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The genus *Ornithogalum* (Liliaceae) and its karyotype variation in European Turkey

Abstract

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Ornithogalum is currently represented in European Turkey by 13 species. Chromosome numbers, counted on all, are tabulated, and micrographs of somatic metaphase plates are provided.

Introduction

Ornithogalum is a taxonomically difficult genus, in which clear-cut limits between taxa are exceptional, while morphology is poorly correlated with variation in chromosome number and karyotype. According to the *Flora of Turkey* (Davis 1984, 1988), the genus is represented in Turkey by 27 species, to which recent publications (Speta 1989, 1990, 1991a-e, 1992, Johnson & al. 1991) have added 15 more. In European Turkey, 13 *Ornithogalum* species have so far been found, which are grouped into 3 subgenera, as follows: *O.* subg. *Beryllis* (*O. pyrenaicum*, *O. brevistylum*); *O.* subg. *Ornithogalum* (*O. armeniacum*, *O. orthophyllum*, *O. comosum*, *O. fimbriatum*, *O. montanum*, *O. oligophyllum*, *O. sibthorpii*, *O. refractum*, *O. umbellatum*); and *O.* subg. *Myogalum* (*O. nutans*, *O. boucheanum*).

Material and methods

All 13 *Ornithogalum* species occurring in European Turkey have been studied cytologically. The plant material (see Table 1) consisted of bulbs collected from the wild and cultivated in greenhouses or out of doors in the experimental garden at the Departments of Botany in Edirne and/or Istanbul.

Root tips were pre-treated in saturated aqueous alpha-bromonaphthalene for 24 hours at 5-6°C and fixed in 3 : 1 alcohol : acetic acid. Chromosome preparations were made using a standard Feulgen-stain squash technique (Johnson & al. 1991). An Olympus photo-microscope was used for the photographs.

Table 1. Chromosome numbers of *Ornithogalum* species found in European Turkey. – Locality data are available from the authors on request.

<i>Ornithogalum</i>	2n	Voucher Nos.
subg. <i>Beryllis</i> (Salisb.) Baker		
<i>pyrenaicum</i> L.	18	EDTU 3191, ISTE 60628
<i>brevistylum</i> Wolfner *	24	EDTU 2361, ISTE 59802
subg. <i>Ornithogalum</i>		
<i>oligophyllum</i> E. D. Clarke	18	EDTU 1944, ISTE 59758
	18	EDTU 1957, ISTE 59757
<i>montanum</i> Cirillo aggr.	14	EDTU 1984, ISTE 59747
	14	ISTE 61625
<i>fimbriatum</i> Willd.	12	EDTU 1903, ISTE 59720
	12	EDTU 1907, ISTE 59732
<i>sibthorpii</i> Greuter aggr.	14	EDTU 1929, ISTE 59746
	14	EDTU 1833
	14	EDTU 1881
	28	EDTU 3145, ISTE 60535
	28	EDTU 1846
	28	EDTU 1853
	28	EDTU 1902, ISTE 59726
	32	EDTU 1931, ISTE 60536
<i>umbellatum</i> L.	36	ISTE 59737
	36	EDTU 1968, ISTE 59773
	45	EDTU 1948
	45	EDTU 1956, ISTE 59759
	54	EDTU 1941, ISTE 59762
<i>orthophyllum</i> Ten.	14	EDTU 1984
	14	EDTU 2034, ISTE 60063
<i>comosum</i> (L.) Mill. *	14	EDTU 2151, ISTE 59799
	18	EDTU 2055, ISTE 59792
	20	EDTU 2060, ISTE 60064
<i>armeniicum</i> Baker	16	EDTU 3115, ISTE 60184
<i>refractum</i> Kit. ex Schldl.	28	EDTU 1832
	28	EDTU 1917
	28	EDTU 1863
	28	EDTU 3144, ISTE 60528
	54	EDTU 1889
subg. <i>Myogalum</i> (Link) Baker		
<i>nutans</i> L.	14	EDTU 1970
	35	ISTE 61269
<i>boucheanum</i> (Kunth) Asch. *	56	EDTU 3150, ISTE 59744

