Genetic diversity of *Juniperus turbinata* subsp. *canariensis* in the Canary Islands. Implications in conservation.

Juan F. Jiménez[1], Miloud Aouissat[2], Isabell Hensen[3], Jose Luis Cánovas[1], & Pedro Sánchez-Gómez[1]

1 Departamento de Biología Vegetal (Botánica). Universidad de Murcia. 30100 Murcia. España
2 Departamento de Biología. Universidad de Saida. Saida. Argelia
3 Institut für Biologie. Martin-Luther Universitat. 06099 Halle. Alemania

INTRODUCTION

J. Turbinata Guss. subsp. *canariensis* is an endemic taxa from the Macaronesian region (Canarias and Madeira archipelago). Populations are small and scarce and usually are located in environments in which soil and climatic conditions are unfavorable, such as coastal dune formations, litosoils, cold moors or windy areas (Fig 1, Fig 2). *J. turbinata* subsp. *canariensis* is protected under law in Canary islands and moreover it is of great interest from the point of view of conservation since this species can be found in habitats given priority in the European Directive 92/43 EEC.

In this work, as partial result of a global study on this species, we present results on the genetic variability of 8 Canarian populations as well as on the distribution of the genetic diversity using AFLP (Amplified Fragment Length Polymorphism) molecular markers.

Fig. 1. *J. turbinata* from El Hierro.

Fig. 2. *J. turbinata* from Gran Canaria.

MATERIAL AND METHODS

78 individuals belonging to 8 populations were collected covering the whole range of *J. turbinata* (Fig 3) in Canary Islands. The study of genetic variability and genetic structure of populations was carried out with three selected AFLP primers

Amplification products were analyzed with an automated sequencer. Data sizing and scoring were done with Genemapper software. Genetic diversity parameters were calculated with.AFLPsurv 1.0 and MVSP 3.2. A bayesian model-based analysis was performed to infer the genetic structure of populations with Structure 2.2. DeltaK was used to infer the number of clusters in which the individuals were included.

RESULTS

A total of 591 AFLP fragments were scored with 3 primer combinations, being polymorphic 504 (85.3%) of them.

Genetic diversity was high in every population, and no genetic differentiation between populations was observed (Fig 3).

Bayesian inference (Fig 3) suggest that genetic variation is distributed in two main groups, the first one includes the populations of Tenerife, La Gomera and La Palma, whereas the second one groups El Hierro populations. Individuals of Gran Canaria populations are assigned to one or another group in similar percentages. PCoA (Fig 4) plot shows similar results; Gran Canaria populations are in an intermediate position between the other two groups.

