Hieracium subgen. *Pilosella*: pollen stainability in sexual, apomictic, and sterile plants

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Introduction

Hieracium subgen. *Pilosella* is well known by the diversity of reproductive strategies: sexuality, apomixis, and vegetative reproduction. Sexual and apomictic taxa produce viable pollen grains and serve as pollen donors in sexual reproduction, as was confirmed by hybridization experiments in some taxa. Detection of pollen viability (pollen stainability) is a important step before experimental hybridization.

Aims

1. To detect pollen stainability in sexual, apomictic, and sterile plants from *Hieracium* subgen. *Pilosella*.
2. To compare two different stain methods.

Plant material

36 plants of 17 populations (1–3 plants from each locality):
- sexual tetraploid *H. bauhini* (ba36) and *H. densiflorum* (de36)
- apomictic pentaploid and hexaploid *H. bauhini* (ba45, ba54) and pentaploid *H. pilosellinum* (pi45)
- sterile triploid *H. pistoriense* (pi27) and pentaploid *H. brachiatum* (bra45)

Methods

- three slides were made from one unopened capitulum (Fig. 1)
- at least 100 pollen grains were counted from each slide
- acetocarmine and Alexander‘s stain were used (Fig. 2)

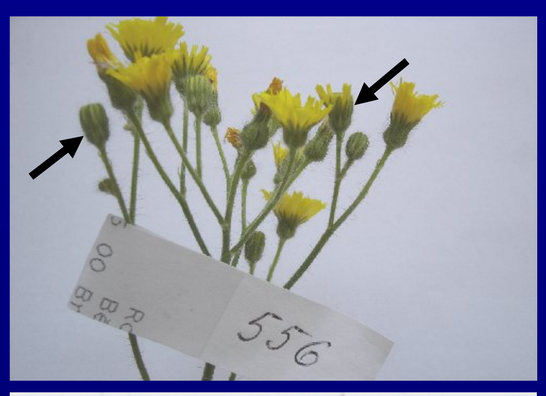

Fig. 1. Pollen grains from unopened capitula (marked by arrows) were used for staining.

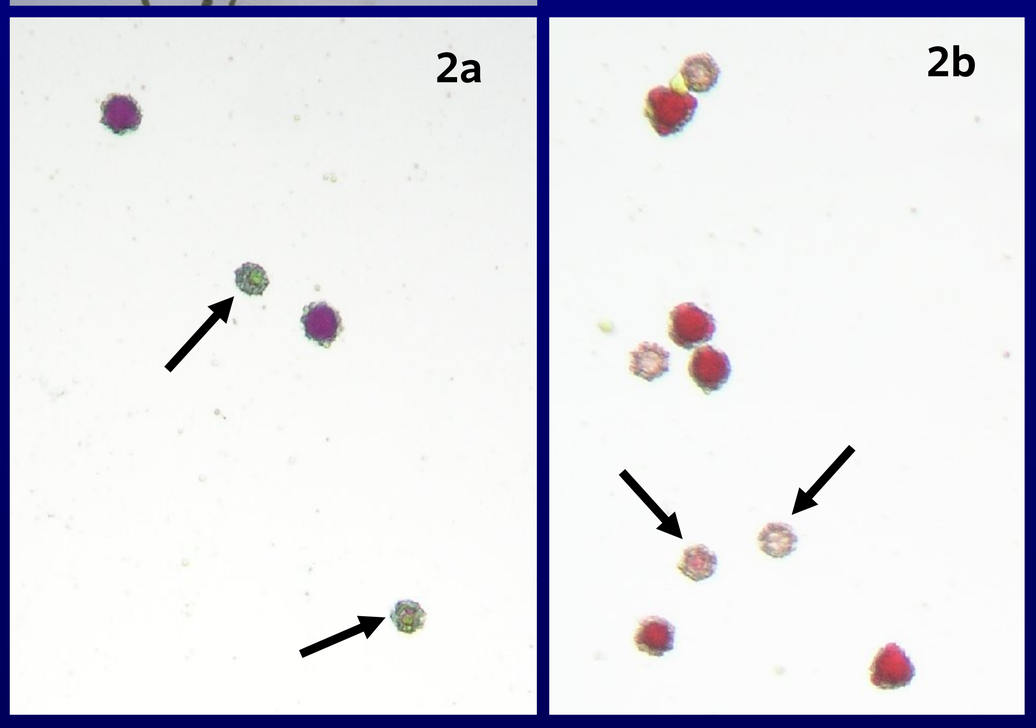

Fig. 2. Microphotographs of pollen grains of plant ba54: (a) Alexander's stain, (b) acetocarmine. Nonviable pollen grains (green in 2a and light pink in 2b) are marked by arrows.

Results

1. Detected pollen stainability is the highest in sexual plants (ba36, de36), lower in apomictic plants (ba45, ba54, pi45) and the lowest in sterile plants (pis27, bra45, see Table 1). Large pollen stainability differences between similar apomitic plants were detected (Fig. 3).

