

THE INFLUENCE OF ENVIRONMENTAL FACTORS ON WEED SPECTRUM



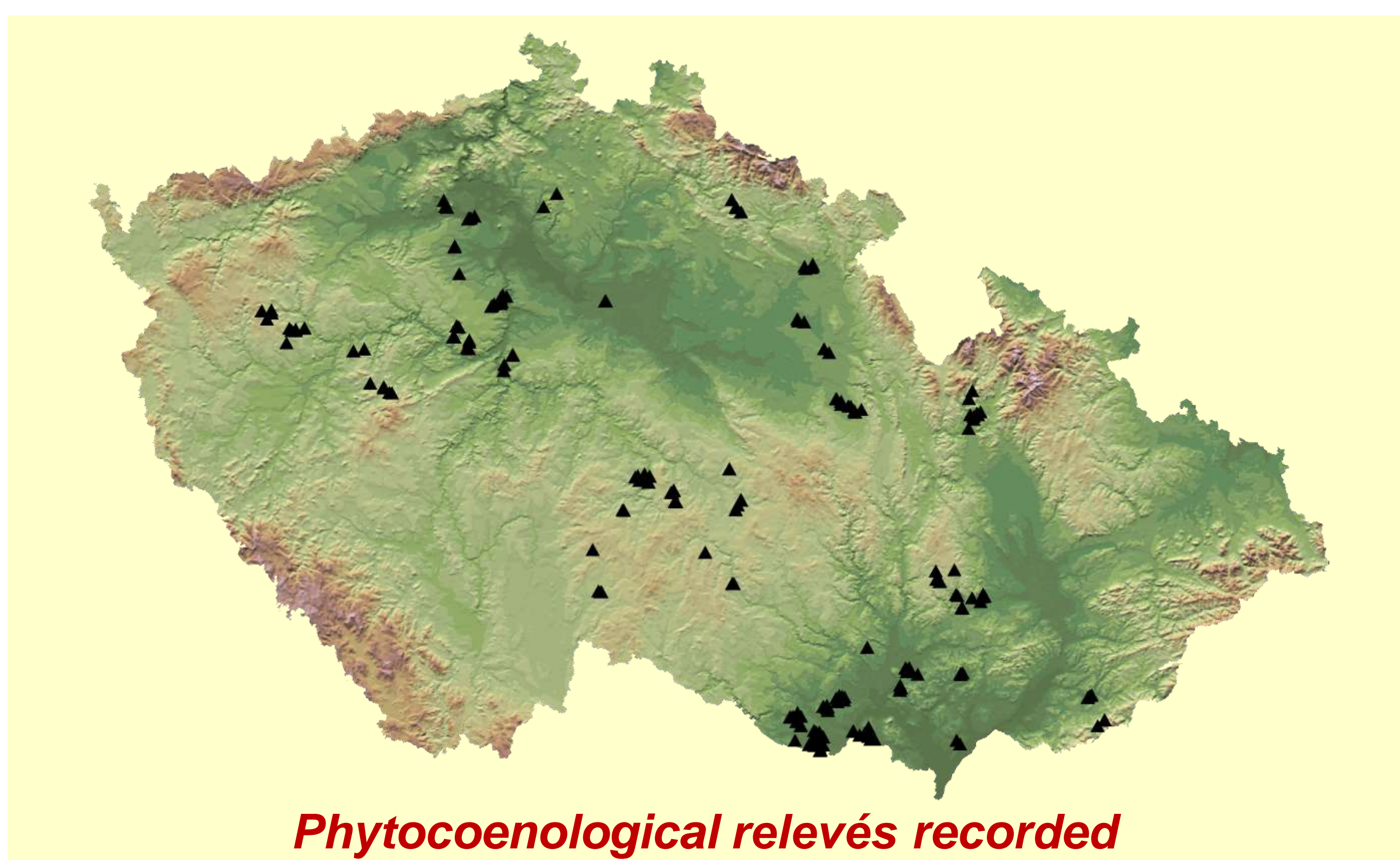
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In 2006-2008, a phytocoenological survey was carried out on selected farms across the Czech Republic. These farms were chosen in different climatic and soil conditions practicing conventional or organic farming. In total, 290 phytocoenological relevés in winter and spring cereals, and root crops were recorded (158 in conventional and 132 in organic farming). One relevé of 100 m² size was recorded in each field. Species dominance was assessed by Braun-Blanquet scale. The influence of environmental factors on the occurrence of individual weed species was tested by multivariate analysis CCA (Canonical Correspondence Analysis) in programme Canoco for Windows 4.5.



