Are the paleoclimatic reconstructions based on mammals biased by the local landscape?

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The paleoclimatic reconstructions deduced from mammal associations might have been biased by the complex local effect of the landscape. This effect is especially important in tectonically active regions where important landscape changes occurred in short-time periods. In this abstract, I present a coupled paleoenvironmental approach 1) using the ecological requirement of the faunal associations, and 2) using isotopic analyses in both sediments and small mammal teeth in order to discern between climate and landscape effects. Southern Iberian Peninsula was a tectonically active area during the late Miocene and Pliocene, and the environmental and humidity data deduced from the faunal associations agree with the sedimentary evolution of the basin. However, these humidity trends are usually opposite to the humidity reconstruction deduced from the carbon isotopic data in rodent teeth and from the isotopic composition of the sediments (C and O), which are scarcely influenced by the landscape. So, changes in the landscape, probably boosted by tectonics, gave rise to the development of endorheic and/or exorheic systems in the areas and conditioned the extension of these systems, affecting taxa with high dependence on humidity. Similar outcomes have been observed in early-middle Miocene records from north Spain. In those cases, the response of small mammal associations to abrupt climate changes might have been also buffered by the landscape. On the other hand, records where there was no important landscape changes, such as those from an early- middle Miocene coastal area of eastern Spain, do not show that disagreement in the humidity and environmental reconstructions following both methods.