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Title

Genetic Variability in Hydrastis Canadensis L. Using Rapd Analysis

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Abstract

ABSTRACT GENETIC VARIABILITY IN HYDRASTIS CANADENSIS L. USING RAPD ANALYSIS
FEBRUARY 2009 KERRY J. KELLEY, B.A. MOUNT HOLYOKE COLLEGE M.A. UNIVERSITY OF
MASSACHUSETTS AMHERST Directed by: Professor Lyle Craker Hydrastis canadensis L.
(goldenseal) is an endangered perennial wildflower species native to eastern North America. In
this study, several populations of goldenseal, (both cultivated and wild type) were analyzed for
genetic variability. The samples were collected from plant populations in North Carolina, Ohio,
Pennsylvania and West Virginia and preserved using silica gel during collection. Random
amplified polymorphic DNA (RAPD) analysis technique was used to generate DNA profiles from
individual plants and to estimate genetic variability between groups (cultivated and wild type),
among populations within groups and within populations using analysis of molecular variance
(AMOVA) and a UPGMA clustering phenogram. Our results demonstrate that the bulk of genetic
diversity may be within and among populations, but not between groups. This indicates the need
for preservation and conservation efforts at the population level. The next step would be to study
goldenseal populations more in depth for underlying causes of the genetic variability observed in
this study. Further study of genetic variability with different molecular markers may be needed to
clarify the level of diversity for the species at the group level. Increased knowledge of genetic
variability and the identification of accessions of goldenseal would prove useful for reintroduction
and cultivation strategies.

First Advisor

Lyle E. Craker

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