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CHROMOSOME NUMBERS FOR THE FLORA OF CYPRUS (***)

Riassunto — *Numeri cromosomici per la flora di Cipro.* Sono state analizzate nove specie raccolte nell'isola di Cipro e coltivate nell'Orto Botanico pisano. *Ranunculus asiaticus* L. ($2n=32$) e *Bellevalia nivalis* Boiss. et Kotschy ($2n=16$) sono risultati tetraploidi mentre *Valeriana italica* L. ($2n=16$), *Narcissus tazetta* L. ($2n=20$), *Hyacinthella millingenii* (Post) Feinbr. ($2n=22$) e *Bellevalia trifoliata* (Ten.) Kunth ($2n=8$) sono diploidi. Ciò conferma precedenti osservazioni. Il numero cromosomico di due specie di *Ornithogalum* diploidi (*O. pedicellare* Boiss. et Kotschy, $2n=22$; *O. chionophilum* Holmboe, $2n=20$) è stato accertato per la prima volta.

Abstract — Nine species from Cyprus have been caryologically investigated. The chromosome numbers of *Ranunculus asiaticus* L. ($2n=32$), *Valeriana italica* Lam. ($2n=16$), *Narcissus tazetta* L. ($2n=20$), *Hyacinthella millingenii* (Post) Feinbr. ($2n=22$), *Bellevalia trifoliata* (Ten.) Kunth ($2n=8$), *B. nivalis* Boiss. et Kotschy ($2n=16$) and *Muscari comosum* (L.) Miller ($2n=18$) have been confirmed. The chromosome numbers of *Ornithogalum pedicellare* Boiss. et Kotschy ($2n=22$) and of *O. chionophilum* Holmboe ($2n=20$) appear to be new.

Key words — Chromosome numbers - Cyprus flora.

Numerous living specimens of plants, mainly geophytes, were gathered during a campaign on Cyprus in late March - early April 1986 and grown in Pisa University Botanic Gardens (H.B.P.). Some were caryologically investigated using root tip meristems dyed by the commonly used Heitz method after treatment with 0.3% colchicin. Specimens were identified using Meikle's (1977-1985) analytical keys, nomenclature and systematic sequence without modification. *Exsiccata* in PI.

Chromosome counts confirmed previous results for *Valeriana italica*, *Narcissus tazetta*, *Hyacinthella millingenii*, *Bellevalia trifoliata*

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and *B. nivalis*. Data for *Ornithogalum pedicellare* and *O. chionophilum* appear to be new.

Ranunculus asiaticus appeared to be tetraploid, in agreement with early counts but at variance with more recent observations.

1 - *Ranunculus asiaticus* L.

Chromosome number: $2n = 32$ (Fig. 1)

Source: between Ayia Anna and Psevdas, in arid garigue, 31.3.1986, Garbari & Arnold (H.B.P. 101/1986).

Observations: the tetraploid level for *R. asiaticus* was reported by LARTER (1932) but accepted with reservations by Löve and Löve (1961). This species is diploid ($2n = 16$) according to NAKAJIMA (1936), KURITA (1957), LANGLET (1927), GOEPFERT (1974) and KLIPHUS & BAR-KOUDAH (1977).

2 - *Valeriana italica* Lam.

Chromosome number: $2n = 16$ (Fig. 2)

Source: at the turning off for Kornos, 5 km below the Lefkara Pass, at valley bottom, 1.4.1986, Garbari & Arnold (H.B.P. 148/1986).

Observations: the chromosome number found here agrees with that already reported for Greek specimens (STRID, 1981; sub *V. dictoridis* Sibth. & Sm.).

3 - *Narcissus tazetta* L.

Chromosome number: $2n = 20$ (Fig. 3)

Source: near Birth of Aphrodite, on rocks, 4.4.1986, Garbari & Arnold (H.B.P. 121/1986).

Observations: this datum is particularly interesting since it concerns plants which we agree with Meikle (1985) in considering wholly native. This entity belongs to a highly complex caryological picture (cfr. FEDOROV, 1969; and references) which comprises many cultivated entities under the subsect. *Hermione* (FERNANDES, 1969; FERNANDES & ALMEIDA, 1971).

4 - *Ornithogalum pedicellare* Boiss. et Kotschy

Chromosome number: $2n = 22$ (Fig. 4)

Source: near «Baths of Aphrodite» in garigue and copse environment, 3.4.1986, Garbari & Arnold (H.B.P. 75/1986).

Observations: this entity has not hitherto been caryologically

studied; this data is therefore new for the species.

5 - *Ornithogalum chionophilum* Holmboe

Chromosome number: $2n = 20$ (Fig. 5)

Source: near the «Troödos» peak on Mt. Olympus at Khionistra («*locus classicus*») beneath *Pinus nigra* Arnold var. *caramanica* (Loudon) Rihder, 2.4.1986, Garbari & Arnold (H.B.P. 159/1986).

Observations: the chromosomal pattern of this endemic entity had not hitherto been studied either.

6 - *Hyacinthella millingenii* (Post) Feinbr.

