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BOOK OF ABSTRACT

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS



1.1. = ADAPTIVE RESPONSES TO HUMAN IMPACTS IN THE THREATENED WEBB'S HYACINTH (*BELLEVALIA WEBBIANA* PARL., ASPARAGACEAE)

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Biodiversity is facing significant loss due to global climate change and to human activity, causing habitat loss and degradation, pollution, overexploitation and invasive species introduction (1).

Bellevalia webbiana Parl. is a bulbous geophyte endemic to a restricted, highly anthropised area of pre-Appenninic Tuscany and Emilia-Romagna. By considering the significant reduction of the species range, the bad condition and low number of its populations and the threats they face (2), *B. webbiana* is currently listed as *Endangered* (EN) in the Global IUCN Red List (3).

This species occurs in open habitats, especially at the margins of oak forests, olive tree groves, fields and meadows. Changes in land use associated with natural wooded vegetation recovery are related with the reduction and loss of several populations. Moreover, most part of the stands are included within private lands, leading to a high management unpredictability. Nevertheless, the species successfully survives in early successional stages after abandonment and, having a bulb buried deep in the soil, it seems able to cope with most farming practices (e.g. ploughing). However, accurate field surveys at the population level and the species adaptive responses have never been investigated.

Given the uniqueness and vulnerability of this species, our study aims to understand the impact that anthropic disturbance may have on populations of *B. webbiana*.

In order to cover as best as possible the range of the species, five different populations have been selected, three in Tuscany (Province of Florence) located in Pratinoro (Vaglia), Uccellatoio (Vaglia) and Villa Antinori (Impruneta) and two in Emilia-Romagna (Province of Ravenna) located in Casola Valsenio and Faenza. In both regions, the populations were selected according to different degrees of disturbance. The analysis was based on the comparison of several functional traits through the LHS (Leaf-Height-Seed) model, seed set, vegetative and inflorescence heights, number of flowers per inflorescence, number of fruits per individual, number of seeds per fruit and number of pollen grains per flower (4). In addition, soil analyses were carried out, searching for differences between the sites and to test correlations with the functional and reproductive features of the populations.

From the very first data acquired, disturbed and undisturbed populations appeared to be fairly different in the fitness of single individuals, in favor of the undisturbed sites (i.e. Villa Antinori and Faenza). In these undisturbed sites taller and healthier plants with high amounts of flowers, fruits and seeds were found. On the other hand, the bad conservation status of the disturbed sites appeared evident, even more increased by grass-cutting activity in Pratinoro, by change in land use in Casola Valsenio, and by predation (i.e. wild boars) in Uccellatoio. Indeed, non-parametric tests (Kruskal-Wallis and Mann-Whitney pairwise comparisons) confirm these patterns with significant differences among area and dry mass of sampled leaves respectively with value $p < 0.01$ and $p < 0.001$.

Overall, we conclude that the plants show different responses in growth and fitness according to their site of occurrence and environmental variations.

- 1) H. Stuart, M. Butchart, et. al. (2010) *Science*, 328, 1164-1168
- 2) G. Gestri, A. Alessandrini, N. Sirotti, A. Carta, L. Peruzzi (2010) *Inform. Bot. Ital.*, 42, 449-455
- 3) L. Peruzzi, A. Carta (2011). *Bellevalia webbiana*. The IUCN Red List of Threatened Species 2011
- 4) N. Pérez-Harguindeguy, S. Diáz, E. Garnier et al. (2013) *Aust. J. Bot.*, 61, 167-234

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