INCREASING THE GERMINATION PERCENTAGE OF AN ENDANGERED NATIVE ORCHID (*HIMANTOGLOSSUM ADRIATICUM*) BY POLLEN TRANSFER AND OUTBREEDING BETWEEN POPULATIONS

Silvia DEL VECCHIO[1], Simon PIERCE[2], Edy FANTINATO[1], Gabriella BUFFA[1]

[1]*Department of Environmental Science, Informatics and Statistic, Ca Foscari University,Venice, Italy;* [2]*Department of Agricultural and Environmental Sciences (DiSAA), University of Milan, Milan, Italy*

Contact: Silvia Del Vecchio, silviadelvecchio@unive.it

The endangered native orchid *Himantoglossum adriaticum* H. Baumann is a European endemic species of priority interest (92/43/ EEC, Annex II). Italian populations of *H. adriaticum* are small and isolated, with depressed germination (< 5%) and seed set. Given the important implications for plant population conservation, we tested the efficacy of artificial pollen transfer (hand pollination) and outbreeding between populations for increasing the germination percentage.

Artificial cross-pollination included a). pollen transfer from one large population to two small and isolated populations; b). pollen transfer between two small but not very isolated populations; c) within-population pollen transfer used as a control. Seeds were sown on a modified Malmgren's medium *in vitro* and cultured in a controlled environment. Total germination was recorded when no further germination was observed. Germination percentage was compared using a Kruskall-Wallis analysis of variance.

Pollen transfer produced a significant increase in total germination but increases were not homogeneous between crosses nor between ramets. Pollen transfer from the largest population to the smaller ones enhanced the germination capacity in one population (1.1% *vs.* 3.1%; p=0.019). Cross pollination between small-sized and less isolated populations resulted in the largest increase of germination (6.1% *vs.* 1.58%; p=0.028). The largest differences in total germination occurred between ramets within each crossed-pollinated population.

Although germination capacity was essentially ramet-specific and was never high, the results of pollen transfer between the small populations are particularly encouraging, since the mean increase in germination was almost four times that of the control. Our results suggest that pollen transfer and outbreeding between small populations can be considered as a valuable tool to increase genetic flow and germination capacity in natural populations, limit the accumulation of detrimental effects on their fitness driven by the repeated breeding with closely-related individuals, thereby increasing the possibility of conservation of endangered native species.

Preferred presentation format (talk or poster): ……Talk……..