurements (*Anolis kunayalae* SMF 91484): (A) The horizontal and vertical diameters of the tail are measured at the point reached by the heel of the extended hind leg; (B) shank length; (C) axilla-groin distance.

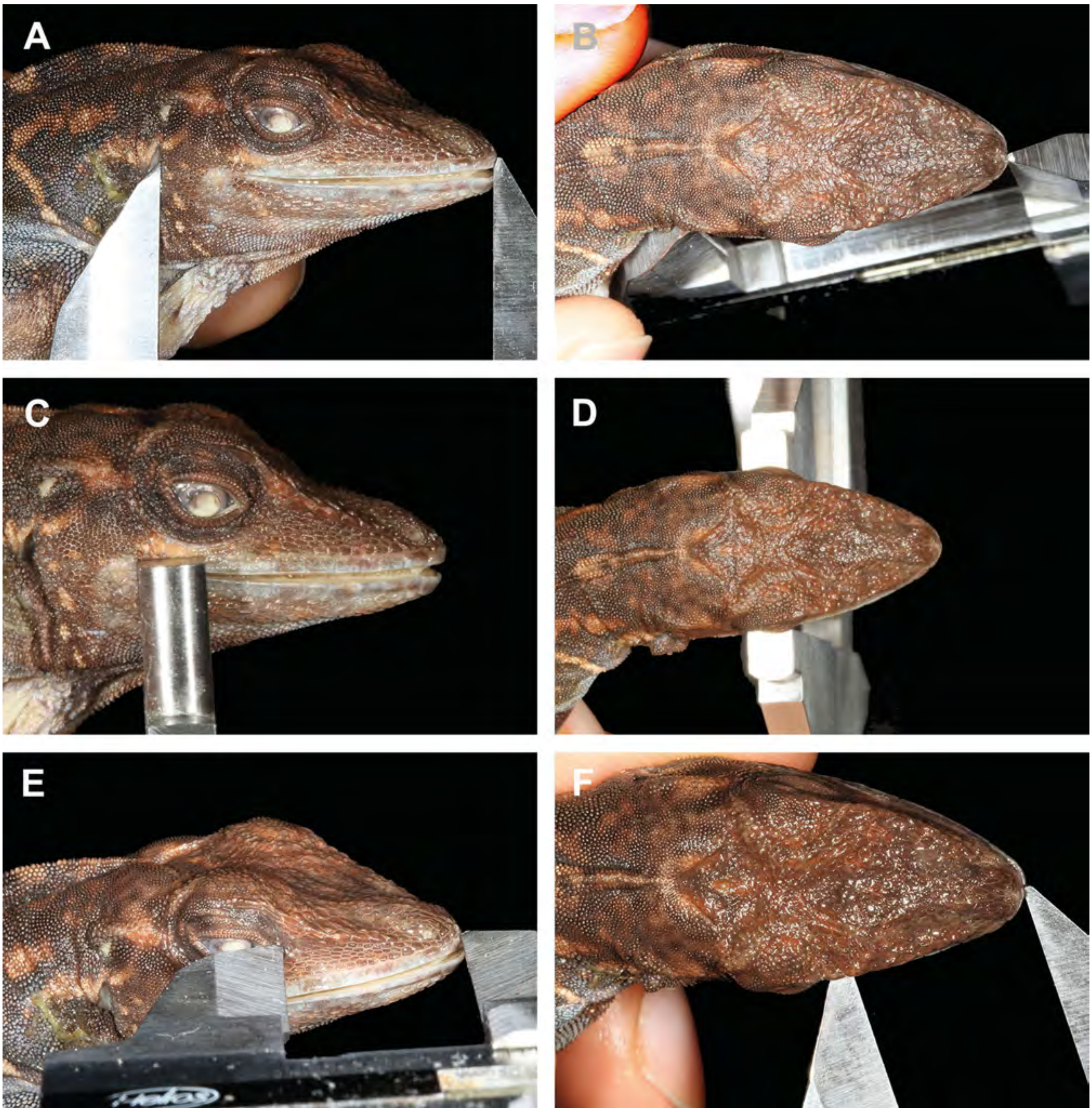

FIGURE 3. Morphometric measurements (*Anolis kunayalae* SMF 91484): (A,B) head length; (C,D) head width; (E,F) snout length.

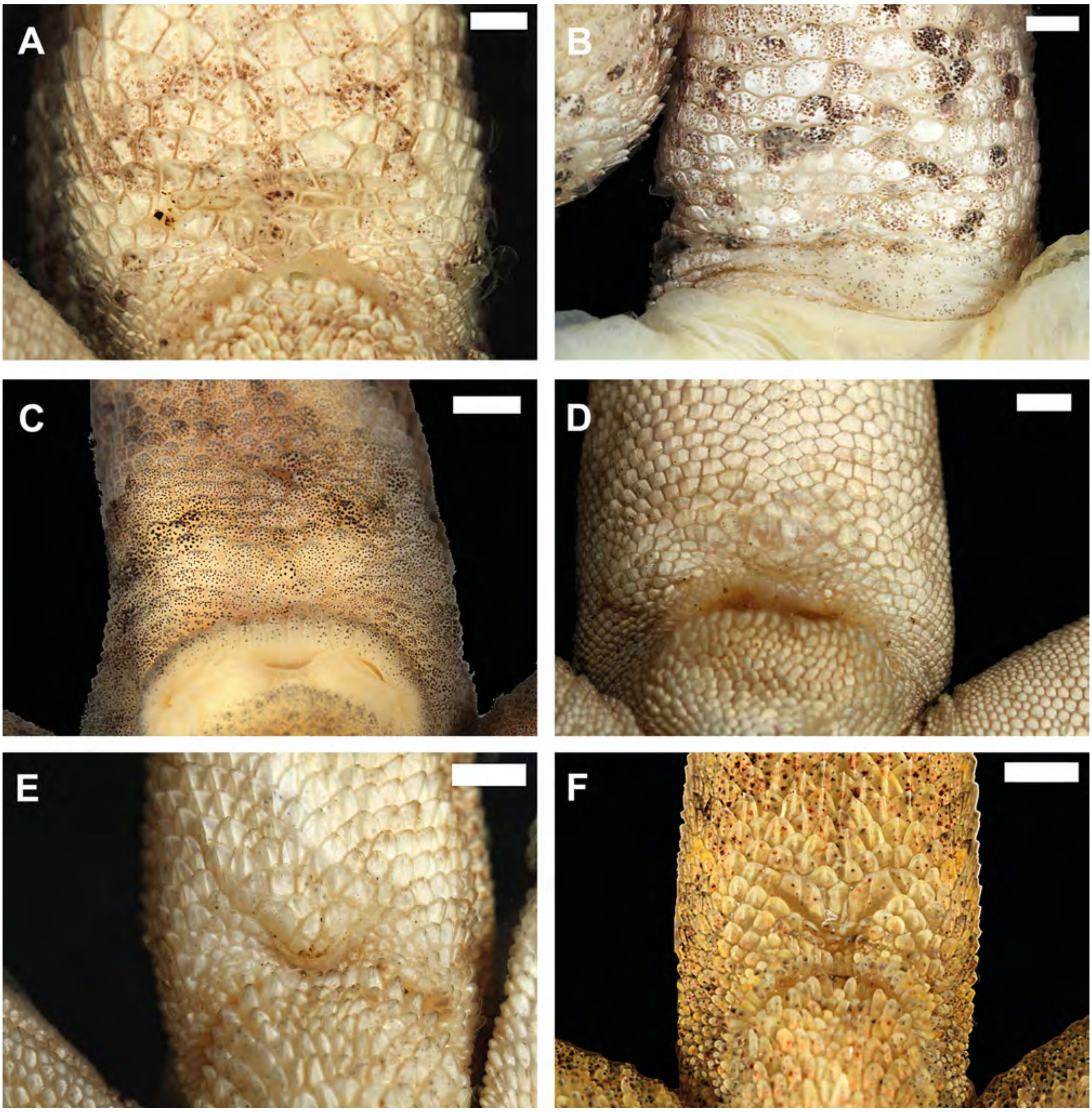

FIGURE 4. Condition of cloacal region: (A) *Anolis onca* (SMF 93909); (B) *A. biporcatus* (SMF 91934); (C) *A. lineatus* (SMF 22979); (D) *A. loveridgei* (SMF 86951); (E) *A. nebulosus* (MCZ 154476); (F) *A. nebuloides* (SMF 96248); (G) *A. cybotes* (SMF 25721); (H) *A. gingivinus* (SMF 55769); (I) *A. baleatus* (SMF 10446); (J) *A. barbatus* (SMF 93915). Postcloacal scales not differentiated in A and B; moderately enlarged in C, D, and E; and greatly enlarged in F to J. Scale bars equal 1 mm.

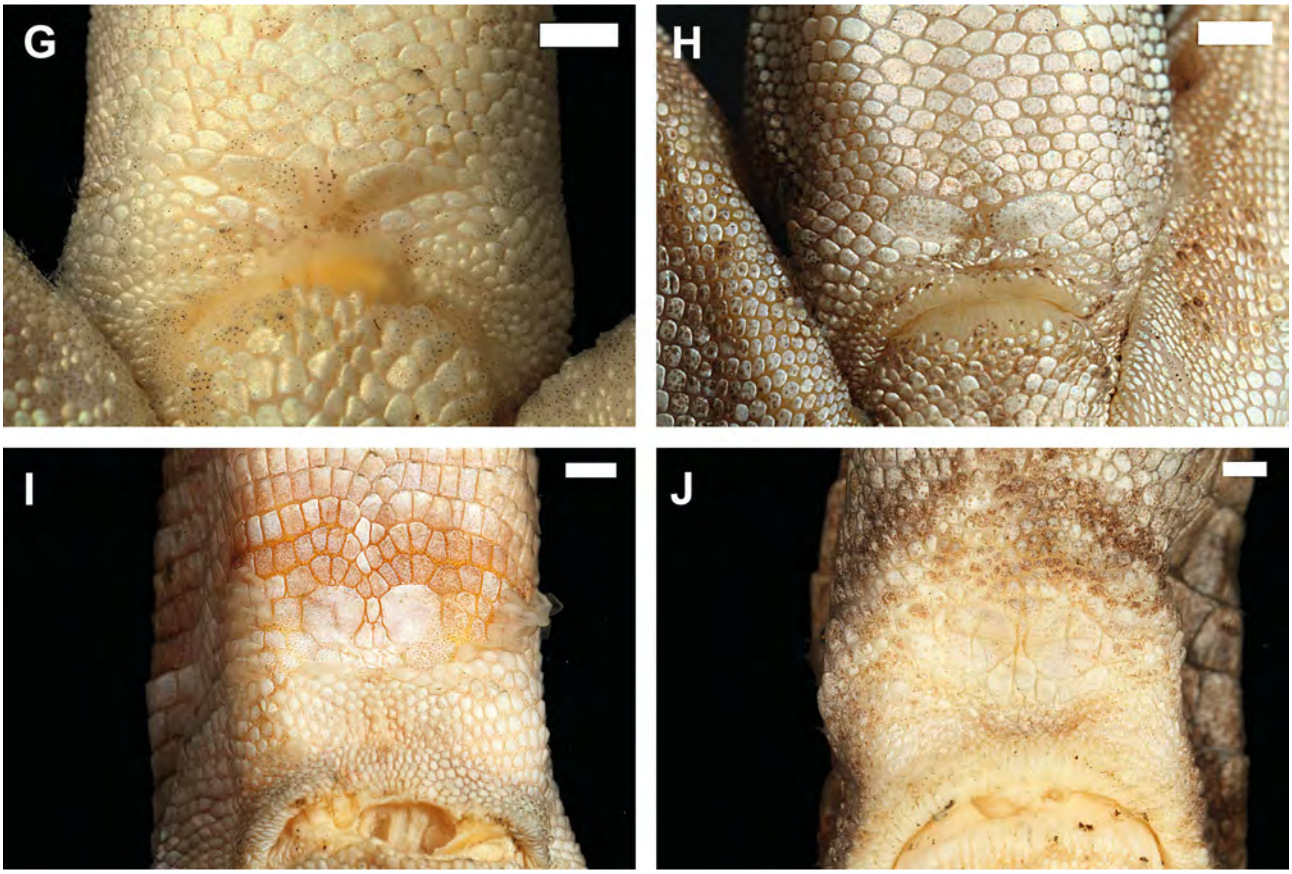

FIGURE 4. Condition of cloacal region: (A) *Anolis onca* (SMF 93909); (B) *A. biporcatus* (SMF 91934); (C) *A. lineatus* (SMF 22979); (D) *A. loveridgei* (SMF 86951); (E) *A. nebulosus* (MCZ 154476); (F) *A. nebuloides* (SMF 96248); (G) *A. cybotes* (SMF 25721); (H) *A. gingivinus* (SMF 55769); (I) *A. baleatus* (SMF 10446); (J) *A. barbatus* (SMF 93915). Postcloacal scales not differentiated in A and B; moderately enlarged in C, D, and E; and greatly enlarged in F to J. Scale bars equal 1 mm.

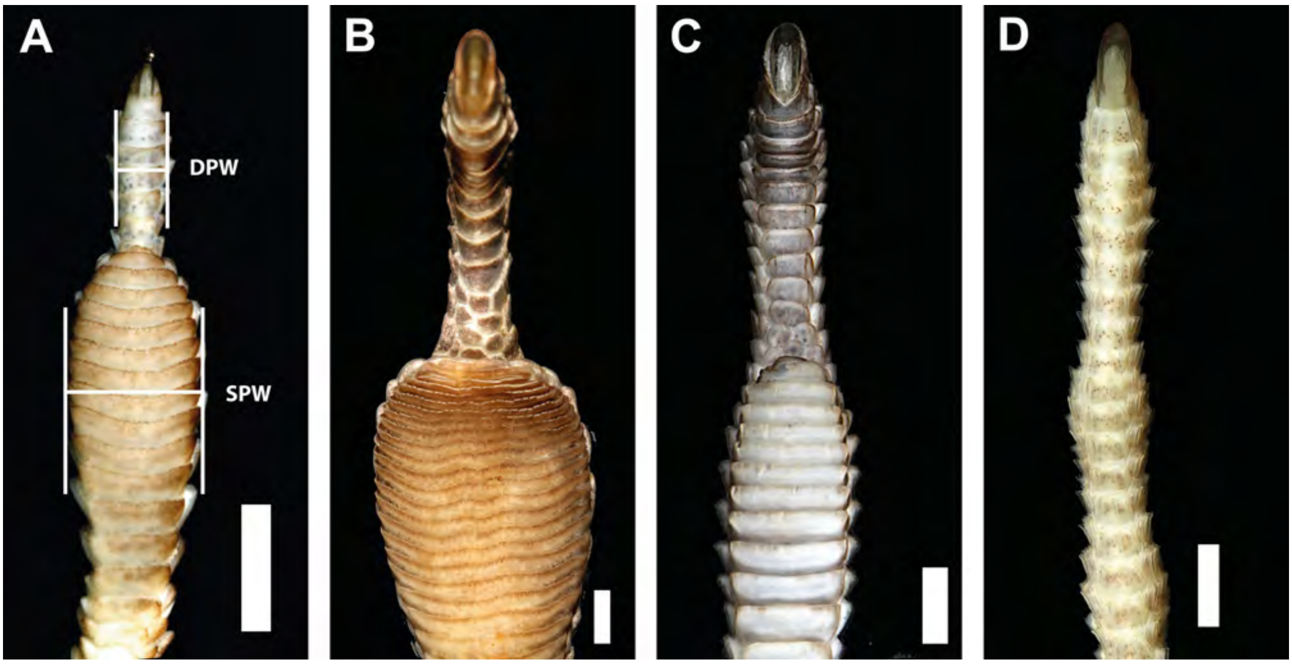

FIGURE 5. Subdigital pad width: (A) *Anolis gadovii* (SMF 96195); (B) *A. barbatus* (SMF 77959); (C) *A. capito* (SMF 96357); (D) *A. onca* (SMF 93909). Scale bars equal 1 mm. See text for details.

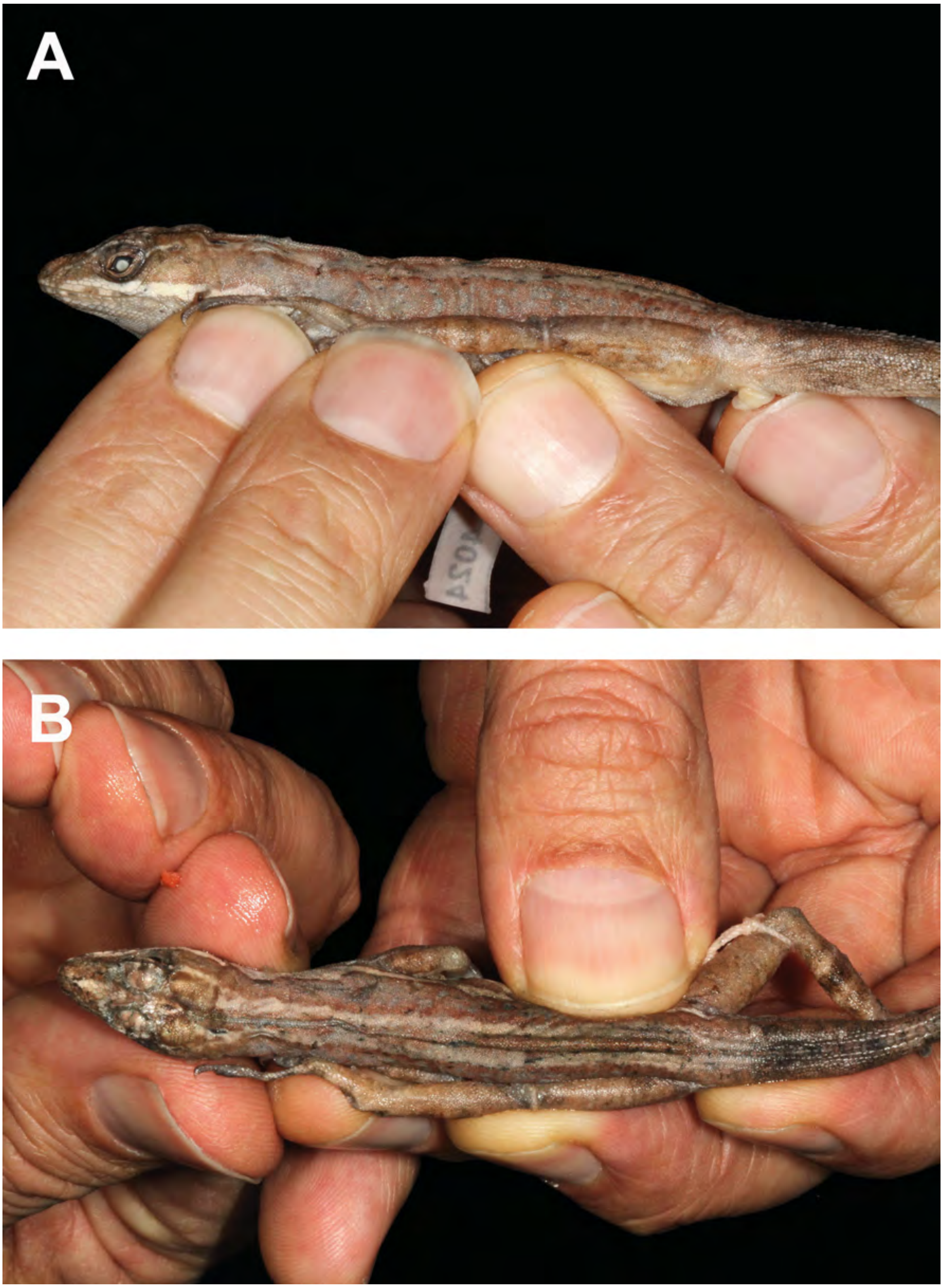

FIGURE 6. Adpressing the extended hind limb along the straightened specimen to determine relative hind limb length (*Anolis taylori* SMF 96273). See text for details.

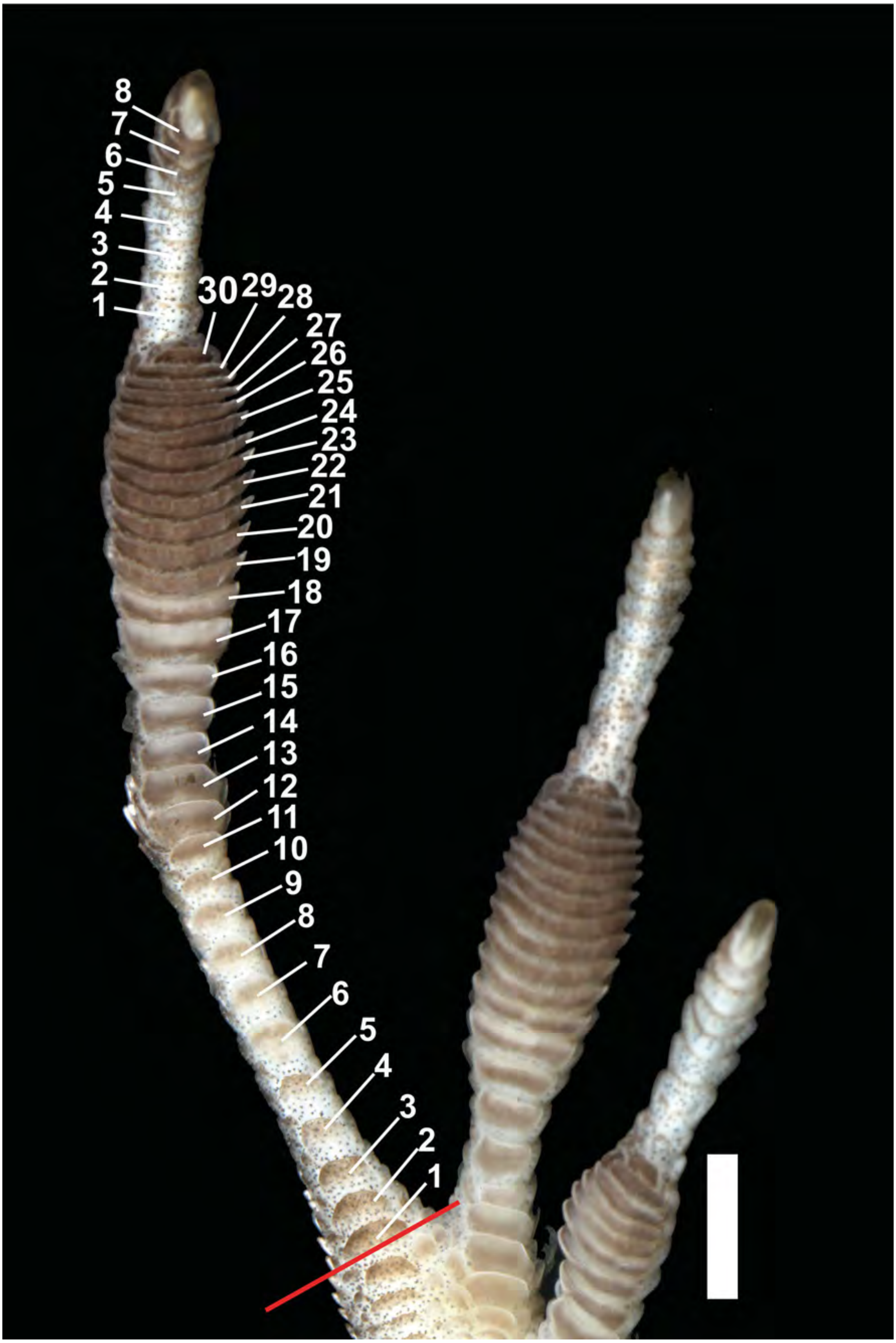

FIGURE 7. Count of subdigital lamellae (*Anolis gadovii* SMF 96195). Red line indicates the proximal starting point for the count at the level of the basal joint of Toes III and IV. Scale bar equals 1 mm. See text for details.

