Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Preliminary Field Records of Four Calamus Species and Their Resource Management Implications in a Mindanao Forest Landscape

Medrid T. Mait
Davao del Sur State College
Janny Sumilla
janny.sumilla@dssc.edu.ph

Davao del Sur State College
Jay Mark Plaza
Davao del Sur State College
Christine Ramos
Davao del Sur State College

Short Report

Keywords:

Posted Date: August 24th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10746384/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Not applicable. This manuscript is submitted as a Brief Report (Notes on Culturally Important Plants), for which an abstract is not required according to the journal guidelines and the editorial instructions for this resubmission.

Introduction

Rattans are useful climbing palms whose management links forest conservation with rural resource use, yet local management decisions are often made without species-level baseline information. A field survey in Mount Dumalao Altu-Tuna, Davao del Sur, Philippines, documented four species of Calamus within a forest landscape proposed as a Local Conservation Area. These records provide a preliminary baseline for species monitoring and precautionary resource management without implying the existence of a harvestable surplus.

Rattan harvesting can affect plant survival, growth, reproduction, and population structure, and the consequences vary among species and management contexts (Ticktin 2004). Comparative work on commercial non-timber forest products likewise shows that livelihood and conservation outcomes depend on the ecological and socioeconomic setting rather than on commodity status alone (Belcher et al. 2005). For local governments and communities, species identification is therefore an essential first step, but it must be followed by repeated observations before decisions on extraction, propagation, or enterprise development are made.

Mount Dumalao Altu-Tuna, also known locally as Datu Dumalao Peak, is in Barangay Colonsabac, Municipality of Matanao, Davao del Sur, Mindanao, Philippines. Approximately 600 ha of the forest landscape have been proposed for establishment as a Local Conservation Area. This Brief Report documents the Calamus species recorded during the field survey, places the records in their regional botanical context, and identifies management actions that can be supported directly by this baseline.

Materials and Methods

Fieldwork was conducted from 24 to 28 November 2024. The team surveyed an approximately 2-km route through lower, middle, and upper portions of Mount Dumalao Altu-Tuna, Matanao, Davao del Sur, Philippines and recorded rattans at nine observation stations. The survey was designed as a rapid floristic baseline rather than a population census; consequently, the data establish species presence at the surveyed stations but do not estimate abundance, cane volume, population density, or sustainable yield.

Field identifications were based on diagnostic morphological characters observed and photographed during the survey and were subsequently checked against Henderson's revision of Calamus (Henderson 2020) and the distributional information in Co's Digital Flora of the Philippines (Pelser et al. 2011 onwards). No herbarium voucher specimens were collected or deposited during the survey. The records

reported here should therefore be interpreted as photographically documented field identifications rather than voucher-backed taxonomic records. Regional occurrence information was used to assess consistency with known distributions and not as a substitute for field observations.

At each observation station, Calamus occurrences were documented as field observations. Available field photographs were retained as supporting documentation. Because the survey was designed as a rapid floristic baseline and did not include voucher collection or repeated demographic measurements, no harvest quota, recruitment rate, population trend, population density, or carrying-capacity estimate was calculated.

Results

Four Calamus species were identified in the field: *Calamus discolor* Mart., *C. mitis* Becc., *C. oblongus* Reinw. ex Blume, and *C. ochrolepis* (Becc.) W.J.Baker (Table 1). These identifications were supported by field observations and photographs but not by deposited voucher specimens. Co's Digital Flora of the Philippines documents all four taxa from Mindanao. *Calamus mitis, C. oblongus*, and *C. ochrolepis* are documented from Davao del Sur, whereas C. discolor is documented from several Mindanao localities, including Davao Oriental (Pelser et al. 2011 onwards).

Three of the recorded species—*C. discolor, C. mitis, and C. ochrolepis*—are Philippine endemics. *Calamus oblongus* is native to the Philippines but has a wider Malesian distribution that includes Borneo, Java, Sulawesi, and Sumatra (Pelser et al. 2011 onwards; Henderson 2020). Thus, three of the four recorded species are Philippine endemics, whereas C. oblongus has a broader Malesian distribution.

