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Cytotaxonomical contributions on the Flora of Crete. II

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RÉSUMÉ

PHITOS, D. & G. KAMARI (1984). Contributions cytotaxonomiques à la flore de Crète. II. *Candollea* 39: 447-451. En anglais, résumé français.

La cytotaxonomie des espèces *Lutzia cretica*, *Verbascum spinosum*, *V. arcturus*, *Campanula laciniata*, *Centaurea redempta*, *C. idaea*, *Staechelina petiolata* et *Allium tardans*, endémiques de la Crète ou de l'aire Cardegienne plus large est étudiée. Les nombres chromosomiques de *Verbascum arcturus*, *Centaurea idaea* et *Staechelina petiolata*, sont fournis pour la première fois et les nombres chromosomiques déjà constatés pour les cinq autres espèces sont vérifiés.

ABSTRACT

PHITOS, D. & G. KAMARI (1984). Cytotaxonomical contributions on the Flora of Crete. II. *Candollea* 39: 447-451. In English, French abstract.

The species *Lutzia cretica*, *Verbascum spinosum*, *V. arcturus*, *Campanula laciniata*, *Centaurea redempta*, *C. idaea*, *Staechelina petiolata* and *Allium tardans*, endemic of Crete or of the larger Cardegean area are studied cytotaxinomically. Chromosome numbers for *Verbascum arcturus*, *Centaurea idaea* and *Staechelina petiolata*, are given for the first time; the already reported chromosome numbers for the remaining five species are verified.

This contribution to the cytotaxonomy of the flora of Crete is the second by the same authors (PHITOS & KAMARI, 1974).

The material examined comes not only from Crete but also from the island of Karpathos and belongs to endemics of the larger South Aegean area, i.e. the region so properly named Cardaegean by GREUTER (1971).

All the plants used for this study were grown in the experimental garden of the Botanical Institute, Patras University, from seeds or bulbs collected from natural populations. The method used for the chromosome study has been described in the previous paper of this series (PHITOS & KAMARI, 1974); only minor modifications have been occasionally adopted.

1. *Lutzia cretica* (L.) Greuter & Burdet ($2n = 16 + 2B$)

This species, known also as *Alyssoides cretica*, is a distinctive endemic of Crete, Karpathos and other islands of the Cardaegean area. It is a chasmophyte on calcareous cliffs and shows a considerable altitudinal amplitude, occurring along the coast as well as at higher altitudes.

The chromosome number of *Lutzia cretica* is already known ($2n = 16$), being reported (as *Alyssoides cretica*) by CONTANDRIOPOULOS (1969) from plants of Crete and PERSSON (1971) from plants of Astypalea. We examined plants from Karpathos and found also $2n = 16$. Two additional B chromosomes were invariably present (Fig. 1a).

2. *Verbascum spinosum* L. ($2n = 26$)

It is a most characteristic species, endemic of Crete and restricted to Levka Ori. Within the genus *Verbascum* it is taxinomically isolated, placed, alone to a separate subsectio (subsect. *Spinosa*). Its chromosome number $2n = 26$, already determined by MONTMOLLIN (1982) is verified (Fig. 1b).



Fig. 1. — Mitotic metaphase plates of: a, *Lutzia cretica*; b, *Verbascum spinosum*; c, *Centaurea redempta*; , *Centaurea idaea*; e, *Stachelina petiolata*.

3. *Verbascum arcturus* L. ($2n = 46$)

It is a chasmophyte, also endemic of Crete, occurring in most parts of the island and at altitudes of 200-1000 m. Its chromosome number, $2n = 46$, is given here for the first time. The length of the chromosomes varies from 0.2 to 0.6 μm .

4. *Campanula laciniata* L. ($2n = 34$)

This beautiful and taxonomically most interesting species of *Campanula* is an endemic of the South Aegean area.

When its chromosome number was determined for the first time (PHITOS, 1964) it was known from Karpathos, Folegandros, Astypalea and Kardiotissa islands. In the meantime it was also found in Crete (GREUTER, 1973). The specimens examined now come from Karpathos and have the same chromosome number $2n = 34$ and a similar caryotype as the ones studied previously from Folegandros (PHITOS, 1964).

