

Role of yam species and medicinal plants for food self-sufficiency and farmers' livelihoods in SW Madagascar

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Throughout the year the rainfed, subsistence oriented agriculture in the Mahafaly region of semi-arid SW-Madagascar is limited by the harsh climatic conditions and the availability of plant nutrients. Consequently, food insecurity in this area is high and rural households strongly depend on the exploitation of natural resources for their basic needs and income regeneration. In the view of the increasing pressure on ecosystem services and functions, we analysed the availability of important provisioning services from forest habitats, and their importance for farmers' livelihoods in the Mahafaly region. Wild yams and medicinal plants were selected as key provisioning services that are frequently collected from forest habitats and used in various ways by the local people to improve food security and health care.

An ethnobotanical survey was conducted to study the diversity, local use and knowledge of wild yams and medicinal plants in five villages in the Mahafaly region. To predict yam species distribution along environmental gradients, yam species abundance and environmental variables were inventoried in the field using a systematic plot design within a yams collection area of four villages.

Six endemic species of wild yam were identified as potential food resources on the plateau. All the interviewed households (n=250) consumed wild yam tubers and 70 % of them collected wild yam. Yam is mostly consumed additionally to the daily quantity of staple food (cassava and maize), but also as main food, especially in the villages near forest areas, where daily collection is possible. A generalized linear model indicated the importance of economic factors, which significantly affected the collection intensity of wild yams, whereas the usage of medicinal plants depended to a higher degree on socio-cultural factors (Andriamparany et al., 2014).

Our species distribution models highlighted the importance of human interventions, vegetation structure, and soil characteristics to determine the distribution of wild yam species. Predicted distribution maps showed a scarce occurrence of wild yam species, which were mostly located in restricted areas of open spiny forests and dry spiny forest thickets (Andriamparany et al., 2015).

An overuse of wild yams threatens the natural environment and people's livelihood and we, therefore, recommend to raise awareness on sustainable use of forest products in the villages near forests. Wild yam collectors should be encouraged to replant the corm part of the tubers in the soil after harvesting wild yam tubers. Domestication of wild germplasm and *in situ* conservation of wild populations may contribute to counteract the devastating effects of high harvesting intensity on the existing wild yam populations in this region. We, therefore, investigated the relative regeneration abilities of six wild yam species as well as the agronomic performance of the wild yam species *Dioscorea alatipes* and a local variety of *D. alata*.

References

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