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A new species of *Liolaemus* lacking precloacal pores in males from the Andean south-eastern mountains of Mendoza Province, Argentina.
(Liolaemidae, Iguania, Lacertilia, Reptilia)

ABSTRACT

A new *Liolaemus* species related to *L. therrmarum* from Peteroa volcano region and also lacking precloacal pores in adult males, has been described from the frontier area of Pehuenche pass, Malargüe dept., Mendoza province. It lives at about 2500 meters of altitude, in a rocky habitat with streamlets and thermal springs. Morphological and ecological data suggest to establish a peculiar Andean species group, the "neuquensis" group, assembling the new species, *L. therrmarum* and *L. cristiani* from Chile, at the same latitude, besides *L. coeruleus* and *L. neuquensis* from the close frontier mountains of Neuquén. Their habitat is a volcanic landscape scattered with thermal springs and isolated clusters of *Araucaria* woods, relic of a primeval antantandic biome, fossil in the above cited Andean district of Mendoza province. Differences between the "neuquensis" and "elongatus" groups are outlined, but the ancestral phyletic relationships of these liolaemine lizards are also taken into account.

Key words: Andean herpetofauna, *Liolaemus*, Pehuenche glacial valley, preanal pores, sexual dichromatism, *elongatus* group, *neuquensis* group.

INTRODUCTION

In March 1996 a scientific commission of IADIZA (Instituto Argentino de Investigaciones de zonas áridas), working in the upper region of the Río Grande basin (Malargüe dept., southern Mendoza

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province, Argentina), at altitudes of 2500 m, about 10 km from Peteroa volcano, discovered a new lizard of the genus *Liolaemus*, referable to the “*chiliensis*” group (sensu Etheridge, 1995) and characterized by a complete absence of precloacal pores in both sexes. After a careful comparison with the morphologically related species of the group, such a liolaemine taxon was described as *Liolaemus thermarum* Videla and Cei, 1996, whose etymology was appointing the sulphureous springs (Baños del Azufre) welling in its apparently exclusive locality. The analysed character combination of this lizard could point out an evident relationship with a trans-Andean form, *Liolaemus cristiani* Nuñez, Navarro and Loyola 1991, from the Maule region of Chile (Nuñez et al. 1991), as well as with *Liolaemus coeruleus* Cei and Ortiz-Zapata, 1983, from western mountains of Neuquén, Argentina, and *Liolaemus neuquensis* Müller and Hellmich, 1938, from Copahue volcanic highlands of Neuquén, near Chilean frontier. All these forms show effectually a peculiar absence of precloacal pores, besides a significant similarity in their dorsal color patterns and in general features of their lepidosis. A further expedition to these hardly accessible Andean environments, in February 2002, confirmed with another sample the population of *L. thermarum* from the rocky biotopes of thermal springs at Baños del Azufre.

But in February 2001, during herpetological field works in the bordering region of Pehuenche pass, Malargüe dept., Mendoza province, at about 2500 m a.s.l., also near the Chilean frontier, another liolaemine lizard, apparently related to the above mentioned species lacking preanal pores, was discovered, being later again collected, at the same locality, in February 2002. Morphological and ecological relationships with *Liolaemus thermarum* of such a new *Liolaemus* without preanal pores can be emphasized, in spite of the several differences supporting it significant specific diagnosis.

The following study, description and discussion of this lizard shall be thus the purpose of our present paper.

Some considerations must be added to make clear a still current misleading conclusion, based on assumptions given in a recent publication (Espinoza, Lobo and Cruz, 2000), appointing a correct definition of a natural “*elongatus*” group, assembling several *Liolaemus* species from the above cited “*chiliensis*” group (sensu Etheridge 1995). The taxon *L. thermarum* was however included in such a postulated “*elongatus*” group, on the only basis of 3 examined adult specimens from Malargüe dept., Niña Encantada lagoon, Mendoza province (FML-7189 - 7191). Unfortunately an erroneous identification (furtherly corrected by the same authors on the labelled specimens, after the paper issue) added a troubling argument in the general assumptions of that by itself interesting contribution to the Argentinian herpetofauna. These 3 specimens, reported there as *L. thermarum* in table 2, p. 510 and Appendix I, p. 516,

are all unquestionably *L. austromendocinus*. Therefore the proposed “*elongatus*” group corresponds to the taxa *elongatus*, *petrophilus*, *austromendocinus*, *capillitas* and *heliodermis*. Of course, nobody can avoid to make a mistaken identification of poorly known herpetological samples, but a rectification was here indispensable, given the interest and good quality of the questioned article (except the inconsistency of several sentences of its “content of the *elongatus* group”, at page 514- 515).

