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14 – 18 December 2020

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Silvicultural treatment as tool for ensuring preservation of narrow endemic forests: the case of *Cedrus brevifolia* forest

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Kyriacos Pitharides (Department of Forests Ministry of Agriculture Rural Development and Environment 1414 Nicosia Cy)

Cedrus brevifolia is a narrow endemic coniferous species in Cyprus, growing in an area of 263 ha and an altitudinal range of 900-1362m. Since 1879 the forest has been under non-management, consisting a 'taboo' for forest managers, mainly because the targeted habitat, designated as a Nature Reserve, was left without silvicultural treatments for a long time. As a result, many cedar trees are suppressed by the s competitive *Pinus brutia*, while other cedar stems compete with each other, and younger trees are many times suppressed by *Quercus alnifolia*. Today the Mediterranean region is under the pressure of climate change with geographically marginal and peripheral habitats being negatively affected by this change. The LIFE-KEDROS project investigated the stands structure of natural and artificial stands, analysed natural regeneration of single species and mixed stands, and proposed and implemented principles for silvicultural treatments of natural and artificial stands of *C. brevifolia*.

Co-authors: Dr. Petros Petrou (Department of Forests Ministry of Agriculture Rural Development and Environment Cy), Dr. Andreas Christou (Department of Forests Ministry of Agriculture Rural Development and Environment Cy), Prof. Elias Milios (Department of Forestry and Management of the Environment and Natural Resources Democritus University), Dr. Nicolas-George Eliades (Nature Conservation Unit Frederick University)



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Extending the Growth Rate Hypothesis to species development: Can stoichiometric traits explain the composition of macroinvertebrate communities? Join

Miriam Beck (Université de Lorraine)

Within the ecological stoichiometry framework which relates environmental nutrient concentrations to the body stoichiometry of organisms, the Growth Rate Hypothesis states that organism's phosphorus-demand - and therewith body content - will increase with increasing growth rate. In this study, we extended this concept to development rate and investigated its applicability to explain patterns in community composition.

Using trait information of >400 macroinvertebrate taxa, we defined groups based on three developmental traits. In six streams along a gradient of water N:P we sampled 18 invertebrate taxa to obtain stoichiometric information and additionally conducted a one-year survey quantifying invertebrate taxa abundances. Combining this data, we tested whether community composition regarding the developmental trait-groups differs, depending on nutrient concentration.

We found that taxa with low (high) nutrient:P stoichiometry were associated with faster (slower) development and tended to occur at higher proportions in low (high) water N:P streams.

Co-authors: Cedric Mondy (Office Français de la Biodiversité), Michael Danger (Université de Lorraine), Elise Billoir (Université de Lorraine), Philippe Usseglio-Polatera (Université de Lorraine)

Silvicultural treatment as tool for ensuring preservation of narrow endemic forests: the case of *Cedrus brevifolia* forest (Click here to submit questions)



Silvicultural treatment as tool for ensuring preservation of narrow endemic forests: the case of *Cedrus brevifolia* forest

Kyriakos Pitharides¹, Petros Petrou¹, Elias Milios², Andreas K. Christou¹, Nicolas-George Eliades³

¹Department of Forests, Ministry of Agriculture, Rural Development and Environment (Cyprus); ²Department of Forestry and Management of the Environment and Natural Resources, Democritus University of Thrace (Greece); ³Nature Conservation Unit, Frederick University (Cyprus)



The forest of *Cedrus brevifolia*

Cedrus brevifolia is a narrow endemic coniferous tree in Cyprus. It grows in an area of 263 ha and an altitudinal range of 900-1362 m. The sole population of *C. brevifolia* shapes the habitat type of "9590* *Cedrus brevifolia* forests (Cedrosetum brevifolia)", which is included in the Annex I of the Directive 92/43/EEC, where it is characterised as a priority habitat type. Since 1879 has been under non-management, and, hence, without silvicultural treatments. Today the Mediterranean region is under the pressure of climate change with geographically marginal and peripheral forests/habitats being negatively affected by this change.

The LIFE-KEDROS project investigated the structure of natural and artificial stands, analysed natural regeneration of single species and mixed stands, and proposed and implemented principles for silvicultural treatments of natural and artificial stands of *C. brevifolia* (Cyprus cedar).

Field work

To achieve the objectives of this study, eight structure types were set for the natural formations and eight for the artificial formations of *C. brevifolia*. The structure types in *C. brevifolia* were classified based on the species composition and the site productivity. For this



Q&A

Send

of *Cedrus brevifolia* forest

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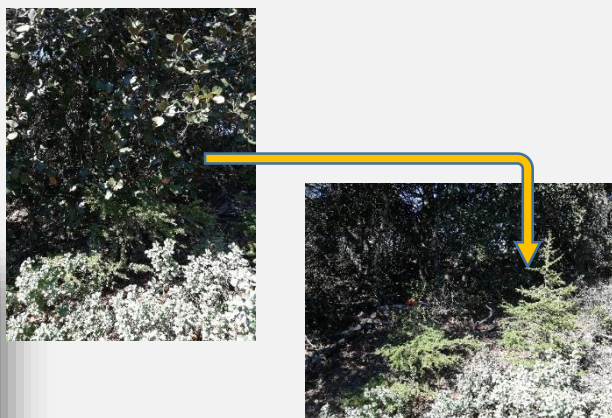
Shape of adult Cyprus cedar tree and examples of the negative impact of *M. schimitscheki* and bark beetles on the trees' ability.

In each sampling plot established in the natural stands, numerous parameters were recorded for each woody species (trees with a height of over 1.3 m): total height, breast height diameter (dbh), height where the living crown begins. Further, the growth form of regeneration plants was determined, together with the vitality of the regeneration plants and the number of seedlings (height > 10 cm). In the artificial stand all trees were classified according to their social position as dominants, co-dominants, intermediates or suppressed.

Results - Outcomes

Scientific outcomes from this study imply that *C. brevifolia* is a high competitive species, which can grow in various site qualities. Thus, *C. brevifolia* has an increased ability to cope with unfavourable soil conditions.

The current study led to the elaboration, for the first time, of the "Principles for silvicultural treatments of natural and artificial stands of *C. brevifolia*", based on which silvicultural manipulations are implemented in natural and artificial formations of *C. brevifolia*. These manipulations are applied for distributing the growing space in order to favour *C. brevifolia* individuals. The intensity of manipulations is light in most cases.



So far:

- 6924 trees were cut, equaling to 1017.27 m³
- 8398 *C. brevifolia* are favored