Table 1. Average pollen stainability in sexual, apomictic, and sterile taxa.

plants	reproductive system	stainability (%)
ba36	sexual	97,41
de36	sexual	90,14
ba45	apomictic	85,87
ba54	apomictic	76,35
pi45	apomictic	94,19
pis27	sterile	33,00
bra45	sterile	26,56

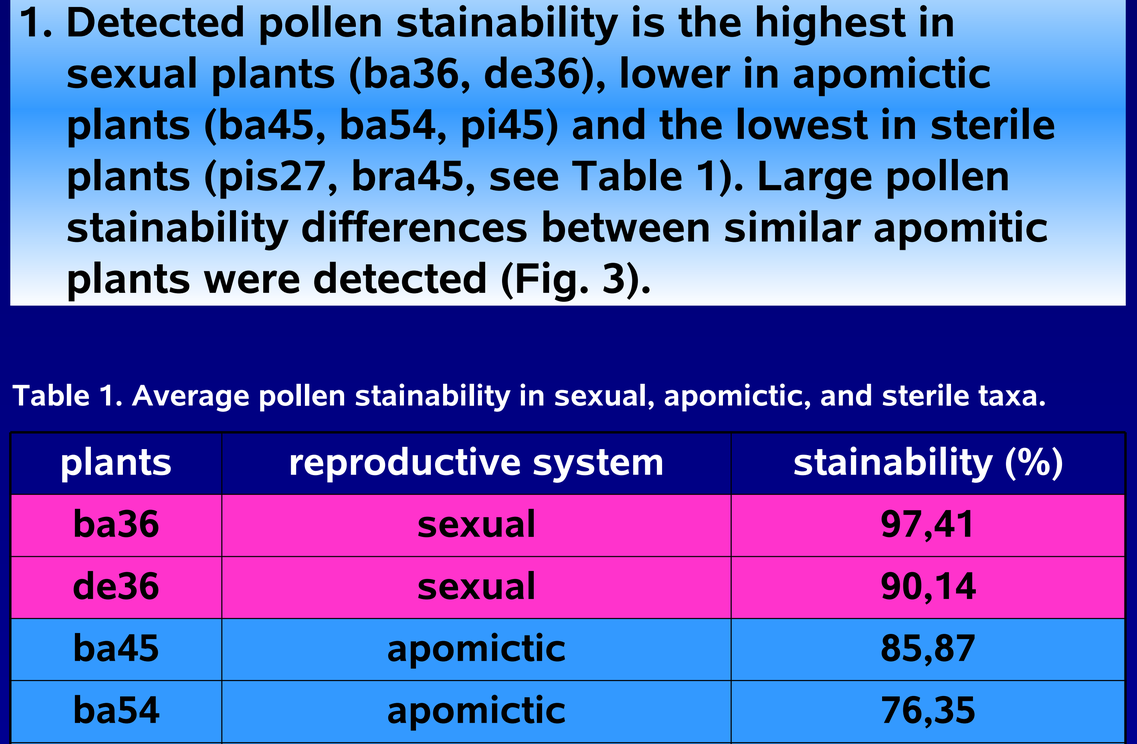

Fig. 3. Comparision of pollen stainability in sexual (ba36, de36) and apomictic (ba45, ba54) taxa.

2. Detected acetocarmine pollen stainability was significantly higher than in Alexander´s stain (Fig.4).

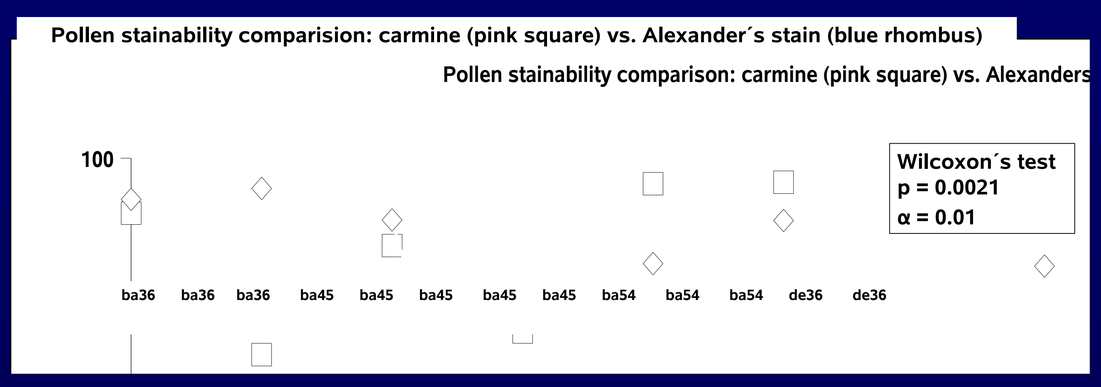

Fig. 4. Comparision of the average stainability between two different staining methods: acetocarmine (pink square) and Alexander´s stain (blue rhombus).

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