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Preliminary Analysis of Variation in the Cytochrome Oxidase I (COI)
Mitochondrial Gene in Spectaclecase (*Cumberlandia monodonta*)

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We have performed a preliminary analysis of within-population and among-population variation at the COI mitochondrial gene for three populations of the spectaclecase (*Cumberlandia monodonta*). These results are based on 40-48 individuals each for populations from the Gasconade River (Missouri), the St. Croix River (Minnesota/Wisconsin), and the Clinch River (Tennessee). Our results show striking differences in the genetic makeup of these three large populations.

Genetic variation within populations varied, with the Clinch River containing considerably more variation than the other populations. Our sampling revealed a total of 17 haplotypes (maternal lineages) in the Clinch River, with 11 of them unique to this river (Figure 1). The other two populations showed similar haplotype totals and considerably fewer unique haplotypes. Thus, the Clinch River population contain a relatively large amount of unique genetic material. However, the other two populations each also contain significant numbers of unique haplotypes.

Haplotype frequencies varied among populations, indicating the presence of geographic structure. Three common haplotypes made up 40% to > 70% of all individuals in each population (Figures 2, 3, and 4). However, more than 25% of individuals in the Clinch River population, and more than 15% of individuals in the Gasconade River population had haplotypes unique to the particular population. Overall, 20 of the 26 haplotypes were found in only one population, 2 were found in two populations (St. Croix and Clinch for both), and 4 were found in all three populations.

Based on these preliminary results, it is likely that each population is significantly different from the others. As a result, the choice of source populations will have major impacts on the reestablishment of extirpated populations. This geographic variation in population genetic structure must be considered when planning such management activities.

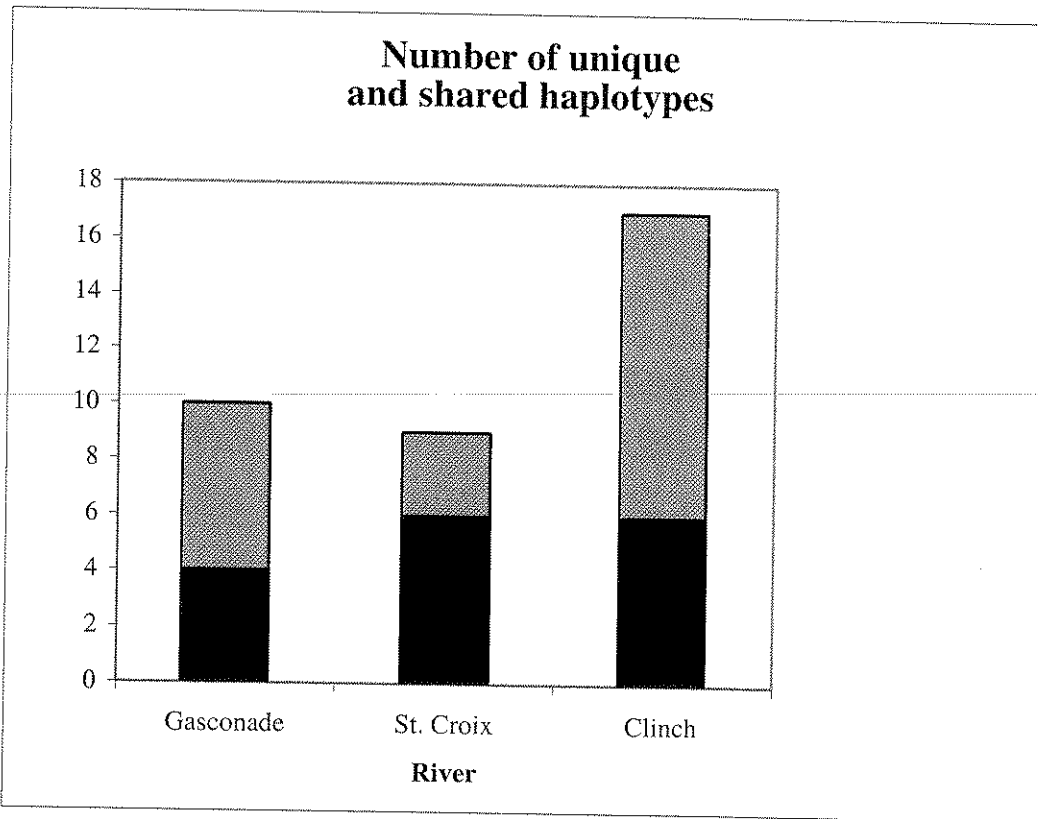


Figure 1. Number of unique (found in only one population) and shared (found in more than one population) haplotypes in populations of spectaclecase (*Cumberlandia monodonta*).