Materials and methods. Samples of these lizards were captured in February 2001 and February 2002 in stony borders of springs and pools in the upper basin of the streamlet Pehuenche, at altitudes of about 2500m, near the Chilean frontier, department of Malargüe, Mendoza province, Argentina.

A total of 6 adult males, 5 females have been examined. Measurements have been taken with dial calipers (0,1 mm accuracy) mainly under a dissecting microscope. Colors in life were registered with Fuji film Superia, 100/21^o - Process CH-16/c-41 or Fujichrome Sensia II-100, 100/21^o, Process CH- 56/E-6.

Specimens for museum collections were fixed in formalin 10% - 15% and preserved in ethylic alcohol 70%. Museum acronyms reported here are: MLP- Museo de La Plata, La Plata, Buenos Aires, Argentina; FML- Fundación Miguel Lillo, Tucumán, Argentina; CH- IADIZA -Colección herpetológica Instituto Argentino de Investigaciones de Zonas Aridas, Mendoza, Argentina; MRSN-R- Museo Regionale Scienze Naturali-Reptiles, Torino, Italy.

***Liolaemus flavipiceus* sp. nov.**

Holotype. MLP-S- 2158, male. Near Pehuenche Pass, rocky streamlets, 2500 m a.s.l., Malargüe Dept., Mendoza province, Argentina. February 2001. Coll: F. Videla, V. Durán.

Paratypes. MLP-S- 2159, female, same data of the Holotype, February 2002; MRSN.R- 1842, male, 1843, female (same data as the precedent specimen); FML- 12523, male (same data); CH- IADIZA- 307, 308, males, 309, 310, females (same data).

Etymology. From Latin *flavus* (yellow) and *piceus* (blackish), in reference to the peculiar dorsal coloration of the lizards.

Diagnosis. A medium-size, stout *Liolaemus*, belonging to the general “*chiliensis*” group, characterized in having a relatively high scale number at midbody, softly keeled scales, thickening and more keeled on

vertebral region, absence of precloacal pores and a showy dorsal coloration, with wide, indented, lower lateral band of black scales, and medially a predominant number of yellow scales, increasing posteriorly, then widely extending on upper surface of tail. From the several other species lacking precloacal pores it is distinguishable by its peculiar coloration and details of lepidosis. It is recognizable from *Liolaemus neuquensis* and *L. coeruleus* by a distinct dorsal and ventral color pattern, besides the lack of the very deep gular folds of *neuquensis* and the brilliant blue ventral scales of *coeruleus*. From *L. cristiani* it is easily recognizable in having a different medio-dorsal and lateral scutellation, softer in *cristiani*, and a very dissimilar dorsal color pattern, including a black cephalic "pilcus", absent in *cristiani*. From *L. thermarum*, it differs lastly at first sight in having an unmistakable, almost opposite, dorsal and ventral pattern, dorsally more uniform in *thermarum*, which does not show a too distinct cephalic dark "pilcus", dorsal yellow scales and very dark, or melanic, ventral coloration, all distinctive features of *L. flavipiceus*, mainly in the males. Also the yellowish band on the lower femoral scale rows and in precloacal scales of *L. thermarum* males are not present in *L. flavipiceus*.

