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Mediterranean chromosome number reports – 23

edited by G. Kamari, C. Blanché & S. Siljak-Yakovlev

Abstract

Kamari, G., Blanché, C. & Siljak-Yakovlev, S. (eds): Mediterranean chromosome number reports – 23. — Fl. Medit. 23: 255-291. 2013. — ISSN: 1120-4052 printed, 2240-4538 online.

This is the twenty-three 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 56 taxa: *Anthriscus*, *Bupleurum*, *Dichoropetalum*, *Eryngium*, *Ferula*, *Ferulago*, *Lagoecia*, *Oenanthe*, *Prangos*, *Scaligeria*, *Seseli* and *Torilis* from Turkey by Ju. V. Shner, T. V. Alexeeva, M. G. Pimenov & E. V. Kljuykov (Nos 1768-1783); *Astrantia*, *Bupleurum*, *Daucus*, *Dichoropetalum*, *Eryngium*, *Heracleum*, *Laserpitium*, *Melanoselinum*, *Oreoselinum*, *Pimpinella*, *Pteroselinum* and *Ridolfia* from Former Jugoslavia (Slovenia), Morocco and Portugal by J. Shner & M. Pimenov (1784-1798); *Arum*, *Biarum* and *Eminium* from Turkey by E. Akalın, S. Demirci & E. Kaya (1799-1804); *Colchicum* from Turkey by G. E. Genç, N. Özhatay & E. Kaya (1805-1808); *Crocus* and *Galanthus* from Turkey by S. Yüzbaşıoğlu, S. Demirci & E. Kaya (1809-1812); *Pilosella* from Italy by E. Di Gristina, G. Domina & A. Geraci (1813-1814); *Narcissus* from Sicily by A. Troia, A. M. Orlando & R. M. Baldini (1815-1816); *Allium*, *Cerastium*, *Cochicum*, *Fritillaria*, *Narcissus* and *Thymus* from Greece, Kepfallinia by S. Samaropoulou, P. Bareka & G. Kamari (1817-1823).

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Reports (1768-1783) by Ju. V. Shner, T. V. Alexeeva, M. G. Pimenov & E. V. Kljuykov

1768. ***Anthriscus kotschyi*** Fenzl ex Boiss. & Balansa — $2n = 14$ (Fig. 1).

Tu: Turkey, A4 Kastamonu, Ilgaz Dağ, Ilgazdaği Milli Park, limestones, 41° 05' N, 33° 51' E, 2200 m a.s.l., 19 Aug 2008, *Pimenov & Kljuykov 100* (MW).

This is the first chromosome number determination for the species. The closely related species *A. ruprechtii* Boiss. from E. Caucasus, sometimes treated as conspecific, has the chromosome number $2n = 16$ (Magulaev 1976, Vasilieva & Pimenov 1985).

1769. ***Bupleurum pulchellum*** Boiss. & Heldr. — $2n = 16$ (Fig. 2).

Tu: Turkey, C3 Antalya, near Finike, 36° 25' N, 30° 08' E, 180 m a.s.l., 12 Jul 2007, *Pimenov & Kljuykov 114* (MW).

We confirm the earlier count of chromosome number for this endemic Turkish species made by Cauwet-Marc (1976, 1978, 1979).

1770. ***Bupleurum zoharii*** Snogerup — $2n = 16$ (Fig. 3).