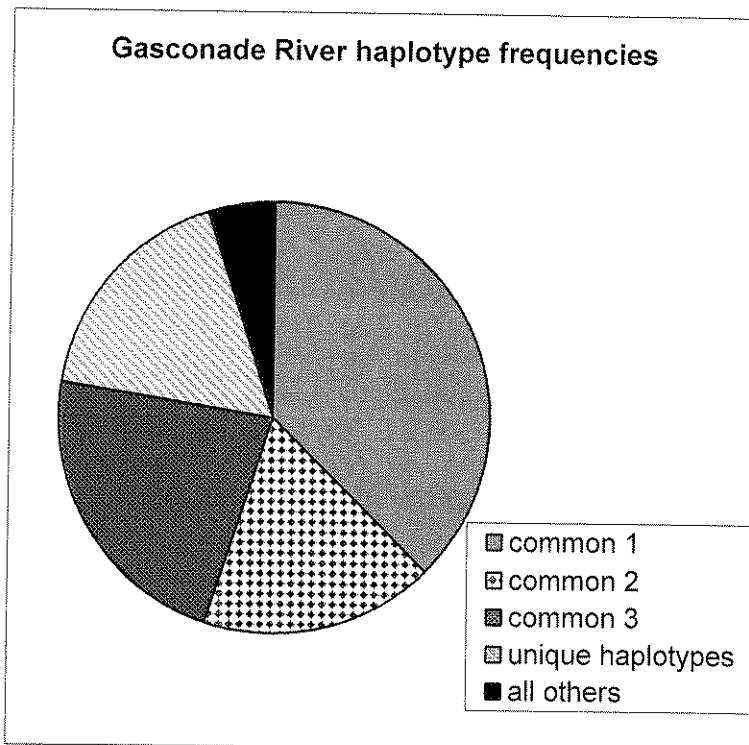


Figure 2. Proportion of each haplotype within the Gasconade River population.

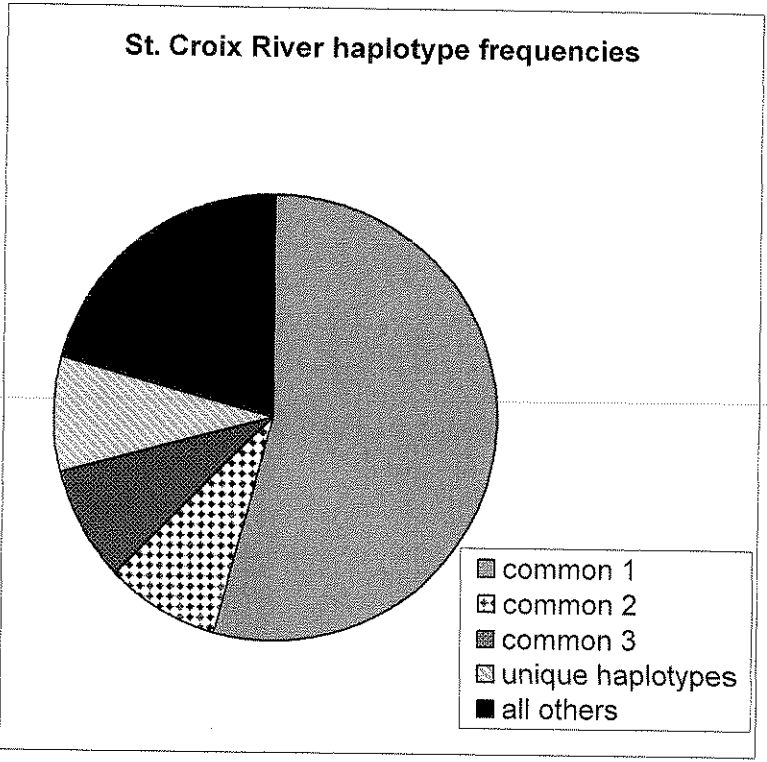


Figure 3. Proportion of each haplotype within the St. Croix River population.

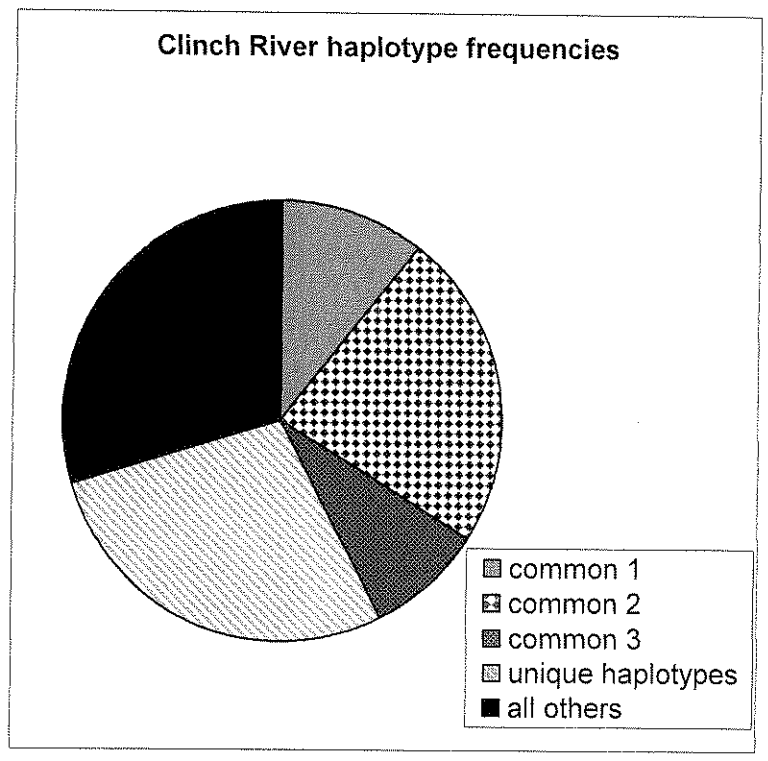


Figure 4. Proportion of each haplotype within the Clinch River population.