

Historical distribution of fringed-toed lizards *Acanthodactylus boskianus* in northern Africa since the last Glacial Maximum

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The Sahara desert alternated dry phases with humid periods throughout time. At the Last Glacial Maximum (LGM, 18000 yr B.P.), the climate was arider and sand dunes were further extensive than today. At the mid Holocene optimum (MHO, 6000 yr B.P.), the desert was replaced by steppes and temperate forests. Aridity raised afterwards, follow-on present conditions. Habitat modifications over time induced fast adjustments in species range. This was probably the case of *Acanthodactylus boskianus*, a lacertid lizard occupying semi-arid to desert ecosystems but avoiding extreme desert areas. This work aimed to identify the distribution at the LGM/MHO and historical refuge areas for *A. boskianus*. Niche-based modelling techniques, Logistic Regression and Maximum Entropy Modelling, and 282 localities were used to correlate current distribution with environmental conditions. Derived variables and weights were applied to LGM/MHO scenarios of temperature, precipitation and land cover. Current distribution was negatively correlated with rainfall, extreme hot temperatures, sandy and rocky deserts and closed shrub areas, and positively correlated with semi-arid regions of bare rock and open grasslands. At the LGM, *A. boskianus* was confined to Mediterranean costal areas, Atlas Mountains, isolated Sahara mountains and a sub-Saharan continuous belt of open grasslands. At the MHO, the range was almost continuous from the Atlantic to the Red Sea coast, but the species was absent from the more humid Maghreb. Putative historical refuges include a continuous band from coastal Mauritania to Egypt (but south of the Atlas mountains) and isolated Saharan mountains (Hoggar, Tassili, Tibesti).

