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LEPIDOBLEPHARIS IN AMAZONIA (SAURIA, GEKKONIDAE)

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ABSTRACT

Lepidoblepharis heyerorum, sp. n., is described from the middle Madeira, central Amazonia. Some Brazilian specimens previously assigned to *L. festae* are now identified as *heyerorum*. *L. festae* is thought to be western Amazonian, and a still undescribed species to occur in easternmost Amazonia. The nearest relatives of these forms occur on the humid Pacific lowlands of Colombia and Ecuador, and on the Cordillera Oriental of Colombia.

INTRODUCTION

Many years ago I provisionally identified as *Lepidoblepharis festae* a small lizard collected by Ernesto Garbe in the Rio Juruá in 1902: "The specimen approaches the descriptions of both *L. festae* and *L. peraccae* but fits exactly neither. It is provisionally assigned to *festae* because of its distribution" (Vanzolini, 1953: 268). In 1961 Cunha assigned one specimen from Amapá to "*Lepidoblepharis* cf. *festae*", copying *ipsis litteris* (without acknowledgment) my description of the pholidosis and adding color notes presumably from his specimen (mine was completely blanched).

Later (Vanzolini 1968, 1968a) I assigned to *festae*, no longer with doubt, but without any further study, this same specimen, as well as others from Peru, Ecuador and eastern Pará. Subsequent authors (Mechler, 1968; Crump, 1971; Dixon & Soini, 1975) accepted my assignments. However, our Museum has acquired some specimens that make it necessary to revise this position.

In 1975 William Ronald Heyer, of the United States National Museum, Miriam Heyer, Francisca Carolina do Val and myself undertook a collecting trip to the Rio Madeira. We used the boats "Garbe" and "Lindolpho R. Guimarães" of the Expedição Permanente da Amazônia, maintained at the time by this Museum and by the Fundação de Amparo à Pesquisa do Estado de São Paulo, and travelled as far upstream as possible (the rapids just above Porto Velho). Among our collecting activities was a "lizard market" at each stop. At the

mouth of the Igarapé Puruzinho, the outlet of a lake some 10 km downstream from the city of Humaitá, among other excellent materials, children brought in a couple of what seemed at first blush a brilliantly coloured new species of *Gonatodes*, but that proved on examination to be a *Lepidoblepharis*, which I describe as

***Lepidoblepharis heyerorum*, sp. n.**

Holotype: MZUSP 42046, ♂, Puruzinho, Rio Madeira, Amazonas, Brasil, 3-6.xii.75, Expedição Permanente da Amazônia (EPA) field number 75.1624. Body length 34 mm, tail autotomized.

Allotype: MZUSP 42047, ♀, same data as the type (EPA 75.1625). Body length 35 mm, tail, regenerated, ca. 30 mm.

DIAGNOSIS

Approaches *L. buchwaldi*, *festae*, *intermedius* and *peraccae*; characterized by: supranasals very large, separated by one granule on the midline. Granules on the snout much larger than those on top of the head, a little larger than those on the back. Posterior margin of symphyisial transverse, bordered by 3-5 small scales; gular granules minute, uniform. Male black with yellow dorsal markings, throat with vivid black and orange pattern; female dark brown with delicate light markings, throat similar to that of male, but less vivid. Both sexes with two light parallel dorso-lateral lines on the posterior fourth of the trunk, continuing on the tail.

DESCRIPTION

Rostral high, with a median cleft, the central depression not sharply marked; with transverse posterior margin in contact with two very large supranasals, separated on the midline by one (type) or two, longitudinally arranged, granules (allotype). Granules on top of the snout polygonal, not very prominent, becoming gradually smaller towards the vertex, where they are minute and conical. Approximately 17-20 granules on a transverse line between the anterior notches of the superciliary flaps. Nostril indenting the rostral; three postnasals, the last one minute. Upper labials 4, decreasing, the suture between third and fourth under the middle of the eye. Superciliary flap with one enlarged scale, posterior half bristly in the type, less so in the allotype. Symphyisial moderate, with posterior margins transverse, slightly concave; a row of 3 (type) or 4 (allotype) flat enlarged granules (or small scales) in contact with the symphyisial and the anterior corner of the first lower labials, followed by a few slightly enlarged granules. A row of small, flat, elongate granules along the lower labials. All other gular granules small, conical, uniform. Lower labials 3 in the allotype, decreasing; first and second labials fused in the type.