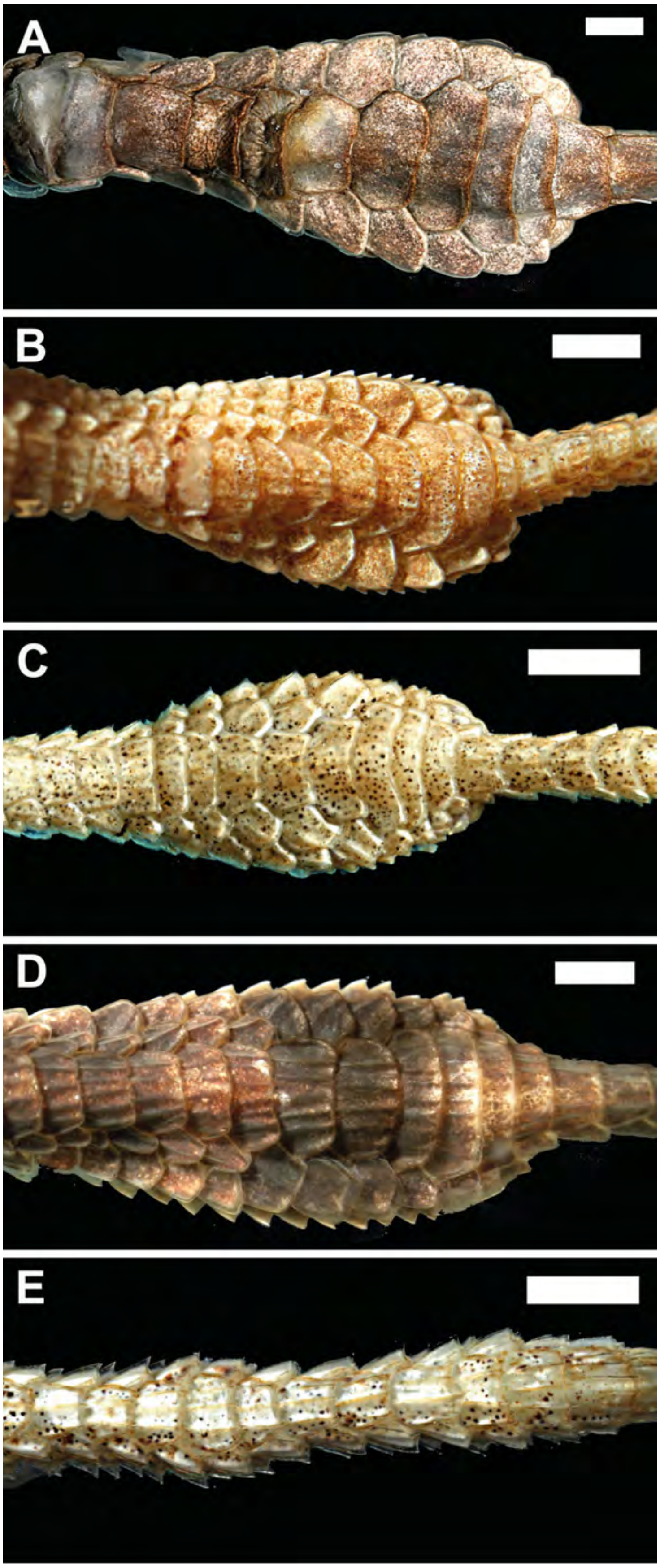

FIGURE 8. Condition of supradigital scales. (A) *Anolis barbatus* (SMF 77959); (B) *A. richardii* (SMF 66836); (C) *A. lineatus* SMF 22979); (D) *A. frenatus* (SMF 96578); (E) *A. onca* (SMF 93909). Supradigital scales smooth in A, weakly keeled in B and C, strongly keeled in D and E. Scale bars equal 1 mm.

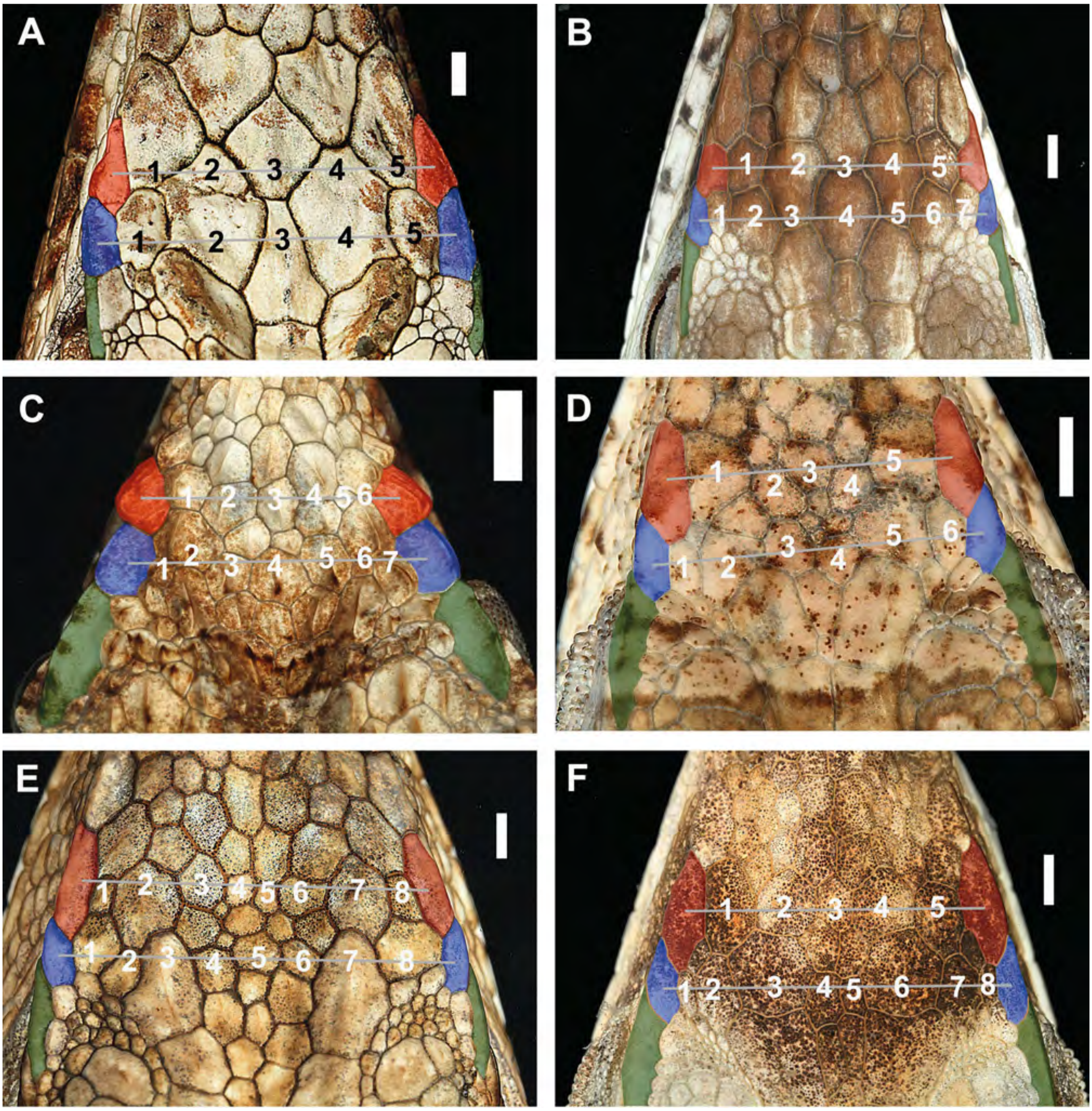

FIGURE 9. Counts of scales between first and second canthals, respectively: (A) *Anolis valencienni* (SMF 10442); (B) *A. porcatus* (SMF 90415); (C) *A. barbouri* (SMF 90497); (D) *A. omiltemanus* (SMF 96227); (E) *A. macrinii* (SMF 96208); (F) *A. cybotes* (SMF 90421); (G) *A. bahorucoensis* (SMF 77251); (H) *A. extremus* (SMF 95871); (I) *A. desiradei* (SMF 94734); (J) *A. auratus* (SMF 91940). Superciliaries highlighted green, first canthals blue, and second canthals red, respectively. Scale bars equal 1 mm.

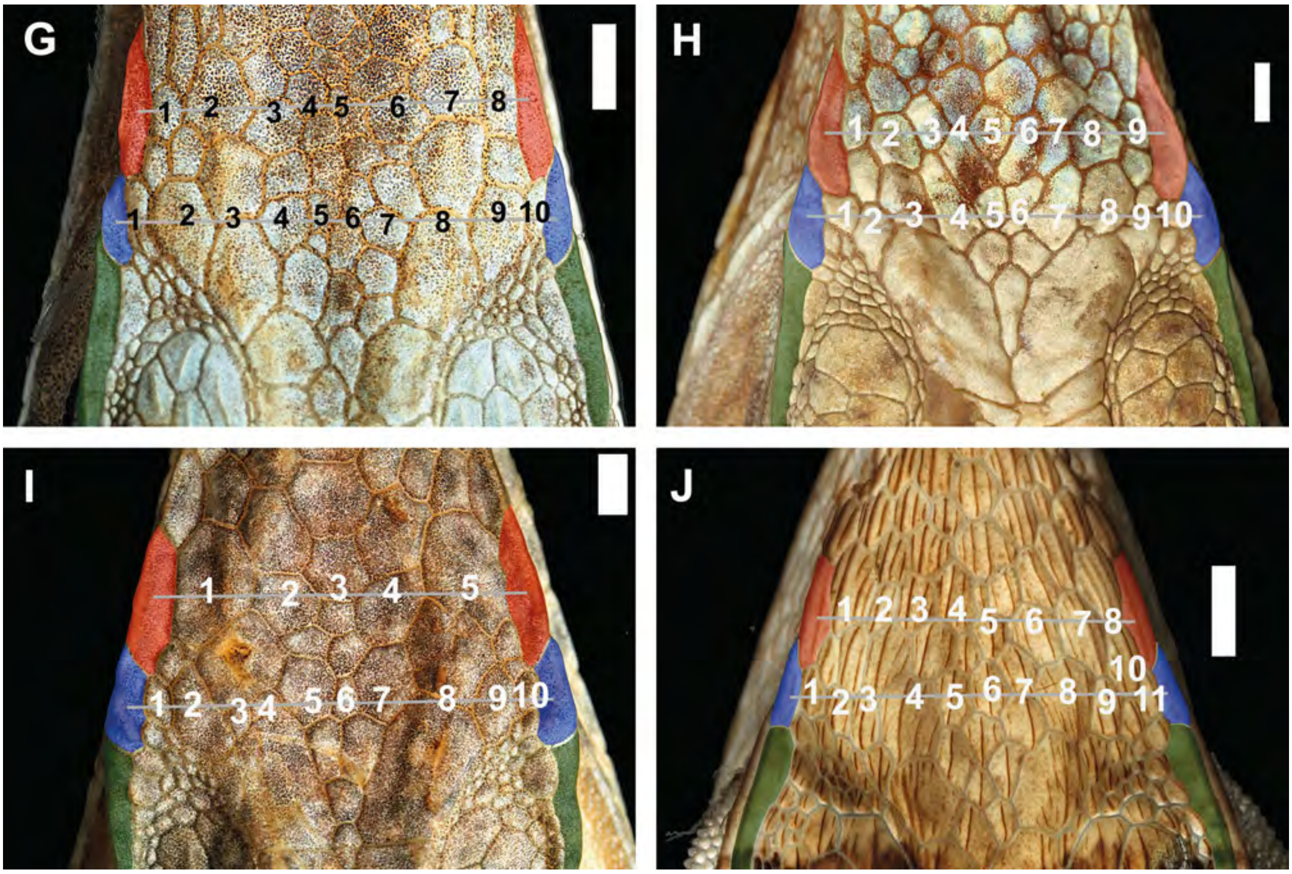

FIGURE 9. Counts of scales between first and second canthals, respectively: (A) *Anolis valencienni* (SMF 10442); (B) *A. porcatus* (SMF 90415); (C) *A. barbouri* (SMF 90497); (D) *A. omiltemanus* (SMF 96227); (E) *A. macrinii* (SMF 96208); (F) *A. cybotes* (SMF 90421); (G) *A. bahorucoensis* (SMF 77251); (H) *A. extremus* (SMF 95871); (I) *A. desiradei* (SMF 94734); (J) *A. auratus* (SMF 91940). Superciliaries highlighted green, first canthals blue, and second canthals red, respectively. Scale bars equal 1 mm.

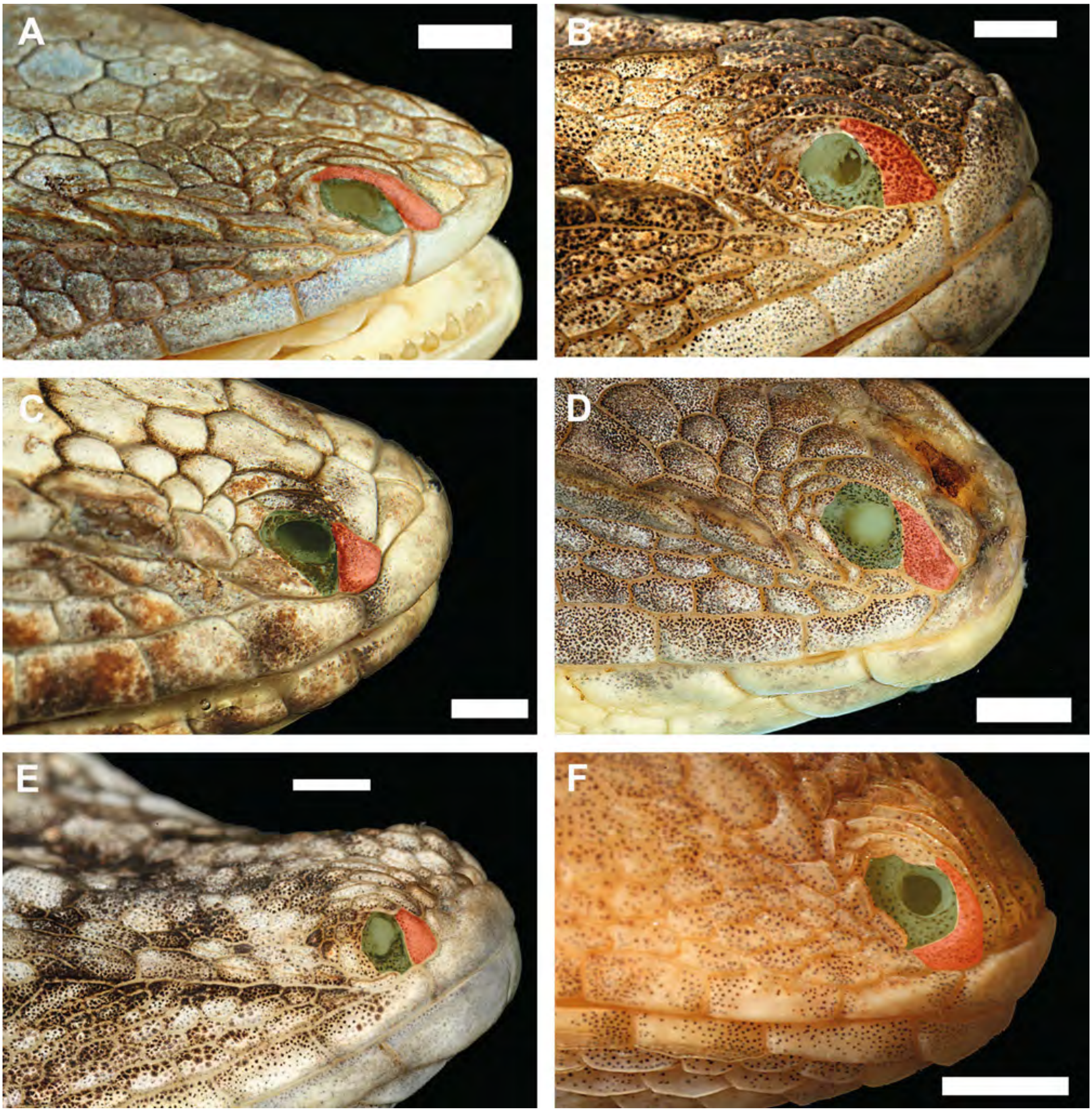

FIGURE 10. Condition of prenasal scales: (A) *Anolis aliniger* (SMF 90481); (B) *A. cybotes* (SMF 90421); (C) *A. valencienni* (SMF 10442); (D) *A. desiradei* (SMF 94734); (E) *A. gadovii* (SMF 96196); (F) *A. hobartsmithi* (SMF 83107); (G) *A. dunni* (IBH 26594); (H) *A. lineatus* (SMF 22979); (I) *A. baleatus* (SMF 10446); (J) *A. barbatus* (SMF 93915); (K) *A. salvini* (SMF 91527); (L) *A. tropidolepis* (SMF 93654); (M) *A. porcatus* (SMF 90415); (N) *A. barbouri* (SMF 90497); (O) *A. vermiculatus* (SMF 30008); (P) *A.* sp. (SMF 10946). Circumnasal highlighted green, single or upper prenasal, respectively, red, lower prenasal (if present), blue, and scales separating prenasal and/or circumnasal from supralabials or rostral yellow (if present). Scale bars equal 1 mm.

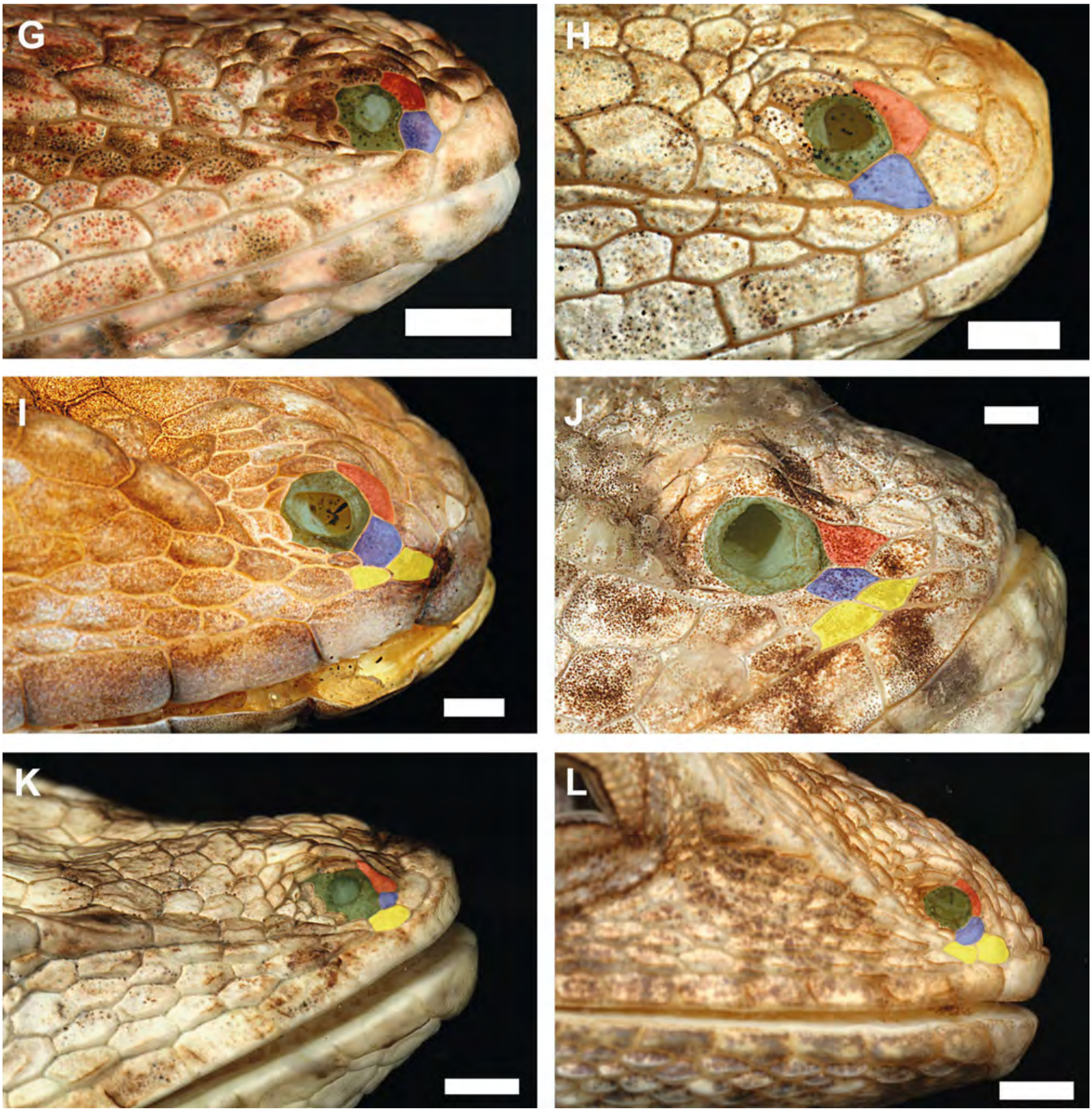

FIGURE 10. Condition of prenasal scales: (A) *Anolis aliniger* (SMF 90481); (B) *A. cybotes* (SMF 90421); (C) *A. valencienni* (SMF 10442); (D) *A. desiradei* (SMF 94734); (E) *A. gadovii* (SMF 96196); (F) *A. hobartsmithi* (SMF 83107); (G) *A. dunni* (IBH 26594); (H) *A. lineatus* (SMF 22979); (I) *A. baleatus* (SMF 10446); (J) *A. barbatus* (SMF 93915); (K) *A. salvini* (SMF 91527); (L) *A. tropidolepis* (SMF 93654); (M) *A. porcatus* (SMF 90415); (N) *A. barbouri* (SMF 90497); (O) *A. vermiculatus* (SMF 30008); (P) *A.* sp. (SMF 10946). Circumnasal highlighted green, single or upper prenasal, respectively, red, lower prenasal (if present), blue, and scales separating prenasal and/or circumnasal from supralabials or rostral yellow (if present). Scale bars equal 1 mm.

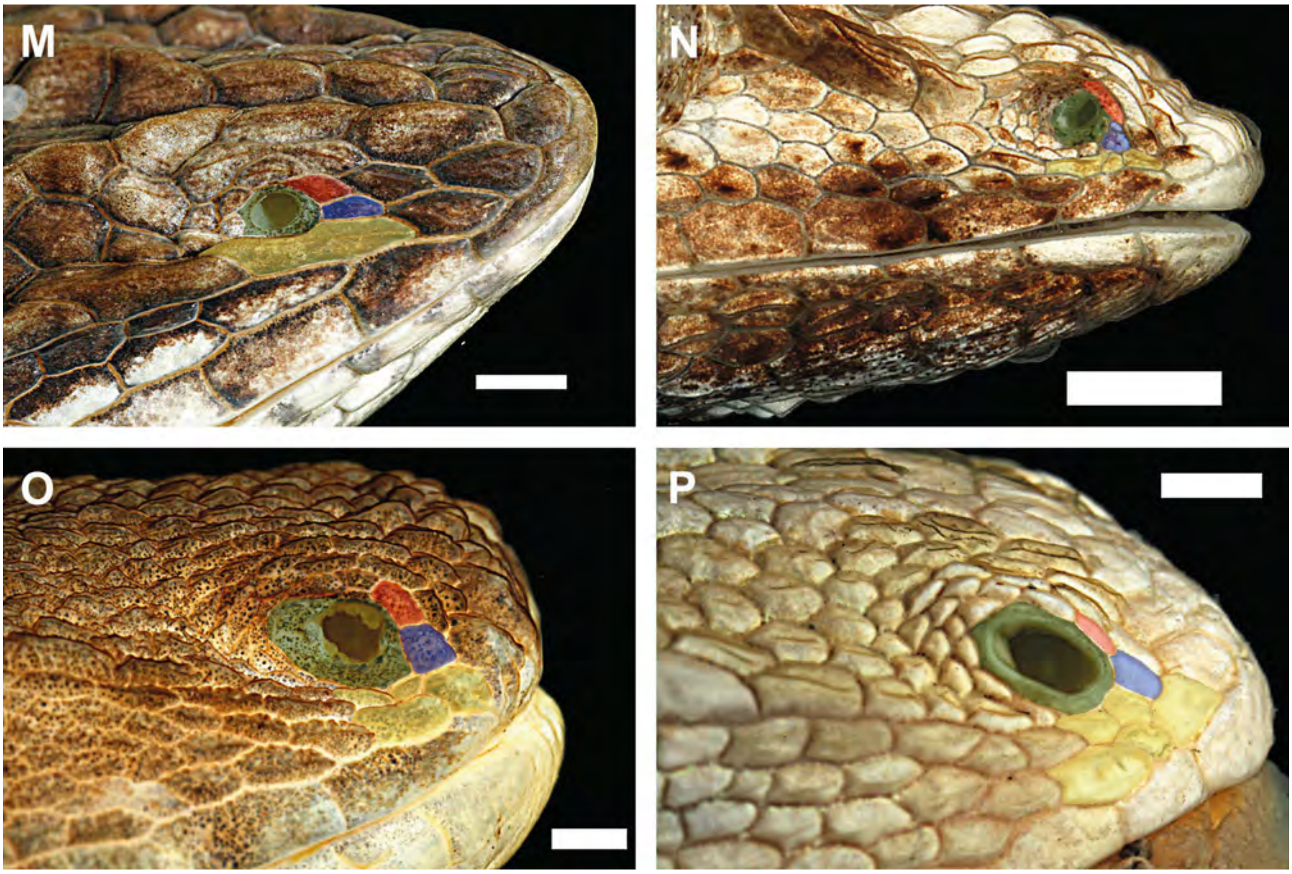

FIGURE 10. Condition of prenasal scales: (A) *Anolis aliniger* (SMF 90481); (B) *A. cybotes* (SMF 90421); (C) *A. valencienni* (SMF 10442); (D) *A. desiradei* (SMF 94734); (E) *A. gadovii* (SMF 96196); (F) *A. hobartsmithi* (SMF 83107); (G) *A. dunni* (IBH 26594); (H) *A. lineatus* (SMF 22979); (I) *A. baleatus* (SMF 10446); (J) *A. barbatus* (SMF 93915); (K) *A. salvini* (SMF 91527); (L) *A. tropidolepis* (SMF 93654); (M) *A. porcatus* (SMF 90415); (N) *A. barbouri* (SMF 90497); (O) *A. vermiculatus* (SMF 30008); (P) *A.* sp. (SMF 10946). Circumnasal highlighted green, single or upper prenasal, respectively, red, lower prenasal (if present), blue, and scales separating prenasal and/or circumnasal from supralabials or rostral yellow (if present). Scale bars equal 1 mm.