Description of the holotype. Body stout, 86.5 mm snout-vent length; tail 112.5 mm, almost cylindrical, 57% total length in the holotype. Hindlimbs taller than in *thermarum*, 47 mm length, 55% snout-vent length; forelimbs 32 mm, 37% snout-vent length; when adpressed, hindlimbs reach the shoulder, forelimbs cross the middle of the body. Axilla-groin distance 41.5 mm. Head large, slightly distinct from neck, 17.5 mm (as measured from inferior apex of ear opening to snout point apex), widest 15 mm across temporal region. Snout moderately large, 5.7 mm (from tip of snout to anterior eye commissure), no projecting beyond lower jaws. Orbit large, 6.2 mm along its greater horizontal length, about 0.28 times head length. Nasal region swollen, convex in profile; fronto-nasal region slightly concave in profile. Rostral wider than high, bordered by 6 irregular scales. Nasal scales small, contacting rostral, being separated by two irregular scales, and by a row of very diminute scales from anterior supralabials. Supralabials 6-6. Nostrils oriented antero-laterally; dorsal head scales very irregular, bulky and rough. Supraorbital semicircles regular, small and complete; two large scales, a frontal azygos and two small posterior scale rows between orbits; 5 supraoculars irregular, separated from superciliaries by smaller rounded scales; five superciliaries enlarged, irregular. Interparietal polygonal, subequal to the adjacent, irregular, bulky, parietal scales; subocular and postoculars enlarged, fused, forming an irregularly sharpened slightly projecting shelf; temporals very irregular, small, slightly keeled; a single, irregular row of loreolabials, separating the suboculars from supralabials. External ear

opening vertical, smaller than orbit and bordered by granular scales. Mental slightly wider than rostral, bordered by 2 infralabials and 2 postmentals; 5-4 infralabials; two rows of 5 lateral large postmentals, separated by subtriangular gulars, flat and imbricate, decreasing posteriorly, smaller than ventrals; an irregular row of enlarged scales between infralabials and postmentals.

Dorsal scales in about 15 transverse rows on neck, subimbricate, small but increasing posteriorly, strongly keeled, granular on the wide folds of the neck. Larger keeled scales on dorsum, grading into smooth, flat, wider lateral and ventral scales. On the vertebral region 8-10 longitudinally thickened scale rows are present, determining evident longitudinal dark keeled lines. Ventrals rhomboidal, imbricate, subequal to dorsals, but smaller, almost triangular, on precloacal region. Lateral nuchal folds very evident, with a prominent larger longitudinal fold from the ear opening to the shoulder; hemigular fold present; conical granules on axillary region and groin. Number of scales around midbody 83.

Brachial and antebrachial scales imbricate and slightly keeled above; smaller, imbricate and soft on ventral surface. Suprafemoral scales large, smooth, irregular; postfemorals granular. Supratibials large, in regularly keeled scale rows; post-tibials smooth, flat and imbricate. Supracarpals and supratarsal smooth, somewhat irregular in size, imbricate; infracarpals and infratarsals very small, slightly keeled, imbricate; supradigital smooth, imbricate. Terminal distal margin of supradigital notched, with short, curved blackish claws; subdigital lamellae tricarinate: 22 on fourth finger, 26 on fourth toe. Dorsal and lateral caudal scales larger than body scales, keeled, imbricate and slightly mucronate proximally, regularly imbricate and keeled, verticillate distally. Ventrals like abdominal scales, becoming keeled and verticillate distally.

Coloration in life - Upper and lateral scales of head black or blackish, scattered with reddish or yellowish scanty spots; clear limit between head and neck coloration determining a "pileus"-like cephalic pattern; posterior nuchal region and neck pale yellowish, scattered with small, longitudinal dark marks on regular medial rows of keeled scales, continued on dorsal surface becoming extensively yellow, or orange-yellow, on its posterior region and then on all the tail, almost lacking small blackish marks. Dense blackish spots on the swelling lateral neck skin folds. From shoulders to groin a dark, wide lateral band, irregularly indented on its superior border, contacting ventral scales inferiorly. Upper surface of forelimbs and hindlimbs yellowish or creamish, speckled with distinct black or brownish marks or spots. Ventrally reddish or dark, with dense blackish marks on throat and chest; lower surface of limbs reddish, speckled with dense dark marks. Lower surface of tail reddish, with scanty melanic pigmentation (Plate 1, 1, 2).

Coloration in preservative. Head, lateral dark bands and upper surface of limbs black; dorsal yellow surface and tail creamish or pale yellowish, speckled with black marks. Ventral surface gray, with darker marks or spots on throat and whitish lateral surface contacting the lateral black band. Lower tail surface reddish gray.