Dorsal granules larger than those on top of the head, somewhat irregular (especially in the type) in shape, size and arrangement. On the sacral region they become gradually larger, but not especially

well organized, and grade into flat imbricate scales on the root of the tail.

The transition between gular granules and ventral scales is abrupt and occurs halfway between the level of the ear and of the shoulder. The ventrals are flat, smooth, imbricate, arranged in diagonal rows. In the type they are rounded on the thorax, diamond-shaped on the abdomen; in the allotype they are rounded throughout. This difference suggests the presence of an "escutcheon" in the male. There are respectively 17 and 18 ventrals counted transversely at midbody.

Fore limb with scales similar to the ventrals on the dorsal aspect and front edge of the upper arm, front edge of the forearm and dorsal aspect of the carpus; with granules elsewhere. Palm with flat granules. Digits II, III and IV subequal, V shorter, the pollex the shortest.

Hind limb with scales similar to the ventrals on the front half of the thigh, the ventral aspect of the tibia and the dorsal aspect of the tarsus; granular elsewhere. The posterior granules of the thigh are very thin and high, practically aciculate.

Ungual sheath with the two median dorsal elements characteristic for the genus. In the type the apical scale is very small, in some digits apparently absent; in the allotype it is normal.

The type was brought in without tail. The allotype has what seemed a complete tail, but proved to be partly regenerated — the color pattern is interrupted and the ventral pholidosis shows an abrupt change. Dorsally the scales are flat, imbricate, similar to the ventrals of the trunk, and do not show any marked changes in the regenerated segment. Ventrally, the proximal scales of the mid row are twice as broad and once and one half as long as the others; on the regenerated portion they are very short and as broad as 4-5 of the other scales.

As usual in the sphaerodactylines, there is sex dimorphism in color pattern. The type, a male, shows in alcohol a dark brown dorsum with a vivid white pattern, composed of groups of granules, forming marblings, vermiculations and largish round spots, denser on the head and becoming sparser behind. On the posterior fourth of the back there are two light dorso-lateral lines, continuing on the tail. When fresh, the specimen was black; the markings were very bright sulphur yellow in front, changing to greyish yellow behind.

The sides of the neck are vividly spotted, the flanks a little less so. A very sharp light line runs from the eye to the temporal region. These markings were also bright yellow in the fresh animal.

The throat pattern is composed of 3 convergent light lines over a dark background. The first line begins on the first upper labial, the second under the eye and the third between the eye and ear. A fourth, interrupted but vivid, line runs from the ear to near the insertion of the arm. In the fresh animal the throat was generally suffused with rusty orange, and the convergent lines bright orange, with smudgy black outlines.

The chest is densely spotted with melanophores; on the abdomen (the "escutcheon" area) the melanophores are concentrated on the edges of the scales. In the posterior gular region there are scattered black scales.

The fore limb is patterned, dorsally and ventrally, as the dorsum; the hind limb as the thorax. On the posterior surface of the thigh there is a longitudinal light line (greyish yellow in the fresh specimen); the granules below it are deep black. The granules on the palms and soles are very dark, separated by a criss-cross of light lines.