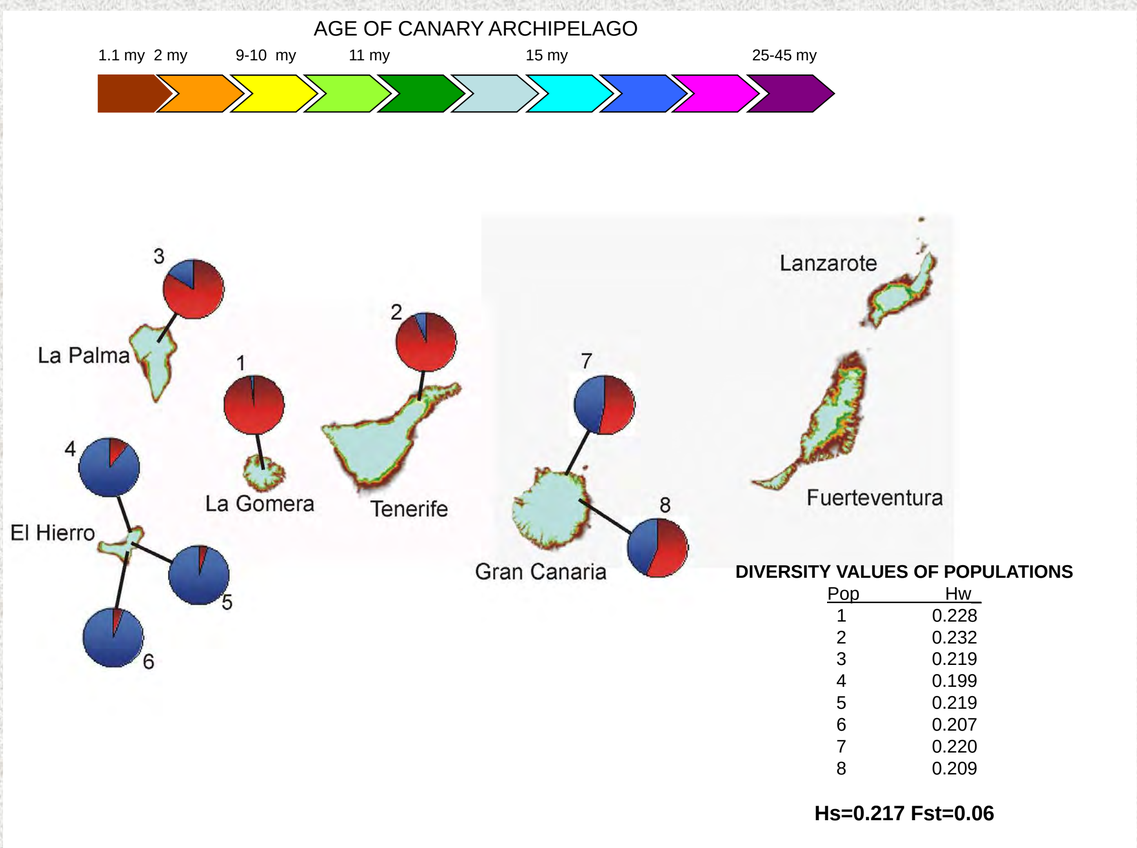

Fig. 3. Sampled populations of *J. turbinata.* Pie charts represent the proportion of membership of individuals to one or other group inferred with Structure 2.2. Hw, genetic diversity. Hs= Total Genetic diversity. Fst, Wright fixation index. The age of every island is located above them. The oldest island is Fuerteventura, whereas the youngest is El Hierro.

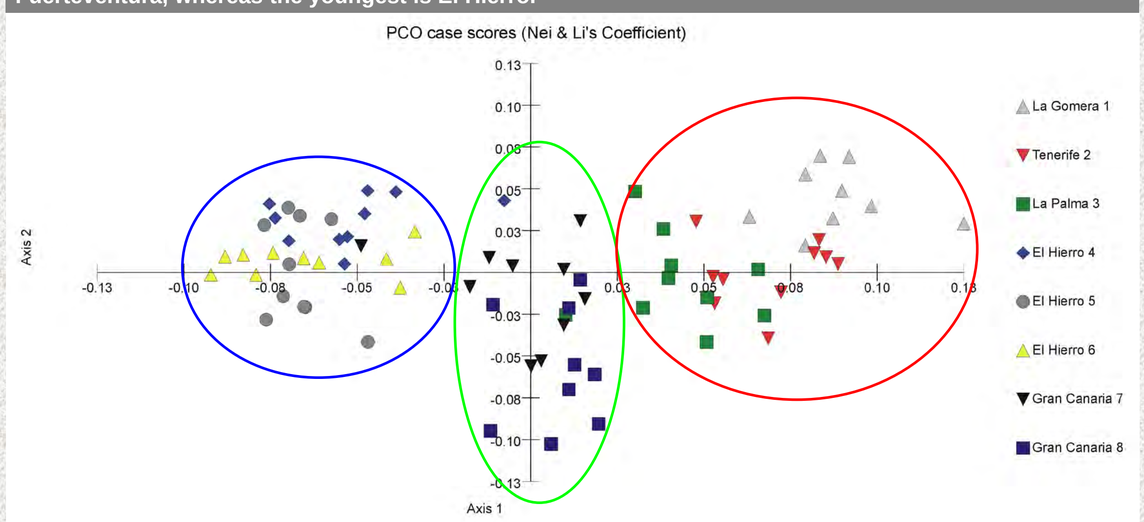

Fig.4. PCoA plot showing the genetic relationships among 8 populations of *J. turbinata* from Canary islands.

DISCUSSION

AFLP shows high genetic diversity in *J. turbinata*. In deed, our data shows higher genetic diversity values than other studies that used other kind of molecular markers.

Fst values suggest that gene flow between populations is maintained, or alternatively, the effects of isolation are minimised due the longevity of individuals.

The genetic structure of populations do not show a pattern of colonization of island according to the age of them. According to such pattern, Gran Canaria, the oldest island in which lives *J. turbinata* (Fig 3), should be more related to Tenerife than to El Hierro. A complex pattern of colonization, or long-dispersal gene flow are the hypotheses that will let us to explain genetic relationships between the populations.

Conservation plains should take into account the genetic structure of populations, especially for reintroductions or reinforcement of populations.

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