CHROMOSOME NUMBERS IN SOME TRIPLEUROSPERMUM (ASTERACEAE) SPECIES FROM IRAN

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This study includes 4 reports of chromosome counts in *Tripleurospermum* Sch. Bip. belonging to the tribe Anthemideae of the family Asteraceae from Iran. Confirming the reported base number of x=9 for this genus, the species studied include diploid and tetraploid species. Chromosome counts for three species are reported for the first time from Iran.

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Key words: chromosome; Iran; polyploidy**;** Tripleurospermum**;** new report

شمارش کروموزومی در برخی گونه های جنس Tripleurospermum Sch. Bip در ایران

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در این بررسی تعداد کروموزوم های چهار گونه از جنس Tripleurospermum Sch. Bip متعلق به طایفه Anthemideae از تیره Asteraceae از ایران گزارش می شود. با توجه به عدد کروموزومی پایه x=9 گزارش شده برای این جنس، نمونه های مورد بررسی شامل گونه‌های دیپلوییید و تترا پلوییید بود. عدد کروموزومی سه گونه برای اولین بار از ایران گزارش می شود.

INTRODUCTION

The genus *Tripleurospermum* Sch. Bip. belongs to the tribe *Anthemideae* of the Asteraceae (Compositae) family and comprises *c.* 40 species distributed mainly in Europe and temperate Asia, with a few species also in North America and North Africa (Bremer & Humphries 1993). The genus is represented by 7 taxa at the level of species and variety in the *Flora of* IRAN (Mozaffarian 2008).

The most common basic chromosome number in the *Anthemideae* is *x*=9, although *x*=8 and *x*=10 have been reported by some researchers (Carr *et al.* 1999; Valles *et al*. 2005; Chehregani & Hajisadeghian 2009). The aim of the present study is to provide karyological data of *Tripleurospermum* that might increase our knowledge on systematic and evolutionary relationships within the genus.

MATERIALS AND METHODS

Root tip meristems obtained directly from natural populations were used for chromosome analysis. The tips of roots, cleaned of soil particles, were cut off and pretreated with 0.05% colchicine for 2.5 h (Inceer et al. 2002). The root tips were then fixed in ethanol-acetic acid (3:1) for at least 24 h at 4ºC, hydrolysed in 1NHCl at 60ºC for 12–13 min and then rinsed in tap water for a minimum of 2–3 min Staining was carried out in 1% aqueous aceto-orcein for 12–18 h at room temperature and squashes were made in 45% acetic acid.

RESULTS

Tripleurospermum sevanense (Manden.) Pobed.

Iran, Azerbaijan, Chaldoran, Dardarasi village, 1800m, Khayati, July 2012, ALUH 10626, 2n=36 (Fig.1-A)

This is the first report from Iran populations. Our tetraploid count agrees with many previous reports on material from other areas (Inceer & Hayirlioglu-Ayaz 2010). Our chromosome count confirms the existence of the tetraploid cytotype of this species, reported by