Variation in paratypes. No remarkable sex dimorphism can be pointed out in *L. flavipiceus* for several somatic characters. Snout-vent length averaged 90.3mm (86.5 - 95.0) in 5 males; 80.3mm (77.0 - 84.2) in 5 females. Tail length was unobtainable in males of that species, given their very frequent tail autotomy; in 5 females it averaged 113.8mm (104 - 124), being their mean tail length almost one time and half the snout-vent length. Hindlimb length averaged 49.6mm (44.8 - 53.0) in 5 males, 46.4mm (44.2 - 50.0) in 5 females; forelimb length 33.5mm (31.0 - 35.2) in 5 males, 30.1mm (28.5 - 30.8) in 5 females; axilla-groin distance 42.4mm (41.0 - 46.0) in 5 males, 39.0mm (34.2 - 45.0) in 5 females. Observed sex differences in the relation of length of hindlimbs and forelimbs with snout-vent length were apparently insignificant, as well as in the comparisons of axilla-groin distances and snout-vent length in both sexes. However, the body size of males is significantly greater than the body size of females, being the comparison of their snout-vent length obviously dissimilar.

Head length and head width were in 5 males 18.6mm (17.2 - 19.2) and 16.9mm (15.2 - 18.2), respectively; in 5 females 16.6mm (16.2 - 17.0) and 14.4mm (14.0 - 18.0), respectively. It means an obviously significant sex-difference in size and shape, being so the head larger and wider in males, shorter and narrower in females. Insignificant sex differences were observed for snout length, orbit diameter and cephalic scutellation. Also no remarkable variation for body and limbs lepidosis can be reported. Dorsal scale rows are very irregular in this species, greatly difficulting a clear calculation of its very high scale number at midbody.

Variation and sex differences in coloration will be put in evidence. Dorsal color pattern is somewhat more uniform and dark in males than in females, where the presence of yellow or orange reddish scales is often prevailing and vivacious, specially when the lizards are largely exposed to sun light (Plate 2, 1, 2). Also the distinct black nuchal coloration (the so called "pileus") is particularly evident in females, as well as the medial longitudinal series of small black marks. The specific tendency to a ventral blackish pigmentation is more accentuated in males than in female specimens, where the abdominal surface generally shows a whitish or bluish coloration, with scattered orange or reddish scales, abundant on flanks and proximal region of tail (Plate 2, 1, 2). Gular surface and chest are always scattered with more or less regular white and dark marks or spots, mainly longitudinally disposed.

Ecological notes. *Liolaemus flavipiceus* was discovered in a cordilleran glacial valley, from Malargüe Dept., Mendoza, Argentina (S 35° 58' - W 70° 22'), along rocky borders of the Pehuenche streamlet, near the international Pehuenche Pass to Chile, at about 2500 m. a.s.l. The highest cordilleran summit in this zone is Mt. Campanario (4049 m a.s.l.). The climate is enough humid, with an average of rainfalls, mainly snowfalls, of about 800 mm yearly. From May to November that area is thus quite inaccessible.

The vegetation belongs to the high Andean type. On mountains slopes gramineous *Stipa* div. spp. steppe prevails, being the commonest species *Stipa chrysophylla* and *Poa holciformis*. In the meadow environment two vegetation belts are observed. In the most xeric belt, leaning against the slopes, *Mulinum spinosum*, *Carex gayana*, *Eliocharis albibracteata* are present, but in the stream flows *Oxychloe andina*, *Acaena magellanica* and others species were reported (Martinez Carretero, pers. comm).

The lizards have been seen in basking on rocky slopes or on the borders of sulfurous springs, tributaries of the Pehuenche streamlet. The most activity was registered at midday, with light wind. When frightened they shelter under stones or ravines, being very clever to slit up themselves in sandy ground. Only a peculiar endemic telmatobiine frog, *Alsodes pehuenche*, was still reported for the local herpetofauna.

