Mediterranean chromosome number reports — 12

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Abstract

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This is the twelfth of a series of reports of chromosomes numbers from Mediterranean area, peri-Alpine communities and the Atlantic Islands, in English or French language. It comprises contributions on 38 taxa: *Cyclamen, Crocus, Ajuga, Ornithogalum, Allium* and *Bellis* from Greece, by E. Kriemadi, P. Bareka & G. Kamari (Nos. 1278-1283); *Ononis* and *Astragalus* from Bulgaria and Turkey, by D. Pavlova & A. Tocheva (Nos. 1284-1287); *Geranium* from Bulgaria, by A. Petrova & P. Stanimirova (Nos. 1288-1294); *Scabiosa, Groenlandia, Hypericum, Crocus, Ajuga, Colchicum, Euphorbia, Centaurea, Aconitum* and *Leopoldia* from Italy, by L. Peruzzi & G. Cesca (Nos. 1295-1304); *Delphinium* from Tunisia, Morocco, France, Armenia, Balearic Islands and Canary Islands, by M. Bosch, J. Simon & C. Blanché (Nos. 1305-1311); *Anthyllis* and *Genista* from Spain and Sardinia, by T. Cusma Velari, L. Feoli Chiapella, V. Kosovel, G. Bacchetta & S. Patui (Nos. 1312-1314); *Genista* from Turkey, by T. Cusma Velari, L. Feoli Chiapella & Z. Aytaç (No. 1315); *Colchicum, Silene* and *Halocnemum* from Italy, by O. Cecchi & G. Fiorini (Nos. 1316-1318).

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Reports (1278-1283) by Eleni Kriemadi, Pepy Bareka & Georgia Kamari

1278. *Cyclamen hederifolium* Aiton — $2n = 68$ (Fig. 1).

Gr: Ionian Islands, Nomos Levkadas, Levkas island, close to the village Maradochori, locality known as Amouso, 38°36'N, 20°38'E, 14 Oct 2000, *Kriemadi EK 72* (UPA).

Cyclamen hederifolium is widespread in Mediteranean area, from France to the Balkan Peninsula and Turkey.

The diploid chromosome number $2n = 2x = 34$ has been reported in Greek material from Peloponnisos (Bennett & Grimshaw 1991) and from Mt. Olympos (Strid & Franzen 1981), as well as from Bulgaria (Peev 1976). The tetraploid chromosome number $2n = 4x = 68$ has already been reported in Greek material (Bennett & Grimshaw l.c.) and it is in accordance with our counts from Levkas island. Moreover, the somatic number $2n = 28$ has been given by Peev (1977) in material from Bulgaria, while Bennett & Grimshaw (l.c.) reported the chromosome number $2n = 54$ in material from Italy.

The karyotype of this species is symmetrical, consisting mostly of metecentric (m) chromosomes, six of which bear small, spherical and not always visible satellites. Chromosome size varies from 1.1 to 2.6 µm.

1279. *Crocus boryi* Gay — $2n = 30$ (Fig. 2).

Gr: Ionian Islands, Nomos Levkadas, Levkas island, close to the village Agios Nikolaos, 38°35'N, 20°33'E, 17 Nov 2000, *Kriemadi EK 70* (UPA).

Crocus boryi is a Greek endemic species distributed in W. and S. mainland, Ionian Islands, Kithira and southeast Kriti (Mathew 1982).

The chromosome number $2n = 30$ counted here confirms data reported by Brighton & al. (1973) in material from Peloponnisos and Kerkira island and by Phitos & Kamari (1983) from Kefallinia island.

A microphotograph of the karyotype is presented here from Levkas island. The karyotype is symmetrical, having mostly metacentric (m) chromosomes (Fig. 2). The karyotype formula consists of $2n = 24m + 2m\text{-SAT} + 4sm = 30$ chromosomes, ranging in size between 1.5 and 4.8 µm.

1280. *Ajuga iva* (L.) Schreb. — $2n = 10x = 80$ (Fig. 3).

