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A new mountain lizard from Montes de León (NW Iberian Peninsula): *Iberolacerta monticola astur* ssp. nov. (Squamata: Lacertidae)

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Abstract

Iberolacerta populations from the Northern Montes de León (NML) were studied by means of external morphology (scalation and biometry), osteology and genetics (mtDNA and microsatellites), searching for their homogeneity ("intrazonal analysis") and, once verified, comparing them with *Iberolacerta monticola* s. str. (from Central Cantabrian Mountains) and *I. galani* (from Southern Montes de León) ("extrazonal analysis") from neighboring areas.

Our "intrazonal analysis" revealed discordances between the different approaches, especially the patterns of variation of nuclear microsatellites (congruent with external morphology) and mtDNA, namely a very low nuclear differentiation between relatively highly differentiated mtDNA lineages. The morphological approach was unable to discriminate any of the populations as significantly different from the others in the NML. Mitochondrial DNA revealed a haplotype lineage closely related to *I. galani* (MNL-II in our text) in some specimens of Sierra de Villabandín and Suspirón, but these populations are morphologically indistinguishable from the main part of the other populations that belong to lineage NML-I, phylogenetically closer to *I. monticola*. After a separation from *I. monticola* ca. 1.8 Mya, the populations in this geographic region must have suffered at least two different waves of gene flow from *I. galani*, the second one not much later than 0.5 Mya. Microsatellite results indicate that all the NML populations are genetically similar in terms of their nuclear genomes, independently of their mitochondrial differentiation (NML-I vs. NML-II haplotype groups). Since all the morphological and microsatellite evidences point towards the fact that, independently of the mitochondrial haplotypes that they bear (NML-I or NML-II), there is only one taxon in the area, we describe it as: *Iberolacerta monticola astur* ssp. nov.

Concerning the relationships of *I. m. astur* ssp. nov. with *I. monticola* s. str. and *I. galani* ("extrazonal analysis"), in the female analyses the new taxon centroid is closer to *I. monticola* s. str. than to *I. galani* (more similarity with *I. monticola* s. str.), whereas in the male analyses the relationship is just the contrary (closer to *I. galani*, paralleling the direction of the hypothesized past hybridization). Moreover, in both sexes' ANOVA, *I. m. astur* ssp. nov. results more similar (less $P<0.05$ differences) to *I. galani* than to *I. monticola* s. str. Osteologically, *I. m. astur* ssp. nov. is slightly more similar to *I. monticola* s. str. than to *I. galani*, especially in the squamosal bone, which is regularly arched (primitive shape). Genetically, as indicated above, the NML populations can be subdivided in two groups according to their mitochondrial DNA, namely NML-I (bearing clearly differentiated haplotypes, phylogenetically closer to *I. monticola*) and NML-II (whose haplotypes could have been mistaken for those of an *I. galani* population). This mitochondrial subdivision has at most a subtle nuclear correlate, however. According to the nuclear microsatellite markers, all the NML populations belong to a single group (*I. m. astur* ssp. nov.), which would be more similar to *I. galani* than to *I monticola*, with NML-II populations lying closer to *I. galani* than those from the NML-I group and, correspondingly, more distant from *I. monticola*. The discordant phylogenetic signal of mitochondrial and nuclear markers is discussed in terms of past introgression events and sex-biases in phylopatry and dispersion in these species.

Iberolacerta monticola astur ssp. nov., inhabits the Northern Montes de León (Sierra de Gistreo *sensu latissimo*): Gistredo, Catoute, Tambarón, Nevadín, Villabandín (or Macizo del Alto de la Cañada), Arcos del Agua (or Fernán Pérez), Tiendas and Suspirón, mainly in quartzite and slate rock substrates. Its current distribution, cornered in the NW of the Northern part of the Montes de León, suggests a possible competitive exclusion between this taxon and *I. galani*, as the *galani* haplotypes (NML-II) appear cornered in the most harsh and continental areas, speaking also about a, even in the past, very limited presence of this species in the area that probably was soon absorbed by *I. m. astur* ssp. nov. (with NML-

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Concluding, it seems that the current main distribution area of *I. m. astur* ssp. nov. (especially the typical NML-I) gravitates around what was the divisory between watersheds in the past, later shifted to the East during the Quaternary.

Eastern known limits of *I. m. astur* ssp. nov. do not pass away from Collado de Campo Lamoso (1500 m), which today is perfectly suitable for the species, but during the Pliocene and the main part of the Pleistocene, constituted a barrier across which the two northern immediate valleys drained to the southern slopes. The West-East continuity of this massif during the end of the Miocene was broken by changes in the drainage across this pass in the Pliocene (geological datation uncertain). Although nowadays the pass to the East (to the Filera Massif, 1879 m) is possible for *Iberolacerta*, the prospections in these drier limestone areas had been unfruitful. In the north of these Sierras, the species can reach up to Cascaros peak (1854 m), but this extreme has to be confirmed.

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