Chong 2006

GENETIC AND MORPHOLOGIC VARIATION IN *ANODONTA* OF THE COLUMBIA RIVER BASIN

by

Jer Pin Chong

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Wildlife Biology

Approved:

Karen Mock Major Professor	Mark Vinson Committee Member
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2006

ABSTRACT

Genetic and Morphologic Variation in *Anodonta*

of the Columbia River Basin

by

Jer Pin Chong, Master of Science

Utah State University, 2006

Major Professor: Dr. Karen Mock
Department: Forest, Range and Wildlife Sciences

Freshwater mussels (Order Unionoida) are one of the most endangered fauna in North America. In the western U.S., taxonomy within the genus *Anodonta* has been problematic, and based entirely on shell morphology. In this study, I assessed genetic variation among *Anodonta* currently inhabiting the Columbia River near its confluence with the Willamette River (the type locality for three of the six western U.S. *Anodonta* species). Two highly divergent lineages were discovered in this locality, corresponding to two distinct morphotypes (putatively *A. oregonensis* and *A. nuttalliana*). These lineages were also represented in other western U.S. drainages, and included two other currently recognized *Anodonta* species. The level of divergence between these lineages is suggestive of a need for genus-level taxonomic revision in western *Anodonta*. This research provides an important first step towards resolving taxonomic confusion in western *Anodonta* species, a necessity for the effective conservation, monitoring, and management of this fauna. (53 pages)

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Dick Neves

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Sent: Thursday, June 07, 2007 7:22 PM
Attach: thesis-JPC.pdf
Subject: RE: Anodonta wahlamatensis

Hi Dick,
Dan Graf just told me that there was some unio correspondence about A.wahlametensis (under a snail header!) so I presume this is what you're asking about. There seems to be fairly general agreement that wahlametensis has been synonymized with nuttalliana, and our molecular work seems to confirm that. I'll attach JerPin Chong's thesis fyi. We recently submitted a paper to Conservation Genetics about western Anodonta - including californiensis, nuttalliana (wahlametensis), kennerlyi, oregonensis, and beringiana, and using as much topotypic material as we could. It wil be a while before it gets through review, so it's definitely not in press yet. Bottom line is that there are three clades: 1) californiensis/nuttalliana is one clade with a decent amount of basin-level structuring within, 2) oregonensis/kennerlyi is another clade (~12% divergent COI) with less geographic structure (toptypic specimens for these species share a haplotype), and 3) beriangiana is ~12-13% divergent from both of the other clades,and clusters with A.woodiana. A.nuttalliana and A.wahlametensis morphotypes were not easily distinguished at their type locality (Columbia/Willamette River confluence) and seemed to represent a morphological continuum, and they shared COI haplotypes. At this same type locality, however, oregonensis was quite distiinct (as per above). We confirmed this with nuclear AFLPs so we know it's not some odd mitochondrial introgression issue. I hope that answers your question? Maybe more than you wanted to know? I'm glad there is interest western Anodonta! We are continuing to work on western fw mussel phylogeography, with collections continuing over the next couple of years, and are well into microsatellite development for Anodonta (2 clades) and Margaritifera. Those will be nice tools for population-level work!

Karen

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Subject: Anodonta wahlamatensis

Karen- Art Bogan siad that you are doing some work on western Anodonta. Is this a valid species?

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