The survey establishes a local species baseline but does not demonstrate resource surplus. Presence at the observation stations provides reference points for future monitoring, while the absence of repeated measurements means that population trajectory and sustainable harvest cannot yet be inferred.

Table 1
Calamus species recorded in Mount Dumalao Altu-Tuna and the management interpretation supported by the baseline.

Species	Field Record	Philippine Status	Published regional distribution
Calamus discolor Mart.	Recorded	Endemic	Mindanao, including Davao Orienta
Calamus mitis Becc.	Recorded	Endemic	Davao del Sur and other Mindanao localities
Calamus oblongus Reinw. ex Blume	Recorded	Native	Philippines and wider Malesia
Calamus ochrolepis (Becc.) W.J.Baker	Recorded	Endemic	Davao del Sur and other Mindanao localities

Note. Accepted names follow Henderson (2020); regional evidence follows Co's Digital Flora of the Philippines (Pelser et al. 2011 onwards). Species identifications are based on field observations and photographic documentation; no voucher specimens were collected.

Discussion

The principal value of the survey is not the number of species recorded but the management threshold it establishes. The four-species list identifies which rattans should be explicitly recognized in the proposed Local Conservation Area and where follow-up observations can begin. For climbing palms, maintaining forest structure and supporting vegetation around occupied sites is a defensible immediate action, whereas extraction limits require demographic evidence that the present survey does not provide.

Species-specific monitoring is particularly important because non-timber forest product responses to harvest cannot be assumed to be interchangeable. A minimum follow-up protocol should record occupied stations, individuals by life stage, seedlings and juveniles, reproductive plants, usable or damaged canes, cutting signs, and habitat disturbance. Repeated observations would allow managers to distinguish persistence from decline and to determine whether recruitment is sufficient to justify any future utilization trial. This precautionary interpretation is consistent with evidence that NTFP harvest effects depend on life history, harvested plant part, intensity, and management context (Ticktin 2004).

Monitoring can also be embedded in local governance rather than treated as a purely technical exercise. Participatory biodiversity monitoring can substantially expand the evidence available for protected-area management, although program design must reflect local ecological and social conditions (Mandeville et al. 2023). In Mount Dumalao Altu-Tuna, community monitors could revisit the same stations during existing patrols, while technical partners periodically review identification and measurement consistency. Where local or Indigenous knowledge is recorded, permissions, provenance, and rules for access to culturally sensitive information should be explicit.

Ethnobotanical relevance and future research. The present survey did not systematically document vernacular names, species-specific uses, harvesting practices, cane-quality preferences, livelihood

dependence, or customary rules associated with the four *Calamus* species. These aspects are therefore not treated as empirical findings. Nevertheless, establishing which *Calamus* taxa occur along the surveyed route provides a botanical reference for subsequent ethnobotanical investigation. Future ethnobotanical research should examine whether local people distinguish *C. discolor*, *C. mitis*, *C. oblongus*, and *C. ochrolepis* through local names, cane characteristics, habitat associations, perceived abundance, or particular uses; which species are preferred or avoided for specific purposes; how and when rattans are harvested; and whether access or harvesting is governed by customary or community rules. Linking such knowledge with repeated ecological observations would help determine how species identity, local knowledge, livelihoods, resource governance, and conservation interact in Mount Dumalao Altu-Tuna.

Because these social and ethnobotanical dimensions were not systematically documented, the present baseline does not support claims of commercial viability or community preference for particular rattan species. Nursery and enrichment-planting trials may eventually be useful, but they should be treated as experiments rather than evidence of conservation success. Restoration planning is more durable when ecological opportunity is considered together with livelihoods, tenure, and local priorities (Choksi et al. 2023). For rattan, this means that propagation trials should be evaluated not only by germination and survival but also by labor requirements, access arrangements, benefit distribution, and effects on pressure on wild plants.

The study has important limitations. It was a short survey along a single approximately 2-km route, used nine observation stations, and did not estimate abundance, demographic rates, harvest pressure, or cane yield. No herbarium voucher specimens were collected, so the four species records cannot be independently re-examined from preserved material; identification rests on field observations, photographs, morphology, and consistency with published taxonomic and distributional sources. This limitation should be considered when the records are used for future taxonomic or conservation work, and subsequent surveys should collect properly permitted voucher specimens and obtain expert verification where feasible. The survey also did not quantify cultural use, market demand, or household dependence on rattan. These omissions constrain the present interpretation to a preliminary botanical baseline and its resource-management implications.