The allotype is a little more patterned than the usual female sphaerodactyline. The ground color is in alcohol (and was in the freshly killed animal) deep brown; there are fine transverse vermiculations on the neck and body. There are, on the anterior part of the body, longitudinal light lines (interrupted) and groups of light granules, that become on the posterior part of the trunk the two dorso-lateral streaks that continue along all the unregenerated part of the tail. The throat shows an ensemble of light lines corresponding to those of the male, only thinner and, in the fresh animal, not so vividly colored. The remainder of the under parts is patterned as the chest of the male. The fore limb shows some light cross bars, and the hind limb is patterned like that of the male. The ventral aspect of the tail has some very dark scales, and others with scattered melanophores.

The species is named after W. Ronald and Miriam Heyer. I own the name is a little clumsy, but see no other way of enhancing the efficient teamwork of these colleagues and friends.

DISCUSSION

A good summary does not exist of *Lepidoblepharis*. Parker (1926), who originated the present scheme, omitted *L. buchwaldi* Werner, 1910, and did not notice the peculiarities of *Gonatodes oxycephalus* Werner, 1894, which is almost certainly a *Lepidoblepharis* (Vanzolini, 1953a) (Mechler, 1968, states that the type is lost; if so, the species better be considered *inquirenda* and forgotten). Mechler (1968) included much valuable information, but restricted his work almost exclusively to Colombia. Peters & Donoso-Barros' key (1970) contradicts the literature on which it is based, and should be avoided.

Gathering together the information available, it is possible to say that, in having fairly uniform, small dorsal granules, *heyerorum* approaches *buchwaldi*, *festae*, *intermedium* and *peraccae*. The best characters to separate them seem to be the morphology of the symphyisial area and the male color pattern.

Lepidoblepharis buchwaldi Werner, 1910

The type-locality is "Hacienda Clementina, Babahoyo", which is in the province of Los Rios, on the Rio Babahoyo, some 80 km from Guayaquil (Rendahl, 1937). We have one female from Quevedo (Los Rios) and one male from Bucay (Guayas). It seems to be a trans-Andean form. The cleft symphyisial of *buchwaldi* is V-shaped; there is behind it a group of enlarged scales, one of which is much larger than the others and fits in the vertex of the angle. The posterior margin of the symphyisial of *heyerorum* is transverse, bordered by a row of subequal scales, and there is no cleft.

The color pattern is also widely different, the male of *buchwaldi* having an arcuate band on top of the head, and three longitudinal dark body bands, the median one wavy.

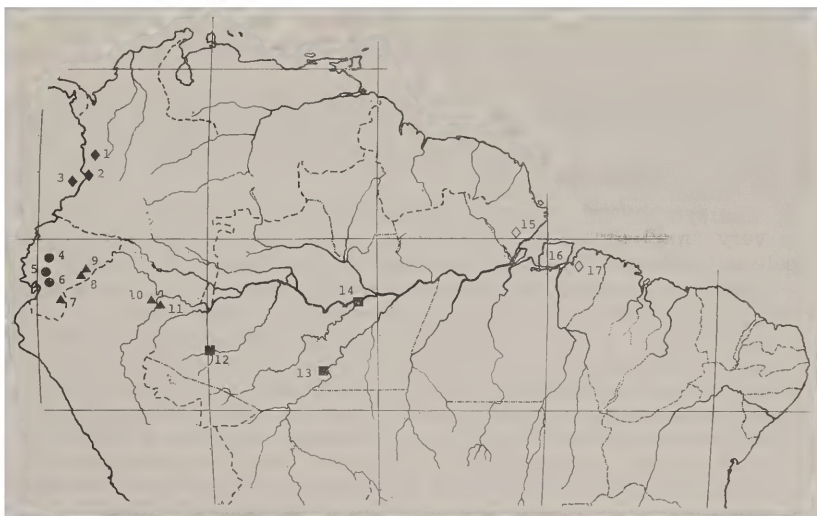
Lepidoblepharis peraccae Boulenger, 1908

The type was collected at "Los Mangos, S. W. Colombia, altitude 300 m., by Mr. M. G. Palmer". Mechler (1968) could not identify the locality, but Medem (1969) places it very near Buenaventura on the road to Cali. Other records are (Parker, 1926) Peña Lisa and Isla Gorgona. This seems to be another trans-Andean form.

