Cytogenetical Studies on Achene Colour Polymorphism of *Picris asplenoides* L. and *Urospermum picroides* L. (Asteraceae) in Egypt

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Abstract

Achene morphs of *Picris asplenoides* L. and *Urospermum picroides* L. were investigated in order to gain insight into its genetic variation based on the evidence obtained from karyotype analysis, electrophoretic pattern of achene proteins as well as nucleic acid analysis. In *Picris asplenoides* L., three achene morphs were observed from every inflorescence as follows: violet, brown and white, these morphs differ in their color. In the inflorescence of *Urospermum picroides* L., three achene morphs were differ also in their color were observed as follows: white, brown and black. All achene morphs of *Picris asplenoides* and *Urospermum picroides* were diploid, with ten chromosomes observed in somatic cells. Karyotype studies showed that the achene morphs of *Picris asplenoides* and *Urospermum picroides* have different karyotype formulae. However, the chromosome type nearly submetacentric (-) and nearly metacentric were common in all karyotype formulae of all different achene morphs of *Picris asplenoides* and *Urospermum picroides*. Not only the dissimilarity was found in the morphology of chromosomes but also in the Mean Chromosome Length (MCL) and Diploid Chromosome Length (DCL). Types and proportions of abnormalities for different achene morphs of *Picris asplenoides* and *Urospermum picroides* observed at mitotic division were analysed. The electrophoretic analysis of *Picris asplenoides* revealed the presence of fourteen bands of molecular weight ranging from 145.00 to 20.00 kD. The band with molecular weight 20.00 kD was restricted to brown achene from and can be used as molecular marker to distinguish brown achene form from violet achene form. The electrophoretic analysis of *Urospermum picroides* reveals the presence of nine bands of molecular weight ranging from 95.00 to 22.00 kD. The band with molecular weight 22.25 kD was restricted to white achene from and can be used as molecular marker to distinguish white achene form other achene forms. The nuclear DNA content for *Picris asplenoides* were 0.0295 and 0.0183 μg g⁻¹ fresh weight for violet and brown achene, respectively, while RNA content were 25.347 and 35.069 μg g⁻¹ fresh weight for violet and brown achene, respectively. The nuclear DNA content for *Urospermum*
*Picris asplenoides* were 0.093, 0.115 and 0.145 μg g⁻¹ fresh weight for brown, black and white achene, respectively while RNA content were 10.417, 17.361 and 21.528 μg g⁻¹ fresh weight for black, white and brown achene, respectively.

**Key words**: *Picris asplenoides*, *Urospermum picroides*, achene color polymorphism, karyotypes, protein profile, nucleic acids

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