

Pollen stainability in facultatively apomictic *Pilosella* hawkweeds (Asteraceae)



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Introduction

Hieracium subgen. *Pilosella* is well known by the diversity of reproductive strategies: sexuality, facultative apomixis, and vegetative reproduction. Various reproductive origin was found within the seeds produced by one apomictic mother. As some apomictic plants were successfully used in hybridization experiments as pollen parents production of viable (stainable) pollen in the apomictic plants was not studied in detail so far.

Aims

1. Form the apomictic hawkweeds stainable pollen grains?
2. What the pollen stainability of apomictic plants compared to sexuals is?

Plant materials

apomictic plants: pentaploid (13 plants, ba45a-f) and hexaploid (4 plants, ba54a-c) *H. bauhini* and pentaploid *H. pilosellinum* (2 plants, pi45)

sexual plants: tetraploid *H. bauhini* (8 plants, ba36) and *H. densiflorum* (5 plants, de36)

seed-sterile plants: triploid *H. pistoriense* (one plant, pi27) and pentaploid *H. brachiatum* (three plants, bra45)

Methods

fresh pollen grains collected from unopened capitulum (Fig. 1a) at least 200 pollen grains were counted from each slide, three capitula were used from each plant, staining-test was repeated four times

Alexander's stain (Fig. 1b)

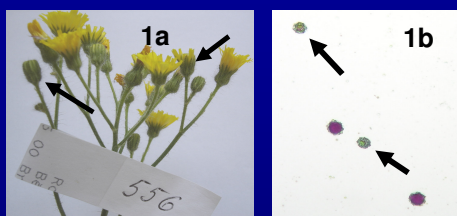


Fig. 1a. Pollen grains from unopened capitula (arrowed) were used for staining. 1b. Microphotographs of pollen grains of plant ba54. Nonviable pollen grains are arrowed

Results

1. Apomictic plants form stainable pollen grains. The average pollen stainability of apomicts is similar or lower than that of sexuals (Table 1).

Table 1. Average pollen stainability in sexual (pink), apomictic (blue), and seed-sterile (green) taxa

plants	reproductive system	average stainability (%)
ba36	sexual	97.4
de36	sexual	90.1
ba45	apomictic	85.9
ba54	apomictic	76.4
pi45	apomictic	94.2
pis27	seed-sterile	33.0
bra45	seed-sterile	26.6

2. Pollen stainability in apomictic plants differs from that in sexuals (Fig. 2): while the pollen stainability in seven apomictic populations was very high and similar to sexuals, large differences and lower pollen stainability were found in plants from another three populations (Fig. 3)

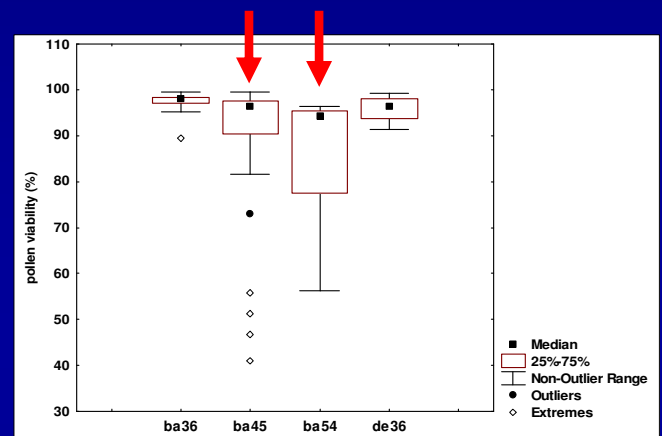


Fig. 2. Comparison of pollen stainability in sexual (ba36, de36) and apomictic (ba45a, ba54, red arrows) taxa

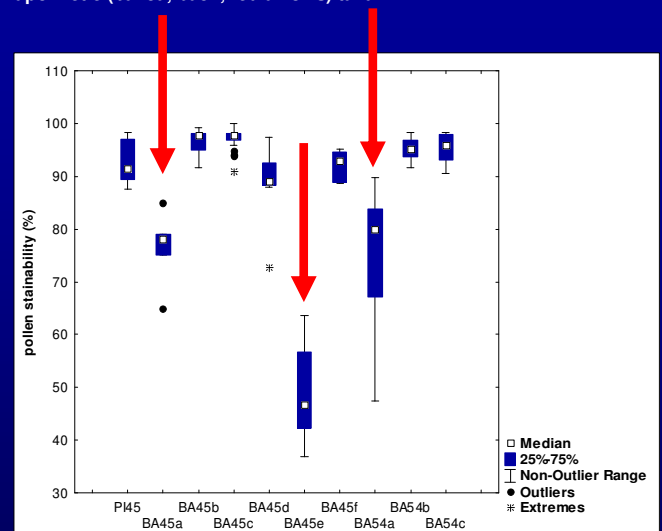


Fig. 3. Comparison of pollen stainability in apomictic plants from different populations. In most populations (seven) pollen stainability was similar to that of sexuals. Lower pollen stainability and large differences within population were found in apomictic plants from another three populations (red arrows)