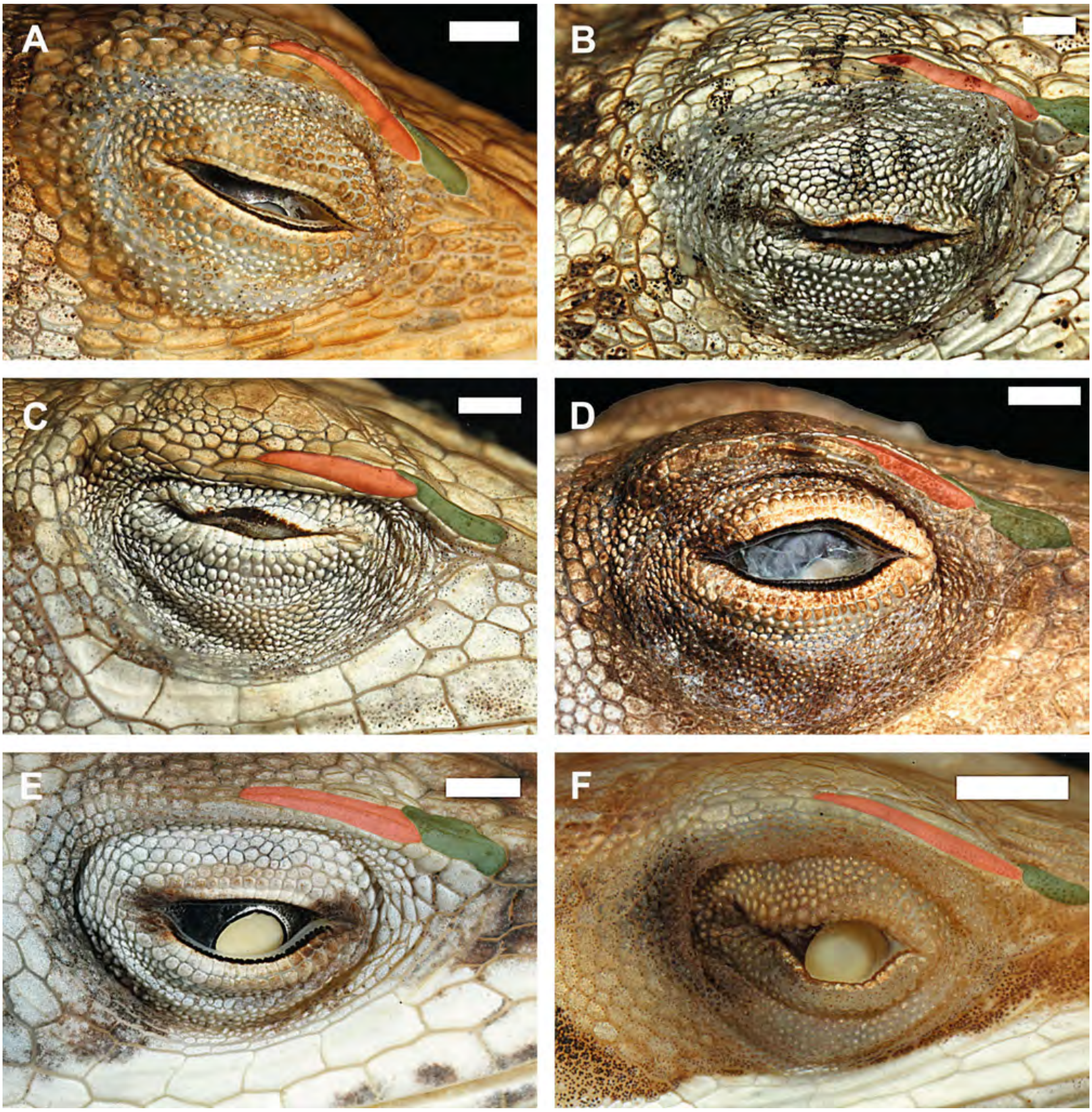

FIGURE 11. Condition of superciliary scales: (A) *Anolis tropidonotus* (SMF 79059); (B) *A. onca* (SMF 93909); (C) *A. lineatus* (SMF 22979); (D) *A. gingivinus* (SMF 55769); (E) *A. porcatus* (SMF 90415); (F) *A. semilineatus* (SMF 26063); (G) *A. barbouri* (SMF 90495); (H) *A. extremus* (SMF 60827); (I) *A. bahorucoensis* (SMF 77248); (J) *A. richardi* (SMF 65825); (K) *A. frenatus* (SMF 96579); (L) *A. latifrons* (SMF 96574); (M) *A. valencienni* (SMF 10442); (N) *A. vermiculatus* (SMF 30008); (O) *A.* sp. (SMF 10946); (P) *A. microtus* (SMF 91499); (Q) *A. aquaticus* (SMF 89667); (R) *A. angusticeps* (SMF 78341). Anterior superciliary highlighted red, first canthal green. Scale bars equal 1 mm.

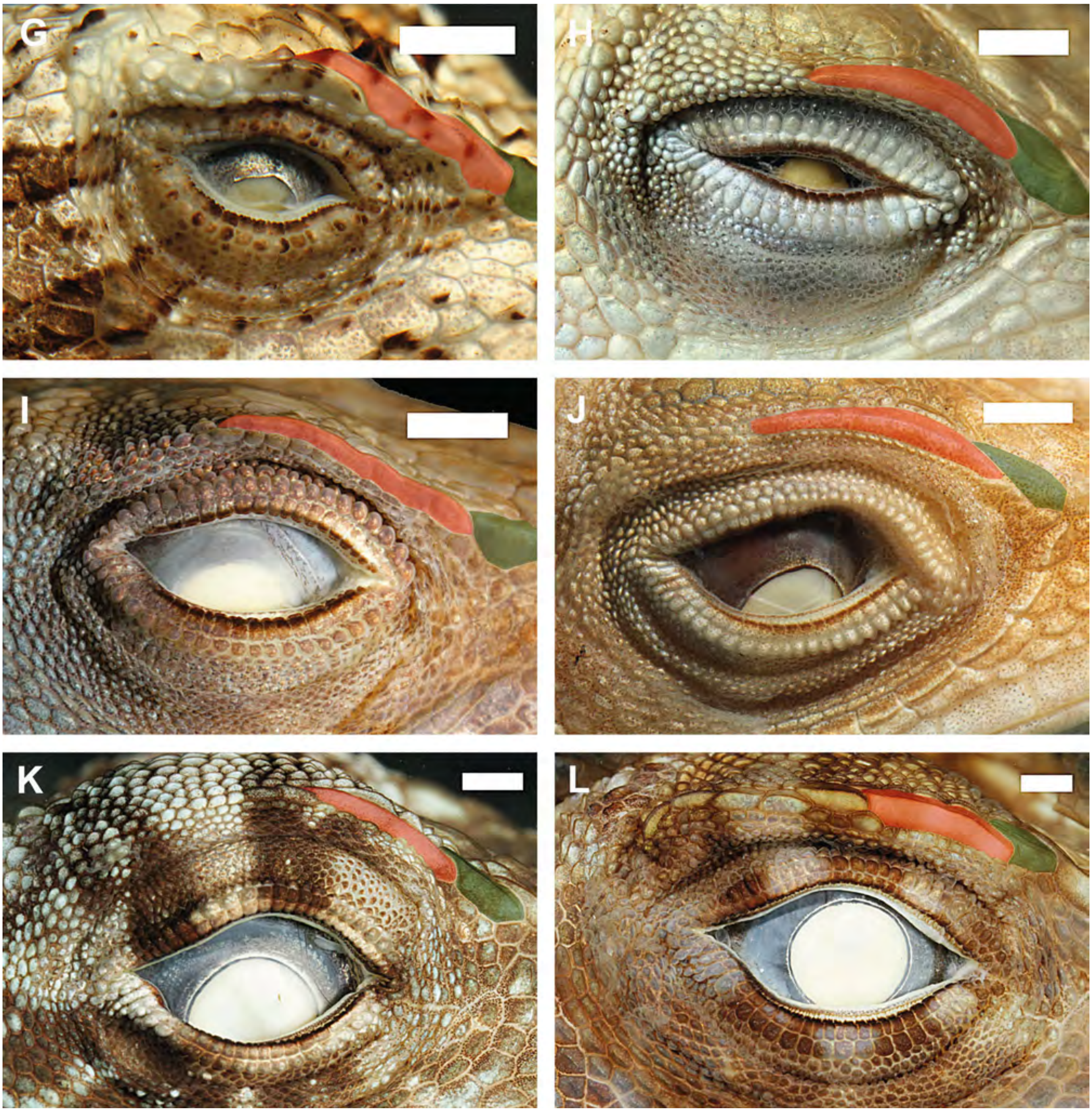

FIGURE 11. Condition of superciliary scales: (A) *Anolis tropidonotus* (SMF 79059); (B) *A. onca* (SMF 93909); (C) *A. lineatus* (SMF 22979); (D) *A. gingivinus* (SMF 55769); (E) *A. porcatus* (SMF 90415); (F) *A. semilineatus* (SMF 26063); (G) *A. barbouri* (SMF 90495); (H) *A. extremus* (SMF 60827); (I) *A. bahorucoensis* (SMF 77248); (J) *A. richardi* (SMF 65825); (K) *A. frenatus* (SMF 96579); (L) *A. latifrons* (SMF 96574); (M) *A. valencienni* (SMF 10442); (N) *A. vermiculatus* (SMF 30008); (O) *A.* sp. (SMF 10946); (P) *A. microtus* (SMF 91499); (Q) *A. aquaticus* (SMF 89667); (R) *A. angusticeps* (SMF 78341). Anterior superciliary highlighted red, first canthal green. Scale bars equal 1 mm.

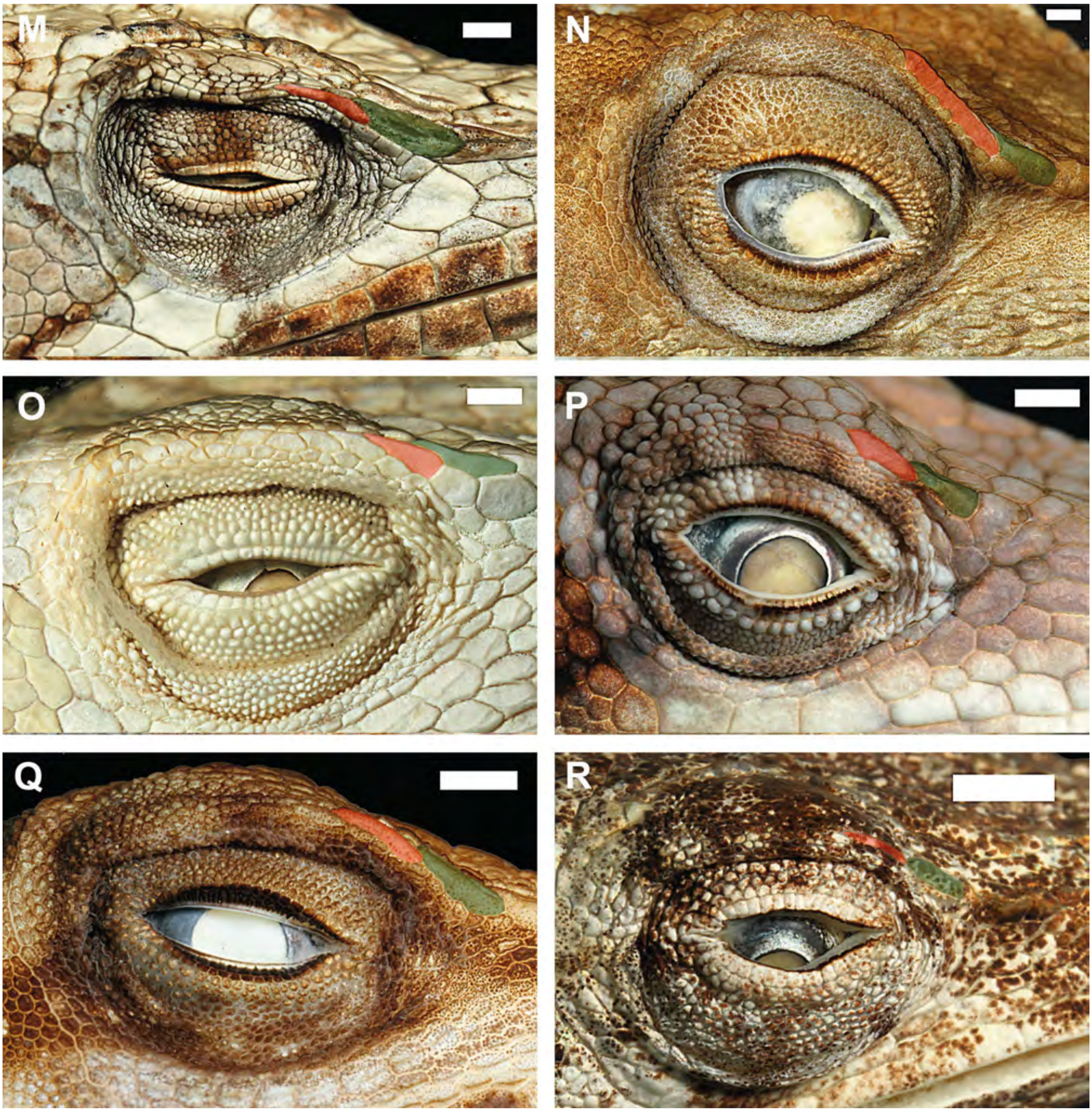

FIGURE 11. Condition of superciliary scales: (A) *Anolis tropidonotus* (SMF 79059); (B) *A. onca* (SMF 93909); (C) *A. lineatus* (SMF 22979); (D) *A. gingivinus* (SMF 55769); (E) *A. porcatus* (SMF 90415); (F) *A. semilineatus* (SMF 26063); (G) *A. barbouri* (SMF 90495); (H) *A. extremus* (SMF 60827); (I) *A. bahorucoensis* (SMF 77248); (J) *A. richardi* (SMF 65825); (K) *A. frenatus* (SMF 96579); (L) *A. latifrons* (SMF 96574); (M) *A. valencienni* (SMF 10442); (N) *A. vermiculatus* (SMF 30008); (O) *A.* sp. (SMF 10946); (P) *A. microtus* (SMF 91499); (Q) *A. aquaticus* (SMF 89667); (R) *A. angusticeps* (SMF 78341). Anterior superciliary highlighted red, first canthal green. Scale bars equal 1 mm.

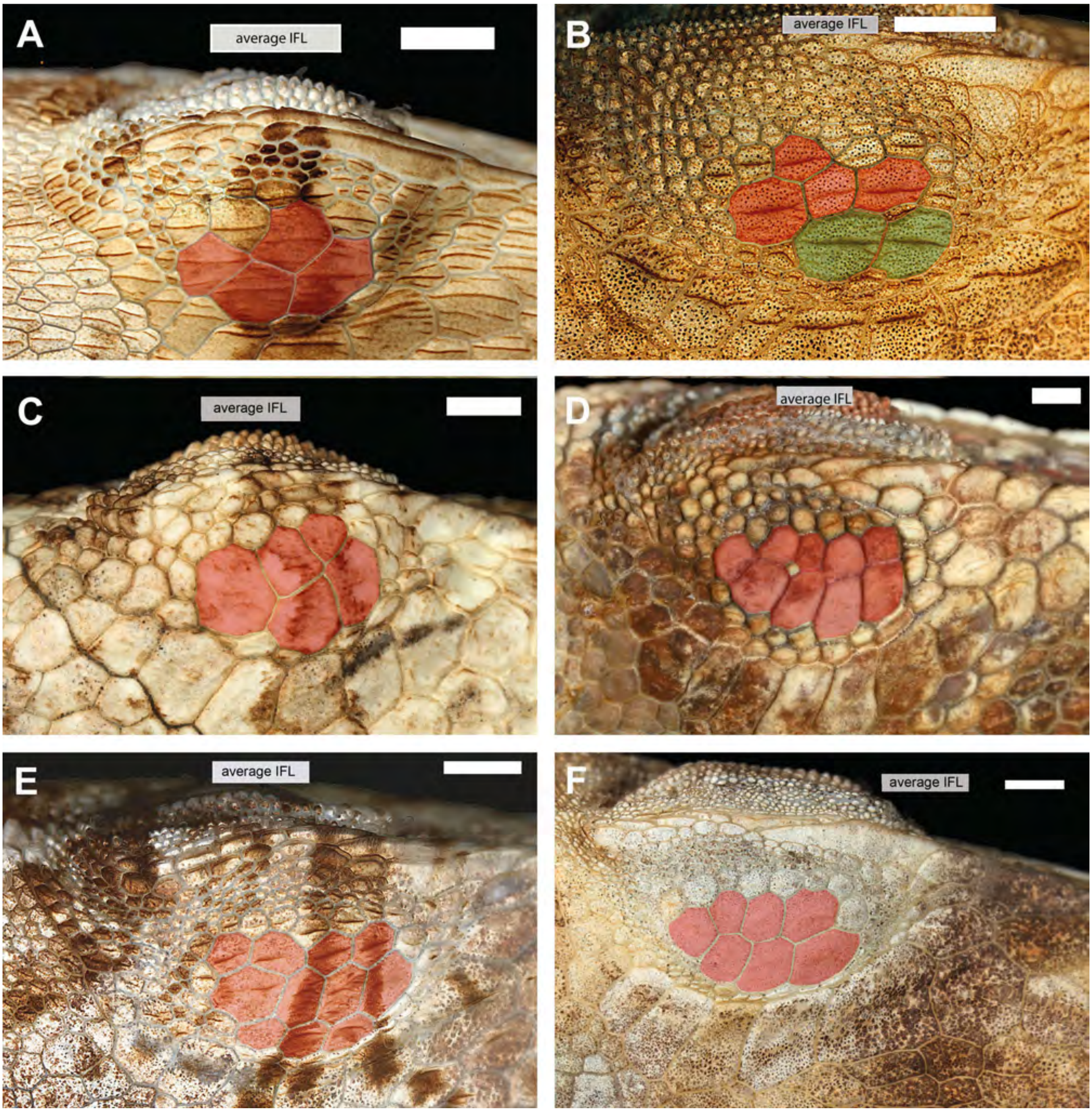

FIGURE 12. Condition of supraocular scales: (A) *Anolis auratus* (SMF 91940); (B) *A. poecilopus* (SMF 80774); (C) *A. salvini* (SMF 91527); (D) *A. biporcatus* (SMF 89669); (E) *A. lemurinus* (SMF 90115); (F) *A. vittigerus* (SMF 89528); (G) *A. tropidolepis* (SMF 93654); (H) *A. unilobatus* (SMF 96275); (I) *A. dunni* (SMF 96254); (J) *A. latifrons* (SMF 96574). Moderately enlarged supraoculars highlighted red, greatly enlarged supraoculars green. White scale bars equal 1 mm. Gray scale bar indicates length of an average infralabial of the same individual.

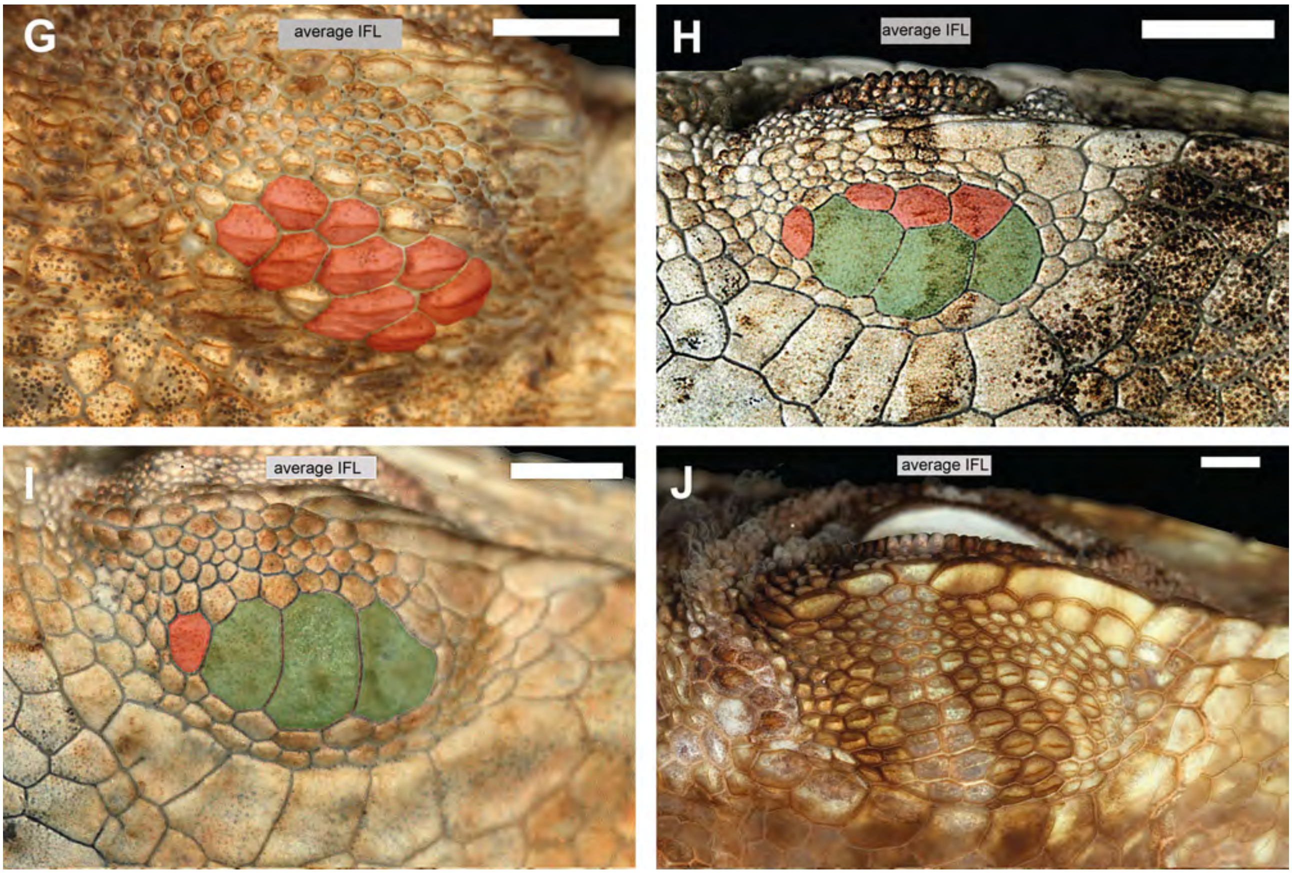

FIGURE 12. Condition of supraocular scales: (A) *Anolis auratus* (SMF 91940); (B) *A. poecilopus* (SMF 80774); (C) *A. salvini* (SMF 91527); (D) *A. biporcatus* (SMF 89669); (E) *A. lemurinus* (SMF 90115); (F) *A. vittigerus* (SMF 89528); (G) *A. tropidolepis* (SMF 93654); (H) *A. unilobatus* (SMF 96275); (I) *A. dunni* (SMF 96254); (J) *A. latifrons* (SMF 96574). Moderately enlarged supraoculars highlighted red, greatly enlarged supraoculars green. White scale bars equal 1 mm. Gray scale bar indicates length of an average infralabial of the same individual.

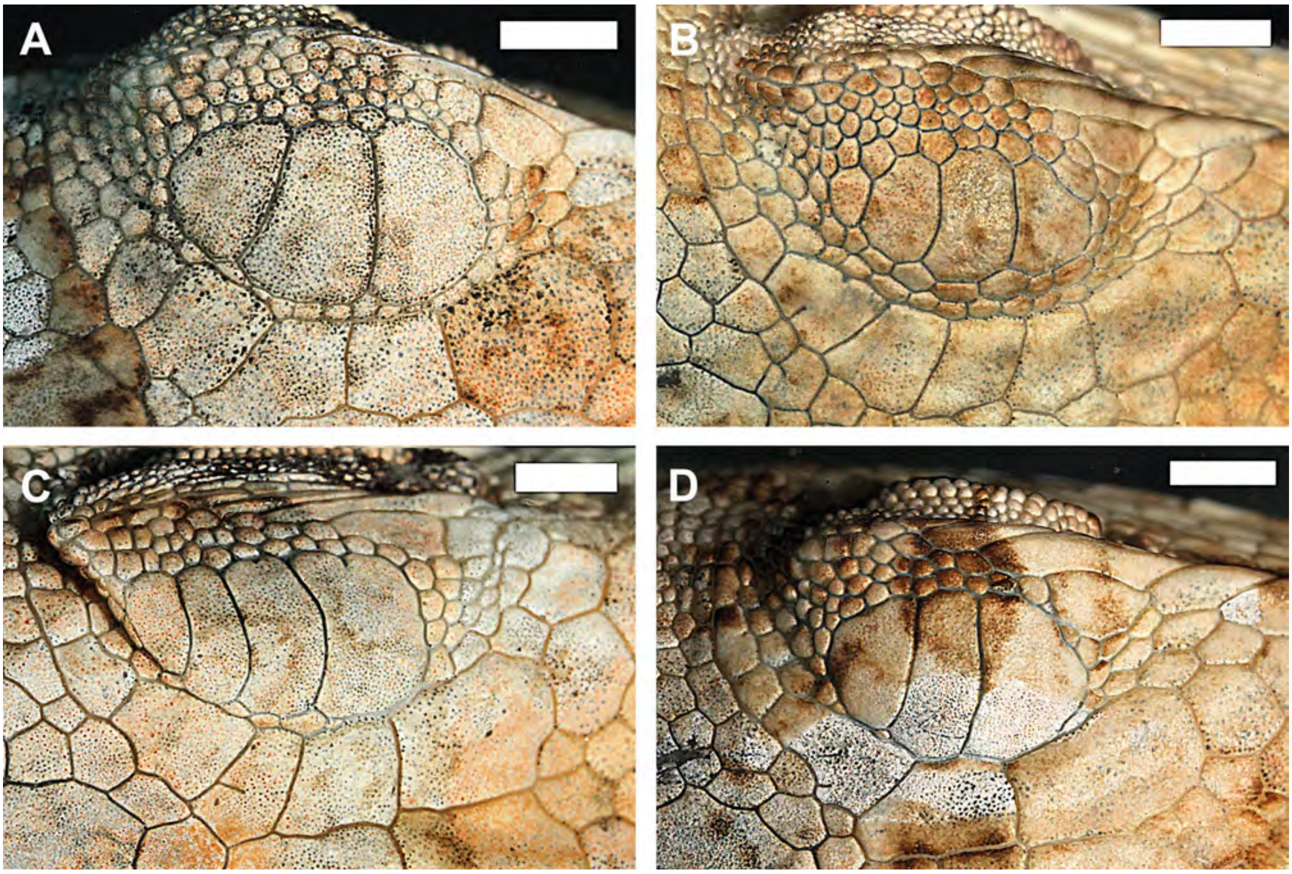

FIGURE 13. Condition of circumorbital scales in *Anolis dunni*: (A) One complete row of circumorbital scales (SMF 96255); (B) Two complete rows of circumorbital scales (SMF 96254); (C) Circumorbital row incomplete (SMF 96252); (D) Circumorbital row mostly absent (SMF 96256). Scale bars equal 1 mm.

