

Diversity of Common Juniper (*Juniperus Communis L.*) from the Typical Geographic Areas in Albania

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Abstract

Juniperus communis L. a wild shrub species, growing especially in mountain areas of Albania in association with the other most important coniferous species, is included in the Red Book of Albania as an endangered species growing wild in Albania. Nowadays, berries of *Juniperus*, exported from Albania to many countries and especially in EU countries, are considered as important income source for the local people that lives in the poor mountain areas of the country. Assessment of geographic distribution of several populations of *Juniperus*, observed in 10 districts of Albania (Malesi e Madhe, Tropoje, Kukes, Diber, Elbasan, Librazhd, Bilisht, Korce, Erseke, Leskovik) was carried out. Berries fruits were also collected from 18 different natural growing areas of *Juniperus* in Albania. Spatial analysis, using grid square cells of 1x1 km, and 10 x 10 km, detects the areas of high diversity of *Juniperus* populations. The geographic areas were separated into small grid square cells, and grid cells of 1 x 1 km, and 10 x 10 km was used to assess the geographic distribution, diversity indices, and richness estimators of *Juniperus* populations. The biodiversity monitoring of Juniper populations, growing naturally in different mountain areas of Albania, contributes for increasing efficiency and enhancement in genetic improvement plant programs which will lead to link the information needed to the improvement of local food and beverages industry.

KEYWORDS: *Juniperus communis*, geographic distribution, Albania

INTRODUCTION

Juniperus communis L. (Cupressaceae) is a genus represented by 60 species, widespread in warm temperature areas in both Hemispheres well as on the Balkan Peninsula (Djordjevic et al., 2011). *Juniperus communis* is present in northern, north-east, central, southern, eastern and south-eastern parts of Albania (Vangjeli et al., 1996). Common Juniper (St. John's wort) is an endangered species growing wild in Albania with interesting pharmacological and biological properties. It is one of the most important medical plants, used as medical herb and also represent an important asset to the livelihoods of mostly of the population in Albania (Asllani U., 2004). Nowadays berries are mainly exported from Albania to many countries especially in Balkan area. Evaluation geographic distribution of several populations of *Juniperus communis* L. is in high interest to be studied. The biodiversity monitoring of Albanian juniper plant population contributes to increasing efficiency and enhancement also to the food and beverages industry in which Albanian local industry is based. This study gives contribution to ensure an important basis for studying different varieties of *Juniperus communis* L. in genetic improvement plant programs.

MATERIALS AND METHODS

- Plant material

Aerial parts of *Juniperus communis* L. were collected from November to December 2017 in full fructification. The study was conducted in the more natural growing areas of juniper *Juniperus communis* L. populations, including 18 districts of Albania: Malësi e Madhe (Vermosh), (Bogë) Tropojë (Valbone), (Lekbibaj); Kukës (Krykcaj), (Kalise); Dibër (Maqellare), (Golloborde); Elbasan (Labinot), (Shushice); Librazhd (Qukës), (FushëStuden); Bilisht (Miras), (Arrze); Korcë (Voskopojë), (Dardhë); Ersekë and Leskovik. The study was conducted in the main natural growing areas of common juniper (*Juniperus communis* L.) populations in Albania for two years. Between the localities it is considered a large distance for the purpose of having diversity regarding the locations for considering as a reference matter also the altitude. Voucher specimens were deposited in the Gene bank of the Agricultural University of Tirana. In this investigation, geographical characters were evaluated.

- Statistical analysis

Spatial analysis, using grid square cells of 1x1 km, and 10 x 10 km, detects the areas of high diversity of *Juniperus* population.

