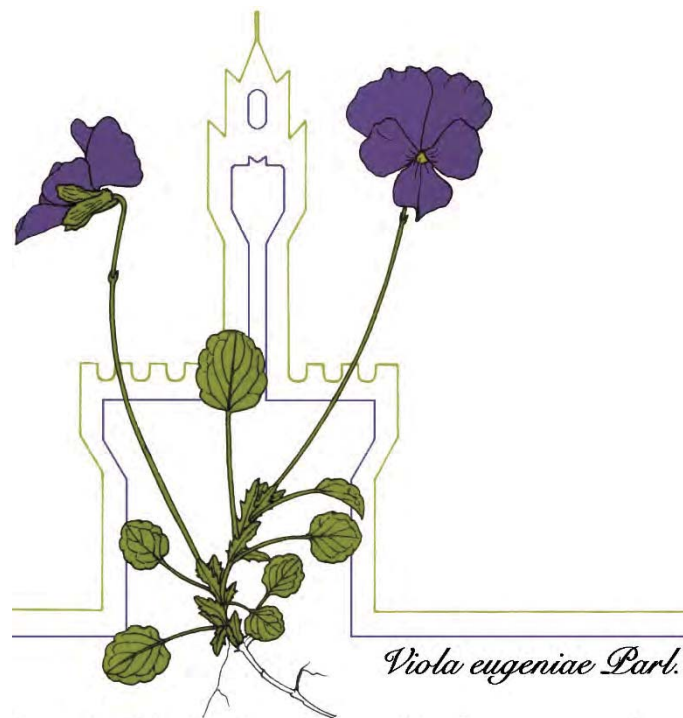


118° Congresso della Società Botanica Italiana

IX INTERNATIONAL PLANT SCIENCE CONFERENCE (IPSC)

PISA, 13 - 16 SEPTEMBER 2023



ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS

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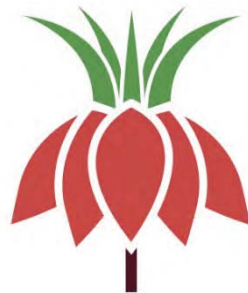
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3.7 = What community completeness can tell about the conservation status of ecosystems: a test on vascular plants in *Fagus sylvatica* forests

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Beech (*Fagus sylvatica* L.) forests are among the habitats with the highest naturalness in Europe (1). They are often considered as species-poor ecosystems since beech is highly competitive especially for light, but examples of species-rich beech forests are also well-documented. It is unclear if the lack of species in many beech forests is due to natural drivers or to anthropic management. In this study we investigated the patterns of plant community completeness (2) in the beech forests of Tuscany, central Italy. Floristic and structural attributes were surveyed in 155 circular plots of 8 m radius in 2020-2021. The regional species pool of beech forests was retrieved from about 1,100 vegetation relevés available in the literature. We built a series of Structural Equation Models based on Generalized Linear Modelling to assess the direct and indirect effects of anthropogenic and environmental variables on beech forests' community completeness. We tested if such effects differed according to forest types on the groups resulting from a modified TWINSPLAN cluster analysis: 1) species-rich, low-elevation and basiphilous beech forests characterized by *Cardamine bulbifera*, *Hedera helix*, *Mercurialis perennis*; 2) species-poor acidophilous beech forests characterized by *Festuca heterophylla*, *Luzula pedemontana*, *Veronica officinalis*; 3) species-poor microthermal beech forests characterized by *Oxalis acetosella*, *Rubus idaeus*, *Dryopteris dilatata*. For the whole dataset, the lack of species at a given site was due to both anthropic and natural factors (Fig. 1): 1) silvicultural management (low DBH, indicating coppicing or recent cuts in high forests) that disadvantages understorey species; 2) low slopes that naturally promote litter accumulation suppressing understory species; 3) increasing elevation, with a natural loss of species. The selected predictors had different effects on the community completeness of the three forest types, with the main causes of species absence being high elevations in type 1, none of the selected predictors in type 2, and silvicultural management and low slopes in type 3. We conclude that community completeness can be used as an indicator of the conservation status of beech forests, since testing the role of different drivers in relation to forest type allows distinguishing natural lacks of species from those induced by human influences.

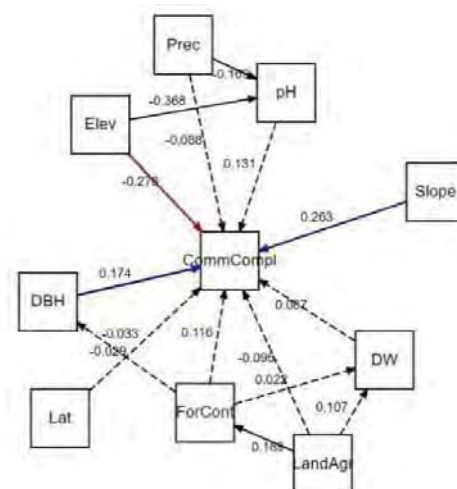


Fig. 1. Structural equation model on the community completeness of Tuscan beech forests. Continuous lines = statistically significant effects. CommCompl = community completeness; Prec = precipitation; Elev = elevation; DBH = mean Diameter at Breast Height; DW = total deadwood; ForCont = forest continuity; Lat = latitude; Land Agr = percentage of agricultural land use in the landscape. Blue = positive effect; red = negative effect.

- 1) G. Abbate, G. Pirone, G. Ciaschetti, S. Bonacquisti, E. Giovi, D. Luzzi, E. Scassellati (2003) *Fitosociologia*, 40(1), 97-108.
- 2) M. Pärtel, R. Szava-Kovats, M. Zobel (2013) *Folia Geobot.*, 48, 307-317.