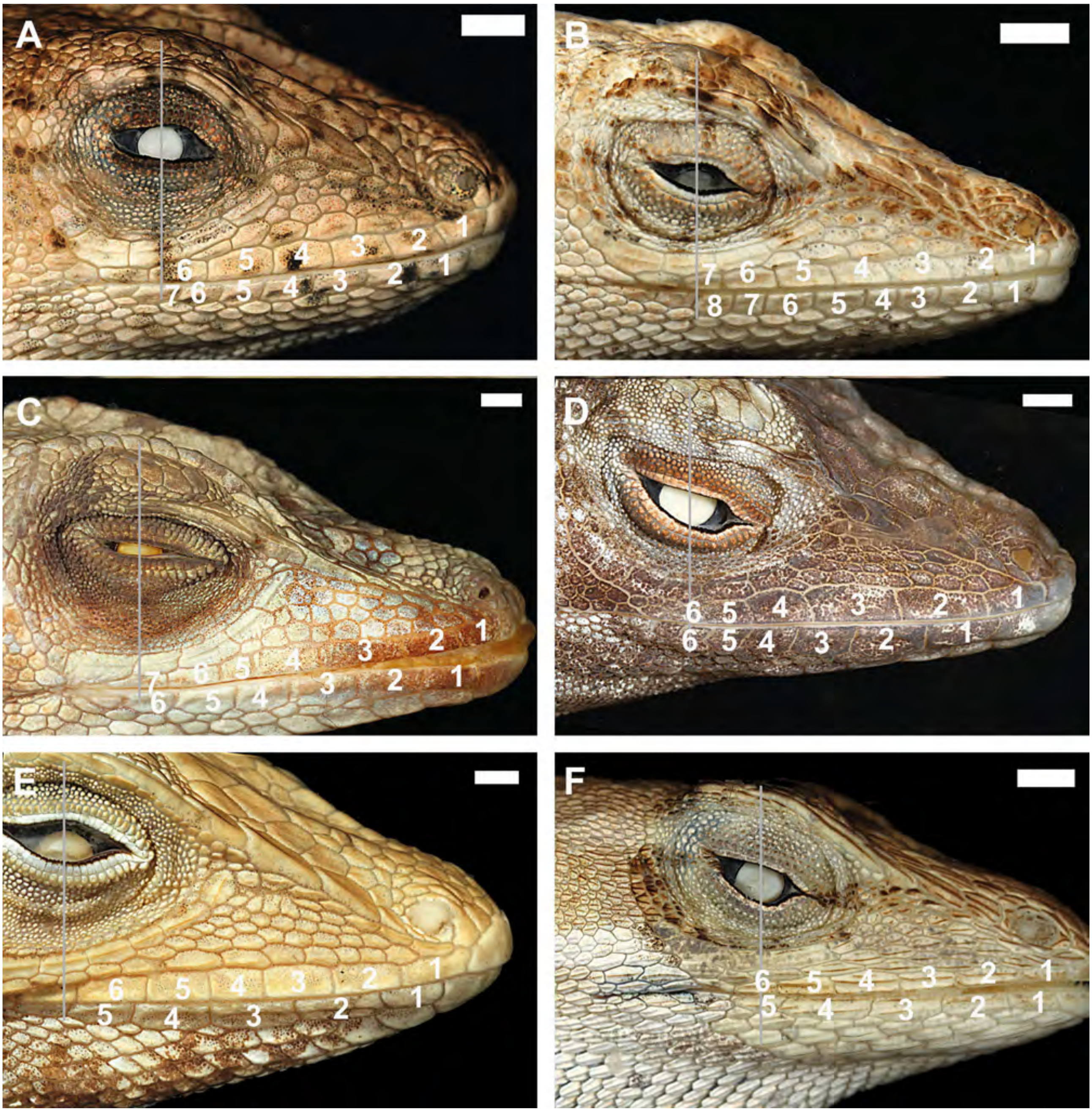

FIGURE 14. Counts of supralabial and infralabial scales, respectively: (A) *Anolis liogaster* (SMF 96202); (B) *A. nebulosus* (IBH 26551); (C) *A. extremus* (SMF 95871); (D) *A. distichus* (SMF 90420); (E) *A. cybotes* (SMF 25721); (F) *A. auratus* (SMF 91940). Gray vertical bar indicates level below center of eye. Scale bars equal 1 mm.

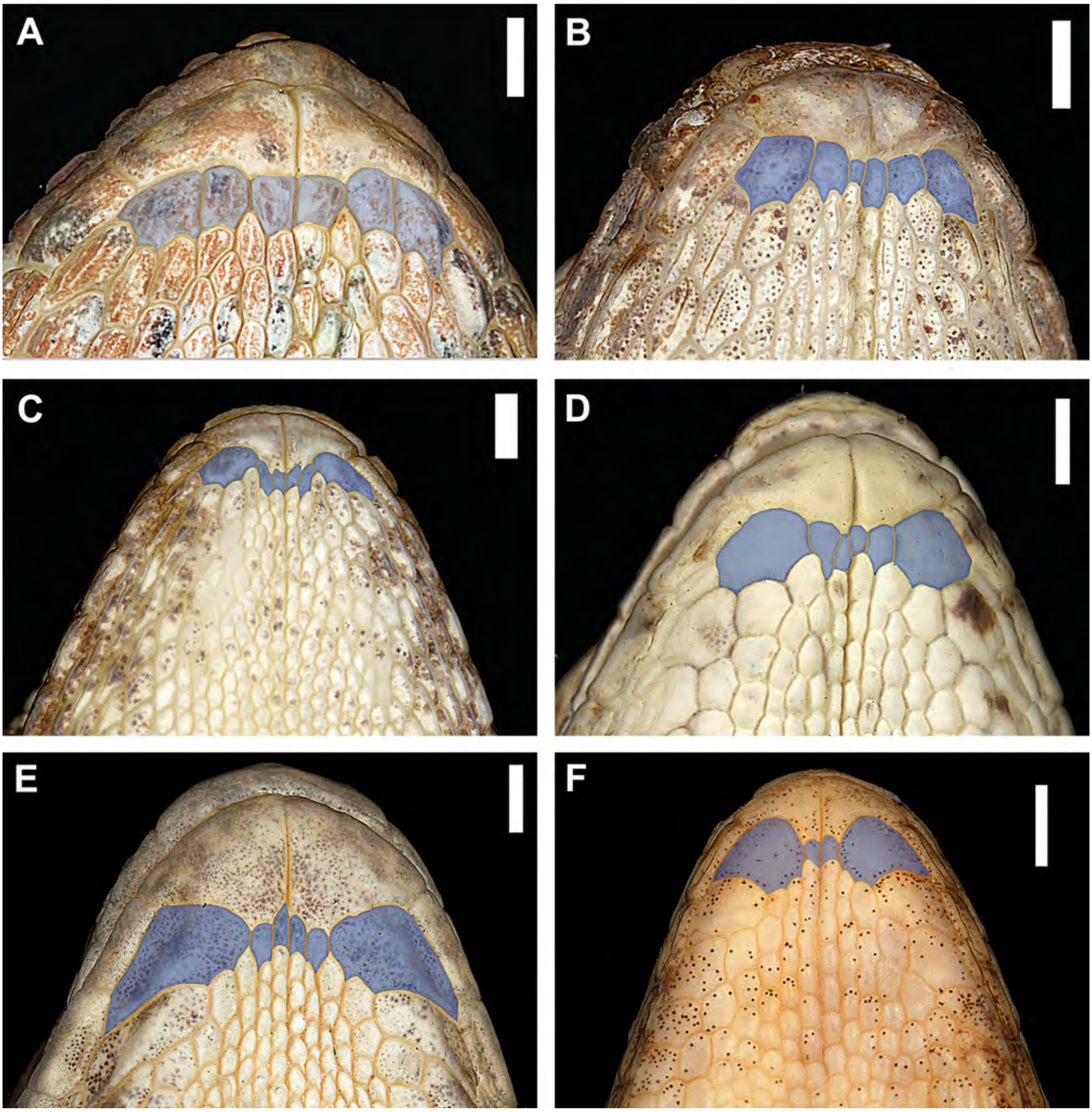

FIGURE 15. Condition of postmental scales: (A) *Anolis biporcatus* (SMF 89669); (B) *A. lemurinus* (SMF 90115); (C) *A. tropidolepis* (SMF 93654); (D) *A. salvini* (SMF 91527); (E) *A. cybotes* (SMF 90421); (F) *A. omiltemanus* (UMMZ 130985); (G) *A. allogus* (SMF 77249); (H) *A. extremus* (SMF 95871); (I) *A. distichus* (SMF 90420); (J) *A. porcatus* (SMF 90415). Postmental scales highlighted blue. Outer postmental scales not enlarged in A, moderately enlarged in B, and greatly enlarged in C to J Scale bars equal 1 mm.

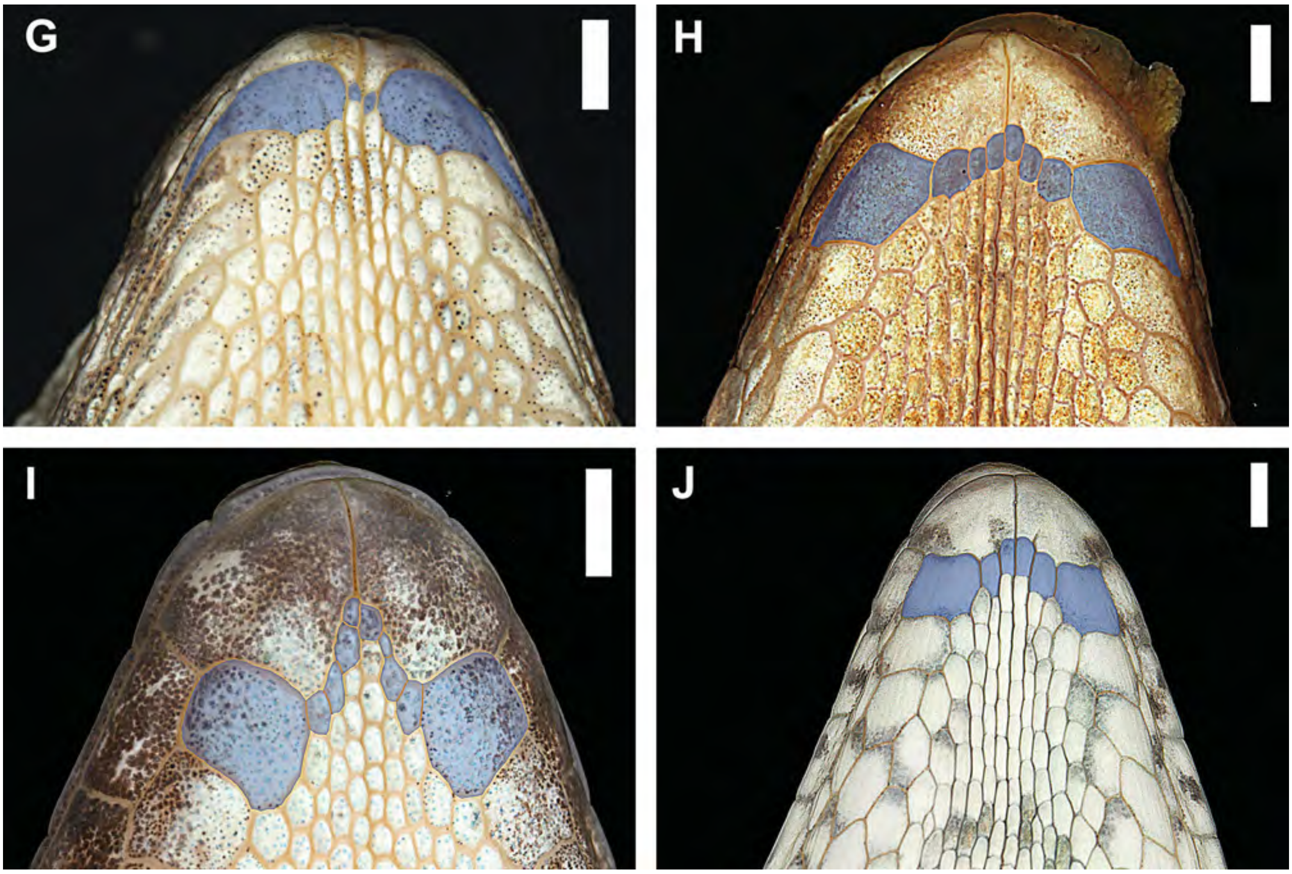

FIGURE 15. Condition of postmental scales: (A) *Anolis biporcatus* (SMF 89669); (B) *A. lemurinus* (SMF 90115); (C) *A. tropidolepis* (SMF 93654); (D) *A. salvini* (SMF 91527); (E) *A. cybotes* (SMF 90421); (F) *A. omiltemanus* (UMMZ 130985); (G) *A. allogus* (SMF 77249); (H) *A. extremus* (SMF 95871); (I) *A. distichus* (SMF 90420); (J) *A. porcatus* (SMF 90415). Postmental scales highlighted blue. Outer postmental scales not enlarged in A, moderately enlarged in B, and greatly enlarged in C to J Scale bars equal 1 mm.

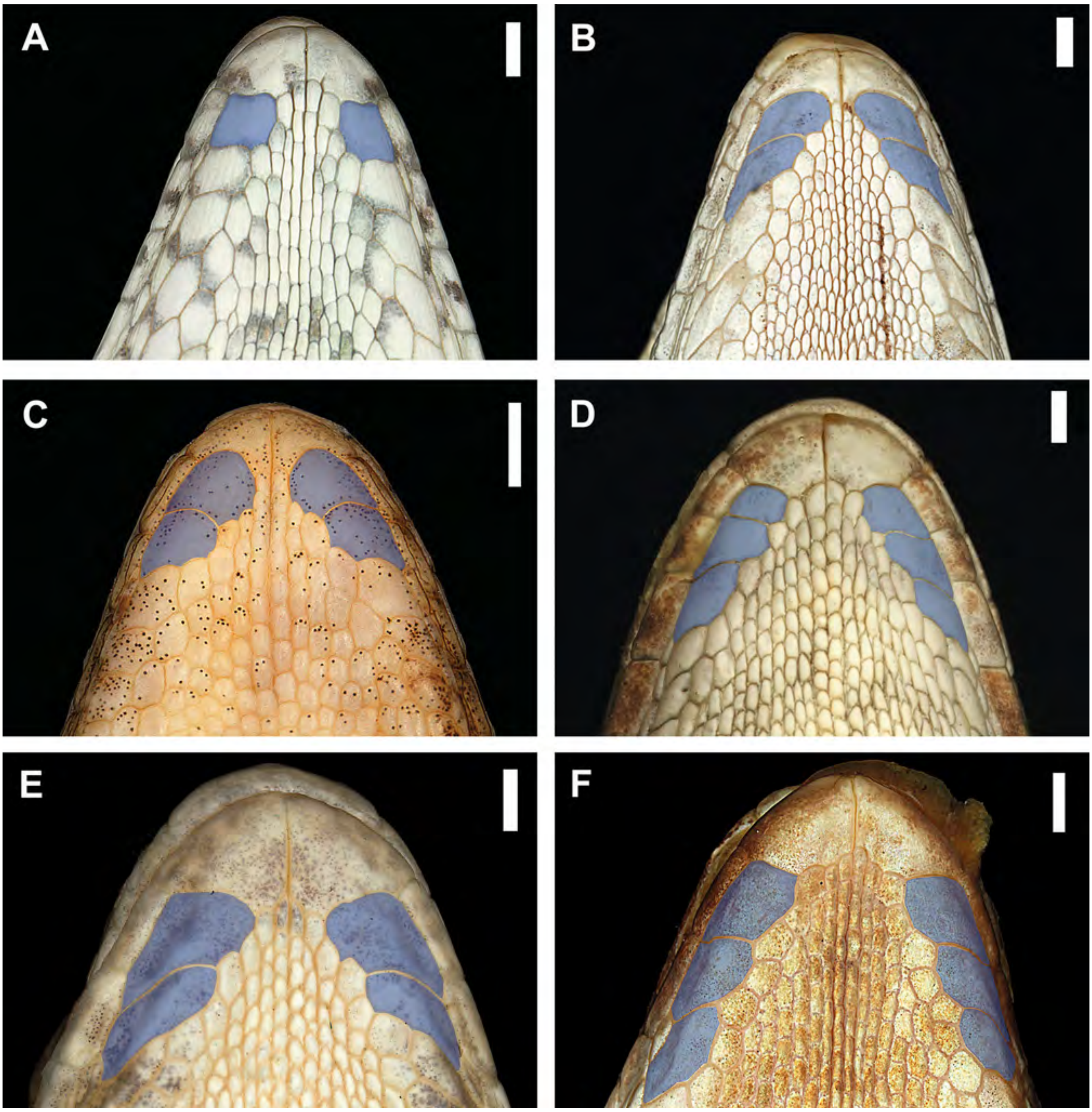

FIGURE 16. Condition of sublabial scales: (A) *Anolis porcatus* (SMF 90415); (B) *A. lineatus* (SMF 22979); (C) *A. omiltemanus* (UMMZ 130985); (D) *A. valencienni* (SMF 10442); (E) *A. cybotes* (SMF 90421); (F) *A. extremus* (SMF 95871); (G) *A. desiradei* (SMF 94734); (H) *A. bahorucoensis* (SMF 77251); (I) *A. distichus* (SMF 25843); (J) *A. noblei* (SMF 79971). Greatly enlarged sublabial scales highlighted blue. Scale bars equal 1 mm.

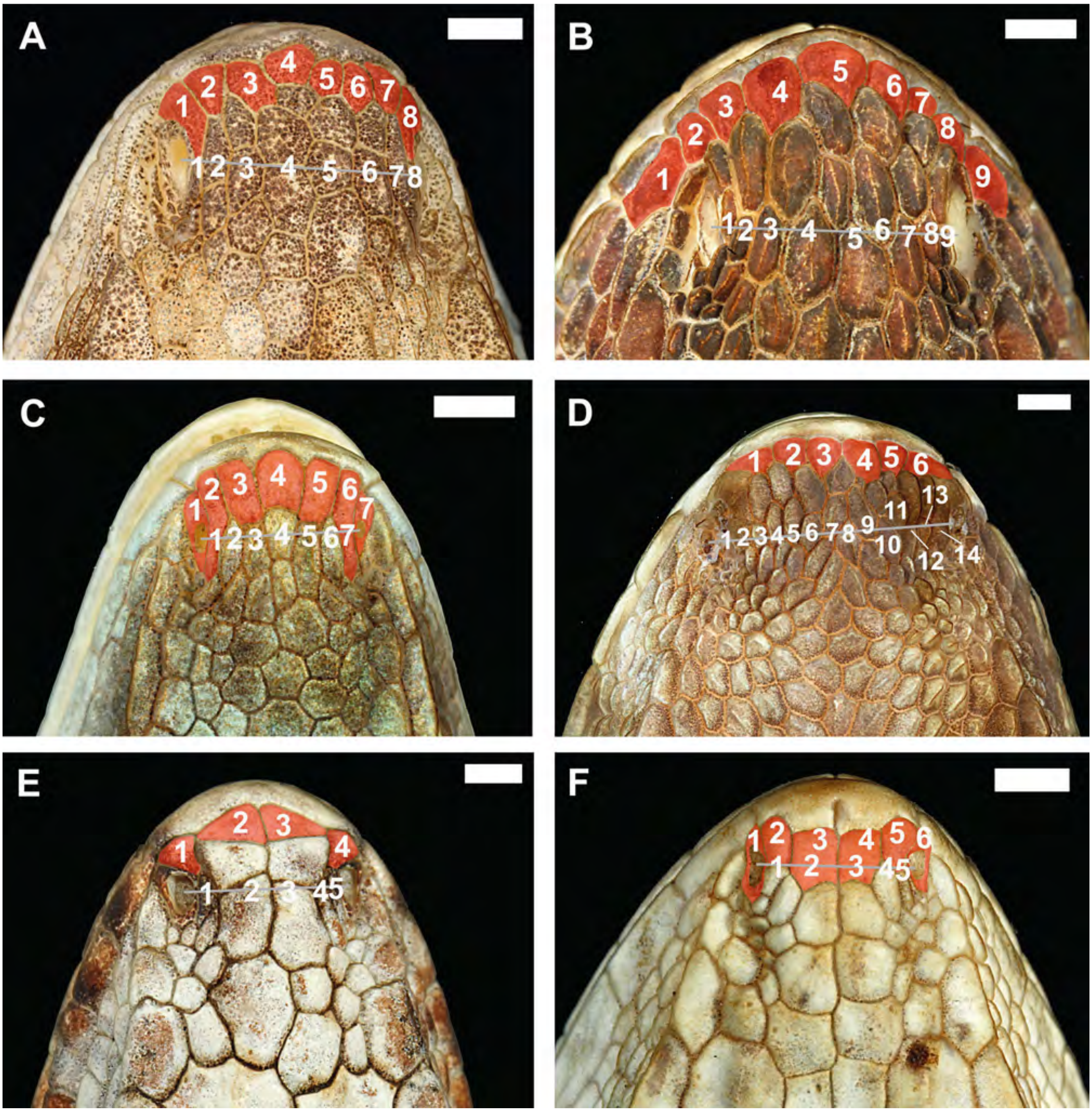

FIGURE 17. Counts of postrostral and internasal scales, respectively: (A) *Anolis vittigerus* (SMF 89528); (B) *A. biporcatus* (SMF 89669); (C) *A. aliniger* (SMF 90481); (D) *A. latifrons* (AB-194); (E) *A. valencienni* (SMF 10442); (F) *A. distichus* (SMF 25843). Postrostral scales highlighted red. Scale bars equal 1 mm.

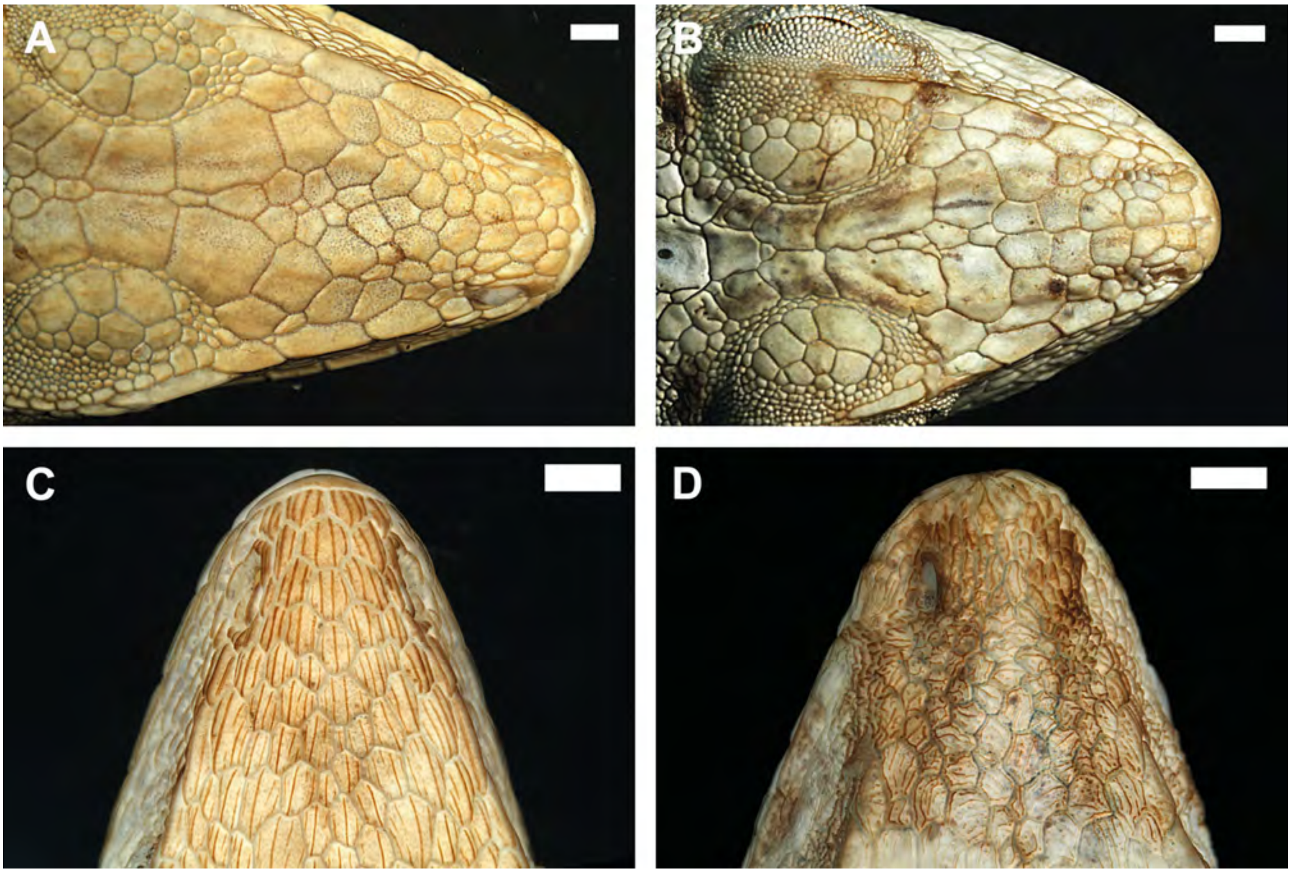

FIGURE 18. Condition of snout scales: (A) *Anolis cybotes* (SMF 25721) with mostly smooth snout scales; (B) *A. distichus* (SMF 25843), note double row of enlarged median snout scales; (C) *A. auratus* (SMF 91940) with multicarinate snout scales, keels mostly straight and oriented longitudinally; (D) *A. datzorum* (SMF 91456) with multicarinate snout scales, shape and orientation of keels varying. Scale bars equal 1 mm.