GENERAL REMARKS

Notorious morphological relationships between *Liolaemus flavipiceus* and *Liolaemus thermarum* have been emphasized through this paper. On the other hand their significant diagnostic differences support a specific status of both these taxa. Besides the peculiar color patterns, meristic characters in size and lepidosis can be pointed out. For instance, on a scale row of 5 mm length, 4-5 dorsals and 4-5 ventrals can be counted in *L. flavipiceus*, but 5-6 dorsals and 4 ventrals are present in *L. thermarum*. Together with *L. cristiani* from Chilean mountains at the same latitudes, they could thus be considered as a natural liolaemine group lacking preloacal pores and showing remarkable morpho-ecological similarities. *Liolaemus coeruleus* and *Liolaemus neuquensis* can be also assigned to this group, having in common a number of significant characters in color patterns and lepidosis, as well as in their distribution and behavior. Given the priority of description, that assemblage of Andean lizards shall be then recognized as "neuquensis" group in the major phyletic line identified as "chiliensis" group in the current tentative cladistic classification of the genus (Etheridge, 1995).

With the deletion of the "false *thermarum* sample" from Niña Encantada lagoon, dept. Malargüe, Mendoza, the "elongatus" group

proposed by Espinoza et al. (2000) can be accepted as a consistent evolutionary unit. However, in our present critical screening, impressive, likely ancestral relationships between the here defined “*neuquensis*” group and the cited “*elongatus*” assemblage of nearly related species, may be taken into account. The anatomo-physiological trend to the loss of sensorial, pheromonic structures, such as precloacal pores, total in the “*neuquensis*” group, is anticipated in the “*elongatus*” group, where the pores are always reduced in number (1-4, occasionally 0). Several morphological characters are likewise similar or converging: features of lepidosis, as the subimbricate dorsal keeled scales, can be observed in both groups; details of coloration as the occurrence of blue scales, have been reported in species of “*neuquensis*” or “*elongatus*” groups, with a remarkable variation. The Table 1 make clear our considerations, where character combinations in species of the “*elongatus*” and “*neuquensis*” groups are fundamentally referred to the “formal diagnosis” by Espinoza et al (2000).

“ <i>elongatus</i> ” group	“ <i>neuquensis</i> ” group
Moderate to large body size (snout-vent mm 58 - 105)	Moderate to large body size (snout-vent mm 63 - 97,6)
Elongate, but robust body form Small body scales at midbody, more than 55	Elongate, prevailing stout body form Small body scales at midbody, more than 63
Non-overlapping or subimbricate scales, non-terminated in a spine	Subimbricate, not mucronate scales
Tails that tend to be circular in cross section, and longer than 1.5 times the length of head and body	Tails almost elliptic in cross section, slightly depressed below, and not longer than 1.5 times the snout-vent length
Lack of sexual dimorphism in body size	Males longer than females in some species
Low number of preanal pores in males (1-4 : exceptionally none)	Constant absence of preanal (= precloacal) pores in males
Lacking or insignificant sexual dichromatism	Prevailing sexual dichromatism
Ringed tail pattern	No ringed tail pattern
Light head scales with narrow black borders: no distinct occipital black scales, or “pileus”	Irregularly black spotted head scales, with distinctly darker or black occipital region, or “pileus”
Dark, wide stripe on the lower flanks, from axilla to groin, absent or similar to a medial wide vertebral stripe	Dark, wide stripe on the lower flanks, from axilla to groin, present
No abdominal melanism: only faint gray ventral scales present in both sexes of some species	Abdominal melanism prevailing in males
No gular folds, or only faint hemigular folds present	Distinct gular folds, or hemigular folds present
Often riparian species, saxicolous, excellent swimmers	Generally riparian species, saxicolous

Tab. 1 - Differentiation between “*elongatus*” and “*neuquensis*” groups according relevant characters, used in the “formal diagnosis” of “*elongatus*” group by Espinoza et al (2000).

As shown in Fig. 1, limits of tentative distribution of the “*elongatus*” group are more dilated than those of the “*neuquensis*” group: from 26° to 46° S lat. and from 66° to 70° W long. versus 35° to 39° S lat. and 70° 10' to 71° 10' W long., approximately. That confirms a major “ecological valency” of the species belonging to the evolutionary “*elongatus*” stem: both the nearly related *elongatus* - *petrophilus* - *austromendocinus* taxa, scattered in an elevation range of 700-3000 meters, and the isolated northern members of the group, as *Liolaemus capillitas* from Catamarca mountains (2500 - 3900 meters) or *L. heliodermis* from Cumbres Calchaquies, Tucumán (2820 meters).