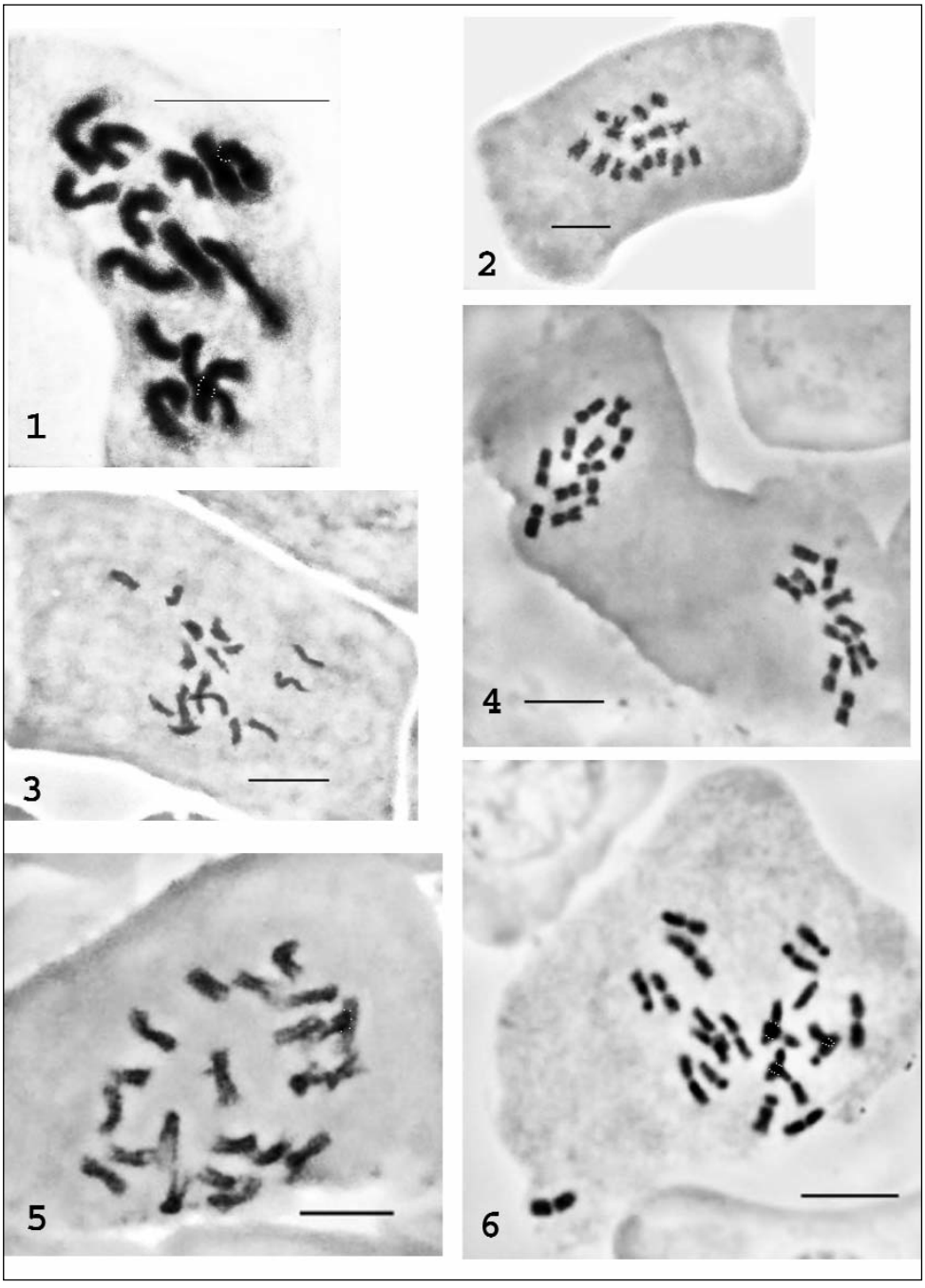
Tu: Turkey, C4 Karaman, Toros Dağlari, Ermenek region, Güney yurt, valley of Küçük Çay, 36° 39' N, 32° 48' E, 900 m a.s.l., 13 Aug 2007, *Pimenov & Kljuykov 72* (MW).

This is the first chromosome number determination for the species.

1771. ***Dichoropetalum chryseum*** (Boiss. & Heldr.) Pimenov & Kljuykov — $2n = 22$ (Fig. 4).

Tu: Turkey, C4 Karaman, Toros Dağlari, Ermenek region, 17 km E of Ermenek, Çamlica köyü, Yerköprü, 36° 36' N, 32° 58' E, 900-1000 m a.s.l., 12 Aug 2007, *Pimenov & Kljuykov 65* (MW).

This is the second chromosome number determination for the species. It corresponds with previous one (Shner & al. 2010) and with the counts, determined for some other species of the genus, recently restored as independent from *Peucedanum* (Pimenov & al. 2007). The caryologically studied species, which have been treated as members of *Peucedanum*, are *P. carvifolia* Vill. (*D. carvifolia* (Vill.) Pimenov & Kljuykov), *P. oligophyllum* (Griseb.) Vandas (*D. oligophyllum* (Griseb.) Pimenov & Kljuykov), *P. palimbioides* Boiss. (*D. palimbioides* (Boiss. Pimenov & Kljuykov), *P. paucifolium* Ledeb. (*D. seseloides* (C.A.Mey.) Pimenov & Kljuykov), *P. schottii* Bess. (*D. schottii* (Bess.) Pimenov & Kljuykov), *P. spreitzenhoferi*



Figs 1-6. Contrasted microphotographs of mitotic chromosomes of: **1.** *Anthriscus kotschyi*, 2*n* = 14; **2.** *Bupleurum pulchellum*, 2*n* = 16; **3.** *Bupleurum zoharii*, 2*n* = 16; **4.** *Dichoropetalum chryseum*, 2*n* = 22; **5.** *Dichoropetalum palimbioides*, 2*n* = 22; **6.** *Ferula drudeana*, 2*n* = 22. – Scale bars = 10 μm.

Dingler (*D. junceum* (Boiss.) Pimenov & Kljuykov) and *P. vittijugum* Boiss. (*D. vittijugum* (Boiss.) Pimenov & Kljuykov. All these species are diploids with x = 11.

1772. *Dichoropetalum palimbioides* (Boiss.) Pimenov & Kljuykov — 2*n* = 22 (Fig. 5).

Tu: Turkey, A4 Çankiri, near Tosya, valley of Devrez River, 40° 57' N, 34° 03' E, 700-750 m a.s.l., 20 Aug 2008, *Pimenov & Kljuykov 105* (MW).

This is the third determination of chromosome number for this species, endemic to Turkey. Our new determination confirms previous two (Pimenov & al. 1996, Shner & al. 2010).