Chromosome number: $2n = 22$ (Fig. 6)

Source: near «Baths of Aphrodite», Akamas in mixed garigue and copse, 3.4.1986, Garbari & Arnold (H.B.P. 76/1986).

Observations: our observations of the chromosome pattern of this entity agree with those already reported in the literature for specimens gathered on Cyprus (SPETA, 1986) and in south-western Asia (PERSSON and WENDELBO, 1981).

7 - *Bellevalia trifoliata* (Ten.) Kunth

Chromosome number: $2n = 8$ (Fig. 7)

Source: between Ayia Napa and Cape Greco among rocks, 30.3.1986, Garbari & Arnold (H.B.P. 88/1986).

Observations: our data agree with those already reported in the literature for specimens from several different places (GARBARI and TORNADORE, 1972; BOTHMER and WENDELBO, 1981).

8 - *Bellevalia nivalis* Boiss. et Kotschy

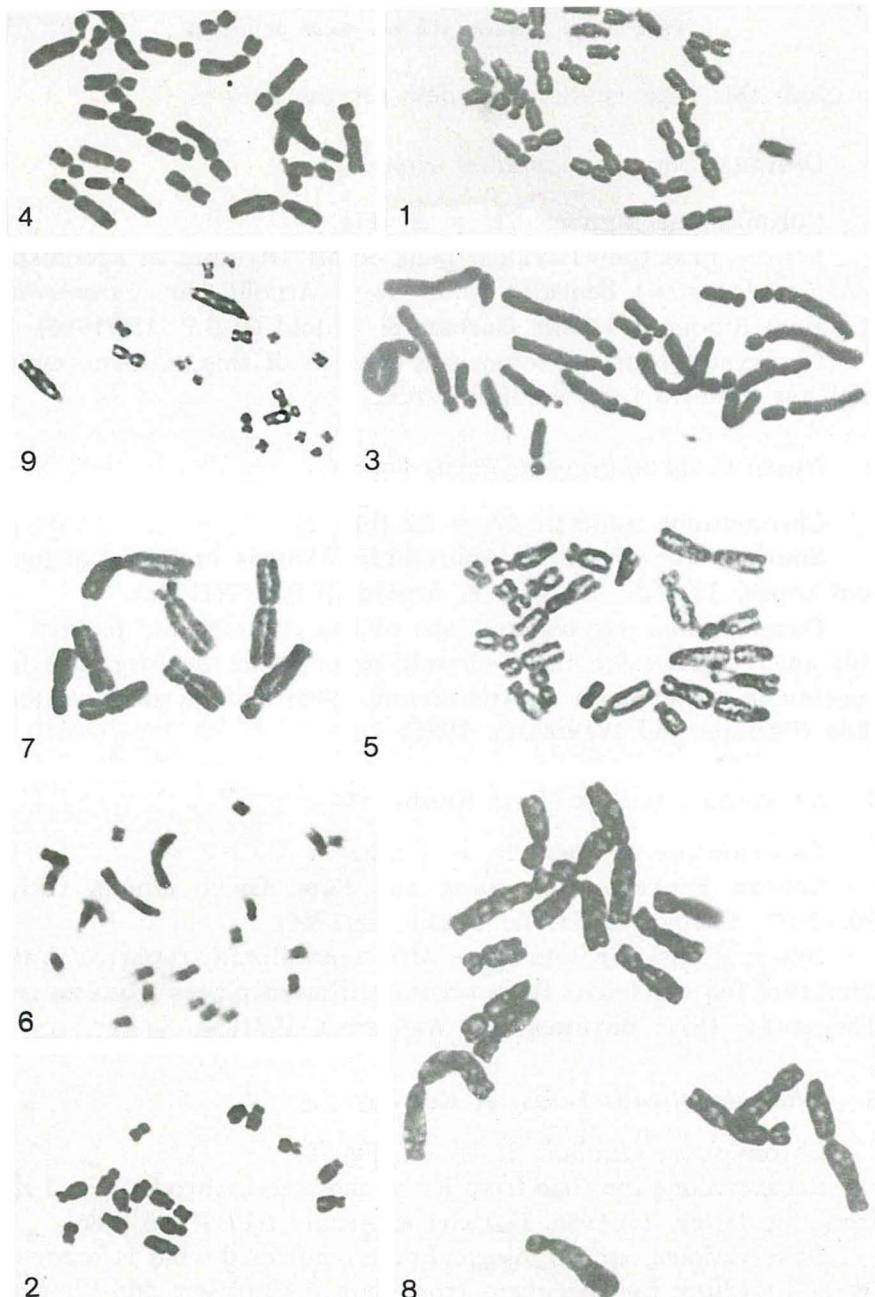
Chromosome number: $2n = 16$ (Fig. 8)

Source: along the road from Kataliondas to Lythrodhonda, 1 km from the latter, 1.4.1986, Garbari & Arnold (H.B.P. 45/1986).

Observations: our caryological data confirmed what is reported in the literature for specimens from Cyprus (BOTHMER and WENDELBO, 1981).