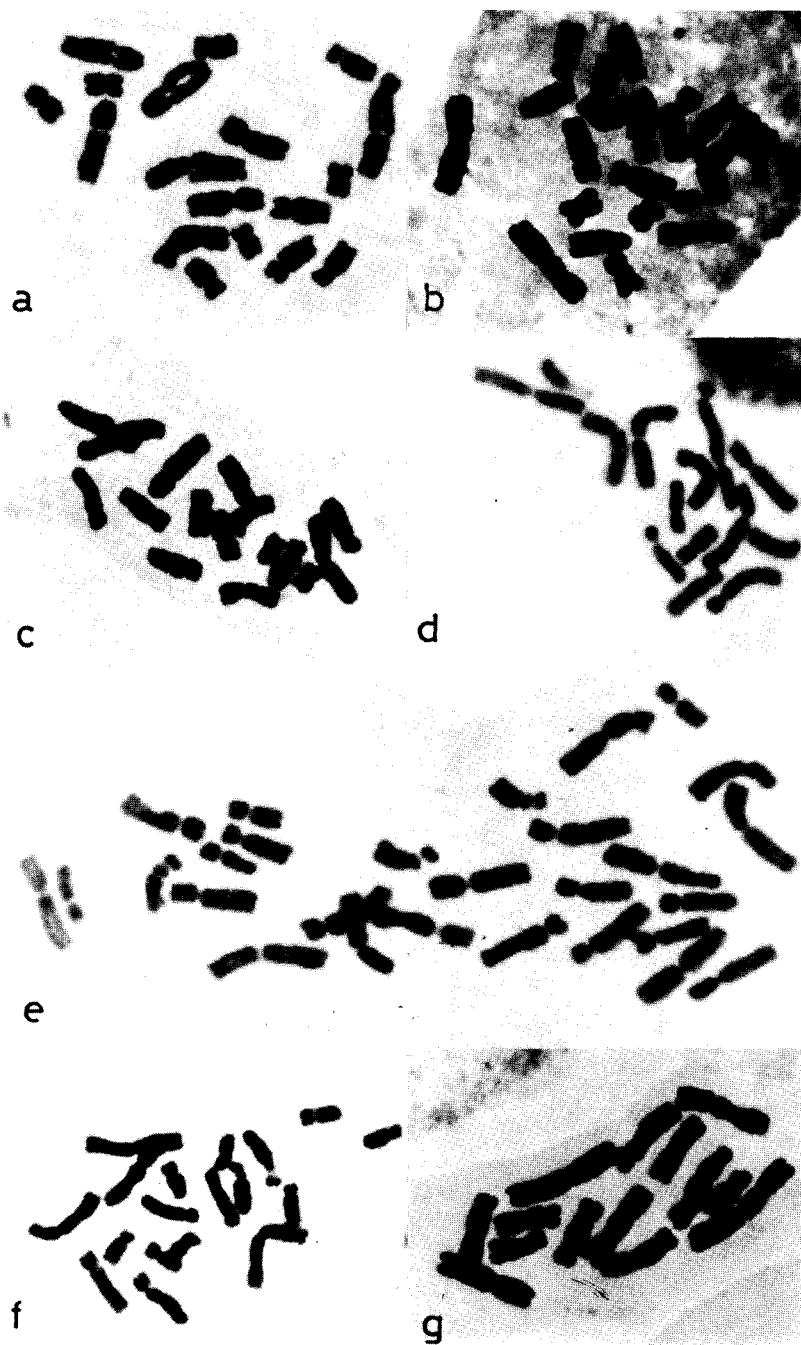


Fig. 1. Metaphase plates of somatic cell divisions of *Ornithogalum* species. – a, *O. pyrenaicum* ($2n = 18$); b, *O. brevistylum* ($2n = 24$); c, *O. armeniacum* ($2n = 16$); d, *O. sibthorpii* ($2n = 14$); e, *O. sibthorpii* ($2n = 32$); f, *O. oligophyllum* ($2n = 18$); g, *O. montanum* ($2n = 14$). – Scale bar = 10 μm .

