

Abstract

A study on the diversity of natural *Arbutus unedo* Hellenic populations

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Abstract: The strawberry tree (*Arbutus unedo*) is well known for the use of its leaves, fruits, bark and roots in traditional medicine and more recently in the therapy of hypertension, diabetes, inflammatory and cardiovascular diseases. The plant contains several antioxidant compounds. The diversity of natural *A. unedo* populations from Greece is studied with leaf morphometrics and DNA markers. Five natural populations spanning from east (Lesvos island 39°12' N, 26°05' A) to west (Igoumenitsa 39°30' N, 20°15' E), and from north (Arnea, 40°29' N, 23°38' E) to south (Ancient Olympia 37°38' N, 21°46' E), were sampled. The fifth population was that of Kassandreia (40°01' N, 23°26' E), and the average sample size per population was N=20 trees. DNA extraction and isolation was a challenge due to high amounts of phenolics present in leaves (arbutin, catechin, ethyl gallate), and among many protocols studied the NucleoSpin® Plant II Mini Kit provided the best results for downstream applications. Morphometric population variation was studied by employing 11 leaf size and shape parameters recorded by image processing and analysing software. In contrasting north/south population comparisons it was found that regarding measurements of central tendency the northern population (Kassandreia) presented the highest values, while in contrast in the measures of spread the highest values were found in the southern population (Ancient Olympia). Furthermore, statistically significant population differences were found in leaf size, but not in leaf shape parameters. The combination of DNA markers and morphometric analyses provides a foundation for diversity studies and characterization of *A. unedo* populations for downstream applications in population genetics studies, genetic conservation, as well as in medicinal and natural products research.

Keywords: Strawberry tree; DNA quality; population variation; leaf morphometrics

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