Gr: Ionian Islands, Nomos Levkadas, Levkas island, close to the village Agios Nikolaos, 38°35'N, 20°33'E, 17 Nov 2000, *Kriemadi EK 73* (UPA).

Ajuga iva is a Mediterranean element, distributed from Portugal eastwards to Jordan.

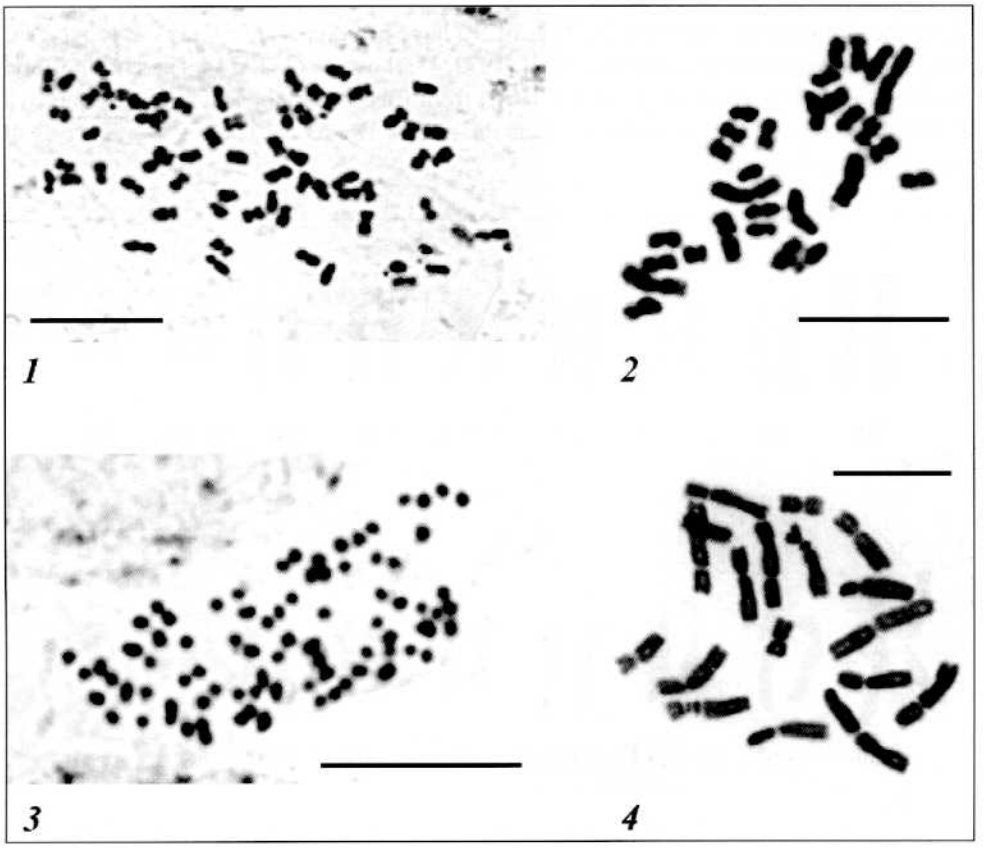
To our knowledge, no former records for this taxon have been reported from Greece. The somatic number $2n =$ c. 86 was counted in material from Balearic Islands, by Dahlgren & al. (1971).

The population examined here has proven to be decaploid, with $2n = 10x = 80$ small chromosomes, varying in size between 0.4 and 1.4 µm. The karyotype morphology cannot be detectable, due to the chromosome size, as well as, to unclear position of the centromeres.

1281. *Ornithogalum montanum* Cyr. [= *O. nyssarum* Petrovic] — $2n = 18$ (Figs. 4, 5a, 5b).

Gr: Ionian Islands, Nomos Levkadas, Levkas island, S. of the village Evgiros, 38°37'N, 20°40'E , 14 Oct 2000, *Kriemadi EK 69* (UPA). - (Figs. 4, 5a).