RESULTS AND DISCUSSION

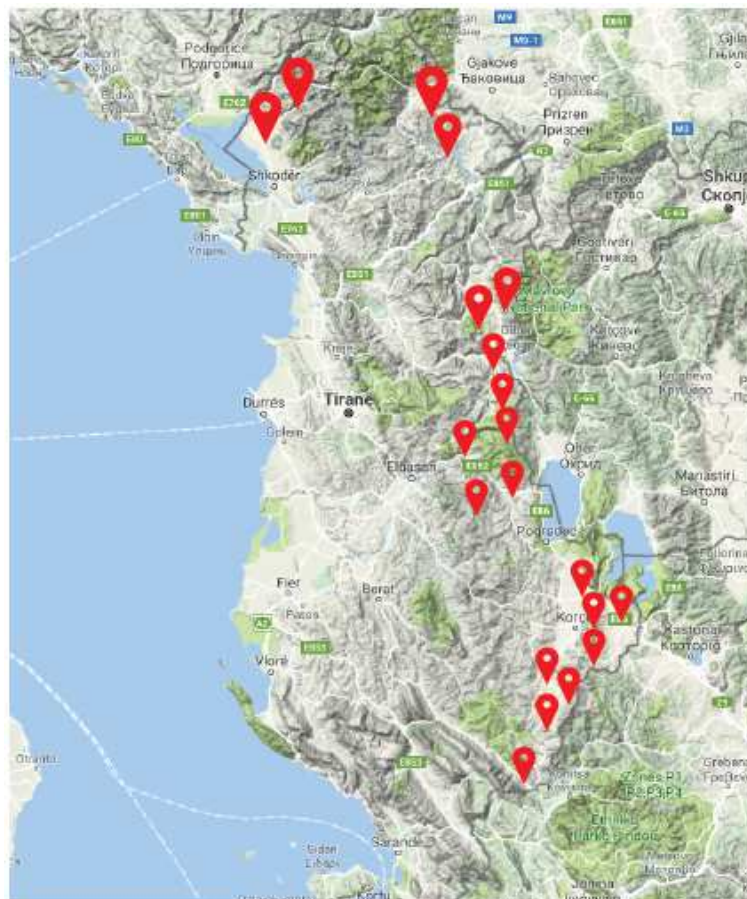


Fig.1- The geographical origins of *Juniperus communis*L. populations, generated by maps.google.com at the study area

Juniperus communis L. is an endangered species growing wild in Albania (PAPADHOPULLI, G. 1976) and since it is included in the Red Book of Albania (Demiri, M, (1983) frequent studies should be done to evaluate the diversity and the highest population locations. Common Juniper is present in northern, north-east, central, southern, eastern and south-eastern parts of Albania (Vangjeli et al., 1996). Our aim was to locate the highest and richness populations growing wild in all territory of Albania. Assessment of geographic distribution of several populations of *Juniperus*, observed in 10 districts of Albania (Malësi e Madhe, Tropojë, Kukës, Dibër, Elbasan, Librazhd, Bilisht, Korçë, Ersekë, Leskovik). Berries fruits were also collected from 18 different natural growing areas of *Juniperus* in Albania. Spatial analysis, using grid square cells of 1x1 km, and 10 x 10 km, detects the areas of high diversity of *Juniperus* population. Elevation and coordinates are registered for the highest populations of *Juniperus Communis* L. (Table 1).

Locality		Elevation	Coordinates
Malësi e Madhe	Vermosh	1046 m	42°35'31.6"N 19°41'48.0"E
	Bogë	899 m	42°23'24.2"N 19°38'13.7"E
Tropojë	Valbonë	951 m	42°26'45.3"N 19°52'53.6"E
	Lekbibaj	283 m	42°17'21.7"N 19°56'05.3"E
Kukës	Kalise	326 m	42°04'53.9"N 20°24'50.1"E
Dibër	Ostren	1048 m	41°25'32.8"N 20°27'21.7"E
	Trebisht	785 m	41°24'29.5"N 20°32'23.7"E
Elbasan	Shushicë	343 m	41°05'34.2"N 20°09'21.9"E
	Labinot-Mal	581 m	41°10'59.9"N 20°09'20.8"E
Librazhd	Qukës	414 m	41°04'51.0"N 20°27'07.9"E
	FusheStuden	1123 m	41°18'58.8"N 20°24'01.2"E
	Steblevë	1197 m	41°20'33.9"N 20°26'54.8"E
Bilisht	Miras	976 m	40°30'18.5"N 20°55'18.0"E
	Arrzë	1128 m	40°30'07.8"N 20°50'13.9"E
Korce	Voskopojë	1255 m	40°38'40.8"N 20°36'13.5"E
	Dardhe	1301 m	40°31'16.1"N 20°49'32.0"E
Ersekë		1021 m	40°19'46.8"N 20°40'41.9"E
Leskovik		903 m	40°09'09.0"N 20°36'26.1"E

Table 1. Geographical coordinates and elevation measured in 18 districts with the highest population of *Juniperus communis* L.

Data quality of *Juniperus communis* L. collection including the accuracy and precision of geographic coordinates firstly georeferenced data were checked for inconsistencies. Data points with incorrect coordinates on the administrative unit (district) were assigned coordinates where possible while duplicate or doubtful data were removed.

CONCLUSION

Geographic distribution results of observed juniper populations given on the map as present points in all Albanian territory show the areas with higher richness of *Juniperus Communis L.* populations. Our precision in finding the appropriate coordinates of high populations of *Juniperus Communis L.* ensures a valuable data for the genetic improvement programs. The information registered will be provided to the proper institutions to update the previous data of locations for *Juniperus communis L.* to erase the incorrect assigned coordinates and to avoid duplicated units.

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