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Synergy between paleoscientists and stakeholders for biodiversity conservation in Madagascar and its surrounding islands

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Biodiversity on islands are uniquely vulnerable to human activities, invasive species, land-use and sea-use change along with climate change (Ortiz et al. 2023). Urgent consultation accompanied by collective remedial actions by relevant stakeholders is essential. The knowledge required for designing successful and sustainable biodiversity conservation initiatives comes from diverse approaches related, but not limited, to sciences, cultures and languages. Knowledge about biodiversity change is often communicated at various classification, spatial and temporal levels. Long-term ecological data that covers centuries to millennia have the potential for informing conservation by reconciling biodiversity conservation knowledge in island ecosystems (e.g. Gillson et al. 2023; Nogué et al. 2017; Razanatsoa et al. 2021). However, the poor integration of long-term datasets into policies may be due to limited opportunities and understanding for effective communication among paleoscientists, social scientists, academics, NGOs and governments.

Madagascar and the Indian Ocean islands have experienced a proliferation of paleoecological research projects, especially over the past two decades (e.g. Gillson et al. 2023; Van Der Plas et al. 2012). The workshop aimed to build upon existing paleoecological knowledge by demonstrating the usefulness of paleoecology in guiding the implementation of conservation led locally by governments, grassroot-level NGOs and private organizations. The workshop attracted paleoecologists, ecologists and conservationists representing Madagascar, Comoros and Mauritius, along with international experts. It was organized in two phases focused on a) introducing case studies that demonstrate the application of paleoecology in conservation and biodiversity management, b) identifying conservation gaps in these islands that could be complemented with paleodatasets, and c) developing a framework to facilitate collaboration and integrate paleowork into policy.

Case studies from Madagascar, Mauritius and the Comoros Islands demonstrated similarities and differences in challenges related to biodiversity conservation, including deforestation and increasing invasive alien species. Most conservation efforts are based on ecological classifications of landscapes with different levels of local community involvement. Paleorecords detailing environmental history are rarely considered in conservation plans. Indeed, the use of long-term datasets has been acknowledged a) to provide information that could shift perceptions which often impact decision-making, for example, related to the origin of grasslands either ancient or anthropogenic (Gillson et al. 2023), and b) to promote conservation and communities' involvement in terms of cultural heritage (Razanatsoaet al. 2021). Participants also acknowledged the need to involve multiple disciplines and establish ecological monitoring in combination with paleodata. Collaborations, a critical key component of such multidisciplinary approaches, are often challenging due to different expectations, viewpoints, language, monitoring methodologies and communications. Therefore, incorporating long-term data in conservation, biodiversity management requires:

(1) Defining specific terms relevant to all stakeholders. How do we define the scale and granularity of paleoecological data to enhance uptake, and how does it relate to more specific stakeholder needs?

(2) Collating knowledge associated with what, how and where conservation is needed to be able to establish baselines, as well as understand climate variability and the full range of ecosystem responses.

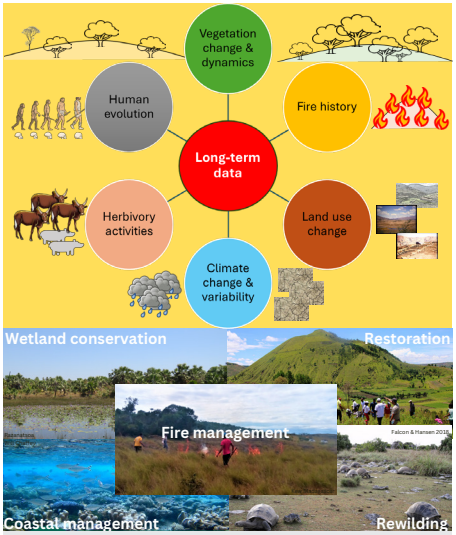

Figure 1: Paleoecological proxies and their environmental inferences, as well as the potential application of paleoecology within the western Indian Ocean islands. Image credit: Adriantsilavo H.I. Razafimanantsoa and Estelle Razanatsoa.

(3) Understanding existing approaches to restoration and reforestation to understand the nature of the landscape.

(4) Establishing long-term and/or large-scale funding for fundamental and applied research, providing career opportunities for local early-career researchers (ECRs).

The workshop concluded with a field trip to the Ambohitantely Special Reserve, a renowned example of a debated site regarding the origin and drivers of open and mosaic landscapes in Madagascar, which dominate the Central Highlands (Lehmann et al. 2022; Razafimanantsoa et al. 2024). The reserve serves as a natural laboratory which provides insights into past ecological conditions that can inform current conservation strategies. The fieldtrip fostered informal discussions and exchanges related to paleoecological methods and approaches. The workshop was the first of its kind as it provided a platform for paleoscientists to engage with various stakeholders working in the western Indian Ocean islands. It stimulated discussions to inform sustainable management of biodiversity and climate change adaptation while inspiring ECRs to ensure continuity in research.

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REFERENCES

Gillson L et al. (2023) Front Conserv Sci 4: 1286459

Lehmann CER et al. (2022) In: Goodman SM (Ed) The New Natural History of Madagascar. Princeton: Princeton University Press, 152-168

Nogué S et al. (2017) Nat Ecol Evol 1: 0181

Ortiz AMD et al. (2023) npj biodivers 2: 18

Razanatsoa E et al. (2021) Malagasy Nat 15: 41–55

Razafimanantsoa AHI et al. (2024) Holocene 35(4): 460-470

Van Der Plas GW et al. (2012) J Quat Sci 27(2): 159-168