I have not seen it, but the data in Boulenger (1908) and Parker (1926) indicate that the presence of two posterior clefts on the symphyseal and the color pattern (dark flanks, with two dorso-lateral light lines that meet on the tail) easily separate *peraccae* from *heyerorum*.

Lepidoblepharis intermedius Boulenger, 1914

The type locality is Peña Lisa, on the Condoto. Other records are Isla Gorgona (Parker, 1926) and Buenaventura (Mechler, 1968). Thus, on the basis of available records, *intermedius* and *peraccae* may be considered as fully sympatric.



Lepidoblepharis intermedius and *peraccae*: 1, Peña Lisa. 2, Buenaventura and Los Mangos. 3, Isla Gorgona. *L. buchwaldi*: 4, Quevedo. 5, La Clementina. 6, Bucay. *L. festae*: 7, San José de Cuchipamba. 8, Montalvo. 9, Conambo. 10, Moropón. 11, Centro Unión. *L. heyerorum*: 12, Eirunepé. 13, Puruzinho. 14, Boca do Purus. Not identified: 15, Alto Rio Maracá. 16, Marajó. 17, Belém.

Boulenger called this form *intermedius* for having "scaling like in *peraccae*, form more like in *festae*". I have not seen it but, from the literature, it seems obvious that the V-shaped, doubly cleft symphyisial (Parker, 1926, fig. 6) and the color pattern ("brown above, with darker and lighter variegation; a whitish streak across the nape; lower parts pale brown, throat whitish") separate easily the two forms.

Lepidoblepharis festae Peracca, 1897

There seems to be no doubt that *Lepidoblepharis festae colombianus* Mechler, 1968, is a valid form, but there is no indication that I can see that it is a subspecies of *festae*; I'll treat both forms as individual species.

The type locality is San José de Cuchipamba, Santiago-Zamora, Ecuador, placed by Peters (1955) on the Rio Branco some five miles above Gualaquiza. Other reliable records are: Montalvo (Pastaza, Ecuador: Vanzolini, 1968); Moropón and Centro Unión (Loreto, Peru: Dixon & Soini, 1975); Rio Ucayali (no further data: Vanzolini, 1968); one male (MZUSP 7123) from Conambo, Pastaza, Ecuador. These data indicate a western cis-Andean distribution, and make a detailed comparison with *heyerorum* mandatory. Now that good materials of both forms are available and that Mechler (1968) published measurements, scale counts and figures of the syntypes of *festae*, it is easy to see that the differences are several and clear-cut.

In *heyerorum* the supranasals are very large, separated on the midline by one granule; in *festae* they are moderate in size, separated by 3-4 irregular granules.

The scales on the snout of *festae* are larger. Taking as a point of reference the anterior insertion of the superciliary flap on the front, I count 11 granules across the snout in the Conambo *festae*, and 17-20 in the *heyerorum* types.

The symphyisial of *festae* is V-shaped, open backwards, bordered by very small granules. In *heyerorum* the posterior margin of the scale is transverse and met by 3-4 distinctly enlarged, flat scales.

Finally, the color patterns are widely different. Dixon & Soini (1975) have a very good description of *festae*: "The males are quite colorful, having a broad white loop passing from the upper posterior corner of the eye, across the top of the head to the opposite side. The white loop is bordered posteriorly by a broad black nuchal band. A white line passes posteriorly from the outer edge of the white loop, dorsolaterally along the body and extends into the proximal one-fifth of the tail. A second white line passes from the posterior corner of the eye, over the shoulder and terminates at the hind limb insertion. A third white line passes from behind (occasionally in front of) the arm insertion to the groin. Each of the three white lines are separated by a blackish brown line of about equal width.