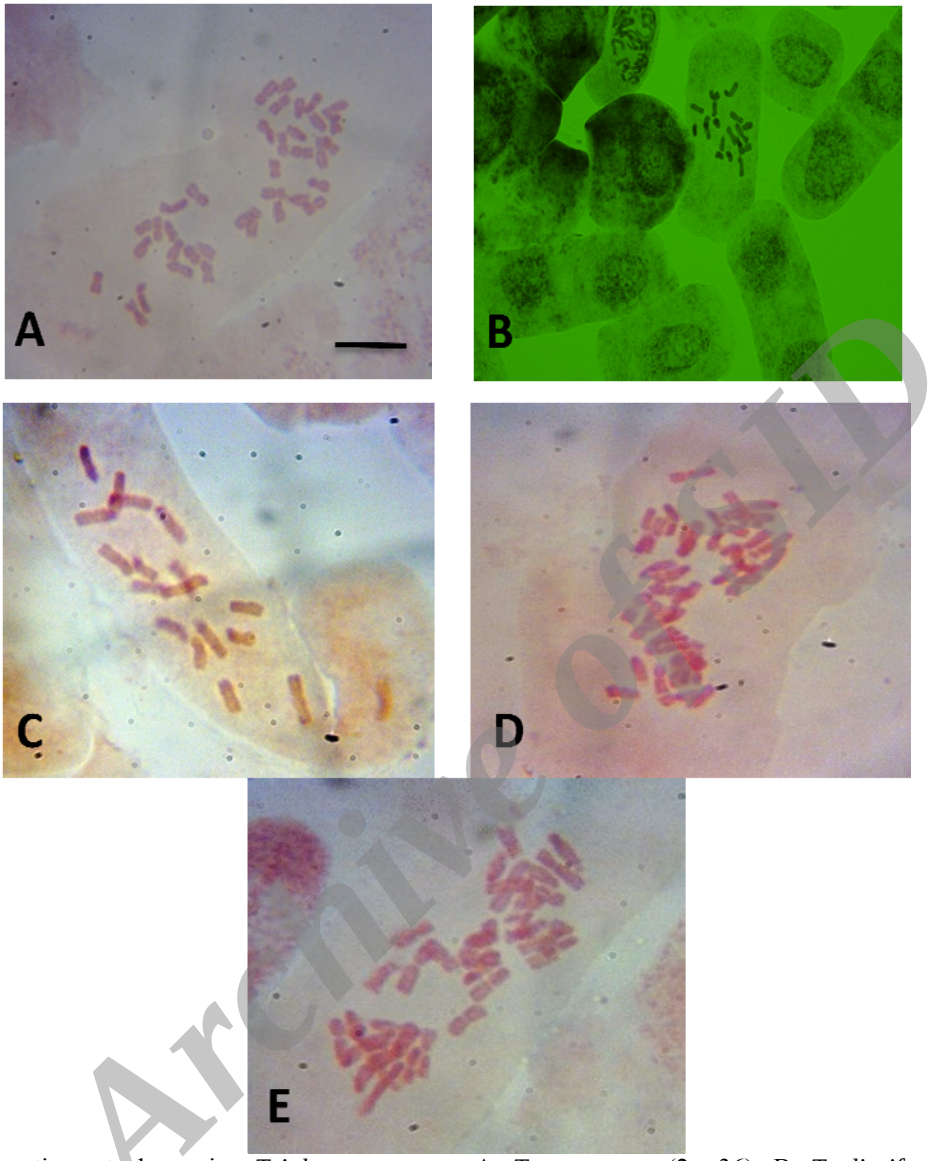

Fig. 1. Somatic metaphases in *Tripleurospermum*: A. *T. sevanense* (2n=36); B. *T. disciforme* (2n=18); C. *T. parviflorum* (2n=18); E & D. *T. transcaucasicum* (2n=36). *Scale bars* 10 µm.

Inceer and Beyazoglu (2004), Garcia et al. (2005) and Inceer and Hayirlioglu-Ayaz (2007) on Turkish materials. Apart from this, one count on Armenian plants has reported the diploid level, 2*n* = 18 (Avetisian and Oganesian 1995).

T. disciforme Sch. Bip.

Iran, Ardebi, Givi, 1400m, Khayati, July 2012, ALUH 10335, 2n=18 (Fig.1-B)

Our diploid count agrees with many previous reports (Razaq *et al.*1994, Ghaffari 1999, Watanabe 2009). It confirms that the diploid level predominates in this species, although the tetraploid level has also been reported in Iranian plants (2*n* = 36; Chehregani and Mehanfar 2008).

T. parviflorum (Willd.) Pobed.

Iran, Azerbaijan, Khoy, 1200m , Khayati, July 2012, ALUH 10346, 2n=18 (Fig.1-c)

This is the first report from Iran populations. Our diploid count agrees with many previous reports on material from other areas (Avetisian & Oganesian

1995, Inceer & Beyazoglu 2004, Inceer & Hayirlioglu-Ayaz 2010). It confirms that the diploid level predominates in this species.

T. transcaucasicum (Manden.) Pobed.

Iran, Azerbaijan, Chaldoran, Siah cheshmeh,1888m, Khayati, June 2012, ALUH 10501, 2n=36 (Fig.1-D & E).

According to our data, this is the first tetraploid report of the chromosome number of this species in Iran based on x=9. Previous counts, 2n=18 has been reported for Turkish plants (Inceer and Beyazoglu 2004, Inceer & Hayirlioglu-Ayaz 2010) and in plants from Armenia (Avetisian and Oganesian 1995). This taxon is thus represented by tetraploid cytotypes in Iran.

The results listed above and in Table 1 confirm the existence of one basic chromosome number in the genus. All of the studied taxa have x = 9, the most common basic number in tribe *Anthemideae* and the family Asteraceae (Fedorov 1969; Solbrig 1977; Schweizer & Ehrendorfer 1983; Valles *et al*. 2001). The ploidy levels range from 2*n* = 2*x* = 18 in *T. disciforme*, *T. parviflorum*, *T. sevanense*, to 2n= 4*x* = 36 in *T. transcaucasicum* and *T. disciforme*.

Table 1. Chromosome number and ploidy level in four *Tripleurosperum* species

Taxon	Chromosome number (2n)	Ploidy level
T. sevanense	36	4x
T. disciforme	18	2x
T. parviflorum	18	2x
T. transcaucasicum	36	4x

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