ACTIONS FOR PLANT BIODIVERSITY IMPROVEMENT AND RECOVERY IN LOWLAND ANCIENT WOODS OR ARTIFICIAL FOREST STANDS

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Italian forest ecosystems, characterized by a long tradition of forestry and agro-pastoral practices that have guided their evolution, have ensured the preservation over time of significant aspects of naturalness to which important landscape,ecological (carbon stock) and recreational values are associated.

These functions have become increasingly important leading to the implementation of several reforestation projects. Nevertheless, the new forest stands, born on lands subject to agricultural use for a long time, evolve into ecologically sustainable ecosystems only in a very long time.

One of the main findings of this process is represented both by the structure of biological communities and their complexity, which remain greatly simplified for a long time.

In particular, nemoral herbaceous species, which represent the most valuable and ecologically significant component of a forest habitat, remain confined to the "ancient forests". These species, closely habitat-specific and substantially unable to adapt to the environmental changes (Buffa and Villani in stampa; Eckert, 2002; Honnay *et al*., 1999), are in risk of local extinction due to the small size and isolation of their populations.

In order to preserve the venetian lowland ecotypes, some experiments were started in 2010 with the aim of producing some target species (*Arum maculatum* L., *Allium ursinum* L., *Asparagus tenuifolius* Lam., *Carex remota* L., *Colchicum autumnale* L., *Mercurialis perennis* L., *Lamium orvala* L., *Leucojum vernum* L., *Loncomelos pyrenaicum* (L.) Hrouda ex J. Holub s.l., *Paris quadrifolia* L., *Ranunculus auricomus* L., *Viola reichenbachiana* Jordan ex Boureau).

The peculiarities of the environment in which these species are adapted impose a continuous integration of autoecology knowledge with plant nursery techniques.

Thus in situ (ancient forest) and *ex situ* (germination room and outdoors cultivation tunnel) germination tests were carried out to understand how soil variables (texture, pH, organic C, N, P), physical environment variables (quantity and quality of light radiation in the undergrowth) and microclimatic variables (soil T at 0 cm) allow to break dormancy, induce germination and promote seedlings recruitment.

The comparison of in situ and *ex situ* tests showed that for the majority of the species germinating output is significantly higher in natural conditions or artificial conditions that simulate more accurately the natural ones than in germination room.

Seeds of some species kept at 20 ° C in dry storage (eg. *Leucojum vernum* L., *Mercurialis perennis* L.) showed a reduction of viability even more than 80% in 6 months since the collection date, proving potential recalcitrance, and explaining the negative results for their germination tests.

The first results encourage further tests in order to implement the knowledge on the production of these species, which is desirable both in terms of biodiversity conservation, and for the reinforcement of existing populations or for the naturalization of artificial forests.

A new frontier, finally, may be offered by their use in private gardens (for aesthetic and naturalistic reasons, in a sort of transposition of the *bird-gardening* practice within the conservation of nemoral species), with the activation of a production chain giving also employment benefits.

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