— Ionian Islands, Nomos Zakinthou, Zakinthos island, S part of the island, locality known as Faros Keriou, phrygana, 37°40'N, 20°49'E, alt. c. 50-150 m, 5 Apr 1997, *Kamari & al. s.n., cult. no* K22 (UPA). - (Fig. 5b).



Figs. 1-4. Microphotographs of mitotic metaphase plates of : **1,** *Cyclamen hederifolium,* $2n = 68$; **2,** *Crocus boryi,* $2n = 30$; **3,** *Ajuga iva,* $2n = 10x = 80$; **4,** *Ornithogalum montanum,* $2n = 18$. — Scale bars = 10 µm.

Ornithogalum montanum is mainly distributed in the E. Mediterranean region extending westwards to Italy and Sicily.

Our count ($2n = 18$) is in accordance with previous records from Greece (Phitos 1980, Van Loon & Oudemans 1982, Cullen & Ratter 1967). The chromosome numbers $2n = 20$, 22, 24 (Phitos l.c.) and $2n = 16$ (Van Loon & Oudemans l.c.) have also been reported for Greek material.

The somatic number $2n = 18$ reported here, is also given from Italy (Garbari & Tornadore 1971, Tornadore & Garbari 1979), from Turkey (Cullen & Ratter 1967) and from Romania (Lungeanu 1972). Moreover, Tornadore & Garbari (l.c.) reported the chromosome complements $2n = 18$, 18+1B, 20, 20+1B, 22, 22+1B, 23, 24; 2n=30 is mentioned by Garbari & Tornadore (1972).

Several authors have reported a great variation in the chromosome number, as well as in B-chromosomes, of *O. montanum* from other countries. Barbujani & Pigliucci (1989) reported the chromosome number $2n = 18 + 2B$ in Italian populations, Kushnir & Galil (1977) found $2n = 16$, 20 in material from Israel, Cullen & Ratter (1967) counted $2n = 14$ in Turkish populations and $2n = 18$ in material from Sicily, Greece, Turkey and Lebanon. Also, the chromosome numbers 2n = 12, 14, 16 have been reported from in material from Bulgaria (Lungeanu 1972, Markova & al. 1972, Markova & al. 1974). The chromosome number $2n = 20$, is given by Agapova (1974) from Russia. Bolkhovskich & Alexandrova (1988) have reported the somatic numbers $2n = 2x = 18+2B$ and $2n = 2x = 36 + 4B$ in material from Armenia.