Phytocoenological relevés recorded

In total, 172 weed species and 28 crop volunteers from 33 families were found. The natural conditions, type of farming, and crop type explained together 12.3 % of the total variability in collected data. Different natural conditions (altitude, precipitation and temperature) had the highest influence on weed spectrum and explained together 6.9 % of total variability (Fig. 1). The second most important factor was crop (3.4 % of total variability, Fig. 2). The type of farming explained 1.7 % of the total variability (Fig. 3).

The warmest, semi-arid region was characterized especially by the occurrence of thermophile summer annual species like e.g. *Echinochloa crus-galli* and *Amaranthus* sp. The temperate region with chernozem soils was typical for thermophile weed species indicating soils with high calcium content like e.g. *Veronica polita* and *Silene noctiflora*. In hilly regions, species indicating colder areas and moist, acidic soils like e.g. *Galeopsis tetrahit* and *Gnaphalium uliginosum* were prevalent.

Weed spectra in individual crops reflected their specific vegetation season and growth characteristics.

For conventional farming, the occurrence of volunteers and weeds with wide ecological amplitude was typical. In organic farming, species sensitive to herbicides or intolerant to intensive farming practices occurred; perennial species were found predominantly in fields with lower intensity of soil tillage. There, some rare species occurred as well.

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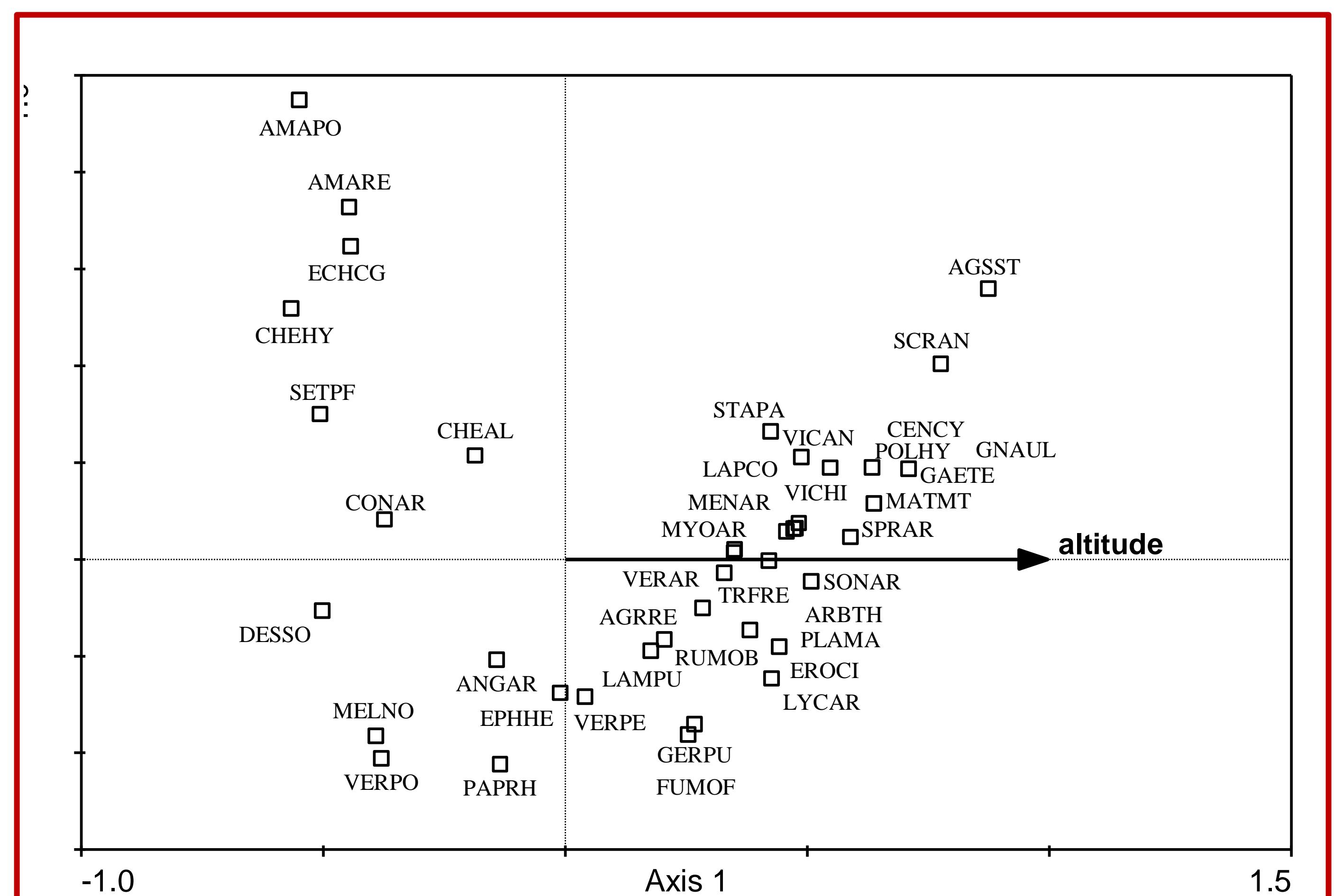