Despite these limitations, the four records provide a usable starting point for local conservation planning. A practical adaptive sequence is to retain habitat around occupied stations, monitor each species separately, review recruitment and disturbance at regular intervals, and permit propagation or utilization trials only when ecological evidence and community governance arrangements support them. This converts a one-time floristic observation into a testable management baseline while avoiding unsupported assumptions about sustainable harvest.

Conclusion

The field records of C. discolor, C. mitis, C. oblongus, and C. ochrolepis provide a preliminary rattan baseline for the surveyed portion of Mount Dumalao Altu-Tuna. Three are Philippine endemics, increasing the conservation relevance of the local assemblage. The immediate management implication is precautionary: protect occupied habitat and establish repeated species-level monitoring before inferring sustainable use. If later demographic evidence demonstrates stable recruitment and persistence, propagation or controlled utilization trials can be evaluated within locally agreed governance arrangements.

The four species records also provide a defined taxonomic starting point for subsequent ethnobotanical research on how local people recognize, use, value, harvest, and govern rattan resources. Integrating these human–plant relationships with repeated ecological monitoring would provide a stronger basis for locally appropriate conservation and sustainable-use decisions.

Declarations

Competing Interests

The authors declare no competing financial or non-financial interests.

Use of Generative AI

Generative AI tools (OpenAI ChatGPT) were used to assist with language editing, structural organization, and reference-format checking. The authors reviewed and verified the manuscript and take responsibility for its content.

Author Contribution

M.T.M., J.M.P.P., and C.A.R. contributed to field investigation and manuscript review and editing. J.A.S. contributed to field investigation, conceptualization of the resource-management interpretation, and writing of the original and revised manuscript. All authors reviewed and approved the manuscript.

Acknowledgement

The authors acknowledge the National Commission on Indigenous Peoples Region XI, the Department of Environment and Natural Resources Region XI, Davao del Sur State College, relevant local officials, community members, and field assistants for institutional or field support.

Data Availability

Species-occurrence information reported in this paper is included in Table 1. No herbarium voucher specimens were collected during the survey. Field photographs supporting the observations are retained by the authors and may be made available on reasonable request, subject to appropriate protection of sensitive locality information.

References

1. Belcher, B., M. Ruíz-Pérez, and R. Achdiawan. 2005. Global patterns and trends in the use and management of commercial NTFPs: Implications for livelihoods and conservation. World Development 33:1435–1452. https://doi.org/10.1016/j.worlddev.2004.10.007.
2. Choksi, P., A. Agrawal, I. Bialy, R. Chaturvedi, K. F. Davis, S. Dhyani, F. Fleischman, J. Lechner, H. Nagendra, V. Srininvasan, and R. DeFries. 2023. Combining socioeconomic and biophysical data to identify people-centric restoration opportunities. npj Biodiversity 2:7. https://doi.org/10.1038/s44185-023-00012-8.
3. Henderson, A. 2020. A revision of Calamus (Arecaceae, Calamoideae, Calameae, Calaminae). Phytotaxa 445:1–656.
4. Mandeville, C. P., E. B. Nilsen, I. Herfindal, and A. G. Finstad. 2023. Participatory monitoring drives biodiversity knowledge in global protected areas. Communications Earth & Environment 4:240. https://doi.org/10.1038/s43247-023-00906-2.
5. Pelser, P. B., J. F. Barcelona, and D. L. Nickrent, eds. 2011 onwards. Co's Digital Flora of the Philippines. Arecaceae. Accessed August 16, 2026.
6. Ticktin, T. 2004. The ecological implications of harvesting non-timber forest products. Journal of Applied Ecology 41:11–21. https://doi.org/10.1111/j.1365-2664.2004.00859.x.

Figures



Figure 1

Four *Calamus* species recorded at Mount Dumalao Altu-Tuna. (A) *Calamus discolor* Mart.; (B) *Calamus mitis* Becc.; (C) *Calamus oblongus* Reinw. ex Blume; and (D) *Calamus ochrolepis* (Becc.) W.J.Baker. Insets show selected morphological features photographed.

