



The calculation of climatic indices for Late Quaternary faunal assemblages from South African sites

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The relative abundance of rodents and insectivores from several Late Quaternary sites in South Africa have been studied using multivariate analysis (notably factor analysis). The highest loadings on the first factor (F1) are obtained for taxa that are today found in warm subtropical environments, contrasting with taxa which have low F1 loadings and which are today distributed in more southerly latitudes and at high altitudes. The latter taxa with low loadings on F1 are able to tolerate cold conditions (and are relatively common in Terminal Pleistocene assemblages associated with Oxygen Isotope Stage 2). A summary statistic based on F1 (SSF1) is calculated and interpreted as a temperature index. The dated temperature indices for Boomplaas cave correlate well ($r=0.95$) with dated deuterium isotope ratios for a Vostok core in Antarctica. Similarly, a moisture index (SSF3) is calculated from factor analysis of the relative abundances of the same faunal assemblages. The results are assessed in terms of a non-linear pattern of variability in temperature and moisture indices calculated from pollen as well as mammalian microfauna. The changes in climate are likely to have influenced the distribution and abundance of human populations in the Late Pleistocene in southern Africa.