

Housing, Databasing, Digitizing and Accessibility Upgrades to the Largest Pacific Island Land Snail Collection (Bishop Museum, Honolulu, Hawaii)



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Introduction

Pacific islands, with their incredible biodiversity, are among our finest natural laboratories for evolutionary, ecological and cultural studies. Nowhere, in relation to land area, does land snail diversity reach that of these islands, with more than 6000 species¹, mostly single island/archipelago endemics¹ (Fig. 1). Unfortunately, molluscs have the highest number of recorded extinctions of any major taxonomic group and most of these extinctions are of Pacific island land snails². Less than 3% of known mollusc species have been evaluated for conservation³, resulting in many extinctions going undocumented and extinction rates underestimated.

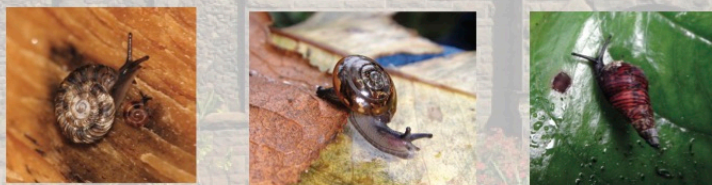


Figure 1: Representatives of endemic Hawaiian land snails
Left to right: *Cookeconcha hystricella*, *Kaala subrutilla*, *Laminella sanguinea*



Figure 2: Examples of the issues threatening the security of BPBM land snail collections.

What's the Problem? (Fig. 2)

- Specimens stored in glass vials with cotton stoppers (threatened by Byne's and/or glass disease)
- Specimen information locked in handwritten labels and other historical documents or if digitally transcribed, records are incomplete with abbreviated or misspelled, names of species and localities
- Type material largely unassessed
- Digital resources (e.g. online database, specimen images) are incomplete and inaccessible to public

References:

- 1) Holland, B.S. Land Snails. 2009. In: *The Encyclopedia of Islands* (R. Gillespie & D.A. Clague, eds), p. 537-542. Science Publishing Group, University of California Press.
- 2) Régnier, C., Fontaine, B. & Bouchet, P. 2009. Not knowing, not recording, not listing: numerous unnoticed mollusk extinctions. *Con Bio* 23(5): 1214-1221.
- 3) Hilton-Taylor, C., Pollock, C.M., Chanson, J.S., Butchart, S.H., Oldfield, T.E. & Katariva, V. 2009. State of the world's species. *Wildlife in a Changing World—An Analysis of the 2008 IUCN Red List of Threatened Species*, 15.

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The Bishop Museum (BPBM) has nearly 4 million land snail specimens in more than 180,000 cataloged lots (*ca.* 13,000 type lots). Species in the collection represent 90% of the Pacific island geographic regions (Fig. 3).



Figure 3: Some BPBM land snail collections from across the Pacific

BPBM Malacology Collection Notes of Interest

- Collections from major expeditions conducted over 100 years ago (e.g. Mangarevan, Tanager, Mary Eleanor King's Pele) throughout the Hawaiian Archipelago and Indo-West Pacific
- Contains non-native species collected since the late 19th century – providing insights to the historical and current distribution, spread and overall timeline of introduction of these species
- Notable collections: Andrew Garrett (purchased 1894), Thaanum and D.B. Langford (160,000 specimens), C.M. Burgess cowries, E.A. Kay (Hawaiian marine molluscs), and a few more land snail collections

What's the Plan?

- Replace all cotton in glass vials with archival foam or polyethylene caps
- Ledger, label, and other historical document data will be digitized and new thermal transfer, acid-free labels with QR codes created
- Each putative type lot will be assessed and imaged
- Specimen data and type images will be made available through the BPBM website, National Hub (IDigBio) and GBIF portals.

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