Population Genetics of the Endemic Hawaiian Species Chrysodracon hawaiiensis and Chrysodracon auwahiensis (Asparagaceae): Insights from RAPD and ISSR Variation

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ABSTRACT

The genus Chrysodracon has six endemic species in the Hawaii Islands. Chrysodracon hawaiiensis is endemic to Hawaii Island and was described as a distinct species in 1980. It was listed as an endangered species on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List in 1997. This woody plant species was, at one time, common in exposed dry forests, but it became very rare due to grazing pressure and human development. The tree species Chrysodracon auwahiensis (C. auwahiensis), endemic to Maui and Molokai, still has large adult populations in dry lands of the islands, but unfortunately no regeneration from seed has been reported in those areas for many years. The two endemic species were examined using the molecular technique of random amplified polymorphic DNA (RAPD) and inter simple sequence repeats (ISSR) to determine the genetic structure of the populations and the amount of variation. Both species possess similar genetic structure. Larger and smaller populations of both species contain similar levels of genetic diversity as determined by the number of polymorphic loci, estimated heterozygosity, and Shannon's index of genetic diversity. Although population diversity of Chrysodracon hawaiiensis (C. hawaiiensis) is thought to have remained near pre-disturbance levels, population size continues to decline as recruitment is either absent or does not keep pace with senescence of mature plants. Conservation recommendations for both species are suggested.

Keywords: Chrysodracon; conservation; Hawaiian species; ISSR; Pleomele; population genetics; RAPD

REFERENCES