Mitglied der Leibniz-Gemeinschaft

museum für naturkunde
Leibniz-Institut für Evolutions- und Biodiversitätsforschung

New insights from a lost world

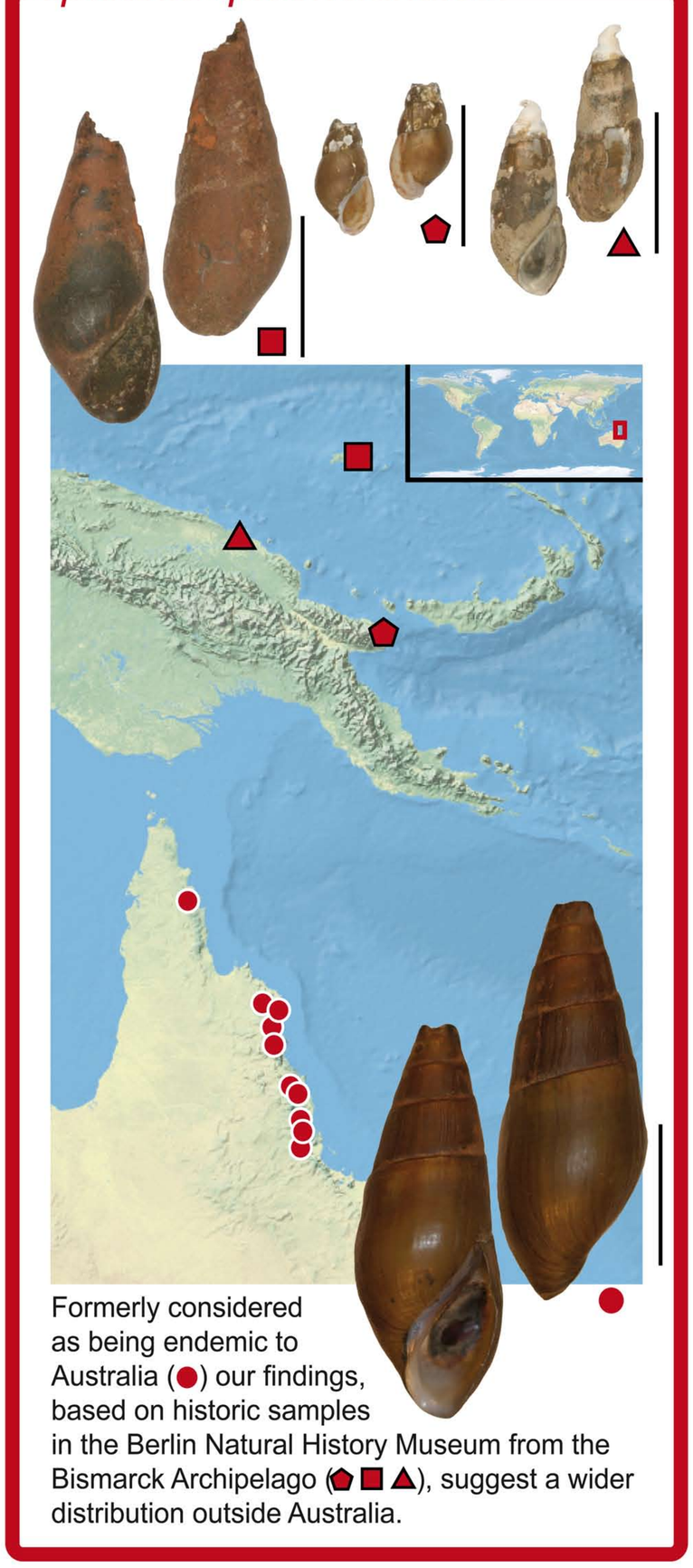
Unlocking the potential of museum collections using historical specimens

Matthias Glaubrecht[1], Alex Greenwood[2], Jana Ebersbach[1], Annabell Szymansky[1], Karin Hönig[2], Benedikt Wiggering[1], France Gimnich[1]

[1] Museum für Naturkunde Berlin, Leibniz Institute for Research in Evolution and Biodiversity at the Humboldt University, Invalidenstraße 43, 10115 Berlin, Germany;
[2]Leibniz Institute for Zoo and Wildlife Research in the Forschungsverbund Berlin e.V., Alfred-Kowalke-Straße 17, 10315 Berlin Germany
matthias.glaubrecht@mfn-berlin.de; benedikt.wiggering@mfn-berlin.de; france.gimnich@mfn-berlin.de

We tested a non-destructive ancient DNA extraction protocol for historical mollusks specimens, sampled during the last century, in order to explore for use and tap malacological museum collections, as e.g. from the Berlin Natural History Museum. The procedure was considered suitable for various historic tissue and shell samples from limnic thiarid and paludomid gastropods, for which here four case studies from SE Asia and Australia underline the potential of this method.

