



Soil , phyto and zoocenosis characteristics along an elevational gradient in the Alps (NW Italy)

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From a global point of view, the distribution of biodiversity can be associated with climate. In particular, a majority of patterns of species diversity can be explained in terms of climatic gradients. Within a given mountain range, climate may affect the distribution of soils and the abundance and richness of plant species and mesofauna composition. In this study, promoted in the framework of an INTERREG Project “Biodiversità: una ricchezza da conservare” we investigate the soil, plant characteristics and mesofauna communities along two elevational gradient in Italian North Western Alps. Mountain environments are well-suited for such studies because of pronounced climatic gradients within short distances.

The study areas, named San Bernardo and Vannino, are located in North Italy, close to the border of Switzerland (San Bernardo: N 46°09' E 08°10'; Vannino: N 46°23' E 08°22'). The first one ranged from 1617 m ASL to 2595 m ASL. while the second one ranged from 1786 to 2515 m ASL , with both a prevalent south aspect. Along both elevational gradients we selected 7 sites, with a vegetation cover ranging from coniferous forest (*Larix*, *Picea* and *Abies*) to high-elevation prairies.

In each site, soil material (0-10 cm depth) was collected and in the laboratory, samples were dried and passed through a 2-mm sieve. The pH and the particle size distribution was determined following standard methods (SISS, 1998, 2000). Total C and N contents of the soil were measured with a C/H/N analyser (Elementar Vario EL). Data on the vegetation structure were collected close to each soil sampling points, covering a surface of 16 m²; each sampling site has been further divided into 4 sub-areas of 4 m².

Soil texture ranged between sand and loamy sand, without any obvious distribution with altitude. On average, in the Vannino transect soil texture was slightly coarser than at San Bernardo.

A total of 118 vascular species were found at the sampling sites. Landolt ecological spectrum values suggest an heterogeneous environment where parameters such as light and temperature display sharp changes along the elevation gradient and/or as function of morphological features at single sites. Consequently, the vegetation physiognomy, abundance and richness change as a function of altitude and morphology. According to mesofauna communities we observed a reduction of “adapted” organisms along the altitudinal gradient. In both transects euedaphic biological forms were more abundant at the altitudinal range, between 1600-2000 m ASL.