Faculty of Silviculture and Forest Engineering

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Section 1:

Forests and biodiversity

COMPARATIVE MORPHO-ANATOMIC CHARACTERISTICS OF CEDRUS BREVIFOLIA HENRY NEEDLES: A TOOL FOR ASSESSING SPECIES LOCAL ADAPTATION.

Eliades N.-G., Frederick Research Center, Cyprus
Kounnamas C., Frederick Research Center, Cyprus
Manolis A., Democritus University of Thrace, Greece
Pirikkis A., Democritus University of Thrace, Greece
Varsamis G., Eastern Macedonia and Thrace Institute of Technology, Greece
Merou Th., Eastern Macedonia and Thrace Institute of Technology, Greece
Christou A., Ministry of Agriculture, Natural Resources and Environment, Cyprus
Tsintides T., Ministry of Agriculture, Natural Resources and Environment, Cyprus
Fady B., Ecologie des Forêts Méditerranéennes (URFM), France.
Papageorgiou A. C., Democritus University of Thrace, Greece

***Abstract**: The present study aims to investigate the variation of morphologic and anatomic characteristics of Cedrus brevifolia, as a result of adaptation within its natural population. This adaptation is expected to reflect the demographic and ecological forces on the species throughout its survival in different environmental conditions. Cyprus cedar (C. brevifolia) is an important endemic tree of the Cyprus flora, with narrow distribution in a sole fragmented population in the Paphos forest. The species is included in the Red Data Book of the Flora of Cyprus as vulnerable, while its habitat type (*9590) is characterised as a priority habitat according to the Habitats Directive (92/43/EC). Recent studies have shown that the species is characterised by high genetic variation and significant genetic differentiation between five patchy subpopulations. For the purposes of the present study, 16 sampling plots have been established within the five fragments, covering the natural and ecological boundaries of the species' distribution. From each plot, plant tissue has been collected from 20 adult cedar individuals; from each individual 10 needles (3-year-old) have been selected for conducting morphological and anatomical measurements. For each needle, 24 morphological parameters and 8 anatomical parameters have been studied; the results were analysed using statistical measurements for extracting relevant conclusions. The results showed that within patches the variability of morpho-anatomic characteristics is higher than among patches. In addition, and despite the narrow distribution of Cyprus cedar, significant differentiation among the five patches was detected, while phenotypes of needles were created. The differences found between patches suggest the adaptive nature of the morpho-anatomic characteristics of this species within its sole population, probably owing to the gene diversity and micro-environmental conditions.*