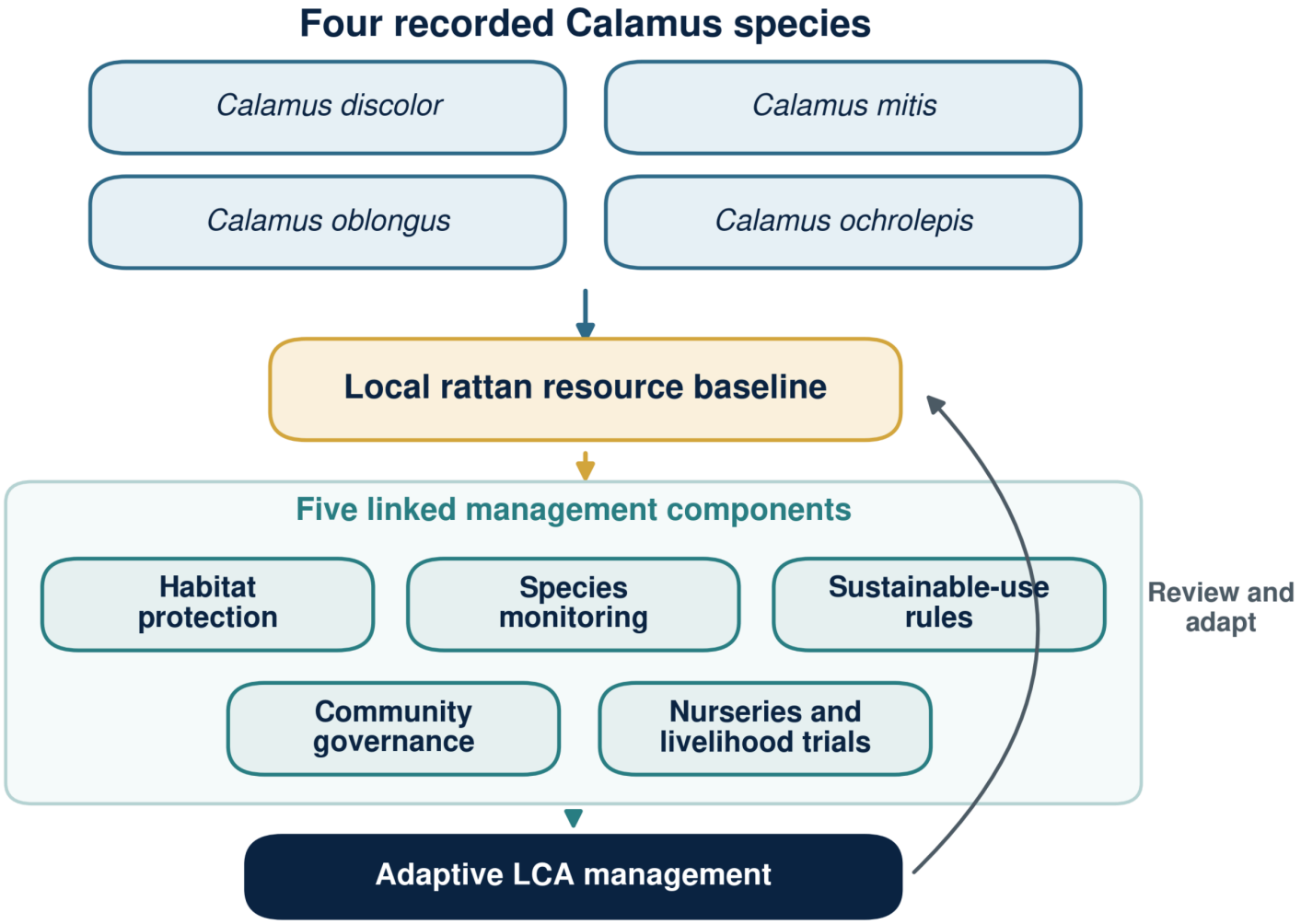


Figure 2

Proposed adaptive management framework for the recorded Calamus species.