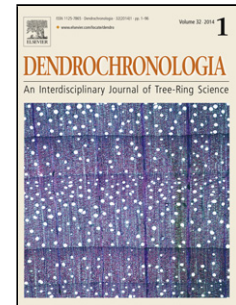


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TREE RING RESPONSES TO CLIMATE VARIABILITY OF XEROPHYTIC THICKETS FROM SOUTH SOALARA, MADAGASCAR

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ABSTRACT

Xerophytic thickets occur along the southwestern part of Madagascar. Although providing a wide variety of resources and services to the local population, this particular vegetation is subjected to deforestation. This study focuses on linking dendroclimatology and dendroecology by examining the spatial and temporal variability of the ecological growth conditions. Information from tree rings was retrieved, on one hand, to identify the problem of the limiting effects of past climate on growth and, on the other hand, to show how local environment takes part in the growth pattern of South Soalara species, in the southwestern part of Madagascar. Methods and principles of dendrochronology were applied on nine species belonging to seven botanical families. A total of 42 stem discs from 3 to 5 trees per species were collected at 30 cm height. All discs exhibited visible tree rings, but anatomical distinctness varied between species. This study highlighted the annual formation of tree rings through successful crossdating techniques. Then, from the nine constructed chronologies, species were grouped into three clusters. Analysis between precipitation and radial growth showed that the response to climate occurred mainly in rainy season. Large-scale climatic drivers such as sea surface temperature (SST¹) of ENSO² regions revealed a teleconnection with tree growth in cluster 1. Mean radial increments were computed from the measured tree ring width and varied from 0.66 to 1.98 mm.year⁻¹, showing that those species are slow-growing. All species were recorded as having a

¹ SST = Sea surface Temperature

² ENSO = El-Niño Southern Oscillation

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