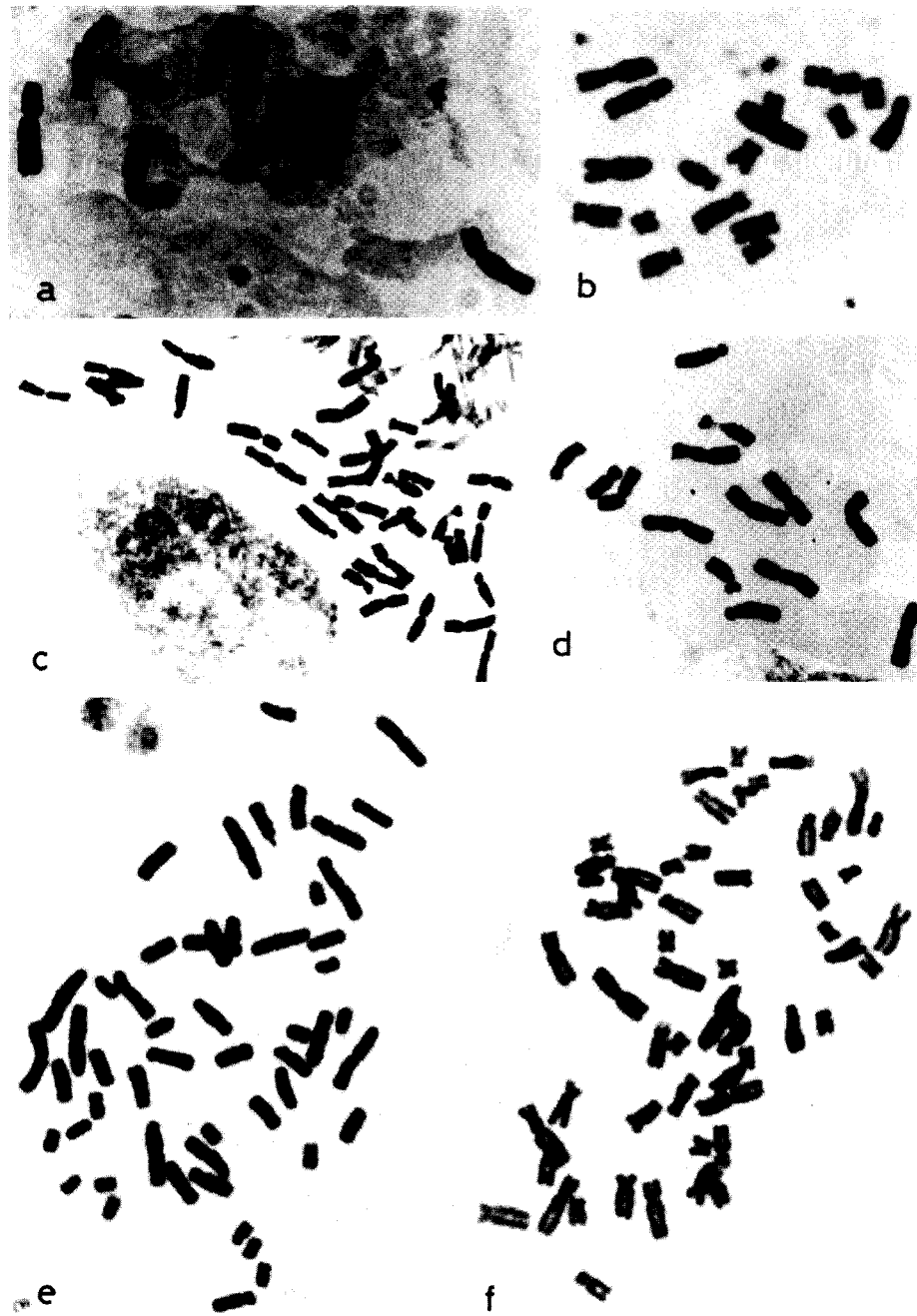


Fig. 2: Metaphase plates of somatic cell divisions of *Ornithogalum* species. – a, *O. fimbriatum* ($2n = 12$); b, *O. comosum* ($2n = 18$); c, *O. nutans* ($2n = 35$); d, *O. nutans* ($2n = 14$); e, *O. boucheanum* ($2n = 56$); f, *O. refractum* ($2n = 54$). – Scale bar = 10 μm .

Permanent slides are stored at the Department of Botany, University of Thrace, Edirne. Herbarium vouchers are kept at ISTE (Herbarium, Faculty of Pharmacy, Istanbul University) and EDTU (Herbarium, Faculty of Science, University of Thrace). All specimens were identified by the authors except those marked with an asterisk (*), in Table 1, which were revised by F. Speta.

Results

The results of our study are summarized in Table 1 and show the range of chromosome variation found in plants of the same species but from different areas. Photographs of somatic metaphase plates, one for each species, are shown in Fig. 1- 2.

Within the 13 species, five different basic chromosome numbers ($x = 6, 7, 8, 9, 10$) and four levels of polyploidy ($4x, 5x, 6x, 7x$) were found.

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