Manuscript ID : 00000-91858

Source ID : 00000242

Annals of Oradea University, Biology Fascicle

Volume 28, Issue 1, 2021, Pages 109-116, Page Count - 8

EFFECT OF ENVIRONMENTAL FACTORS ON VARIATION OF PHENOLIC COMPOUNDS IN LEAVES OF Pistacia lentiscus L. AND Pistacia atlantica Desf

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Abstract

Pistacia lentiscus, evergreen sclerophyll shrub and P. atlantica, deciduous species, belong to Anacardiaceae family. They were chosen in this study because they suit the Mediterranean climate characterized by hot and dry summers and mild winters with heavy rain. Polyphenols are involved in the response to biotic and abiotic stress. However, very few studies have been conducted on the polyphenols of P. lentiscus and P. atlantica and to our knowledge, there are no studies on phenolic variability. The aim of this work is to study polyphenolic variability in Pistacia lentiscus and P. atlantica leaves, in relation to environmental factors. The environmental factors taken into account are altitude, slope exposure and some soil characteristics as pH, organic matter and Calcium carbonate. The total polyphenols were extracted with 70% ethanolic solvent and phenolic aglycones with diethylether after acid hydrolysis. HPLC-DAD was used to identify and quantify polyphenolic compounds in the extracts when GC-MS was used to identify the aglycones. Total polyphenols, total flavonoids and hydrolysable tannins were quantified using an UV/Visible spectrophotometer. In order to understand the variability within and between the two species and its relation to certain environmental factors, principal compound analysis was performed. The results obtained showed the presence of high amounts of polyphenols in the leaves of both species, the total polyphenol content varies from 19.50 ± 2.5 mg·g -1 DM to 28.56 ± 3.61 mg·g -1 DM. They also show intra and inter specific variability with respect to the environmental factors. Presence of several chemotypes of the two species were suggested. P. atlantica was qualitatively and quantitatively richer and relatively more homogeneous than P. lentiscus wich presents high intraspecific variability, fourteen compounds were detected by HPLC-DAD and more than twenty five by CG-MS.

Author Keywords

Pistacia lentiscus, P. atlantica, Phenolic compounds, Environmental factors

ISSN Print: 1224-5119
ISSN Online: 1844-7589
Source Type: Journals
Document Type: Journal Article
Publication Language: English
DOI:
Abbreviated Journal Title: AUOFB
Access Type: Open Access
Publisher Name: Oradea University Publishing House
Resource Licence: CC BY-NC
Major Subject: Physical Sciences
Subject Area classification: Environmental Science

Subject area: Pollution

Source: SCOPEDATABASE

Reference