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Cryptic speciation patterns in Iranian rock lizards uncovered by integrative taxonomy

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While traditionally species recognition has been based solely on morphological differences either typological or quantitative, several newly developed methods can be used for a more objective and integrative approach on species delimitation. This may be especially relevant when dealing with cryptic species or species complexes, where high overall resemblance between species is coupled with comparatively high morphological variation within populations. Rock lizards, genus *Darevskia*, are such an example, as many of its members offer few diagnostic morphological features. Herein, we use a combination of genetic (two nuclear and two mitochondrial loci), morphological (15 morphometric, 16 meristic and four categorical characters) and ecological (eleven newly calculated spatial environmental predictors) criteria to delimit cryptic species within two species complexes, *D. chlorogaster* and *D. defilippii*, both distributed in northern Iran. Phylogenetic analyses of the molecular data confirmed the monophyly of *D. chlorogaster*, while *D. defilippii* is paraphyletic in respect to *D. steineri*. However, each of the complexes comprises several highly divergent clades, especially when compared to other congeners. We identified seven candidate species within each complex, of which three and four species are supported by Bayesian species delimitation within *D. chlorogaster* and *D. defilippii* (including *D. steineri*), respectively. Although the species within one complex lack clear diagnostic features, they can be well separated based on morphological variables when sample size is appropriate. Ecological Niche Modelling provided additional support for the identified species and niche overlaps between them are generally low, especially in the *D. defilippii* complex.

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