The snout is pinkish white with two thin, blackish lines extending from each nostril posteriorly to the anterior corner of the eye. The top of the head is blackish brown an the mid-dorsal area of the body and tail is generally of the same color. The ground color stripe of the

mid-dorsum contains a series of 8 to 10 obscure, blackish blotches. The blotches form two irregular rows and occasionally two or more of the blotches may be united medially. The limbs are obscurely banded with blackish bands over ground color.

The venter is light brown, flecked with darker brown. The chin and throat are white, with a dark brown U-shaped band between the second pair of infralabials, and a short diagonal brown streak from the fourth infralabial to the ventrolateral aspect of the throat".

Our Conambo specimen is a little less vividly patterned, but agrees in all essentials, and the difference from *heyerorum* in color scheme is really very marked.

Lepidoblepharis colombianus Mechler, 1968

The symphysial of this form differs radically from that of *festae*, in being much less sharply angulate and in being followed by enlarged scales. Its shape in a way approaches that of *heyerorum*, but is still sufficiently different to be diagnostic. The color pattern seems to be very similar to that of *peraccae* and thus to be also diagnostic.

The type locality, the Cafetal (coffee plantation) Argelia (not "Argalia", as in Peters & Donoso-Barros 1970) is said by Fuhrmann & Mayor (1914) to be east of Viotá, at a height of 1861 meters on the foothills of the Cordillera de Subia. It is so far the only intra-Andean locality of *Lepidoblepharis*.

BRASILIAN SPECIMENS

MZUSP 2710, 32 mm snout to vent, from the Rio Juruá, collected by Garbe in 1902, the specimen I assigned first provisionally and later confidently to *festae*, is no doubt *heyerorum*. It agrees in all characters, except, of course, as it is bleached, in color. The catalog entry reads only "Rio Juruá", but we know that practically all of Garbe's Juruá reptiles were collected between Eirunepé (then São Felipe) and the mouth of the Xirua (Ihering, 1904, map).

MZUSP 13871, a female collected in 1967 by a Museum ichthyological party at the mouth of the Purus, is also beyond doubt *heyerorum*. It is a juvenile (21 mm snout to vent), and its color pattern is a diluted version of that of the allotype.

Finally, MZUSP 7684, 30 mm snout to vent, a bleached and poorly preserved specimen from the island of Marajó (no exact locality) differs markedly from all specimens at hand. The posterior margin of the rostral is deeply indented by a large granule, behind which there is a transverse row of 4 granules separating the supranasals. The snout scales are a little larger than in *heyerorum* (16 between superciliary flaps); those on the top of the head are also relatively larger. The median post-symphysial is relatively small; the next scale on either side is larger and indents the posterior margin of the symphysial. There are 5 or 6 scales bordering the symphysial. The transition from the immediate post-symphysials to the gulars is rather gradual; the latter are flat and not so small as in *heyerorum* and *festae*. There are 15 ventrals at midbody.

This lizard most probably represents an undescribed form, but is not well preserved enough to warrant a description. I expect that Crump's (1971) and Cunha's (1961) specimens belong to the same form.

CONCLUSION

It can be said that there are at least three cis-Andean forms of *Lepidoblepharis*, distributed between the eastern slopes of the Andes and the mouth of the Amazon. It is of course a moot point whether further materials will show these units to be full species (sympatric or allopatric) or subspecies, or at some other level of differentiation; indeed it is a moot point whether further materials will be forthcoming in time to be useful. The fact remains that we have here at least three units. Their nearest relatives are in the humid Pacific lowlands of Colombia and Ecuador and on the Cordillera Oriental of Colombia. In spite of the scarcity of specimens, this pattern seems clear: affinities certainly do not lie to the northeast (the Guianas), to the southeast (the Atlantic forest) or to the southwest (the foothills of the Altiplano). It is not an easy pattern to explain. I hope to return to the problem on the basis of more favorable materials (the *Anolis fuscoauratus* species group, Williams & Vanzolini, in preparation).

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