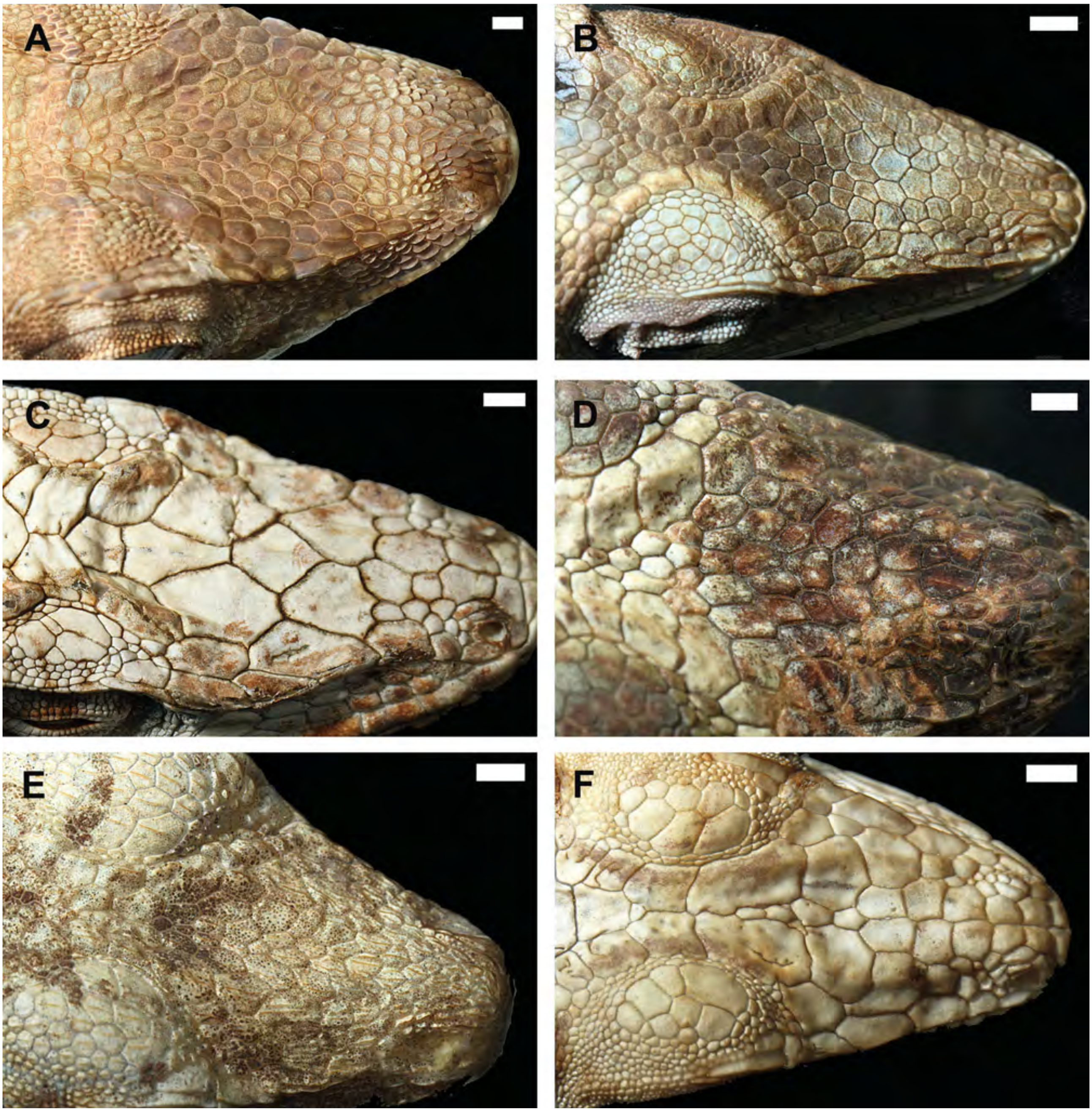

FIGURE 19. Condition of prefrontal depression: (A) *Anolis latifrons* (AB-194); (B) *A. aliniger* (SMF 90481); (C) *A. valencienni* (SMF 10442); (D) *A. biporcatus* (SMF 89671); (E) *A. allogus* (SMF 77249); (E) *A. distichus* (SMF 25843). Shallow prefrontal depression in A and B, moderate in C and D, and deep in E and F. Scales in prefrontal depression smooth in C and F, smooth to rugose in D, rugose to keeled in B, mostly keeled (unicarinate) in A, and keeled (mostly multicarinate) in E. Scale bars equal 1 mm.

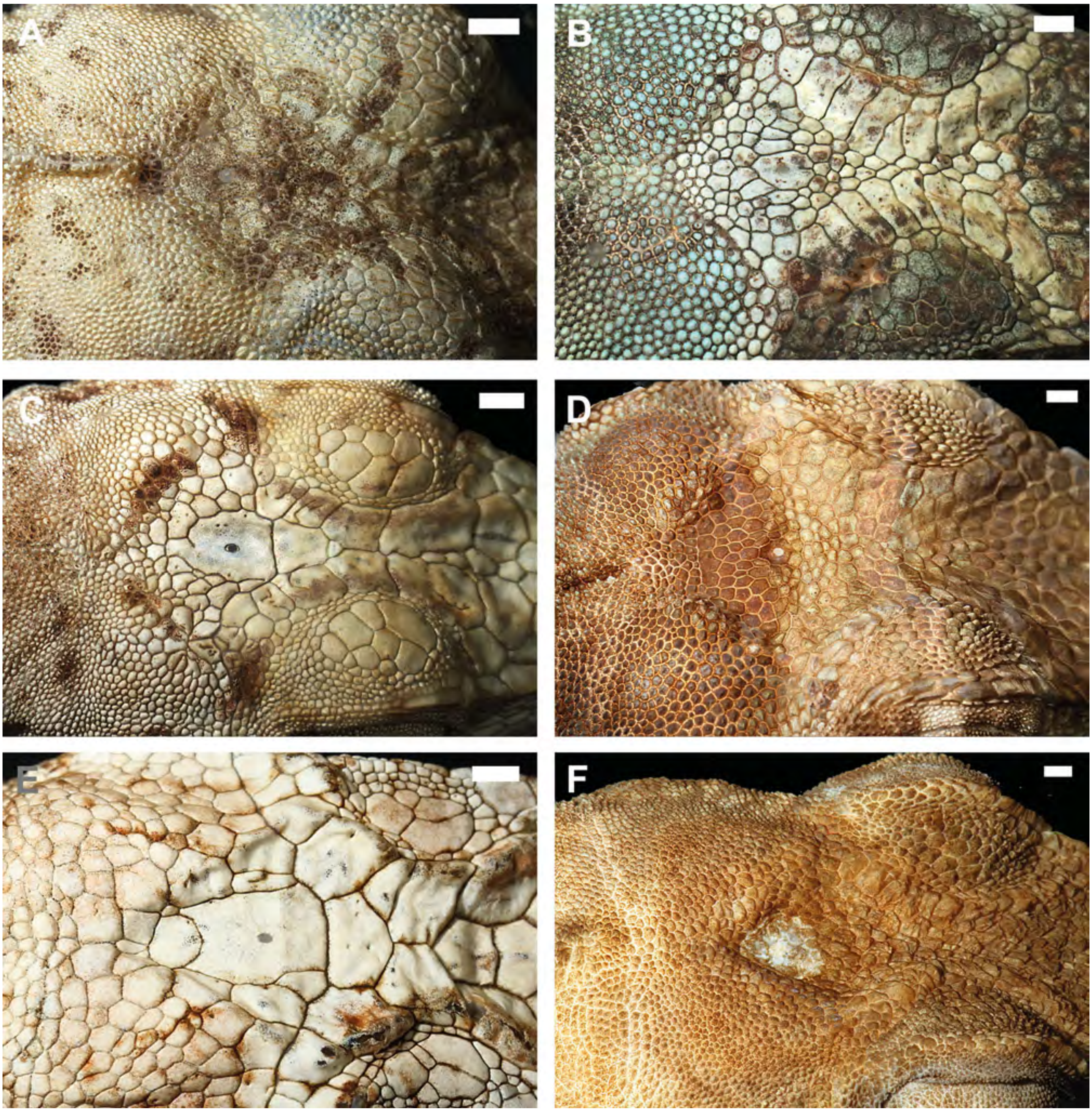

FIGURE 20. Condition of parietal depression: (A) *Anolis allogus* (SMF 77249); (B) *A. biporcatus* (SMF 89671); (C) *A. distichus* (SMF 25843); (D) *A. latifrons* (SMF 96576); (E) *A. valencienni* (SMF 10442); (E) *A. vermiculatus* (SMF 30008). Shallow parietal depression in A and B, moderate in C and D, and deep in E and F. Scale bars equal 1 mm.

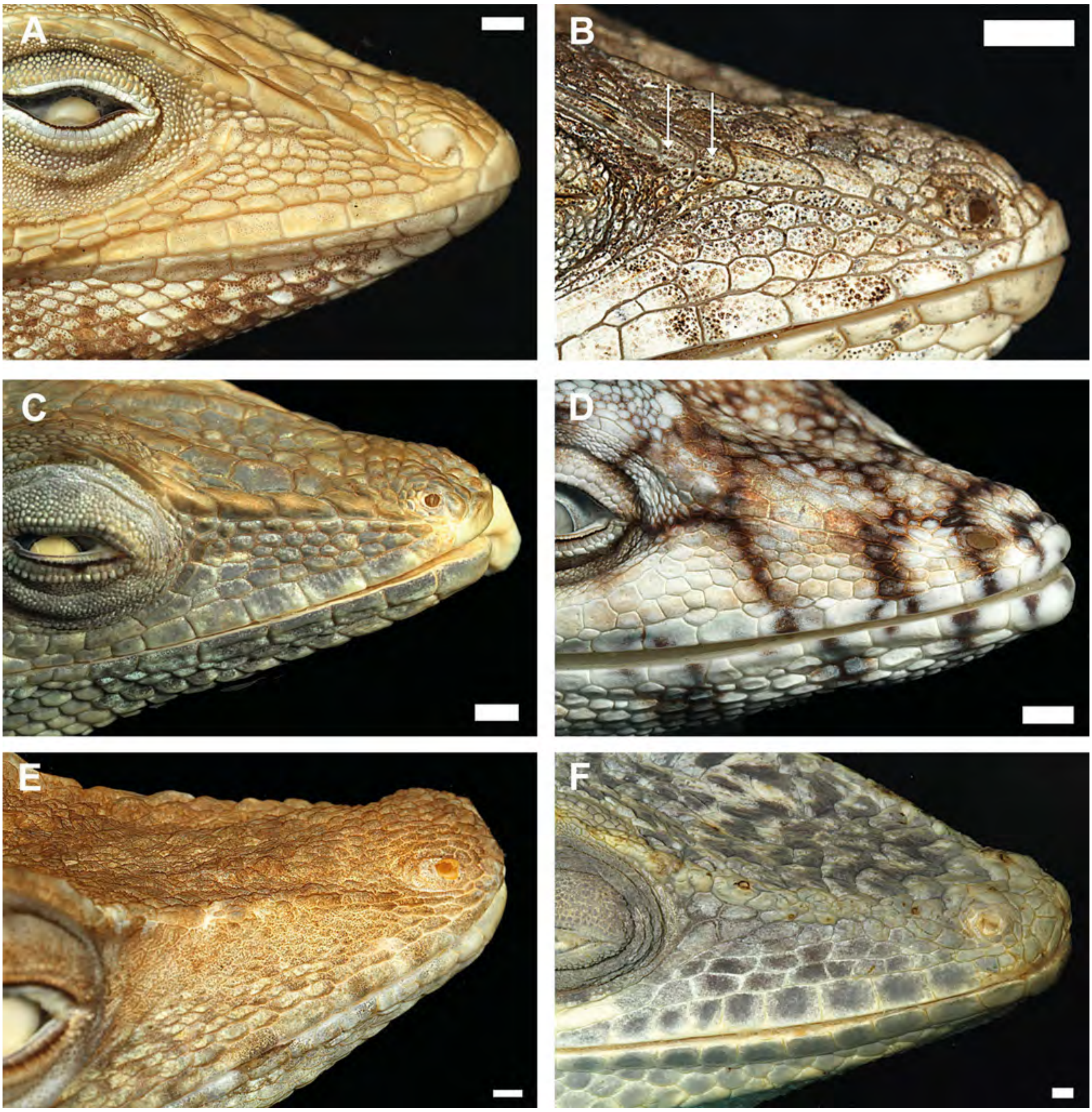

FIGURE 21. Condition of canthal ridge: (A) *Anolis cybotes* (SMF 25721); (B) *A. nebulosus* (UIMNH 47862); (C) *A. evermanni* (SMF 22996); (D) *A. insignis* (SMF 91477); (E) *A. vermiculatus* (SMF 30008); (F) *A. noblei* (SMF 79971). Distinct canthal ridge in A, B, and C, weak in D, forming a vertically elevated ridge in E and F. Note divided first canthal (arrows) in B. Scale bars equal 1 mm.

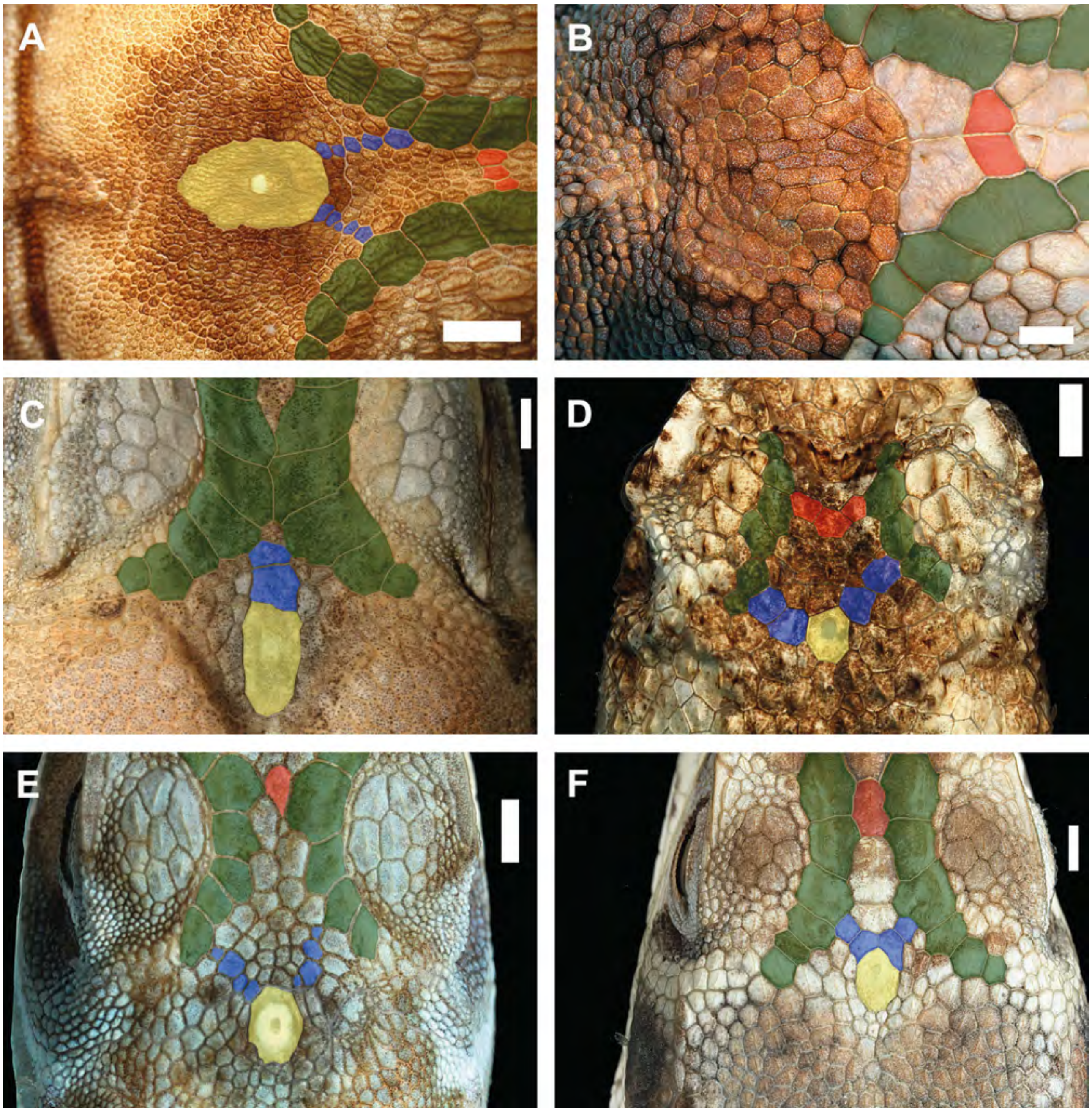

FIGURE 22. Condition of scales in region of, and counts of scales between, interparietal and supraorbital semicircles: (A) *Anolis aquaticus* (SMF 89667); (B) *A. microtus* (SMF 91499; interparietal absent); (C) *A. cybotes* (SMF 90421); (D) *A. barbouri* (SMF 90497); (E) *A. bahorucoensis* (SMF 77251); (F) *A. porcatus* (SMF 90415); (G) *A. desiradei* (SMF 94734); (H) *A. macrinii* (SMF 96210); (I) *A. omiltemanus* (SMF 96229); (J) *A. omiltemanus* (SMF 96227); (K) *A. valencienni* (SMF 10442); (L) *A. lineatus* (SMF 22979). Interparietal highlighted yellow, supraorbital semicircles green, scales between interparietal and supraorbital semicircles blue, and scale(s) between supraorbital semicircles red. Scale bars equal 1 mm.

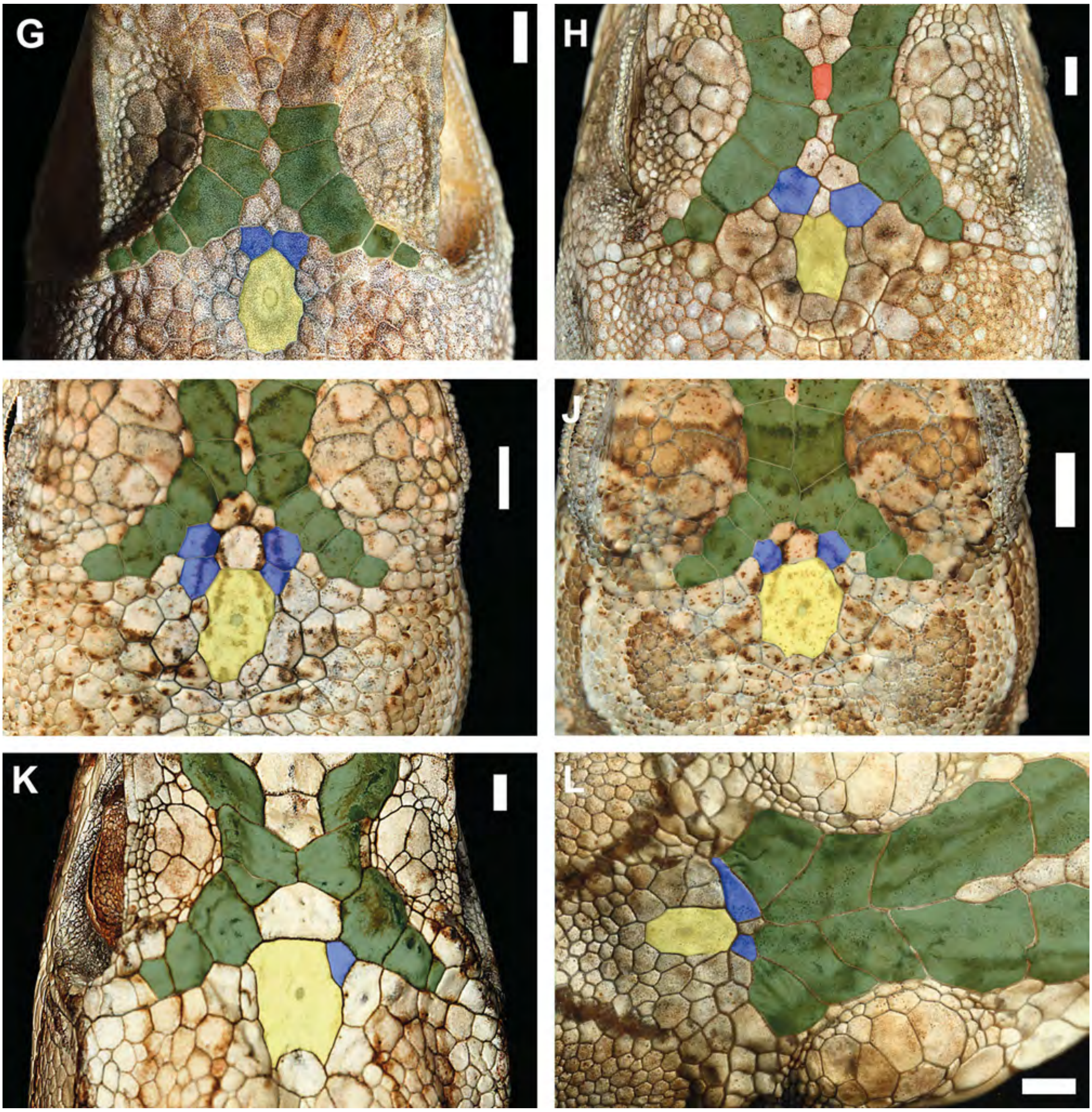

FIGURE 22. Condition of scales in region of, and counts of scales between, interparietal and supraorbital semicircles: (A) *Anolis aquaticus* (SMF 89667); (B) *A. microtus* (SMF 91499; interparietal absent); (C) *A. cybotes* (SMF 90421); (D) *A. barbouri* (SMF 90497); (E) *A. bahorucoensis* (SMF 77251); (F) *A. porcatus* (SMF 90415); (G) *A. desiradei* (SMF 94734); (H) *A. macrinii* (SMF 96210); (I) *A. omiltemanus* (SMF 96229); (J) *A. omiltemanus* (SMF 96227); (K) *A. valencienni* (SMF 10442); (L) *A. lineatus* (SMF 22979). Interparietal highlighted yellow, supraorbital semicircles green, scales between interparietal and supraorbital semicircles blue, and scale(s) between supraorbital semicircles red. Scale bars equal 1 mm.

