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Inga edulis Legume Morphology and Genetic Structure in Wild and Cultivated Populations in Amazonian Peru

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Abstract

Inga species (Fabaceae) are important components of Neotropical forests, as well as local food source. *Inga edulis* is one of the most used species in the Amazon region for fruits and shade tree. To the best of our knowledge little is known about *I. edulis* species' genetic diversity and structure in the wild and cultivated populations. In our study it was assessed the genetic diversity and structure using 259 trees sampled in five wild and 22 cultivated *I. edulis* populations in three different geographical regions (Selva Central, Ucvayali and Loreto) of Amazonian Peru. *Inga edulis* legume length was measured to highlight differences between wild and cultivated *I. edulis* trees. Using microsatellite markers it was determined the genetic diversity and structure of populations using analysis of molecular variance and Bayesian analysis. The average legume length in cultivated *I. edulis* trees (83 cm) was significantly larger than (39 cm) legume length average in wild trees. The Loreto region cultivated *I. edulis* trees had the highest legume length (148 cm) and lowest allelic richness. The expected genetic diversity and the average number of alleles was higher in the wild *I. edulis* compared to the cultivated *I. edulis* populations. A loss of genetic diversity was confirmed in the *I. edulis* cultivated populations. The species could have been simultaneously domesticated in multiple locations, usually with local origin. The original *I. edulis* Amazonian germplasm should be maintained, and cultivated population new germplasm influx from the wild populations could increase genetic diversity, provided that fruit yield will not be compromised.

Keywords: Agroforestry, Amazon basin, biodiversity conservation, domestication, edible fruit, Inga