INTEGRATIVE STUDY ON ANEUPLOIDY AND POLYPLOIDY IN *OPHRYS* L.

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Genus *Ophrys* L. (*Orchidaceae*) comprises about 160 taxa widespread in the Euro-Mediterranean area. *Ophrys* flowers are highly specialized to attract their pollinators. In deceptive orchids, species pairs with a generalized pool of pollinators have more divergent karyotypes if compared to species pairs with different pollinators (Cozzolino *et al*., 2004). In this context, it has been observed that the intrachromosomal asymmetry index is a strong expression of the general morphology of plant chromosomes and is an indirect indication of chromosome rearrangements that have occurred among species (Cozzolino *et al*., 2004). Another important factor involved in plant evolution, and then in sexual deceptive orchids, is the polyploidy, a phenomenon that facilitates a rapid speciation. Previous studies indicate that plant polyploidy can have profound effects on interactions with pollinators (Soltis *et al*., 2003). Recurrent polyploidy is also a source of new populations which is important for the evolution of new species. Most species of *Ophrys* are diploid, very few are polyploid. Study of several morphological parameters of chromosomes in this group revealed that karyological diversity is relatively low (D'Emerico *et al*., 2005). However, karyomorphological studies of *Ophrys* species show that the taxa within the genus have karyotypes from moderately asymmetrical to less asymmetrical. Previous karyological investigations indicate the basic haploid chromosome number as x=18 for the *Ophrys* genus, but within sect. *Pseudophrys* Godfery, in (Garcìa-Barriuso *et al*., 2010) an high degree of polyploidy with 2n=4x=72,73,74 and 2n=5x=90 chromosomes was reported from Iberian Peninsula and North Africa. In (Bianco *et al*., 1991) 2n=3x=54 chromosomes was reported in *Ophrys neglecta* Parl. from southern Italy. Present study supplies new data for chromosome numbers in four *Ophrys* species. Cytogenetical studies on sect. *Pseudophrys* showed both diploid (2n=2x=36) and tetraploid (2n=4x=72) specimens of *O. lupercalis* Devillers-Tersch. & Devillers from Gargano promontory. Autotetraploid plants show karyotype with smaller chromosomes than in diploid ones. The *Ophrys* sect. *Ophrys* L. revealed chromosome number 2n=4x=72 in some specimens of *O. apulica* (O. Danesch & E. Danesch) O. Danesch & E. Danesch from central Apulia; whereas a rare case of triploidy was observed in *O. morisii* (Martelli) Soò with 2n=3x=54 from Sardinia. The triploid origin seems to be due to the fusion of reduced and nonreduced gametes and the chromosome complement of *O. morisii* can be arranged in a karyotype of triplets. In fact, the autotriploid species contains three identical basic sets. Observation of many mitotic plates in tetraploid specimens of *O. apulica* indicated that the chromosome complement contains four identical basic sets. Aneuploidy was observed in *O. biscutella* O. Danesch & E. Danesch from Gargano with chromosome numbers 2n=36 and 2n=37. Observation of meiotic plates at metaphase I in embryo sac mother cells (E.M.C.s) helped to identify the accessory chromosomes. During metaphase I, 18 bivalents + 1 univalent chromosomes could be counted in some plates. Despite the recent advances in our study of polyploid taxa, many aspects remain to be investigated.

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INDICE