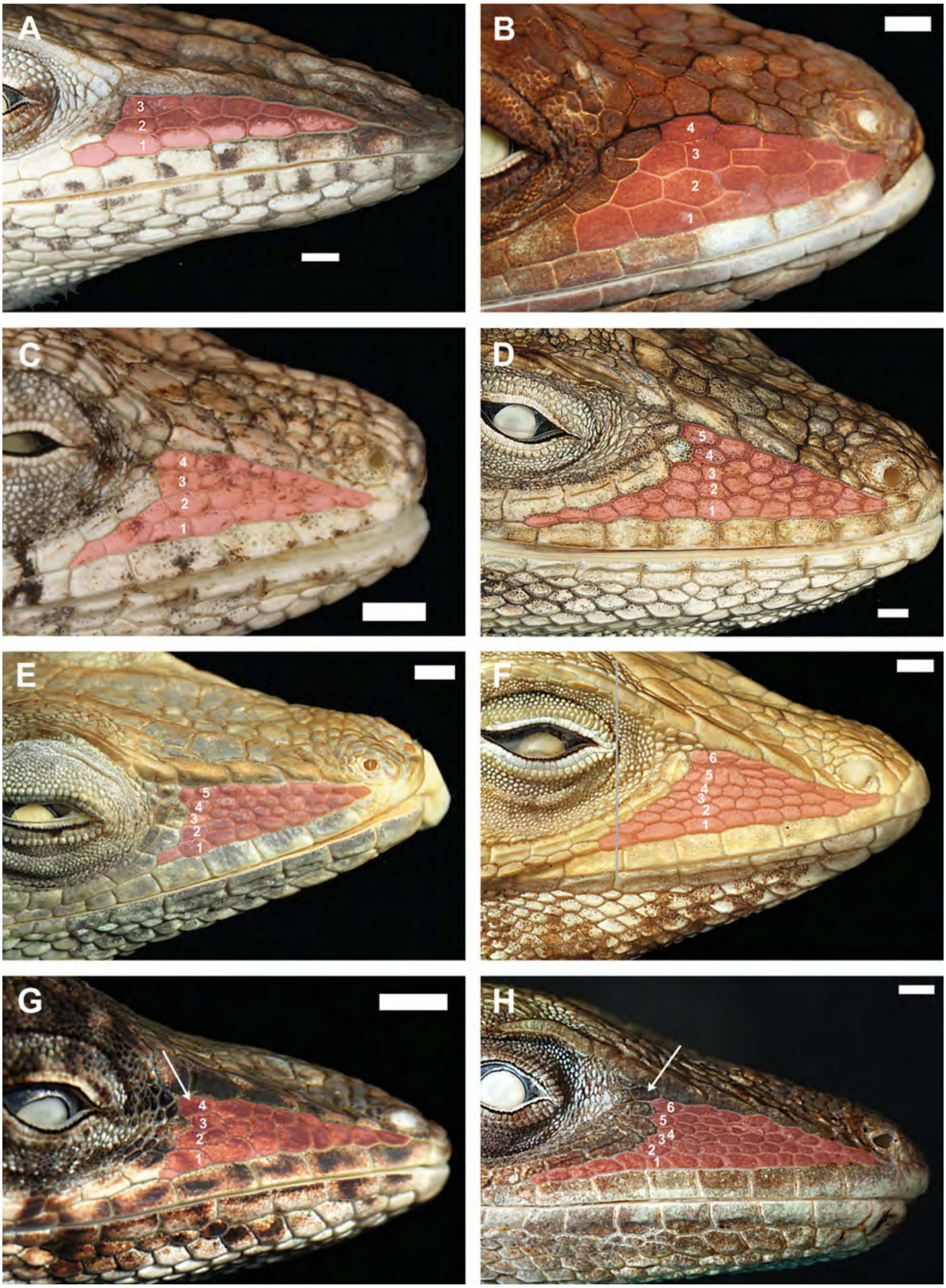

FIGURE 23. Counts of loreal scale rows: (A) *Anolis porcatus* (SMF 90415); (B) *A. microtus* (SMF 91500); (C) *A. omiltemanus* (SMF 96229); (D) *A. macrinii* (SMF 96208); (E) *A. evermanni* (SMF 22996); (F) *A. cybotes* (SMF 25721); (G) *A. singularis* (SMF 97978); (H) *A. coelestinus* (SMF 97857). Loreal scales highlighted red. Gray vertical bar in F indicates level below anterior margin of eye. In G the uppermost scale of the extended subocular series (arrow) is occupying the space normally taken by the uppermost and posteriormost loreal scale: this scale is judged as a fused loreal-preocular scale and included in the loreal count. In H the arrow points to a scale that is above the level of the uppermost loreal scale row and thus excluded from the loreal count. Scale bars equal 1 mm.

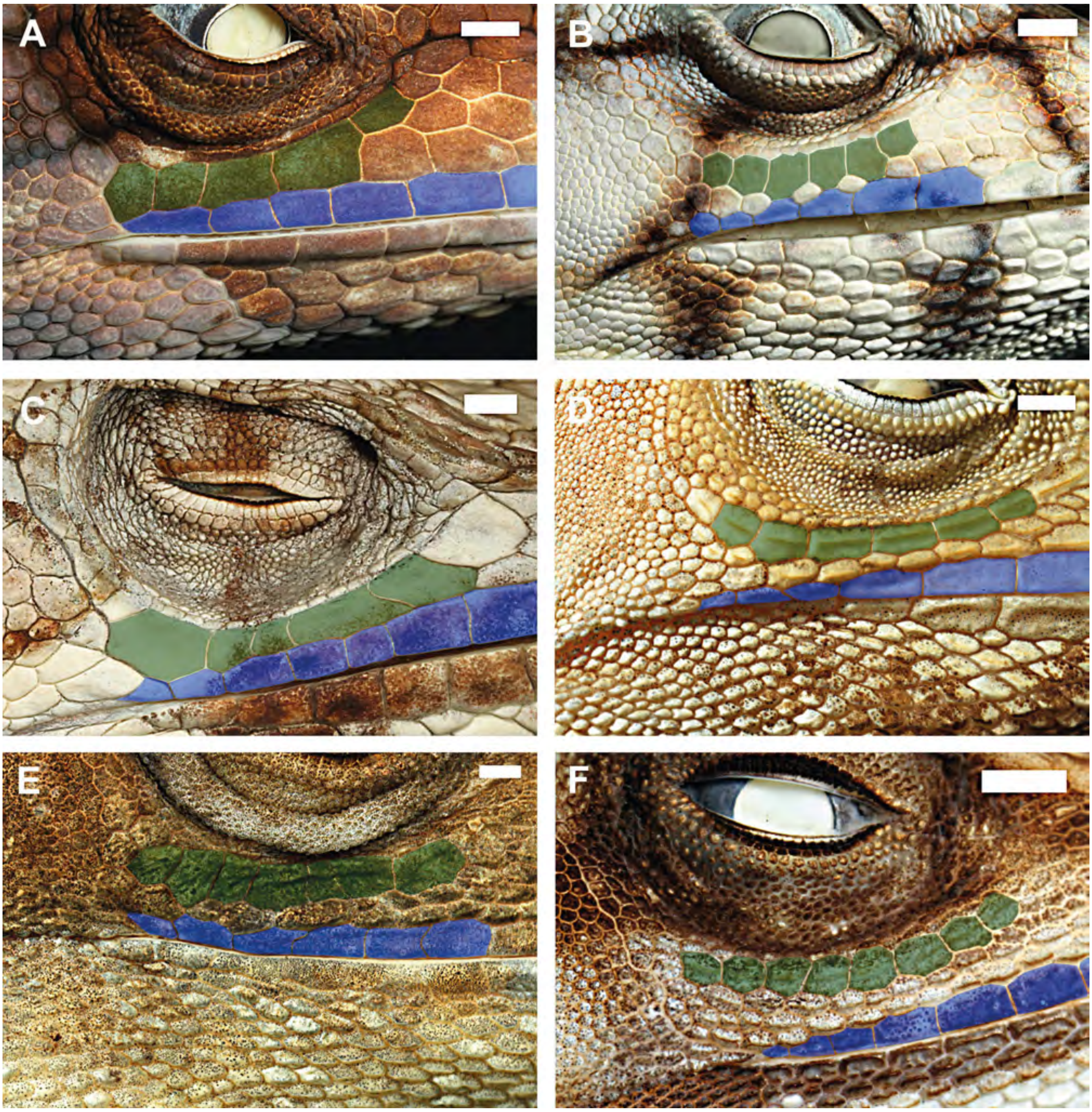

FIGURE 24. Condition of subocular and supralabial scales: (A) *Anolis microtus* (SMF 91500) having four subocular scales in broad contact with five supralabial scales (SO/SPL formular 4/5); (B) *A. insignis* (SMF 91477) having three subocular scales in narrow contact with three supralabial scales (SO/SPL formular 3/3); (C) *A. valencienni* (SMF 10442) having five subocular scales in broad contact with seven supralabial scales (SO/SPL formular 5/7); (D) *A. cybotes* (SMF 25721) having a complete row of scales separating subocular and supralabial scales; (E) *A. vermiculatus* (SMF 30008) having a complete row of scales separating subocular and supralabial scales; (F) *A. aquaticus* (SMF 89667) having two complete rows of scales separating subocular and supralabial scales. Subocular scales highlighted green, supralabial scales blue. Scale bars equal 1 mm.

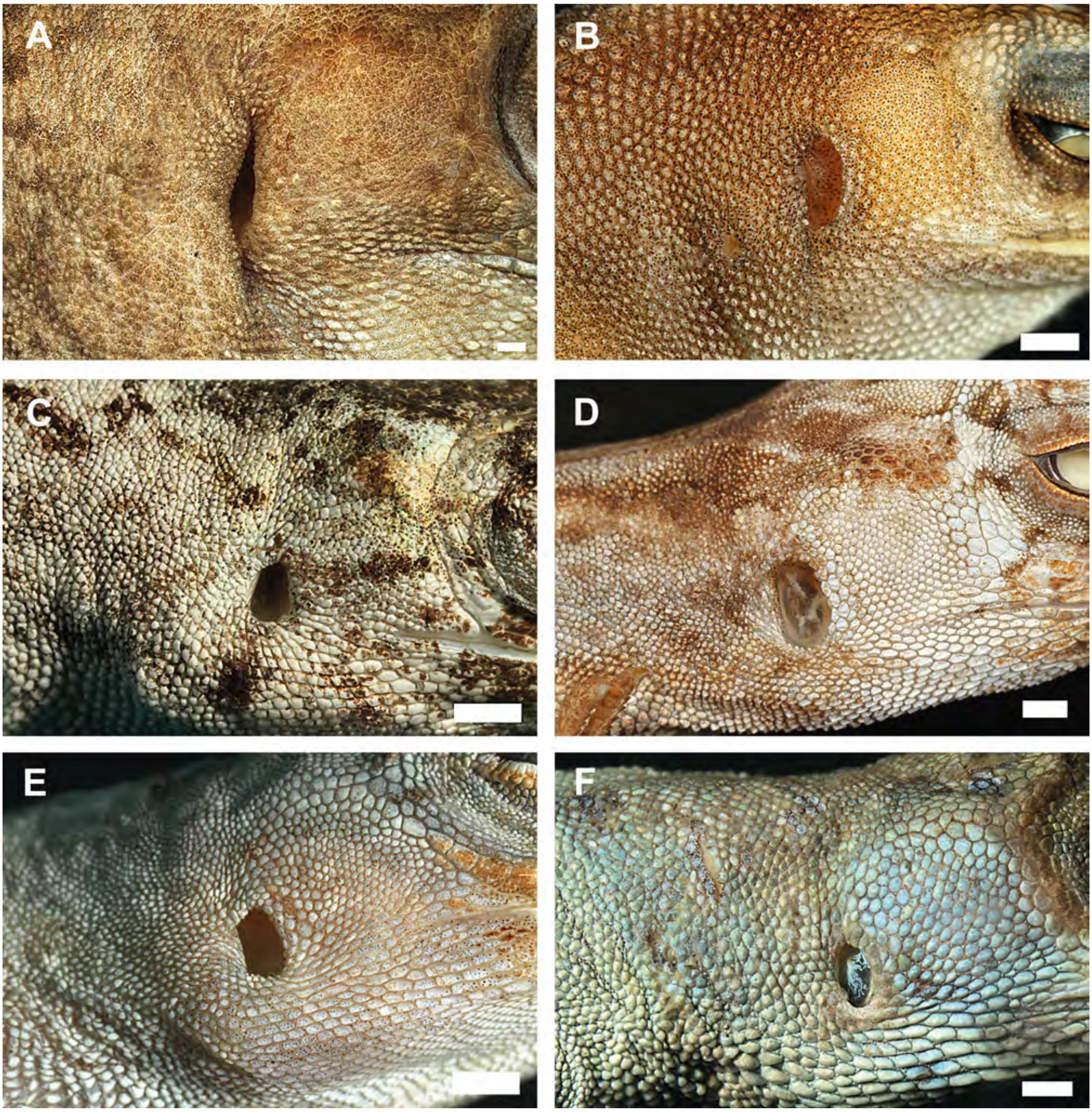

FIGURE 25. Condition of scales anterior and posterior to ear opening: (A) *Anolis vermiculatus* (SMF 30008); (B) *A. uniformis* (SMF 83331); (C) *A. angusticeps* (SMF 78341); (D) *A. lemurinus* (SMF 85887); (E) *A. stratulus* (SMF 10798); (F) *A. aliniger* (SMF 90481); (G) *A. gingivinus* (SMF 55769); (H) *A. lineatus* (SMF 22979); (I) *A. sabanus* (SMF 55758); (J) *A. leachii* (SMF 62478); (K) *A. tropidonotus* (SMF 79059); (L) *A. valencienni* (SMF 10442). Scales anterior and posterior to ear opening about subequal in A to C, scales anterior to ear opening slightly larger than those posterior to it in D to F, and distinctly larger in G to L. Scale bars equal 1 mm.

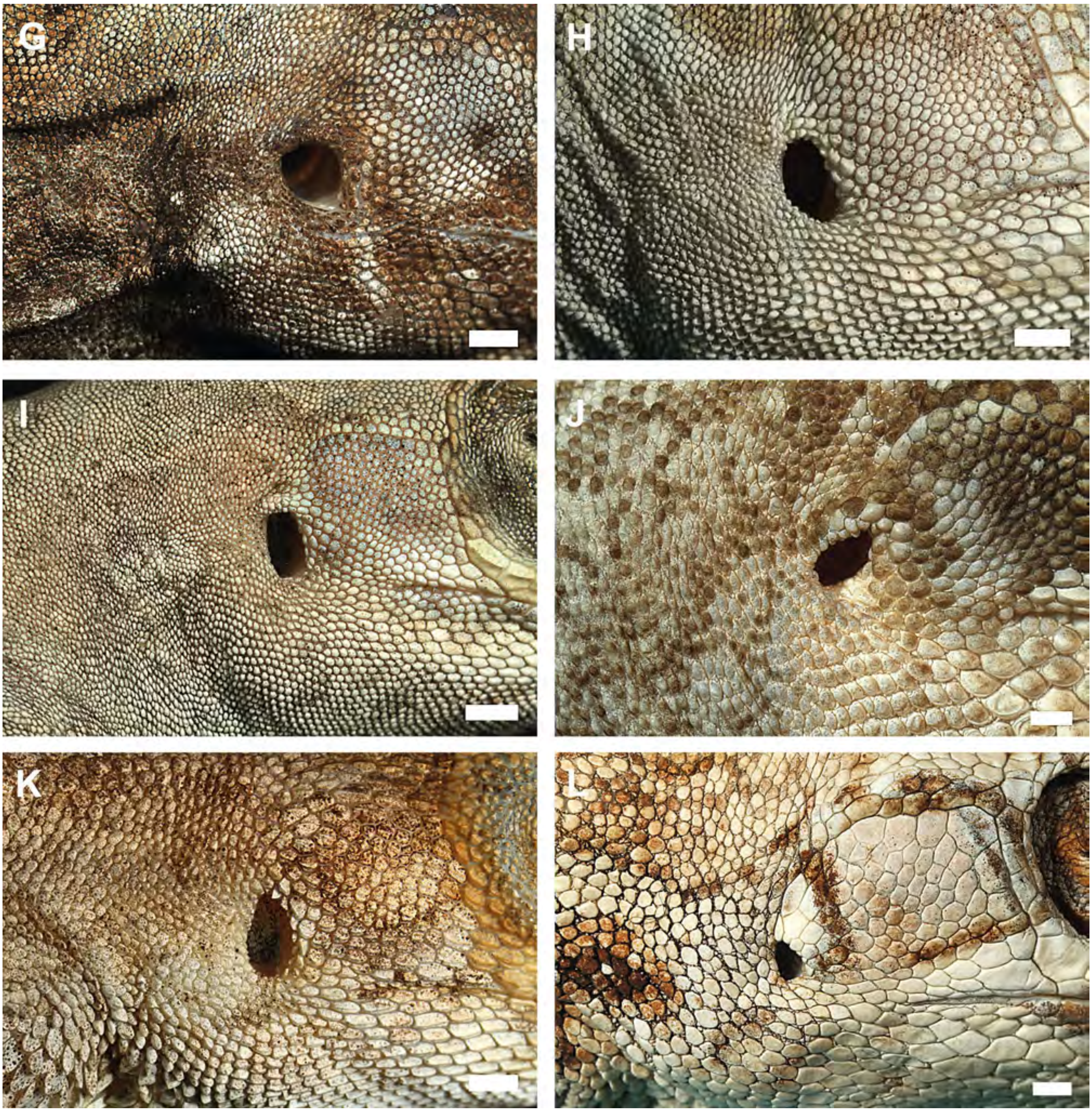

FIGURE 25. Condition of scales anterior and posterior to ear opening: (A) *Anolis vermiculatus* (SMF 30008); (B) *A. uniformis* (SMF 83331); (C) *A. angusticeps* (SMF 78341); (D) *A. lemurinus* (SMF 85887); (E) *A. stratulus* (SMF 10798); (F) *A. aliniger* (SMF 90481); (G) *A. gingivinus* (SMF 55769); (H) *A. lineatus* (SMF 22979); (I) *A. sabanus* (SMF 55758); (J) *A. leachii* (SMF 62478); (K) *A. tropidonotus* (SMF 79059); (L) *A. valencienni* (SMF 10442). Scales anterior and posterior to ear opening about subequal in A to C, scales anterior to ear opening slightly larger than those posterior to it in D to F, and distinctly larger in G to L. Scale bars equal 1 mm.

FIGURE 26. Placement of strings (arrows) to determine the number of ventral scales between levels of axilla and groin (*Anolis macrinii* UTA R52813). See text for details.

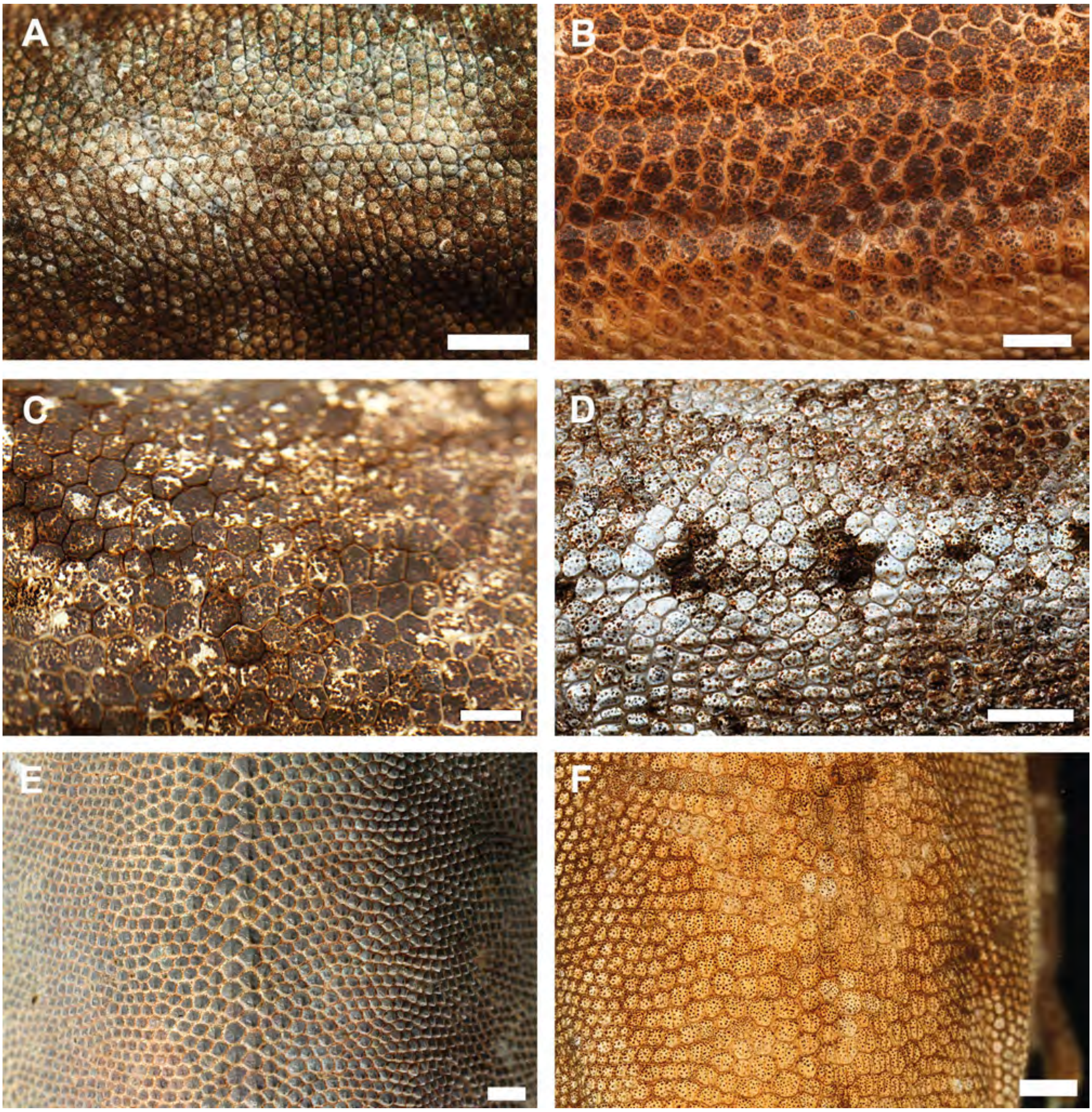

FIGURE 27. Condition of dorsal scales: (A) *Anolis utilensis* (SMF 79866) having smooth, granular scales; (B) *A. oxylophus* (SMF 88677) having smooth, juxtaposed to subimbricate scales with rounded posterior margins; (C) *A. capito* (SMF 91252) having smooth, juxtaposed to subimbricate, mostly hexagonal scales; (D) *A. lemurinus* (SMF 85885) having weakly keeled, subimbricate scales with rounded posterior margins, the two median rows slightly enlarged; (E) *A. evermanni* (SMF 22996) having weakly keeled, subimbricate scales with rounded posterior margins, the two median rows moderately enlarged; (F) *A. poecilopus* (SMF 80774) having keeled, subimbricate scales with rounded posterior margins, the 12 to 14 median rows moderately enlarged; (G) *A. muralla* (SMF 78378) having keeled, juxtaposed to subimbricate scales with rounded posterior margins, the 8 to 10 median rows moderately enlarged; (H) *A. heteropholidotus* (SMF 78027) having keeled, juxtaposed to subimbricate scales with rounded posterior margins, the 7 to 9 median rows moderately enlarged; (I) *A. crassulus* (SMF 78799) having keeled, juxtaposed to subimbricate scales with rounded posterior margins, the 6 to 8 median rows moderately enlarged; (J) *A. amplisquamosus* (SMF 77747) having keeled, imbricate scales with rounded posterior margins, the 6 to 8 median rows greatly enlarged; (K) *A. rejectus* (SMF 90477) having keeled, subimbricate scales with rounded posterior margins, the 4 median rows greatly enlarged; (L) *A. baleatus* (SMF 10446) having keeled, rounded, subimbricate scales, the median row forming a crest. In all figures, orientation is capitad to the left, except E and F where orientation is capitad upwards. Scale bars equal 1 mm.