Fig. 1. Ordination diagram (CCA) of weed species and altitude (weed species are described by EPPO codes)

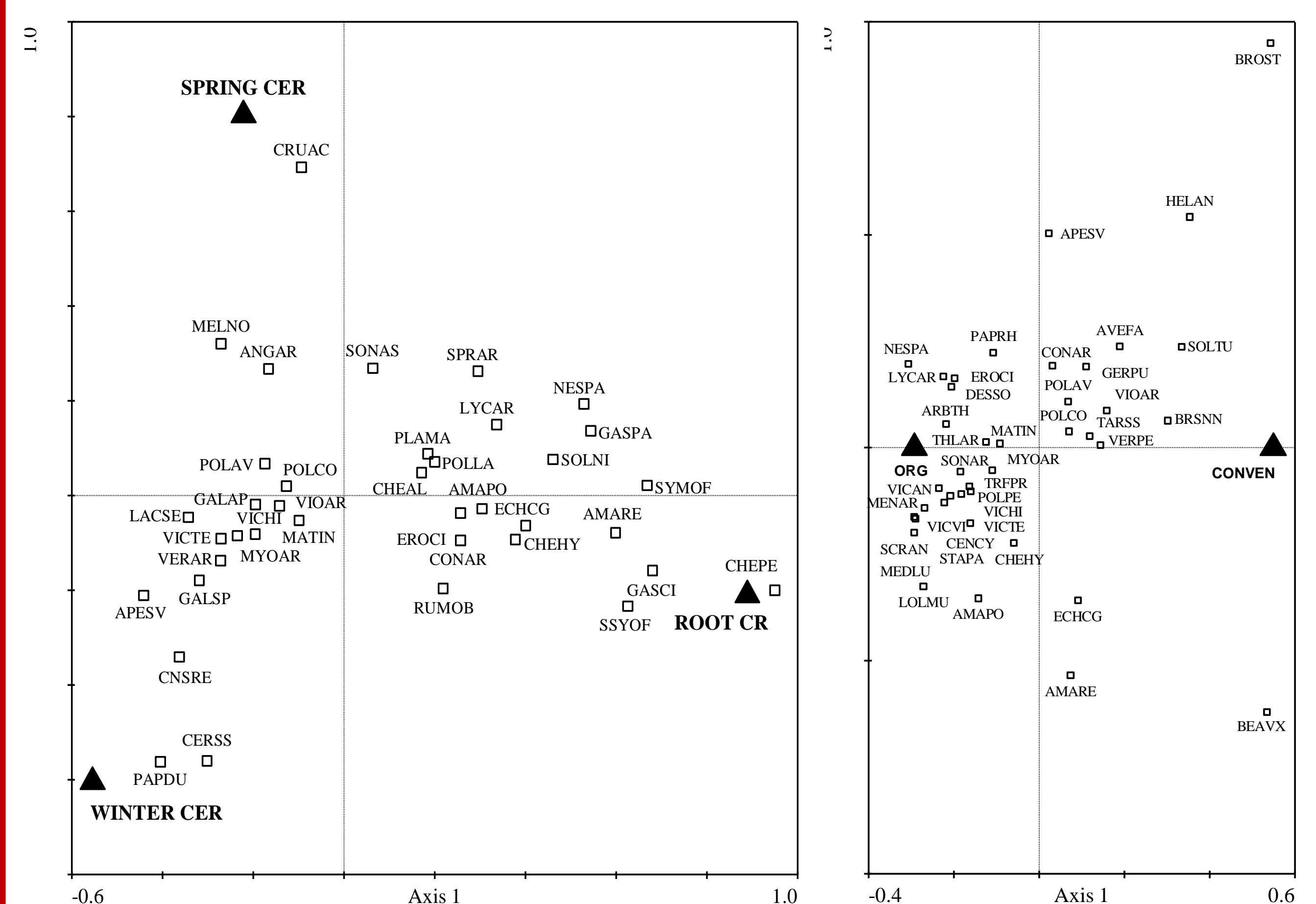


Fig. 2. Ordination diagram (CCA) of weed species and crops (WINTER CER – winter cereals, SPRING CER – spring cereals, ROOT CR – root crops; weed species are described by EPPO codes)

Fig. 3. Ordination diagram (CCA) of weed species and types of farming (ORG – organic, CONVEN – conventional; weed species are described by EPPO codes)