

Examining historical Partulidae material – Bishop Museum collections

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In July 2015 I was able to complete the examination of historical Partulidae material with a visit to the Bishop Museum in Hawaii.

The museum has the largest collection of Pacific island snails anywhere in the world and, most significantly, almost all the shell lots are accompanied by spirit material. For the partulids the collections range from some of Garrett's duplicates from the 1800s through to very recent samples. The bulk of the collection was amassed under the direction of Yoshio Kondo and reflects his particular interest in the family. Many of the samples contain his notes relating to unfinished revisions of different groups of partulids.

During a two week visit I examined all of the shell material, measured 500 shells and dissected 190 specimens, completing my examination of all the species available as spirit material. In most cases this completed gaps in the data, in a few cases unexpected finds were made. Most notably an undescribed species from the Austral islands known only as subfossils and two dead shells was found as a large series of fresh shells and spirit specimens. One of the most contentious species, *Partula compressa*, had been in dispute since 1884 but a small number of spirit specimens were found, confirming its distinctiveness. Similarly, the disputed *P. jackieburchi* was also supported, and a number of overlooked specimens identified. Not all discoveries supported splitting species; three of Crampton's manuscript species from Fiji and Wallis & Futuna now have to be rejected as variants of well established species.

One particular target group for this visit was the *Samoana* species of the Marquesas islands. Current taxonomy of these species is clearly inaccurate, and undescribed species have been set aside since 1929. Kondo had drafted a revision of the group but set it aside, publishing a description of only one species. Enormous collections from each island of the Marquesas allow the species boundaries to be redefined, requiring some reassignments and the description of one new species (one of those identified by Pilsbry in 1929, but never published). Interestingly a series of manuscript names proposed by Cooke refers to distinct forms of a single species



Bishop Museum collections



Bishop Museum spirit material

probably in the process of diverging into three allopatric species, but the radiation appears to have collapsed through movement of snails between populations, probably by human agency.

A final aspect was to examine the material collected by Jack Burch and others in 1970. This is significant material as part of it was preserved in such a way that DNA could be extracted and this forms a very large part of the partulid molecular phylogeny. The Society Islands species had been identified based on Crampton's descriptions but this material led Kondo to change Crampton's species boundaries on Tahiti. The published molecular phylogeny appears to show widespread hybridisation on Moorea and Tahiti but is largely based on the original identifications. Updating the identifications with Kondo's reinterpretations and checking identifications of some specimens shows that there is far less hybridisation that was thought, although it clearly did occur.

In addition to taxonomic work I also had useful discussions with Mike Hadfield, David Sisco and Brenden Holland on the issues caused by *Euglandina* and *Platydemus* introductions, and the problems of conservation breeding. Attending the Hawaiian Landsnail Taxonomic Workshop provided an interesting perspective on the issues facing the remaining Hawaiian snails.

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<http://islandbiodiversity.com/Partulapages.htm>