The taxonomic and biogeographic position of this species have been evaluated not only in the above paper, but also by GREUTER & RECHINGER (1967), RUNEMARK (1969) and GREUTER (1973).

5. *Centaurea redempta* Heldr. ($2n = 20$)

C. redempta belongs to the rich in endemic and vicarious species sectio *Acrocentron*. It is endemic to Western Crete, where it occurs at an altitude of 400-1200 m. The chromosome number $2n = 20$, already given by RUNEMARK (1967), is verified here (Fig. 1c). *C. redempta* is closely related to *C. cytherea*, an endemic of the island of Kythira, which also possesses the same chromosome number ($2n = 20$) found in plants from the "locus classicus".

6. *Centaurea idaea* Boiss. & Heldr. ($2n = 16$)

It is an endemic of Crete distributed in almost every part of the island. It occurs mainly in the mountainous area but it is also found in coastal sites. In addition to the morphological similarities with *C. solstitialis*, the same chromosome number ($2n = 16$), given now for the first time for *C. idaea* (Fig. 1d), underlines the close phylogenetic relation of these two species.

7. *Stachelina petiolata* Hilliard & Burt ($2n = 34$)

The genus *Stachelina* is represented in Crete by two chasmophytic species, i.e. *S. petiolata* and *S. fruticosa*. The former is an exclusive endemic of the island, whereas the later occurs in the larger area of Crete-Karpathos-Kasos-Saria.

Among the five European species of the genus only the chromosome number ($2n = 30$) of *S. dubia* is known, at least to our knowledge. The *S. petiolata* plants examined by us cytologically, were collected from the Theriso area (Kidhonia district) and showed $2n = 34$ (Fig. 1e), which is a new basic chromosome number ($x = 17$) for this genus.

8. *Allium tardans* Greuter & Zahar. ($2n = 16$)

Allium tardans (sectio *Codonoprasum*) has been described from Crete, where it is widespread over almost all the island at an altitude of 400-800 m (see also STEARN, 1978). In addition, it has recently been found in Karpathos (GREUTER & al., 1983).

MICELI & GARBARI (1979), have done a cytological study on plants of this species from Crete and give a chromosome number $2n = 16$ and their caryotype. Plants from Karpathos were examined by us and found to possess the same chromosome number (Fig. 2).

A caryotypic comparison of the plants from Karpathos and Crete reveals certain differences, a phenomenon not uncommon among populations of the genus *Allium*. Namely, in the caryotypes from Karpathos all chromosomes are metacentric (m) i.e. no submetacentric (sm) chromosomes are observed. In addition, the pair of SAT chromosomes are the smallest, i.e. the 8th, in the caryotypes of plants from Karpathos, whereas it is the 6rd in the plants from Crete.

