Flow cytometry, a suitable method for detection of ploidy level and reproductive variability within the hawkweeds populations (*Hieracium* subgen. *Pilosella*)

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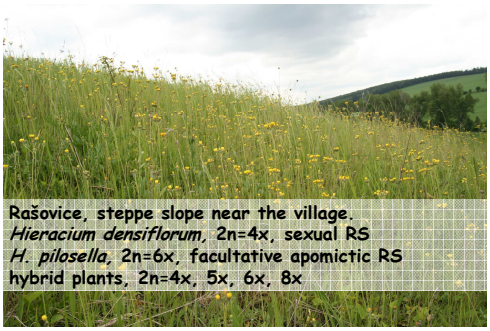
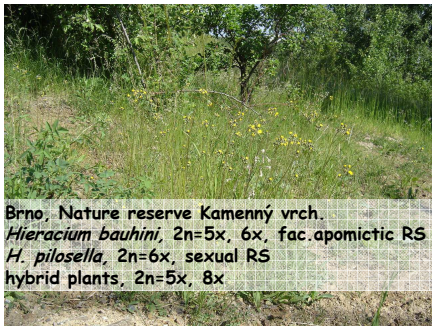
Plant Biodiversity & Biosystematics
Masaryk University Brno

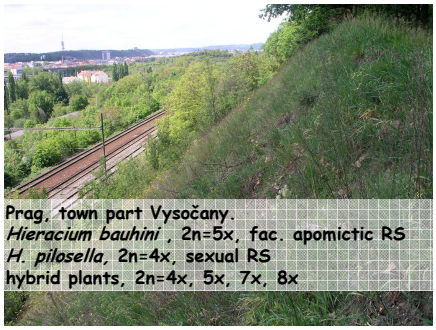
Hieracium subgen. *Pilosella* group has a high diversity of species, subspecies and hybridogenous types. For understanding of selective processes during the evolution of new types the detail studies of the populations with co-occuring sexual and facultative apomictic taxa are necessary. Plants from three polyploid hybrid swarms were studied with regard to variability in ploidy levels and reproductive systems (RS). Flow cytometry of a leaf tissue and seeds was used for all analyses.



Rašovice, steppe slope near the village.
Hieracium densiflorum, 2n=4x, sexual RS
H. pilosella, 2n=6x, facultative apomictic RS
hybrid plants, 2n=4x, 5x, 6x, 8x

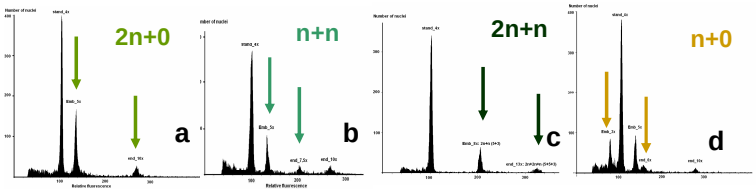


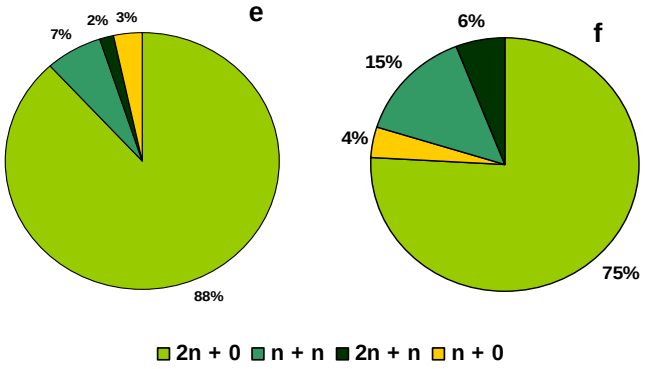
Brno, Nature reserve Kamenný vrch.
Hieracium bauhini, 2n=5x, 6x, fac.apomictic RS
H. pilosella, 2n=6x, sexual RS
hybrid plants, 2n=5x, 8x



Prag, town part Vysočany.
Hieracium bauhini , 2n=5x, fac. apomictic RS
H. pilosella, 2n=4x, sexual RS
hybrid plants, 2n=4x, 5x, 7x, 8x

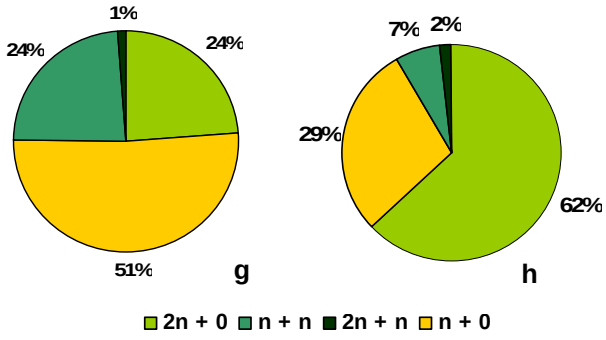
Results (1) Facultatively apomictic plants produce more variability than that of sexuals in the field. Whereas progeny of sexual mothers was formed almost exclusively by hybridization via fusion of reduced gametes (n+n hybrids), the progeny of facultatively apomictic mothers has originated via four different pathways: apomixis (somatic parthenogenesis, 2n+0), hybridization via fusion either of reduced (n+n hybrids) or unreduced (2n+n hybrids, addition hybrids) gametes and haploid parthenogenesis (n+0, polyhaploids).





Progenies variability of facultative apomictic mothers from localities in Brno (a-e) and Prag (f): histograms of flow cytometry seed screen (a-d) and progeny-classes distribution (e, f).

(2) The high-polyploid hybrid biotypes (heptaploids and octoploids) from the field are able to produce many seed via haploid parthenogenesis after open polination or emasculation in the garden.



Progeny-classes distribution within high-polyploid hybrids: Praha, progeny of 7x and 8x hybrids (g), and Rašovice, progeny of 8x hybrids (h).

(3) Different progeny-classes distribution within the seeds than that within the seedlings confirmed the selection of specific progeny classes (namely polyhaploids and addition hybrids) during germination and early development of seedlings. Four progeny-classes were found within the seeds from octoploid hybrids from the locality Rašovice (2n + 0, n + 0, n + n and 2n + n), while within the seedlings were found mainly hybrids (n + n) and apomictic progeny (2n + 0).

This study was supported by the Ministry of Education, Youth and Sports (projects MSM 0021622416 and LC 06073) and by the Grant Agency of the Academy of Sciences of the Czech Republic (project 206/07/0059).