



Abstract book

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A cura di
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Effects of environmental heterogeneity on the phenotypic variations of *Lilium pomponium* L.

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Species response to environmental changes is mainly determined by the response of ecologically marginal populations. Thus, to quantify the variation in the ecological traits across a species' geographic range is crucial to understand factors shaping the distribution patterns. In this study, we compared plant community and phenotypic variation in climatically marginal and central populations of *Lilium pomponium* L., a plant endemic to the Maritime and Ligurian Alps, spanning from Mediterranean to Alpine habitats.

We used bioclimatic variables to group the populations into marginal Mediterranean (MM), marginal continental (MC), central (CC) and marginal subalpine (MS), based on their distance from the climatic optimum of the species. Phenotypic traits related to plant-pollinator interaction and to reproductive capacity (seed production and germination) were considered to verify differences in species performance from the center towards the margins. In particular, we evaluated: (I) the presence of the pollen limitation; (II) seeds production; (III) the capacity for self-fertilization; (IV) seed germination capacity; (V) flower dimension; (VI) the number of flowers per scape; (VII) the relative position of the sexual organs. In addition, we used phytosociological surveys to test any difference in plant community among the groups using statistical analyses. The floristic composition of plant communities was significantly different among groups. In particular, the populations belonging to MS group were clearly clustered together while the other groups were partially overlapped. In fact, MM, MC and CC groups were characterized by Mediterranean species while MS group was characterized by mesophilous and montane species. Even if MM and MC groups were more pollen-limited than CC and MS, no significant differences in seed production and seed set were detected among groups. This result may be explained by different factors like resources limitation, seed predation and herbivory can reduce seed production in CC and MS groups. Moreover, marginal groups did not show an increase in self-fertilization rate. Seed size increases from warm (MM and MC) to cold (MS) edges and in all groups seed germination decreases at high temperature, especially in CC and MS groups. Flower dimension decreases from warm (MM and MC) to cold (MS) edges. Number of flowers per scape was lower in CC group and the proportion of flower showing the separation of sexual organs was significantly higher in MM. Taken together our results show that *L. pomponium* grows mainly in Mediterranean plant communities occurring under different climatic conditions even if in the cold marginal group Mediterranean species were less abundant. Although this similarity in plant community the difference detected in phenotypic traits suggests that populations occurring under different climatic conditions are exposed to different environmental pressure.



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