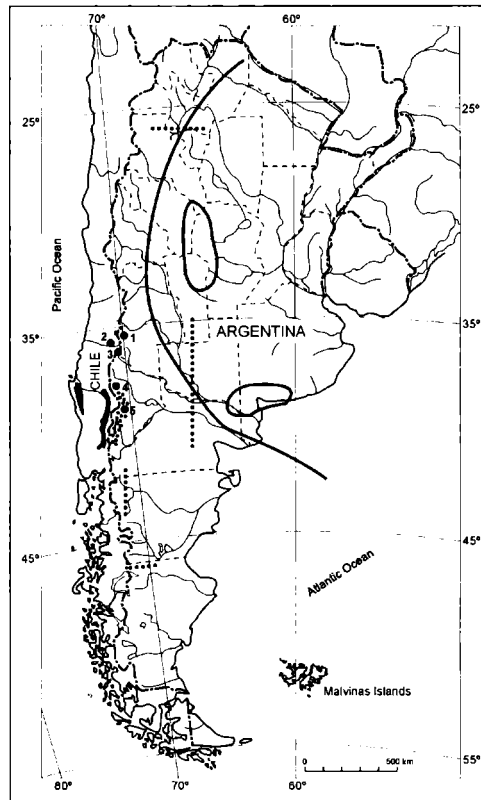


Fig. 1 - Distribution of the *Liolaemus* species of “*neuquensis*” group and limits of post-glacial distribution of *Liolaemus* species of “*elongatus*” group.

— Limits of Pleistocene permafrost (perennial iced ground).

..... Northern, Southern, Western and Eastern limits of post-glacial distribution of *Liolaemus* species of the “*elongatus*” group.

● Species of the “*neuquensis* group: 1- *Liolaemus therrmarum*; 2- *L. cristiani*; 3- *L. flavipiceus*; 4- *L. neuquensis*; 5- *L. coeruleus*.

Black and dotted areas: remains of the *Araucaria* woods.

An ancient origin of their precursors, perhaps preglacial, could be considered with secondary speciation centers of periglacial populations along the quaternary permafrost line (Fig. 1), followed by a progressive post-glacial population shifting westwards, with different adaptive levels as factor of genetic differentiation and biogeographic distribution. We can remember as a suggestive case (Bottari, 1973) the altitudinal limits of two species of the group on the slopes of Payún Liso volcano, in southeastern Mendoza province, where *L. austromendocinus* does not reach altitudes above 2600 meters, being replaced by *L. elongatus* from this level to 3000 meters and near the volcano summit.

A different evolutionary history likely happened to the cis-transcordilleran “*neuquensis*” group, split in localized Andean species from volcanic or thermal areas with probable microclimatic features. Perhaps their past habitat has been connected with paleoecological conditions referable to a former extension of Antartandic biocenotic communities. It is a suggestive observation that in areas neighboring the terra typica of *Liolaemus neuquensis* (Copahue volcano) and *L. coeruleus* (Primeros Pinos, Neuquén), thermal springs are scattered in a landscape with relics of *Araucaria* and *Chusquea* formations, being there surviving species of primitive anurans as *Alsodes gargola neuquensis* and *A. verrucosus*. Likewise, thermal springs with other peculiar frog, *A. pehuenche*, gush in the terra typica of *Liolaemus flavipiceus*, near the Pehuenche streamlet; also *L. thermarum* was discovered in similar environments. The nearly related Chilean species, *L. cristiani*, is a transcordilleran element probably survivor of a primeval major expansion of some ancestral liolaemine group, to which it is not unlikely that the same precursors of the present eastern cisCORDILLERAN “*elongatus*” group could be related.

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RIASSUNTO

Nuova specie di Liolaemus, con maschi privi di pori precloacali, delle montagne Andine sud-orientali della Provincia di Mendoza, Argentina (Liolaemidae, Iguania, Lacertilia, Reptilia).

