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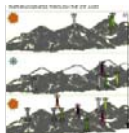
5. Conclusion

Acknowledgements

Appendix A. Supplementary material

References

Figures and tables



Molecular Phylogenetics and Evolution

Volume 102, September 2016, Pages 117–127

Parthenogenesis through the ice ages: A biogeographic analysis of Caucasian rock lizards (genus *Darevskia*)Susana Freitas^{a, b, *}, Sara Rocha^c, João Campos^a, Faraham Ahmadzadeh^d, Claudia Corti^e, Neftali Sillero^f, Çetin Ilgaz^g, Yusuf Kumlucaş^g, Marine Arakelyan^h, D. James Harris^a, Miguel A. Carretero^a[Show more](#)

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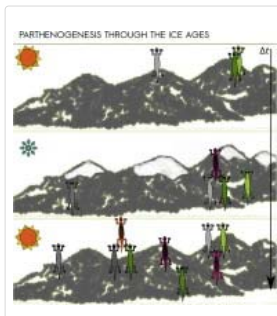
Highlights

- *D. raddei* has a complex refugia-within-refugia pattern of evolution in the Caucasus.
- Hybrid origin of the *Darevskia* parthenogens is confirmed with nuclear and mtDNA.
- The origin of parthenogens is dated to the last Glaciation.

Abstract

Darevskia rock lizards include both sexual and parthenogenetic species, mostly distributed in the heterogeneous and ecologically diverse Caucasus. The parthenogenetic species originated via directional hybridogenesis, with only some of the sexual species known to serve as parentals. However, it remains unclear when and where these events happened and how many parental lineages were involved. A multilocus phylogeographic analysis was performed on the parthenogens *D. unisexualis*, *D. bendimahiensis* and *D. uzzeli*, and their putative maternal species *D. raddei*. Results show the parthenogenetic species all have relatively recent origins, approximately 200–70 kyr ago, and at least three hybridization events were involved in their formation. Ecological niche models identify the region where hybridization events leading to the formation of *D. unisexualis* took place, namely in the northeast of the current distribution. Models also suggest that the sexual *D. raddei* might have undergone a habitat shift between the Last Interglacial and the Last Glacial Maximum.

Graphical abstract



Keywords

Darevskia; Parthenogenesis; mtDNA; Phylogeny; Ecological niche models; Glaciations

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