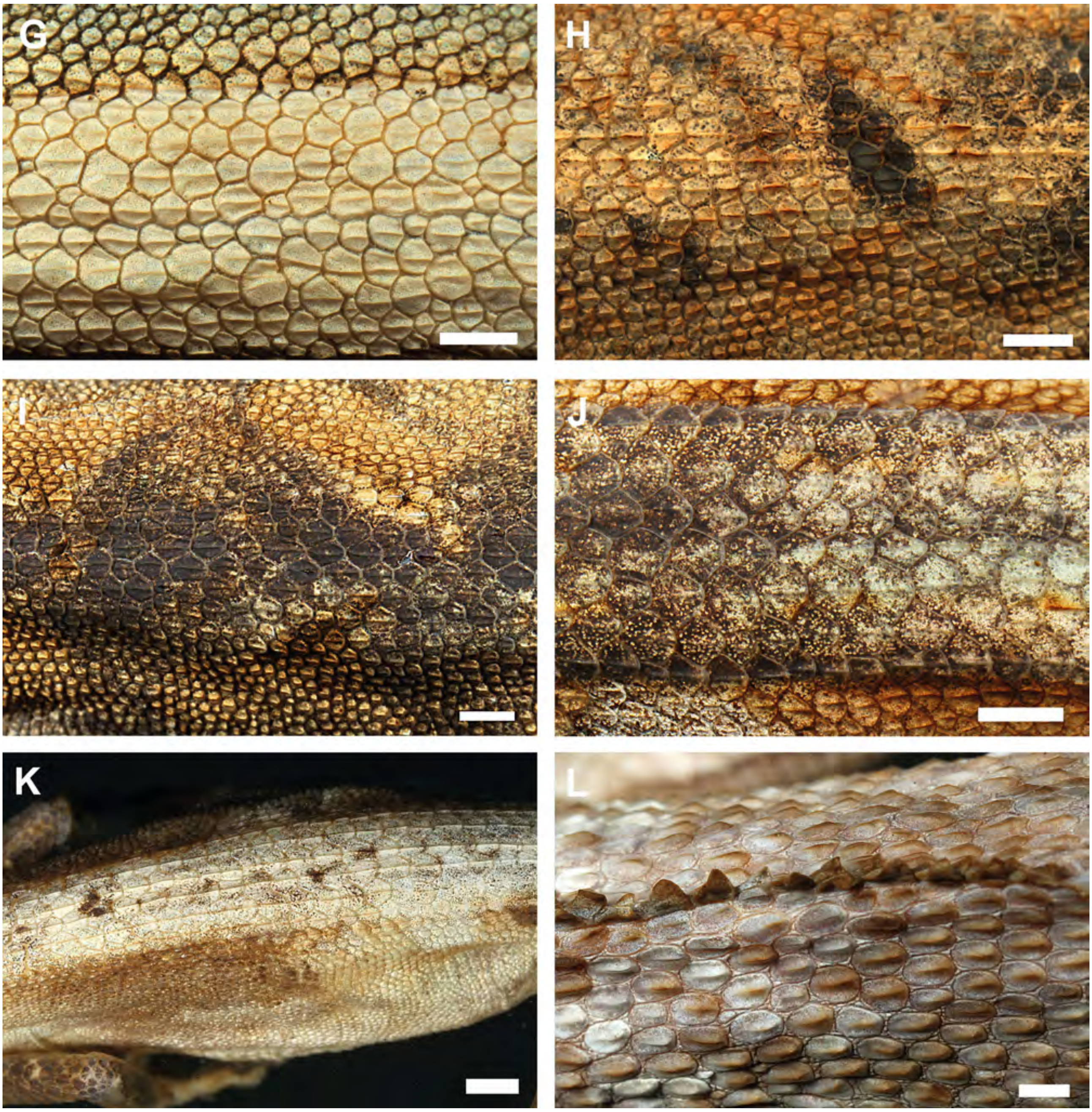

FIGURE 27. Condition of dorsal scales: (A) *Anolis utilensis* (SMF 79866) having smooth, granular scales; (B) *A. oxylophus* (SMF 88677) having smooth, juxtaposed to subimbricate scales with rounded posterior margins; (C) *A. capito* (SMF 91252) having smooth, juxtaposed to subimbricate, mostly hexagonal scales; (D) *A. lemurinus* (SMF 85885) having weakly keeled, subimbricate scales with rounded posterior margins, the two median rows slightly enlarged; (E) *A. evermanni* (SMF 22996) having weakly keeled, subimbricate scales with rounded posterior margins, the two median rows moderately enlarged; (F) *A. poecilopus* (SMF 80774) having keeled, subimbricate scales with rounded posterior margins, the 12 to 14 median rows moderately enlarged; (G) *A. muralla* (SMF 78378) having keeled, juxtaposed to subimbricate scales with rounded posterior margins, the 8 to 10 median rows moderately enlarged; (H) *A. heteropholidotus* (SMF 78027) having keeled, juxtaposed to subimbricate scales with rounded posterior margins, the 7 to 9 median rows moderately enlarged; (I) *A. crassulus* (SMF 78799) having keeled, juxtaposed to subimbricate scales with rounded posterior margins, the 6 to 8 median rows moderately enlarged; (J) *A. amplisquamosus* (SMF 77747) having keeled, imbricate scales with rounded posterior margins, the 6 to 8 median rows greatly enlarged; (K) *A. rejectus* (SMF 90477) having keeled, subimbricate scales with rounded posterior margins, the 4 median rows greatly enlarged; (L) *A. baleatus* (SMF 10446) having keeled, rounded, subimbricate scales, the median row forming a crest. In all figures, orientation is capitad to the left, except E and F where orientation is capitad upwards. Scale bars equal 1 mm.

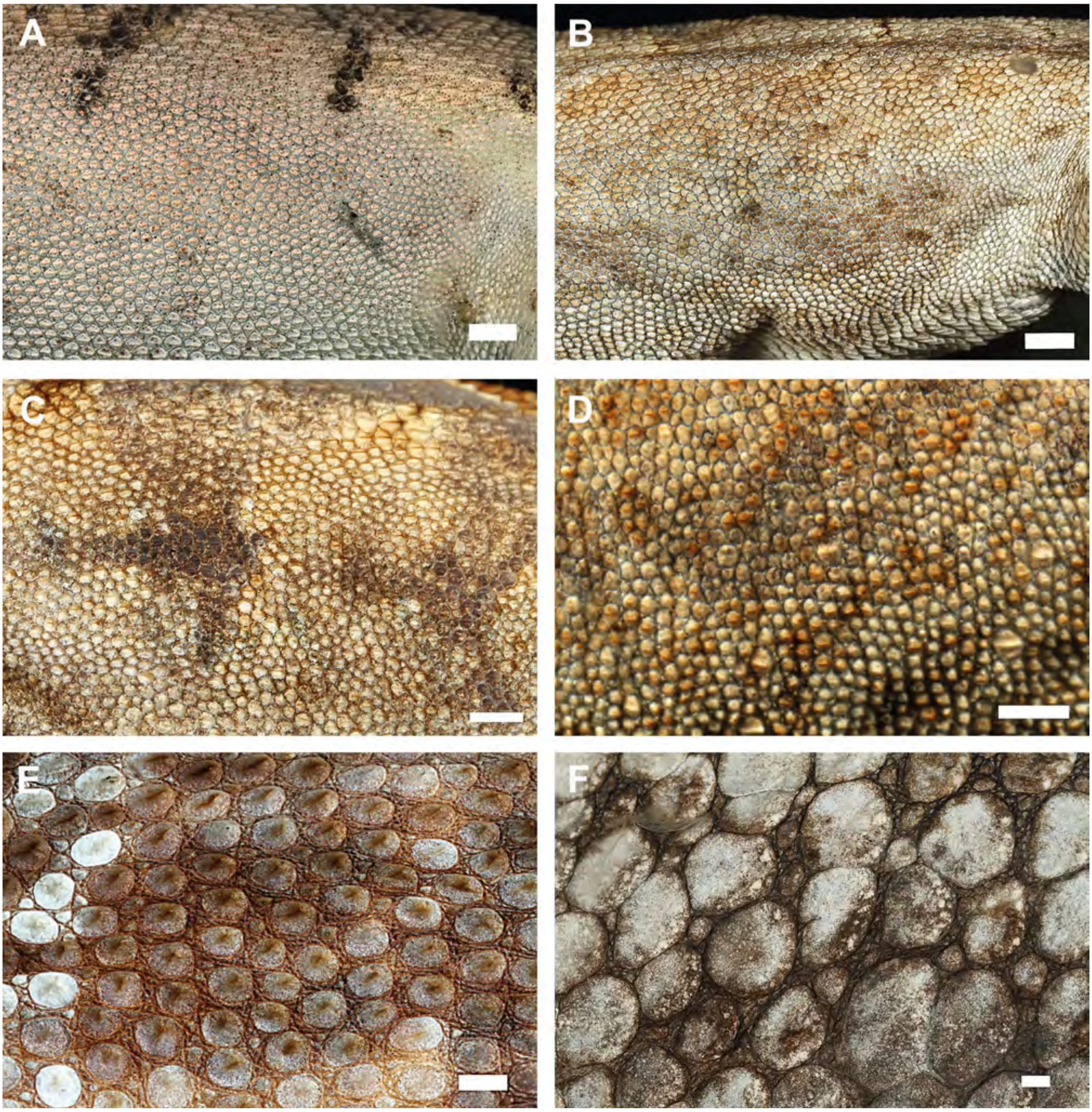

FIGURE 28. Condition of flank scales: (A) *Anolis subocularis* (SMF 96259) having mostly homogeneous, keeled scales; (B) *A. quercorum* (KU 176051) having weakly keeled, slightly heterogeneous scales; (C) *A. crassulus* (SMF 78799) having weakly keeled, moderately heterogeneous scales; (D) *A. heteropholidotus* (SMF 78027) having heterogeneous scales with large keeled scales interspersed in keeled granulars; (E) *A. baleatus* (SMF 10446) having large, keeled, rounded scales separated by small granular scales; (F) *A. barbatus* (SMF 77959) having large, smooth, rounded scales separated by small granular scales. Scale bars equal 1 mm.

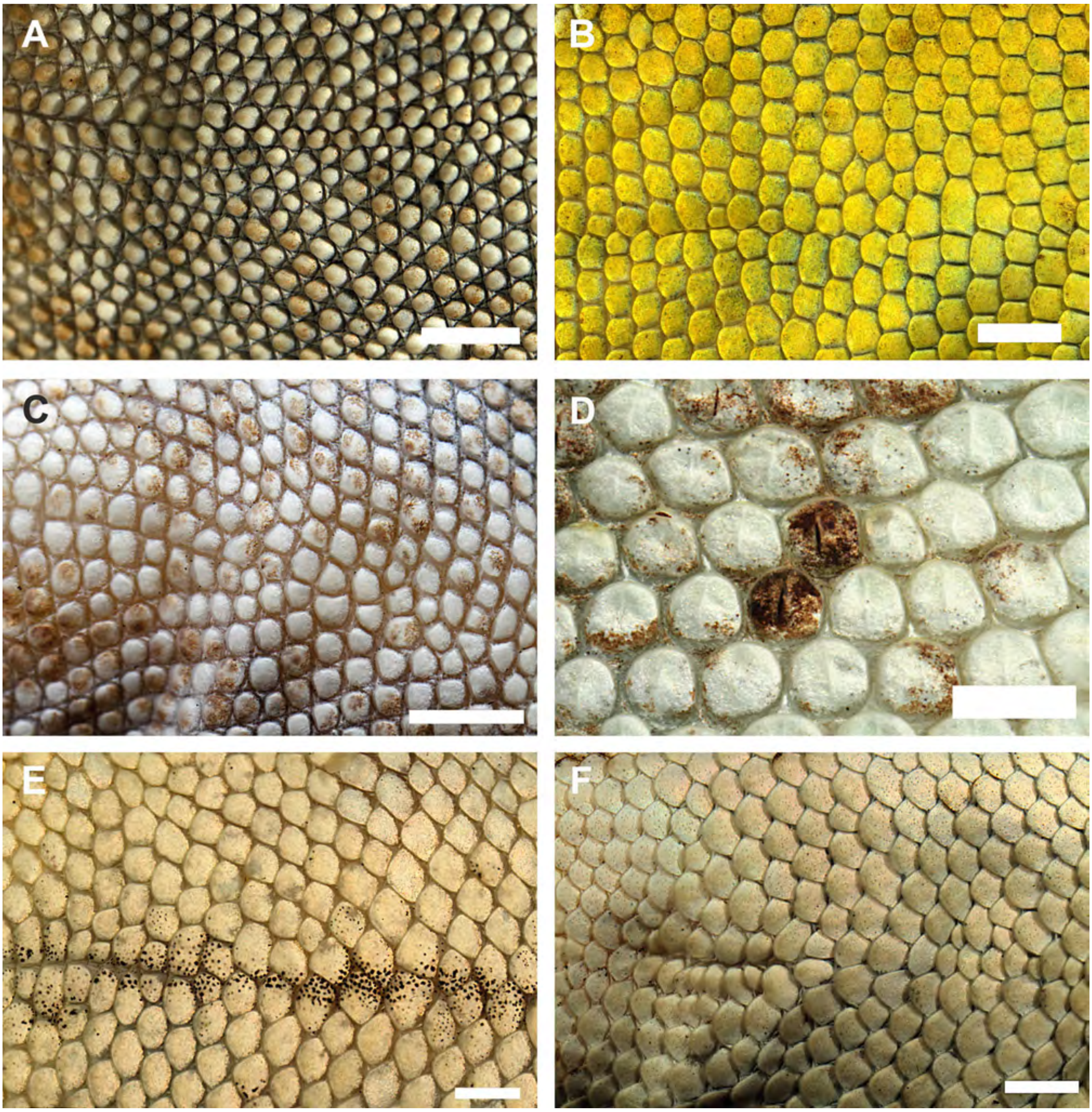

FIGURE 29. Condition of ventral scales: (A) *Anolis utilensis* (SMF 79866) having smooth, granular scales; (B) *A. singularis* (SMF 97971) having smooth, juxtaposed to subimbricate scales with rounded posterior margins; (C) *A. rodriguezii* (SMF 79087) having smooth, rounded, bulging, juxtaposed scales; (D) *A. petersii* (SMF 86943) having weakly keeled, juxtaposed to subimbricate scales with rounded posterior margins; (E) *A. johnmeyeri* (SMF 77756) having smooth, imbricate scales with rounded posterior margins; (F) *A. amplisquamosus* (SMF 77747) having smooth, imbricate scales with rounded posterior margins; (G) *A. yoroensis* (SMF 80768) having weakly keeled, subimbricate scales with mostly rounded posterior margins, some slightly mucronate; (H) *A. sminthus* (SMF 77181) having faintly keeled, imbricate scales with rounded posterior margins; (I) *A. capito* (SMF 91252) having keeled, subimbricate, mostly mucronate scales; (J) *A. lemurinus* (SMF 85885) having keeled, imbricate, mostly mucronate scales; (K) *A. biporcatus* (SMF 78269) having strongly keeled, mucronate, imbricate scales; (L) *A. wellbornae* (SMF 82668) having strongly keeled, mucronate, imbricate scales. In all figures, orientation is capitad to the right, except D and K where orientation is capitad downwards. Scale bars equal 1 mm.

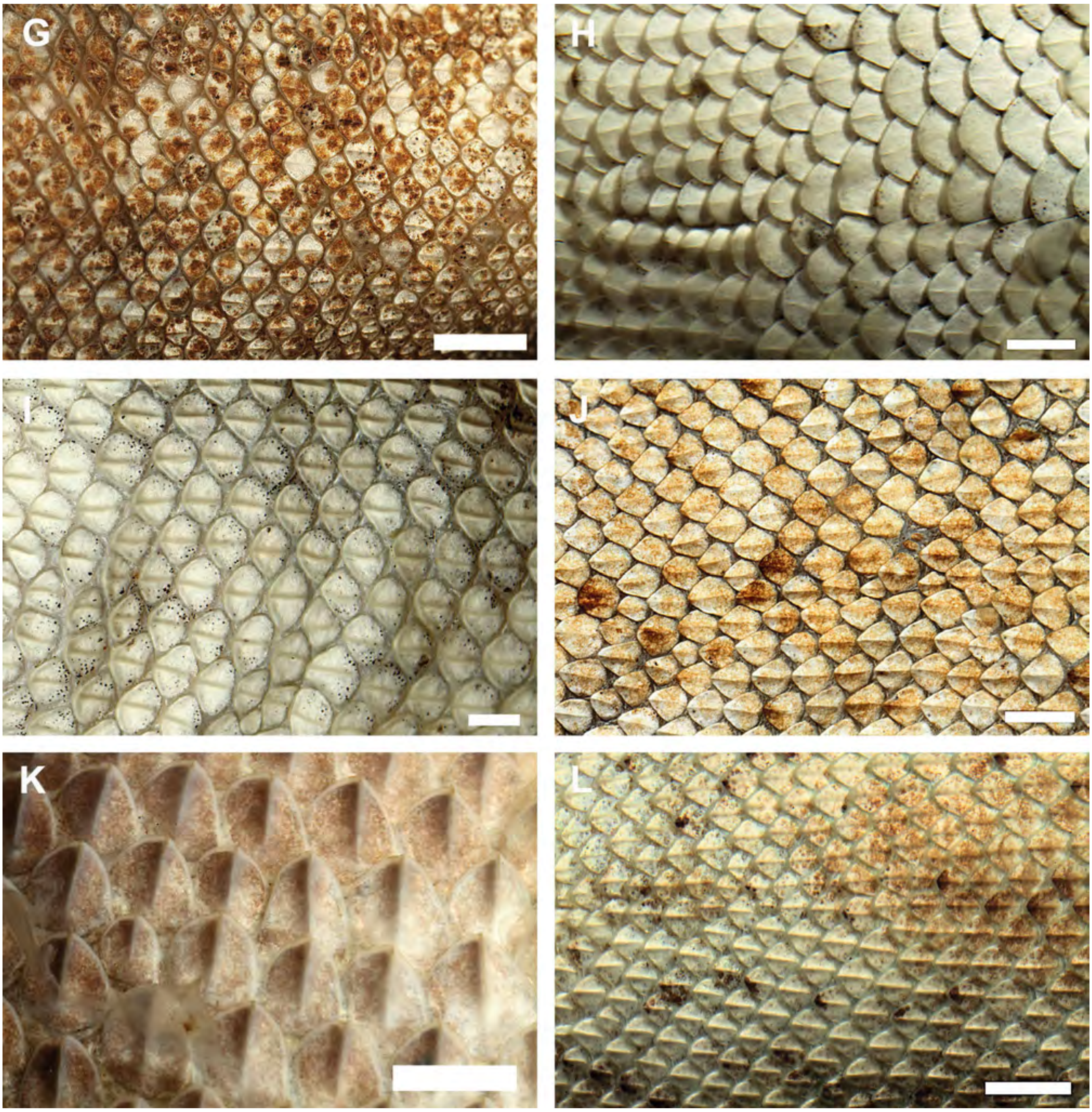

FIGURE 29. Condition of ventral scales: (A) *Anolis utilensis* (SMF 79866) having smooth, granular scales; (B) *A. singularis* (SMF 97971) having smooth, juxtaposed to subimbricate scales with rounded posterior margins; (C) *A. rodriguezii* (SMF 79087) having smooth, rounded, bulging, juxtaposed scales; (D) *A. petersii* (SMF 86943) having weakly keeled, juxtaposed to subimbricate scales with rounded posterior margins; (E) *A. johnmeyeri* (SMF 77756) having smooth, imbricate scales with rounded posterior margins; (F) *A. amplisquamosus* (SMF 77747) having smooth, imbricate scales with rounded posterior margins; (G) *A. yoroensis* (SMF 80768) having weakly keeled, subimbricate scales with mostly rounded posterior margins, some slightly mucronate; (H) *A. sminthus* (SMF 77181) having faintly keeled, imbricate scales with rounded posterior margins; (I) *A. capito* (SMF 91252) having keeled, subimbricate, mostly mucronate scales; (J) *A. lemurinus* (SMF 85885) having keeled, imbricate, mostly mucronate scales; (K) *A. biporcatus* (SMF 78269) having strongly keeled, mucronate, imbricate scales; (L) *A. wellbornae* (SMF 82668) having strongly keeled, mucronate, imbricate scales. In all figures, orientation is capitad to the right, except D and K where orientation is capitad upwards. Scale bars equal 1 mm.

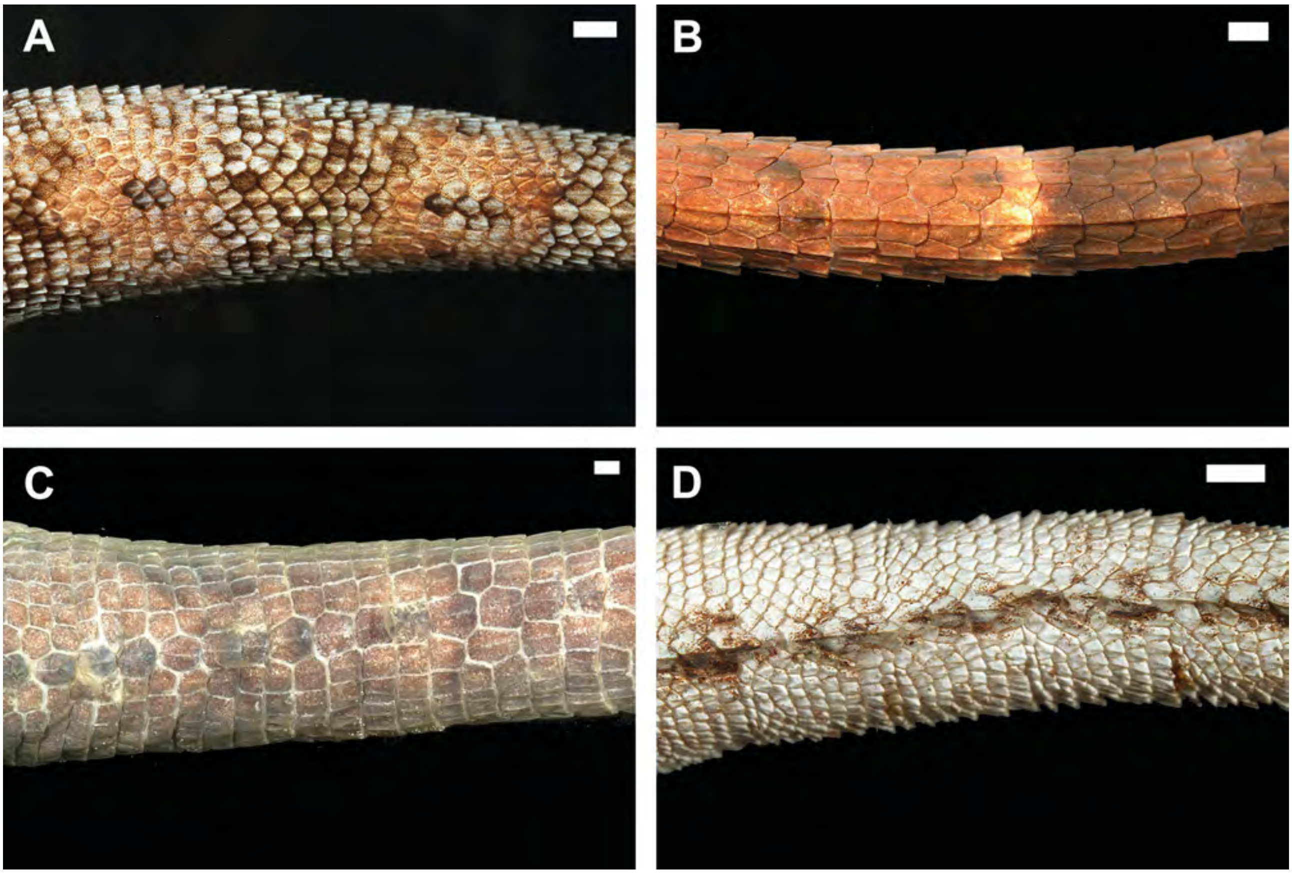

FIGURE 30. Condition of caudal scales (dorsal view): (A) *Anolis latifrons* (SMF 96576); (B) *A. biporcatus* (SMF 89670); (C) *A. noblei* (SMF 79971); (D) *A. distichus* (SMF 25843). Median dorsal scales not enlarged in A, slightly enlarged in B and C, moderately to greatly enlarged in D.

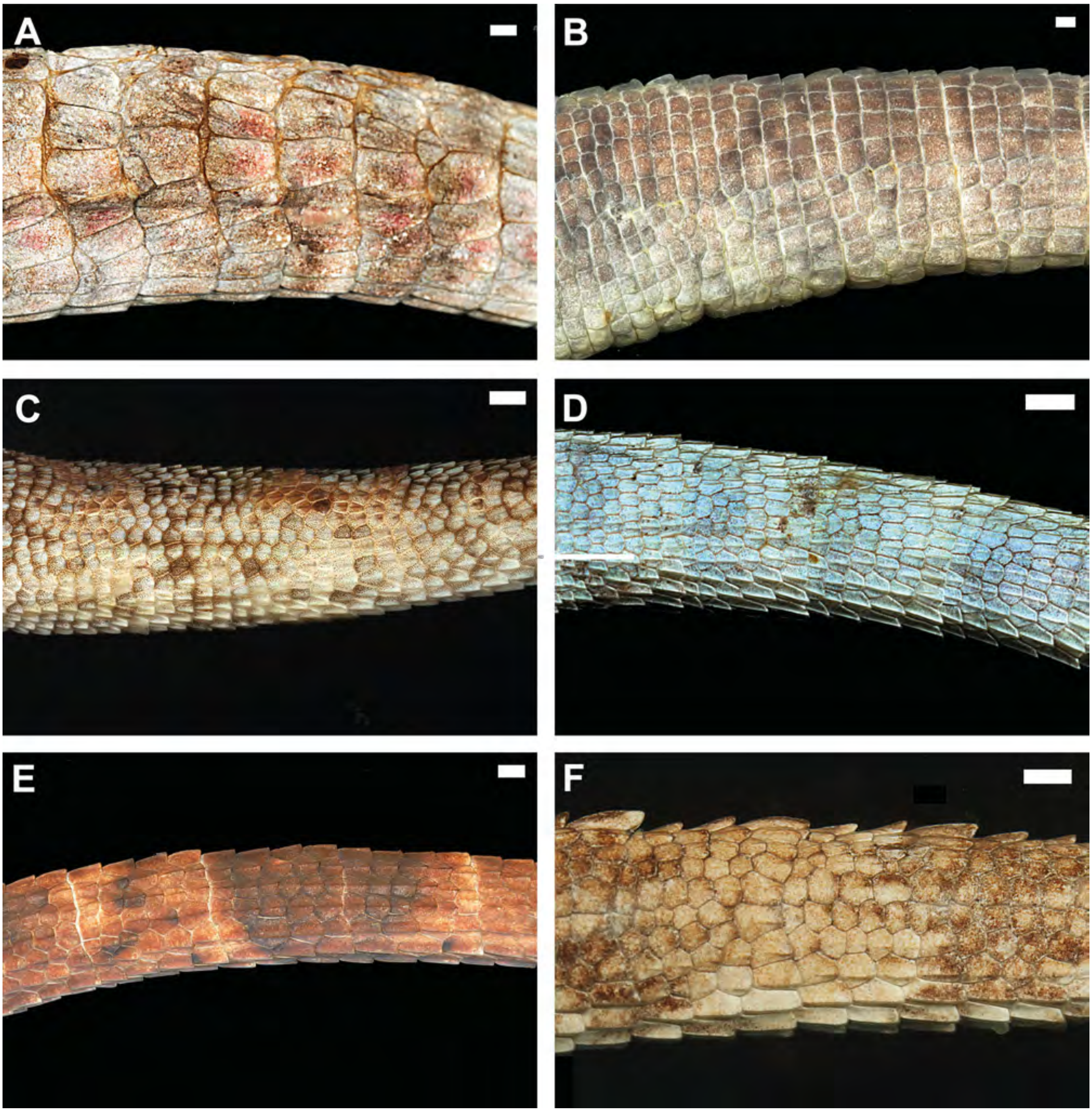

FIGURE 31. Condition of caudal scales (lateral view): (A) *Anolis barbatus* (SMF 93915) having wrinkled to weakly keeled, juxtaposed lateral scales, median dorsal scales not enlarged; (B) *A. noblei* (SMF 79971) having weakly keeled, juxtaposed lateral scales, median dorsal scales slightly enlarged; (C) *A. latifrons* (SMF 96576) having keeled, subimbricate lateral scales, median dorsal scales not enlarged; (D) *A. aliniger* (SMF 90481) having keeled, imbricate lateral scales, median dorsal scales slightly enlarged; (E) *A. biporcatus* (SMF 89670) having keeled, subimbricate lateral scales, median dorsal scales moderately enlarged; (F) *A. valencienni* (SMF 10442) having mostly weakly keeled, subimbricate lateral scales, median dorsal scales moderately to greatly enlarged; (G) *A. evermanni* (SMF 22996) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (H) *A. distichus* (SMF 25843) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (I) *A. vermiculatus* (SMF 30008) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (J) *A. desiradei* (SMF 94734) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (K) *A. gingivinus* (SMF 55769) having weakly keeled, imbricate lateral scales, median dorsal scales in sequential series of moderately to greatly enlarged scales; (L) *A. baleatus* (SMF 10446) having keeled, subimbricate lateral scales, a pronounced dorsal fin present (darker colored upper region). Scale bars equal 1 mm.