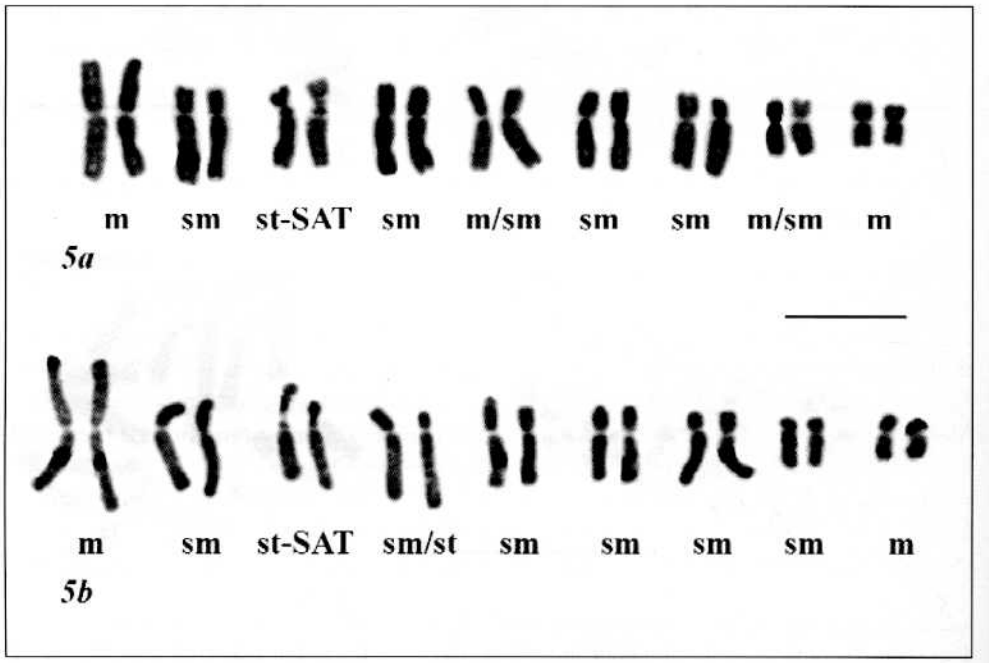


Fig. 5. Karyograms of *Ornithogalum montanum*, $2n = 18$, from the populations: **a,** Kriemadi EK 69; **b,** Kamari & al. *cult. no* K22. — Scale bar = 10 µm.

The karyotype is symmetrical, consisting mainly of metacentric and submetacentric chromosomes. The karyotype formula of the population from Levkas is $2n = 4m + 4m/sm + 8sm + 2st\text{-}SAT = 18$ (Figs. 4, 5a). The population from Zakinthos consists of $2n = 4m + 10sm + 2sm/st + 2st\text{-}SAT = 18$ chromosomes, varying in size between 2.7 and 10.5 μm. The fourth chromosome pair of this population is strongly heteromorphic in the length of its short arms (Fig. 5b).

1282. ***Allium ionicum*** Brullo & Tzanoud. — $2n = 16$ (Fig. 6).

Gr: Ionian Islands, Nomos Levkadas, Levkas island, S. of the village Evgiros, 38°37'N, 20°40'E , 14 Oct 2000, *Kriemadi EK 71* (UPA).

Allium ionicum is a Greek endemic species distributed in the Ionian Islands (Levkas, Kefalonia and Ithaki).

Brullo & Tzanoudakis (1994) have also reported the same chromosome number of $2n = 16$ and a similar symmetrical karyotype in material from Levkas and Ithaki islands. They also refer variation in the number and the morphology of the SAT-chromosomes.

Microphotograph and a karyogram of a different population studied are presented here (Fig. 6). The karyotype is symmetrical, with mostly metacentric chromosomes, which vary in size between 7.0 to 12.8 μm. Satellites are observed on the long arms of the third in size chromosome pair and on the short arms of the submetacentric chromosome pair, which, however, are not always visible. Moreover, the shortest metacentric chromosome pair bears spherical and always visible satellites, in addition to an heterozygosity in the size of their short arms. The karyotype formula is given as: $2n = 10m + 4m\text{-}SAT + 2sm\text{-}SAT = 16$ chromosomes.

1283. ***Bellis perennis*** L. — $2n = 18$ (Fig. 7).

Gr: Ionian Islands, Nomos Levkadas, Levkas island, close to the village Agios Nikolaos, 38°35'N, 20°33'E, 17 Nov 2000, *Kriemadi EK 74* (UPA).

Bellis perennis is a Euro-Siberian element distributed throughout Europe, extending eastwards to Azerbaijan.

The somatic number $2n = 18$ of this species is in accordance with previous reports by Baltisberger (1991) in material from Greece (Mt. Tsoumerka), Kuzmanov & Ko□uharov (1970) in material from Bulgaria and Morton (1977) in material from Great Britain. Material from Levkas island, of which a microphotograph and a karyogram are presented here (Fig. 7), has the same chromosóme number $2n = 18$.

The karyotype of *B. perennis* is symmetrical, consisting of metacentric chromosomes, four of which bear small, spherical and always visible satellites. The karyotype formula is showed as $2n = 14m + 4m\text{-}SAT = 18$ chromosomes, varying in size between 1.9 and 4.2 μm.

