

ABSTRACT

Apomixis is a type of asexual seed formation. During this process the embryo develops from an unreduced cell without the meiosis and fertilization. The resulting offspring should be identical with the maternal plant.

There are two types of apomixis: gametophytic apomixis (with diplospory and apospory) and polyembryony. In Asterace, both types of gametophytic apomixis are present with *Hieracium* as a model plant for apospory and *Taraxacum* for diplospory. In this study we focused on the genetic variation in the progeny of six maternal plants belonging to two apomictic species of *Taraxacum* sect. *Palustria*: tetraploid ($2n=4x=32$) male-sterile *T. brandenburgicum* (4 plants) and triploid ($2n=3x=24$) *T. udum* (2 plants). In *T. brandenburgicum*, the seeds from isolated and not isolated flower heads, and in *T. udum* seeds from isolated, non-isolated and emasculated inflorescences were analysed using selected pairs of microsatellite primers. All the maternal plants were positively tested for the presence of molecular markers associated with the region DIPLOSPOROUS responsible for unreduced female gametophyte formation.

All seeds of *T. brandenburgicum* collected from isolated heads showed microsatellite profiles typical for maternal plants. Three out of the four analysed plants exclusively produced progeny of maternal type also in non-isolated heads. In one plant, however, 54,2% of seeds produced in non-isolated head showed the presence of additional microsatellites which indicated that they originated from foreign fertilization. It accounted for 8,4% of all analysed seeds of *T. brandenburgicum* and about 16,9% of seeds originated from all non-isolated heads.

In *T. udum* only 3,2% of all analysed seeds showed variation consisting exclusively of loss of some products generated by MSTA 64 microsatellite primers. The losses were observed in seeds originating from non-isolated and from emasculated heads and they were most likely caused by the random mutations in the region of primer hybridization. All progeny produced in isolated heads showed microsatellite profiles identical with the maternal plants.

The obtained results showed that *Taraxacum* species which are considered as obligatory apomicts can produce offspring genetically not identical with maternal plants. It was postulated for a long time, but there was a lack reliable data on the frequency of this phenomenon. The microsatellite analysis suggested that in most apomictic individuals it occurs infrequently and is caused mainly by random mutations. Some plants, however, may show a high propensity to the production of hybrid offspring. It can be a very important source of variation in apomictic plants, allowing them to create new, better-adapted genotypes.