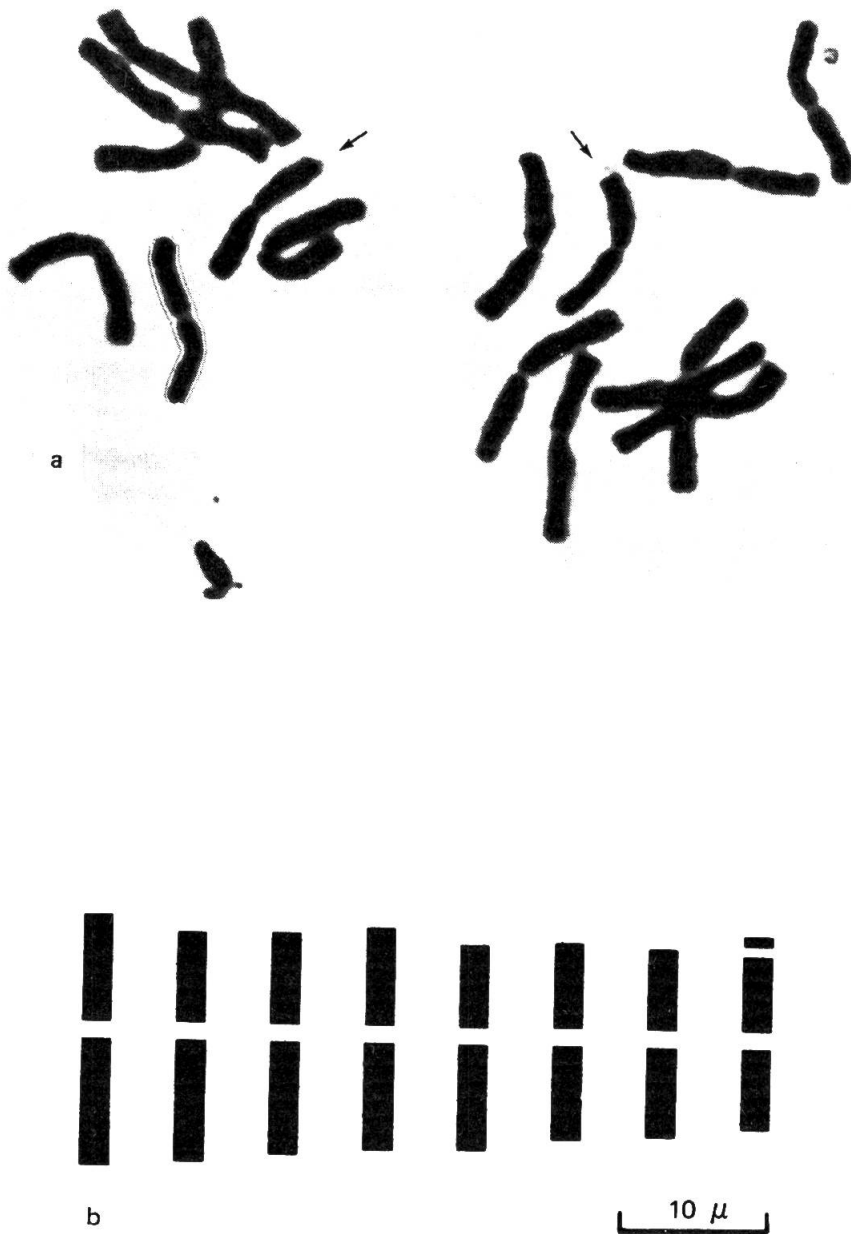


Fig. 2. — Karyotype (a) and idiogram (b) of *Allium tardans* with $n = 8$ metacentric (m) chromosomes (r-index 1-1.3). The smaller chromosome pair has a small satellite (—).

<i>Taxon</i>	<i>Locality</i>	<i>2n</i>
<i>Lutzia cretica</i> (L.) Greuter & Burdet	KARPATOS: near Arkasa (leg.: Phitos & Kamari 19229)	16
<i>Verbascum spinosum</i> L.	CRETE: Distr. Kidhonia, Omalos, alt. 1050 m (leg.: Matthäs, 6.10.1983)	26
<i>V. arcturus</i> L.	CRETE: Distr. Kissamos, near Topolia (leg.: Matthäs, 5.10.1983)	46
<i>Campanula laciniata</i> L.	KARPATOS: near Arkasa (leg.: Phitos & Kamari 19230)	34
<i>Centaurea redempta</i> Heldr.	CRETE: Distr. Hagios Vasilios, Mt. Kryoneritis, alt. 500 m (leg.: Kypriotakis)	20
<i>C. idaea</i> Boiss. & Heldr.	CRETE: Gorge of Samaria, alt. 1120 m (leg.: Matthäs, 6.10.1983)	16
<i>Staehelina petiolata</i> (L.) Hilliard & Burtt	CRETE: Distr. Kidhonia, near Therison (leg.: Matthäs, 9.10.1983)	34
<i>Allium tardans</i> Greuter & Zahar.	KARPATOS: Mt. Kalilimni, alt. 400 m (leg.: Phitos & Kamari 19118)	16

Table 1. — Chromosome numbers.

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