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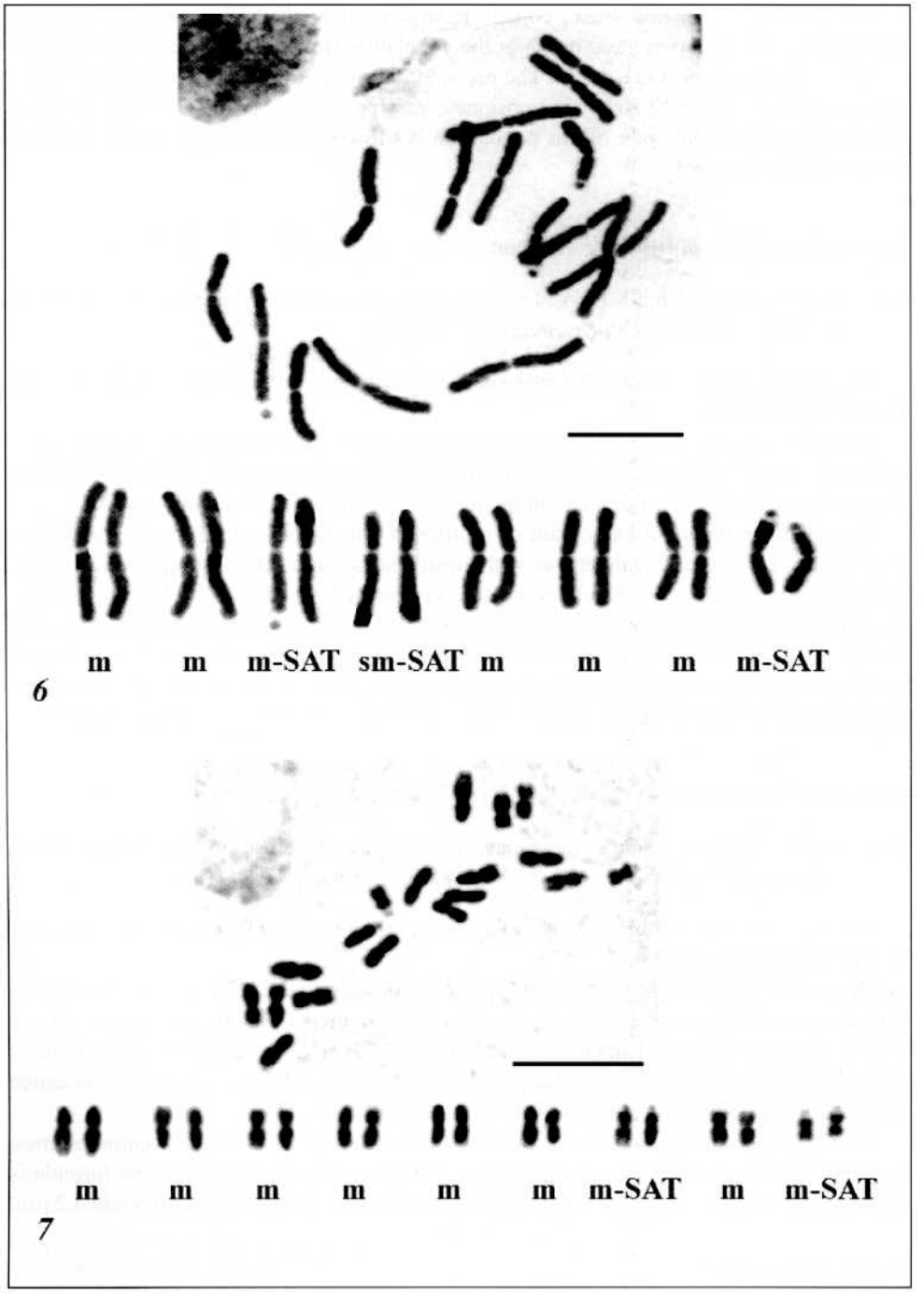

Figs. 6-7. Microphotographs of mitotic metaphase plates and karyograms of : **6,** *Allium ionicum,* 2*n* = 16; **7,** *Bellis perennis,* 2*n* = 18. — Scale bars = 10 µm.

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