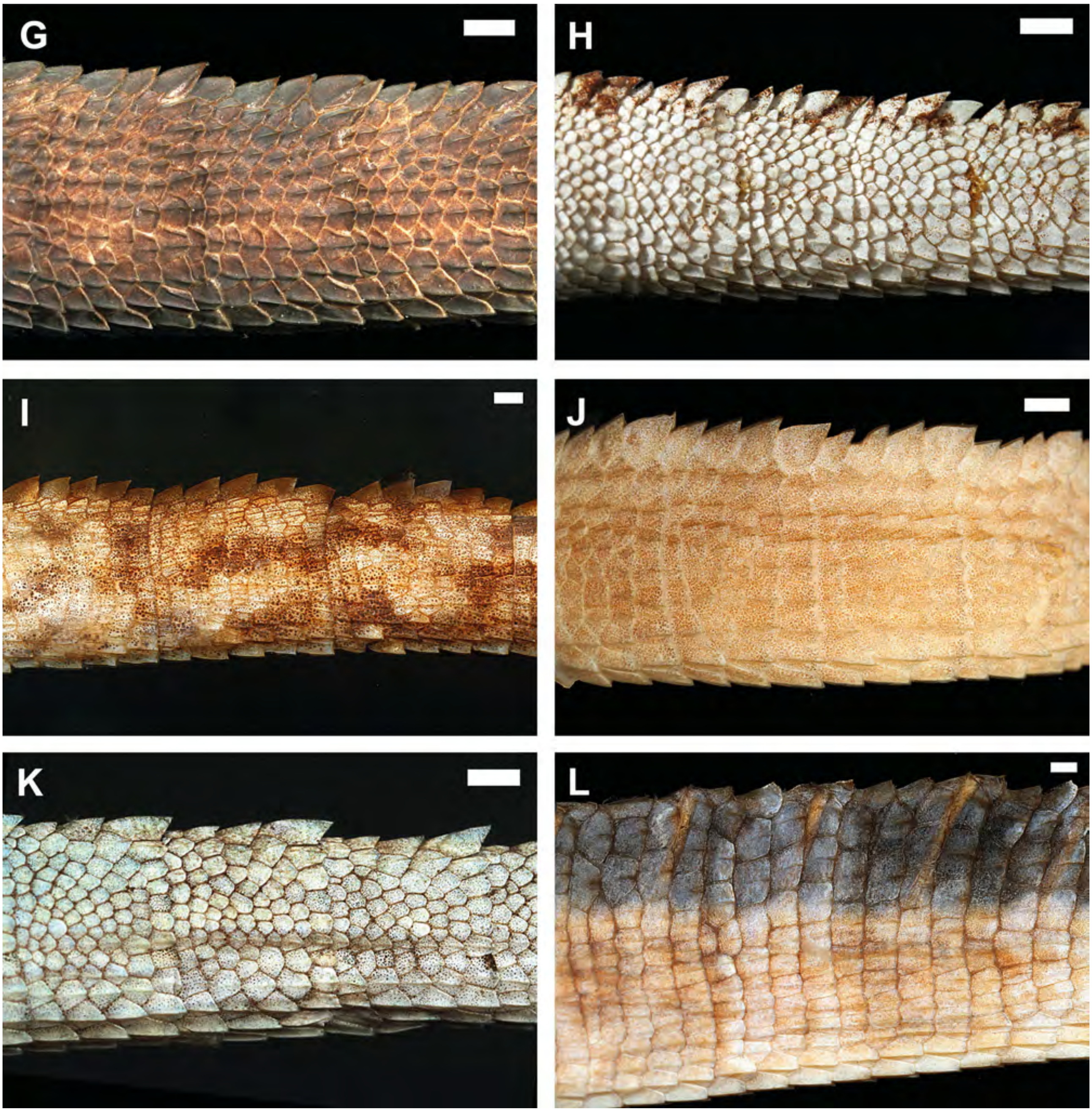

FIGURE 31. Condition of caudal scales (lateral view): (A) *Anolis barbatus* (SMF 93915) having wrinkled to weakly keeled, juxtaposed lateral scales, median dorsal scales not enlarged; (B) *A. noblei* (SMF 79971) having weakly keeled, juxtaposed lateral scales, median dorsal scales slightly enlarged; (C) *A. latifrons* (SMF 96576) having keeled, subimbricate lateral scales, median dorsal scales not enlarged; (D) *A. aliniger* (SMF 90481) having keeled, imbricate lateral scales, median dorsal scales slightly enlarged; (E) *A. biporcatus* (SMF 89670) having keeled, subimbricate lateral scales, median dorsal scales moderately enlarged; (F) *A. valencienni* (SMF 10442) having mostly weakly keeled, subimbricate lateral scales, median dorsal scales moderately to greatly enlarged; (G) *A. evermanni* (SMF 22996) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (H) *A. distichus* (SMF 25843) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (I) *A. vermiculatus* (SMF 30008) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (J) *A. desiradei* (SMF 94734) having keeled, imbricate lateral scales, median dorsal scales moderately to greatly enlarged; (K) *A. gingivinus* (SMF 55769) having weakly keeled, imbricate lateral scales, median dorsal scales in sequential series of moderately to greatly enlarged scales; (L) *A. baleatus* (SMF 10446) having keeled, subimbricate lateral scales, a pronounced dorsal fin present (darker colored upper region). Scale bars equal 1 mm.

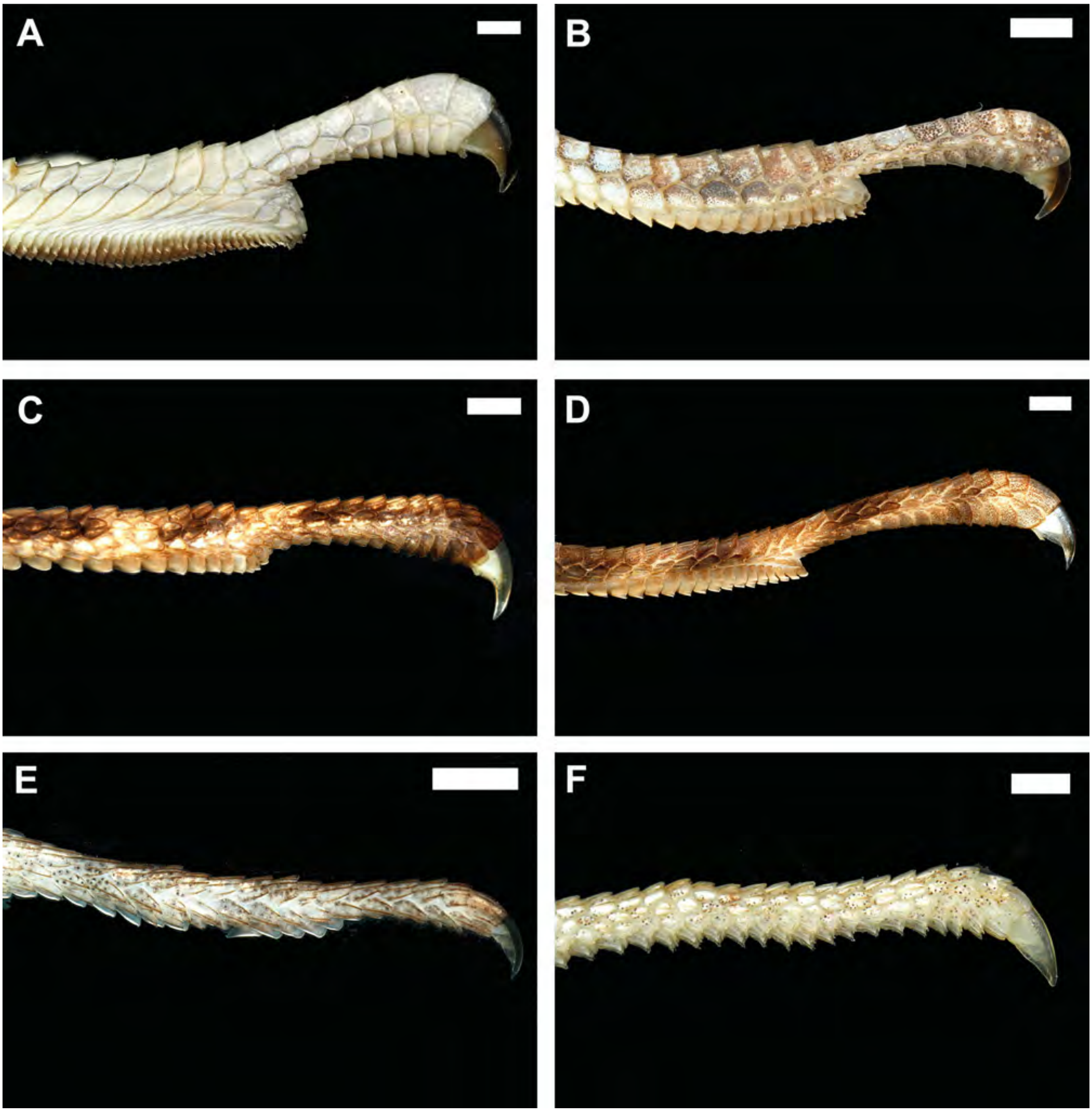

FIGURE 32. Condition of terminal phalanx of fourth toe (lateral view): (A) *Anolis noblei* (SMF 79971); (B) *A. biporcatus* (SMF 89671); (C) *A. capito* (MHCH 2119); (D) *A. latifrons* (SMF 96576); (E) *A. auratus* (SMF 91940); (F) *A. onca* (SMF 93909). In A to D the distal phalanx is raised above the proximal phalanges and the subdigital lamellae of the adhesive pad project distally under the subdigital lamellae of the terminal phalanx. In F the distal end of the adhesive pad is indistinct and gradually continues onto the terminal phalanx. Scale bars equal 1 mm.

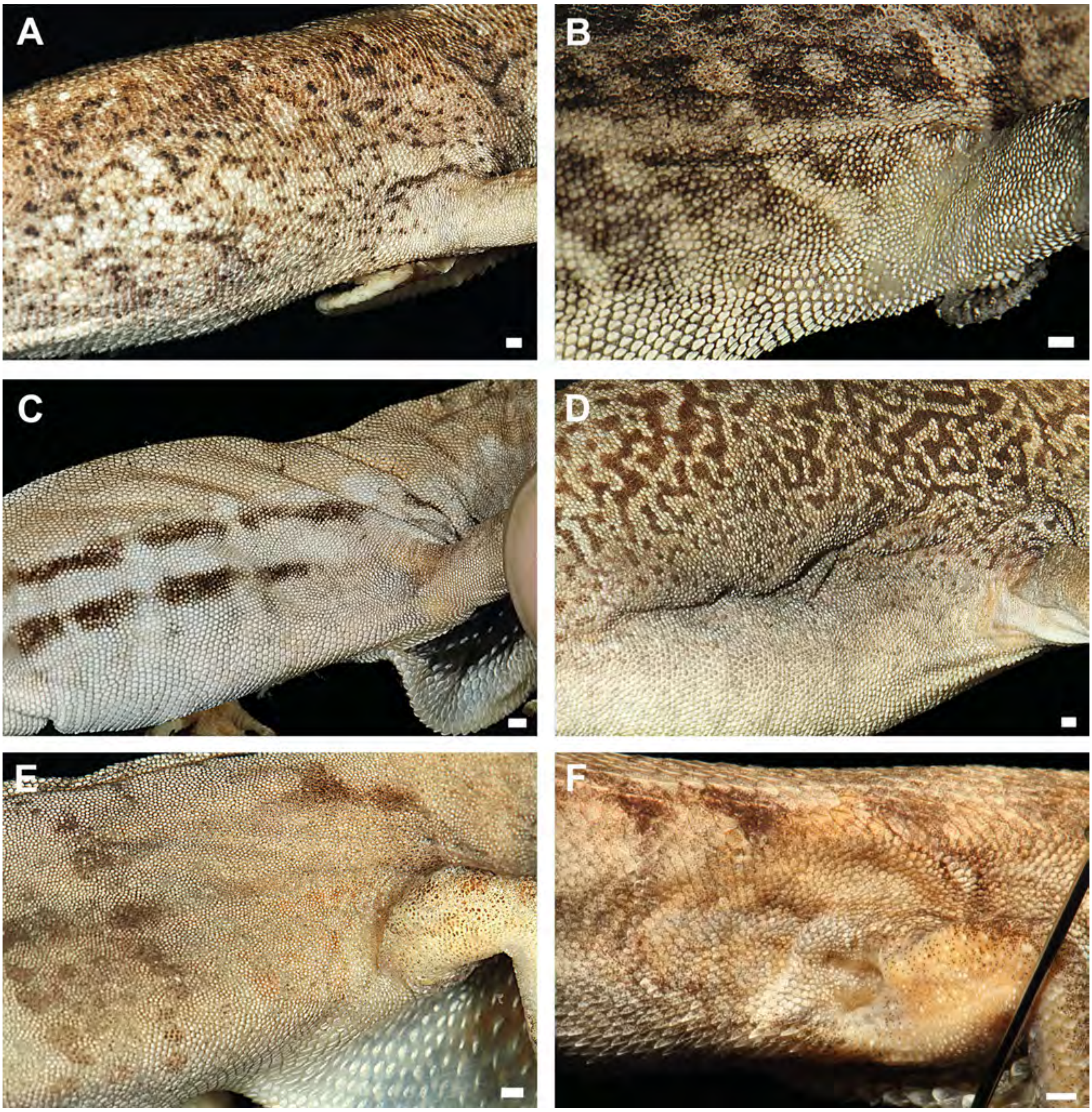

FIGURE 33. Condition of axillary region: (A) *Anolis onca* (SMF 93909); (B) *A. capito* (MHCH 2119); (C) *A. lineatus* (SMF 22979); (D) *A. vermiculatus* (SMF 30008); (E) *A. allogus* (SMF 77249); (F) *A. tropidonotus* (SMF 79058), note tube-like axillary pocket. Scale bars equal 1 mm. A to D without axillary depression. F with a slight axillary depression. G with a tube-like axillary pocket.

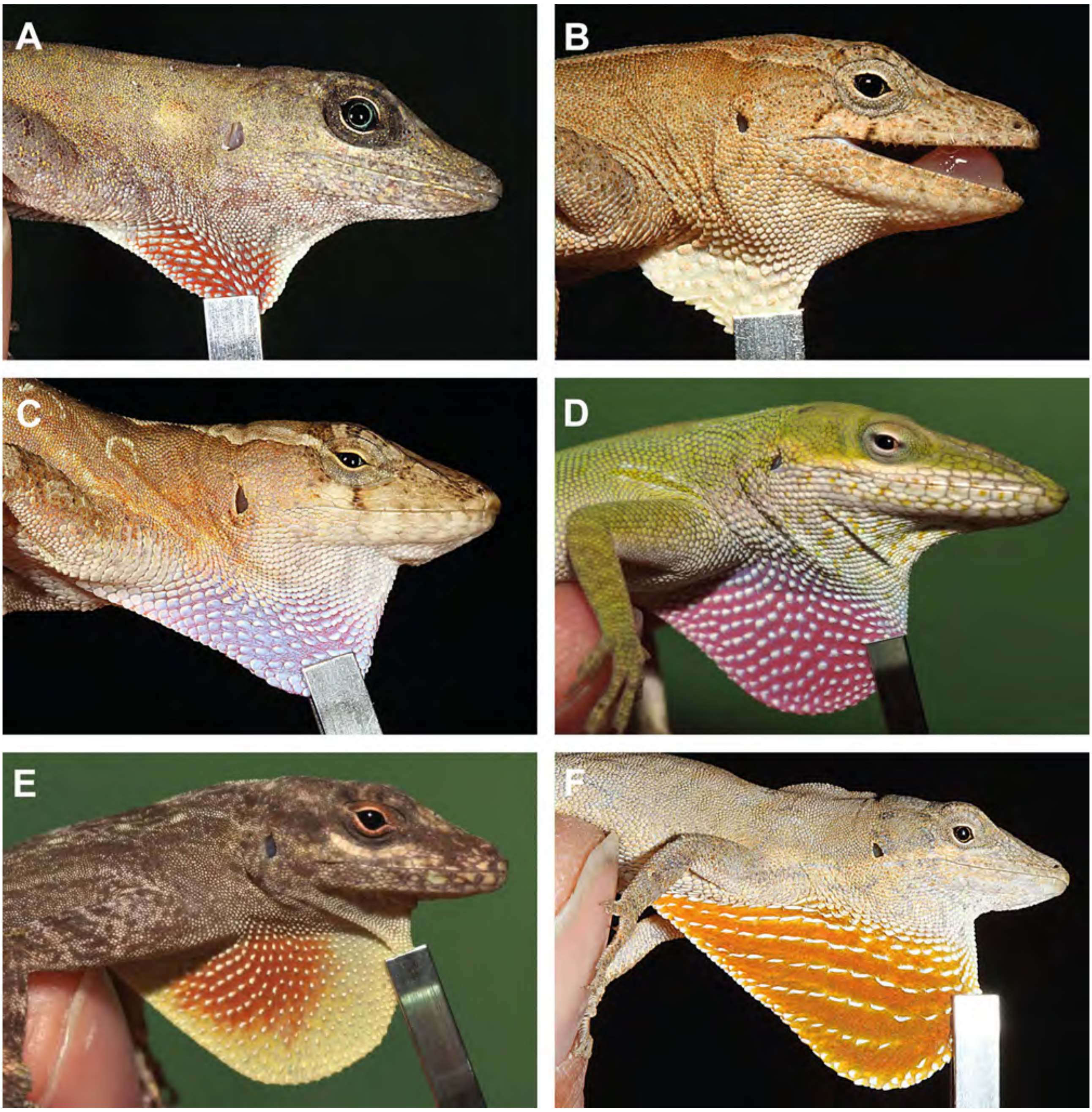

FIGURE 34. Condition and size of the dewlap (A) *Anolis taylori* (female, IBH 26603; RDS 0.5; dewlap very small); (B) *A. omiltemanus* (female, SMF 96227; RDS 0.6; dewlap very small); (C) *A. liogaster* (female, SMF 96200; RDS 1.3; dewlap small); (D) *Anolis porcatus* (male, SMF 90415; RDS 2.5; dewlap small); (E) *A. distichus* (male, SMF 90420; RDS 2.6; dewlap moderate-sized); (F) *A. omiltemanus* (male, SMF 96226; RDS 3.4; dewlap moderate-sized); (G) *A. isthmicus* (male, SMF 96279; RDS 5.0; dewlap large); (H) *A. insignis* (female, SMF 89482; RDS 6.4; dewlap large); (I) *A. liogaster* (male, SMF 96199; RDS 6.8; dewlap large); (J) *A. cupreus* (male, SMF 93908; RDS 9.7; dewlap very large); (K) *A. aquaticus* (male, SMF 92190; RDS 10.6; dewlap very large); (L) *A. macrinii* (male, SMF 96208; RDS 11.6; dewlap very large); RDS = relative dewlap size (see text for details).

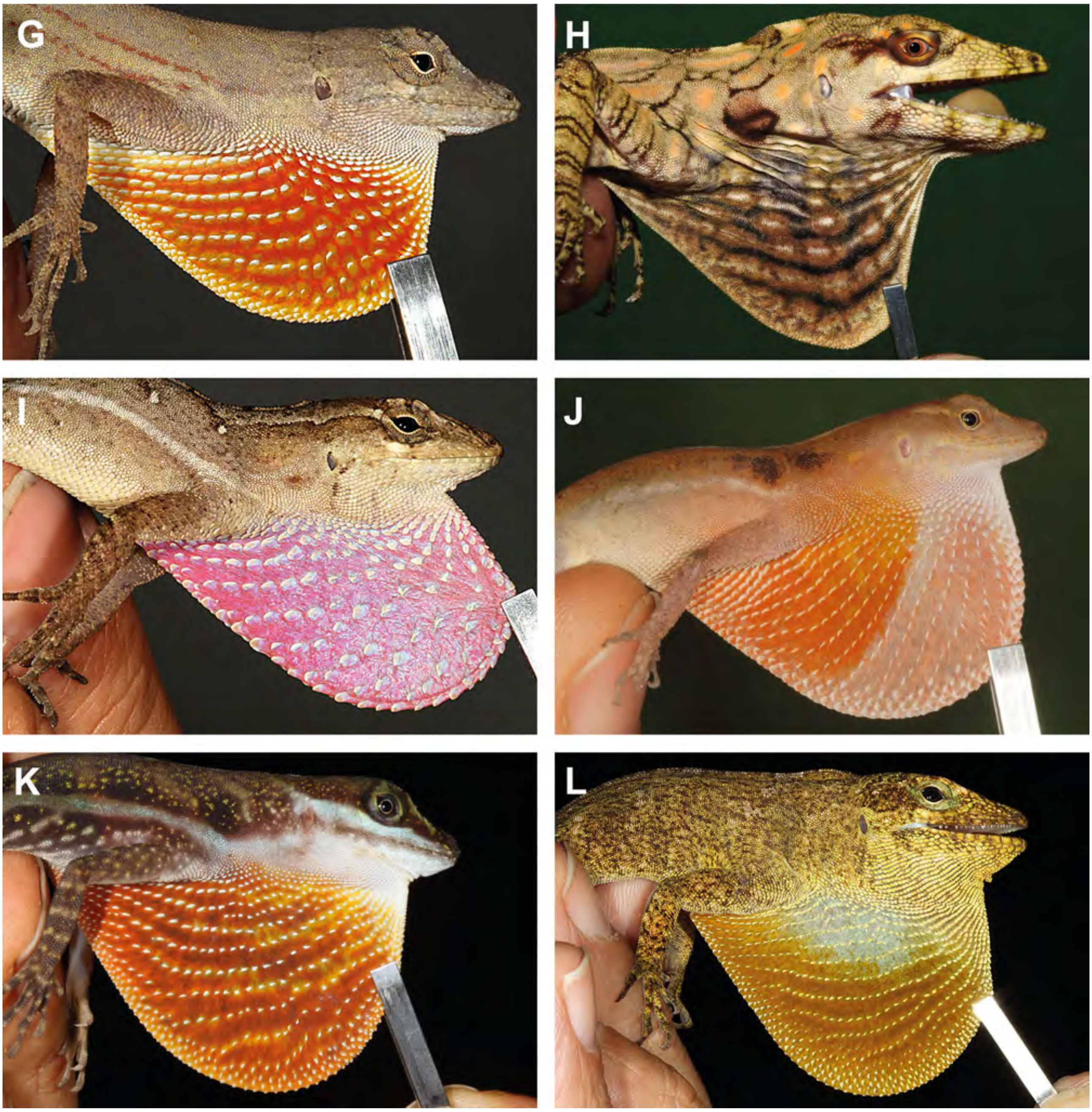

FIGURE 34. Condition and size of the dewlap (A) *Anolis taylori* (female, IBH 26603; RDS 0.5; dewlap very small); (B) *A. omiltemanus* (female, SMF 96227; RDS 0.6; dewlap very small); (C) *A. liogaster* (female, SMF 96200; RDS 1.3; dewlap small); (D) *Anolis porcatus* (male, SMF 90415; RDS 2.5; dewlap small); (E) *A. distichus* (male, SMF 90420; RDS 2.6; dewlap moderate-sized); (F) *A. omiltemanus* (male, SMF 96226; RDS 3.4; dewlap moderate-sized); (G) *A. isthmicus* (male, SMF 96279; RDS 5.0; dewlap large); (H) *A. insignis* (female, SMF 89482; RDS 6.4; dewlap large); (I) *A. liogaster* (male, SMF 96199; RDS 6.8; dewlap large); (J) *A. cupreus* (male, SMF 93908; RDS 9.7; dewlap very large); (K) *A. aquaticus* (male, SMF 92190; RDS 10.6; dewlap very large); (L) *A. macrinii* (male, SMF 96208; RDS 11.6; dewlap very large); RDS = relative dewlap size (see text for details).