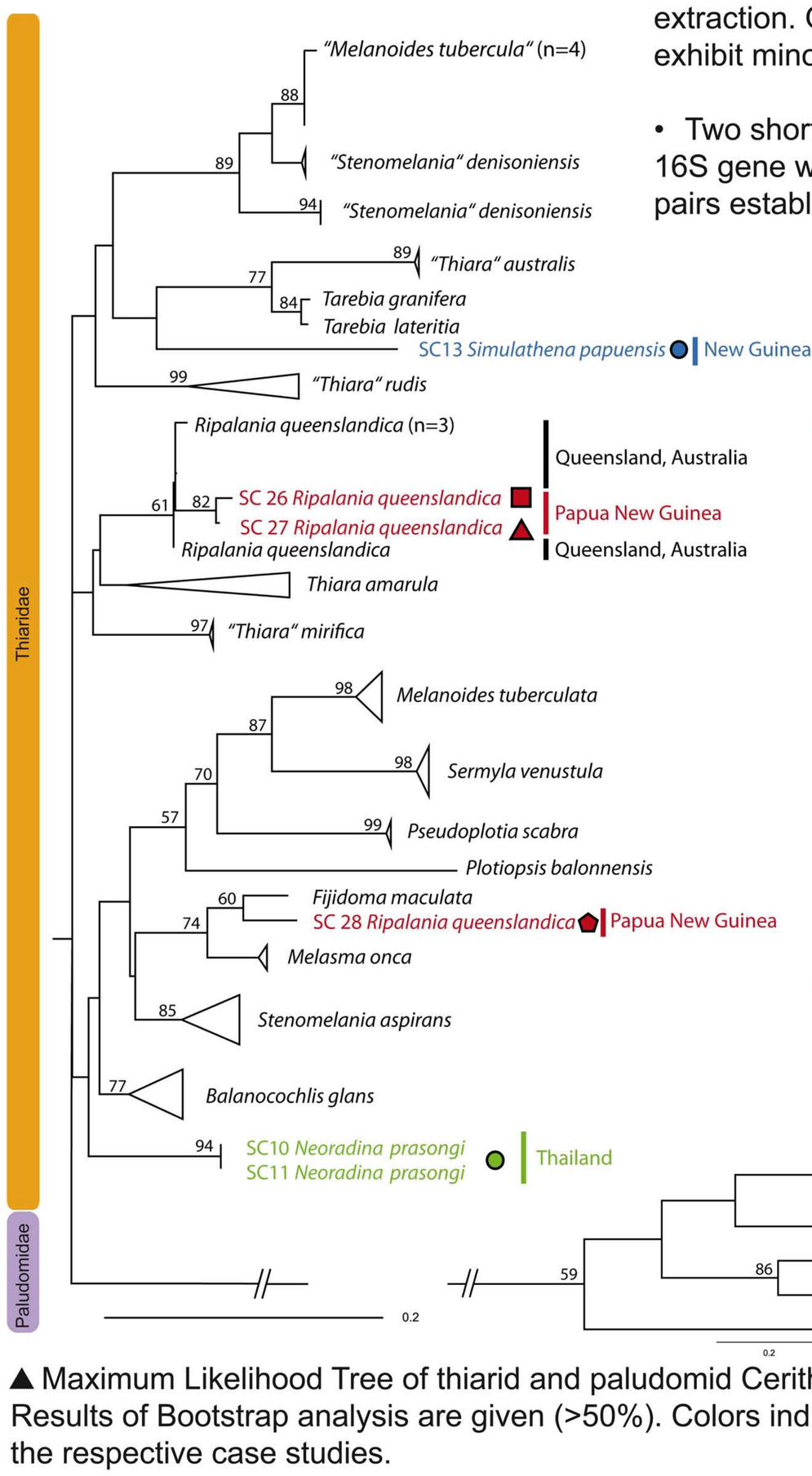
Ripalania queenslandica



Formerly considered as being endemic to Australia (●) our findings, based on historic samples in the Berlin Natural History Museum from the Bismarck Archipelago (⬟ ■ ▲), suggest a wider distribution outside Australia.

