New insights from a lost world
Unlocking the potential of museum collections using historical specimens

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We tested a non-destructive ancient DNA extraction protocol for historical mollusk 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.

• 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.

Described by Houbrink (1992) as a marine Planaxiidae, 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.

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.

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.

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