

Reproductive investment of plants changes along the elevation gradient

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Most plants are entomophilous, insect pollinated. Thus, attracting pollinators with flowers is a key for their reproduction. Producing flowers is costly and the optimal reproductive strategy may change depending on the environment. However, how the environment drives the reproductive efforts of plants, and their floral production is unclear. In addition, plants have innate functional traits, e.g., phenology and pace of life, that largely influence their capabilities to adapt to their environment. Still, the effects of interplay of the functional traits and environmental conditions on the reproductive efforts of the plants remain unexplored.

Here, we investigate how the vegetative cover of species influences the number of flowers produced and how this relationship changes along the elevation gradient. In addition, we study what is the role of the plant functional traits in their reproductive responses to the environment. For this, we combine data from surveys on vegetation cover and flower abundances collected between 600 and 1800 meters above sea level on Mt. Calanda, SE Switzerland.

We find a general decrease in the number of flowers towards the higher elevations. This effect is modified by the vegetative cover of the species: Highly abundant species invest relatively less into flowers at high elevations. These findings indicate that at the harsher conditions and shorter growing season of the high elevations, plants likely invest less resources into reproduction and more into survival. However, with the warming climate, increased investment into reproduction might become a better performing strategy at high elevations.