9 - *Muscat comosum* (L.) Miller

Chromosome number: $2n = 18$ (Fig. 9)



Tab. 1 - Somatic metaphases ($\times 1400$) of plants caryologically investigated.

Fig. 1 - *Ranunculus asiaticus* L., $2n = 32$

Fig. 2 - *Valeriana italica* Lam., $2n = 16$

Fig. 3 - *Narcissus tazetta* L., $2n = 20$

Fig. 4 - *Ornithogalum pedicellare* Boiss. et Kotschy, $2n = 22$

Fig. 5 - *Ornithogalum chionophilum* Holmboe, $2n = 20$

Fig. 6 - *Hyacinthella millingenii* (Post) Feinbr., $2n = 22$

Fig. 7 - *Bellevalia trifoliata* (Ten.) Kunth, $2n = 8$

Fig. 8 - *Bellevalia nivalis* Boiss. et Kotschy, $2n = 16$

Fig. 9 - *Muscari* sp. $2n = 16$

Source: near Ayia Anna on acid rock, 30.3.1986, Garbari & Arnold (H.B.P. 125/1986).

Observations: the chromosome number we observed for Cyprus agrees with previous data (BENTZER, 1973 and GARBARI, 1973 sub *Leopoldia*). The caryotype pattern reveals a structural heterozygosis in the second pair of chromosomes in a similar way to that described for populations in other areas of the Mediterranean basin (RUIZ REJON and OLIVER, 1981; BENTZER and ELLMER, 1975).

REFERENCES

- BENTZER B. (1973) - Taxonomy variation and evolution in representatives of *Leopoldia* Parl. (Liliaceae) in the southern and central Aegean. *Bot. Notiser*, **126**: 69-132.
- BENTZER B., ELLMER M. (1975) - A case of stable polymorphism in *Leopoldia comosa* (Liliaceae). *Hereditas*, **81**: 127-132.
- BOTHMER R., WENDELBO P. (1981) - Cytological and morphological variation in *Bellevallia*. *Nord J. Bot.*, **1**: 4-11. Copenhagen.
- FEDOROV A.A. (Ed.) (1969) - Chromosome numbers of Flowering Plants. Leningrad.
- FERNANDES A. (1969) - Contribution to the knowledge of the biosystematics of some species of genus *Narcissus* L. V Simp. Fl. Europaea, 245-284. Univ. Sevilla.
- FERNANDES A., ALMEIDA M.T. DE (1971) - Sur les nombres chromosomiques de quelques formes horticoles du genre *Narcissus* L. I. *Bol. Soc. Brot.*, **45**: 227-252.
- GARBARI F. (1973) - Le specie del genere *Leopoldia* Parl. (Liliaceae) in Italia. *Webbia*, **28** (1): 57-80.
- GARBARI F., TORNADORE N. (1972) - Numeri cromosomici per la Flora italiana. *Inf. Bot. Ital.*, **4** (1): 63.
- GOEPFERT D. (1974) - Karyotypes and DNA content in species of *Ranunculus* L. and related genera. *Bot. Not.*, **127**: 464-489.
- KLIPHUIS E., BARKOUDAH Y.I. (1977) - Chromosome numbers in some syrian angiosperms. *Acta Bot. Neerl.*, **26**: 239-249.
- KURITA M. (1957) - Chromosome studies in Ranunculaceae. III. Karyotype of the subtribe Ranunculinae. *Rep. Biol. Inst. Ehime Univ.*, **2**: 1-8.
- LANGLET O.F.J. (1927) - Beitrage zur zitologie der Ranunculaceen. *Svensk. Bot. Tids.*, **21**: 1-17.
- LARTER L.N.H. (1932) - Chromosome variation and behavior in *Ranunculus* L. *Jour. Genetics*, **26** (2): 255-283.
- LÖVE A. and LÖVE D. (1961) - Chromosome numbers of central and northwest european plant species. *Opera Botanica*, **5**: 155. Uppsala.
- MEIKLE R.D. (1977-1985) - Flora of Cyprus, **1**, **2**. Kew.
- NAKAJIMA G. (1936) - Chromosome numbers in some crops and wild angiosperms. *Jap. J. Genet.*, **12**: 211-218.

- PERSSON K., WENDELBO P. (1981) - Taxonomy and cytology of the genus *Hyacinthella* (*Liliaceae - Scilloideae*) with special reference to the species of s.w. Asia. Part I. *Candollea*, **36**: 513-541.
- RUIZ-REJON M., OLIVER J.L. (1981) - Genetic variability in *Muscari comosum* (Liliaceae). I. A comparative analysis of chromosome polymorphisms in Spanish and Aegean populations. *Heredity*, **47** (3): 403-407.
- SPETA F. (1986) - Über *Hyacinthella millingenii* (Post) Feinbrun (Hyacinthaceae). *Phyton (Austria)*, **26** (1): 15-22.
- STRID A. (1981) - In: LÖVE A., 1981 - Chromosome number reports 73. *Taxon*, **30** (4): 840.

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