- Entire shells or fragments, operculum and foot tissue from ethanol samples were used for DNA extraction. Only the periostracum in few shells exhibit minor alterations.

- Two short fragments (~100bp/~200bp) of the 16S gene were amplified via PCR using primer pairs established for Thiaridae.

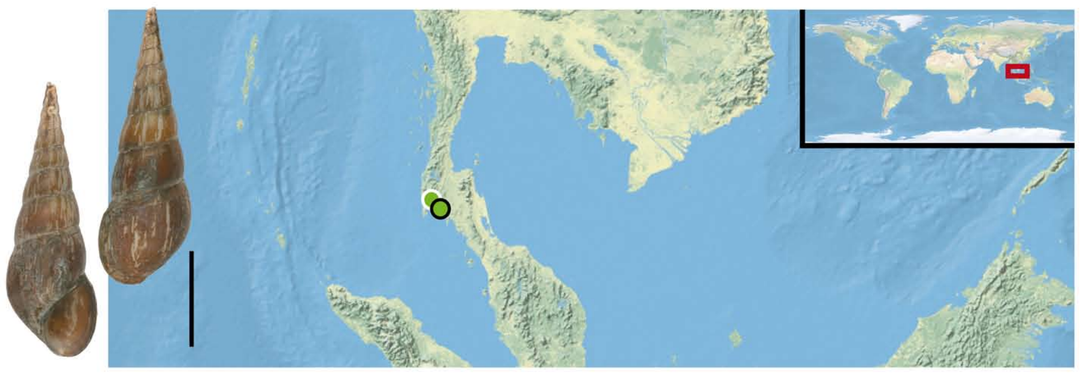


▲ Maximum Likelihood Tree of thiarid and paludomid Cerithioidea, based on 16S mtDNA. Results of Bootstrap analysis are given (>50%). Colors indicate historic DNA samples of the respective case studies.

Simulathena papuensis

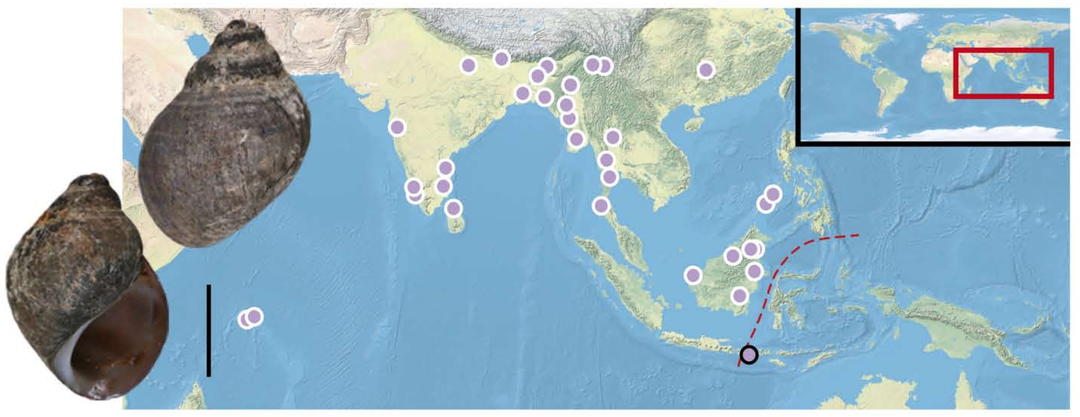
Described by Houbrick (1992) as a marine Planaxidae, *Simulathena papuensis* actually might rather represent a member of the limnic Thiaridae. Several features in the original species description - e.g. anatomy, reproductive biology (brood pouch), radula and protoconch - also hint at a thiarid affinity.

Neoradina prasongi



Neoradina prasongi, verified here with types (◉) and topotypical (●) material from southern Thailand, represents an independent thiarid lineage, distinct both from *Melanoides* and *Stenomelania*.

Paludomus sp.



One historical sample of *Paludomus sp.* (◉) from the island of Lombok reveals that the taxon is apparently not strictly Oriental in its distribution.