Si descrive una nuova specie di *Liolaemus*, affine a *L. thermarum* della regione vulcanica del Peteroa, e come quella priva di pori precloacali nei maschi adulti la nuova specie proviene dal Passo Pehuenche (m 2500 s.l.m.), nel dipartimento di Malargüe, Provincia di Mendoza, nell'area di

frontiera tra Argentina e Cile dove vive in un ambiente roccioso con sorgenti termali. Considerazioni morfologiche ed ecologiche permettono di stabilire un particolare gruppo di specie andine, il gruppo "neuquensis" che comprende, oltre alla nuova specie, *L. thermarum* e *L. cristiani* del vicino Cile, alla stessa latitudine, ai quali si aggiungono *L. coeruleus* e *L. neuquensis*, anch'essi tipici di ambienti vulcanici, con sorgenti termali e isolati resti dei boschi di *Araucaria*, reliquie di un ancestrale bioma antartandico, ormai presente come fossile nei distretti andini del sud di Mendoza, qui citati. Si sottolineano le differenze tra il gruppo "neuquensis" e il gruppo "elongatus", ma si prendono altresì in considerazione le probabili relazioni filetiche ancestrali tra queste due linee evolutive di liolemini.

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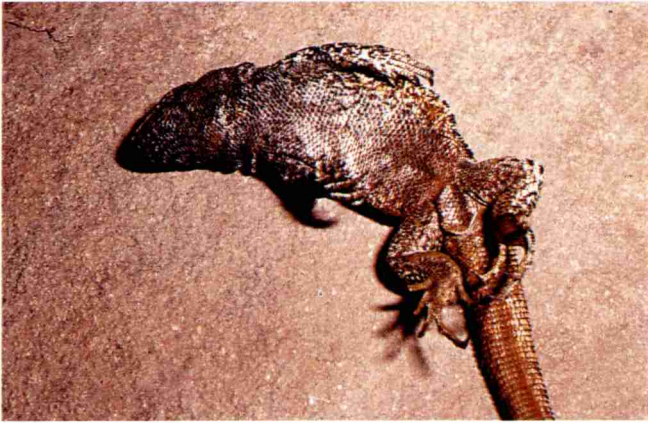
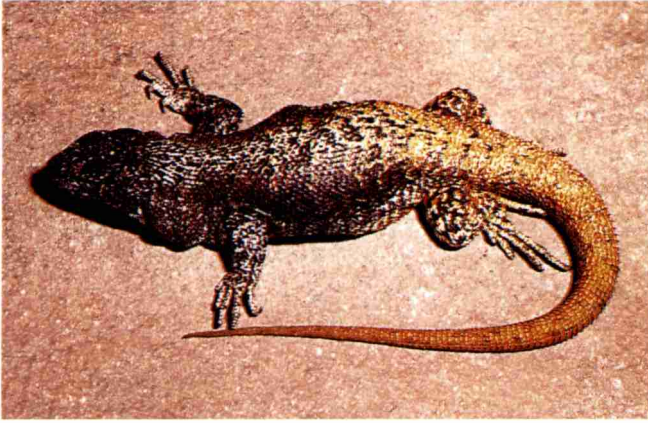
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- Plate 1:
- 1 - *Liolaemus flavipiceus*, male: holotype. Rocky streamlet at Pehuenche pass, 2500 m a.s.l., Malargüe Dept., Mendoza province, Argentina, February 2001. Photo J. M. Cei.
 - 2 - The same specimen, ventral view. Photo J. M. Cei.
 - 3 - Landscape of the Pehuenche valley, near Pehuenche pass. Rocky streamlet at about 2500 m a.s.l., habitat of *Liolaemus flavipiceus*, Malargüe dept., southern Mendoza province, Argentina, february 2002. Photo F. Videla.





- Plate 2:
- 1 - *Lioalemus flavipiceus*, female: paratype.
Rocky streamlet at Pehuenche pass, 2500 m a.s.l., Malargüe dept., Mendoza province, Argentina, February 2002. Photo J. M. Cei.
 - 2 - The same specimen, ventral view. Photo J. M. Cei.
 - 3 - Thermal springs in the natural environment near Pehuenche pass at about 2500 m a.s.l.. Relics of very ancient biomas, as the endemic Telmatobiine *Alsodes pehuenche*, live in this habitat. Malargüe dept., southern Mendoza province, Argentina, February 2001. Photo F. Videla.