1773. *Eryngium polycephalum* Hausskn. ex H.Wolff — 2*n* = 16.

Tu: Turkey, C4 Konya, Toros Dağlari, near Taşkent, 36° 54' N, 32° 29-30' E, 1570-1650 m a.s.l., 16 Aug 2008, *Pimenov & Kljuykov 91* (MW).

This is the first chromosome number determination for the species. The number 2*n* = 16 (*n* = 8) is one of the most usual counts for Old World species of the genus.

1774. *Ferula drudeana* Korovin — 2*n* = 22 (Fig. 6).

Tu: Turkey, C3 Isparta, near Sütçüler, S of Sütçüler, Yeçilder, 37° 25' N, 30° 49' E, 790 m a.s.l., 06 Jul 2007, *Pimenov & Kljuykov 81* (MW).

Previously only one determination for this Turkish endemic species has been known (Pimenov & al. 1998). The number 2*n* = 22 is the only one in this large genus.

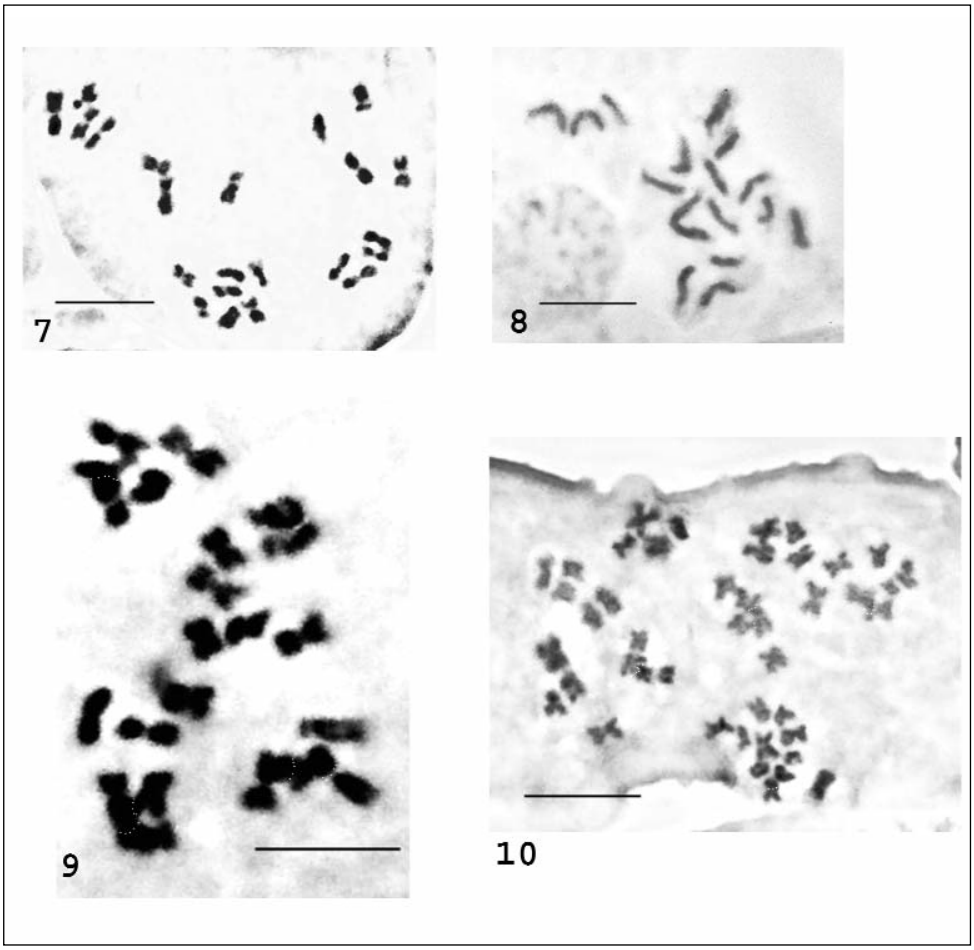
1775. *Ferulago asparagifolia* Boiss. — 2*n* = 22 (Fig. 7).

Tu: Turkey, C4 Karaman, Toros Dağlari, Ermenek region, 17 km E of Ermenek, Çamlica köyü, Yerköprü, 36° 36' N, 32° 58' E, 900-1000 m a.s.l., 12 Aug 2007, *Pimenov & Kljuykov 62* (MW).

The number *n* = 11 has also been determined for the species, based on plants from a distant locality in Turkey (Pimenov & al. 1998).

1776. *Lagoecia cuminoides* L. — 2*n* = 16 (Fig. 8).

Tu: Turkey, C3 Antalya, near Finike, 36° 25' N, 30° 08' E, 150-200 m a.s.l., 12 Jul 2007, *Pimenov & Kljuykov s.n.* (MW).



Figs 7-10. Contrasted microphotographs of mitotic chromosomes of: **7.** *Ferulago asparagifolia*, 2*n* = 22; **8.** *Lagoecia cuminoides*, 2*n* = 16; **9.** *Oenanthe pimpinelloides*, 2*n* = 22; **10.** *Prangos heyniae*, 2*n* = 44. – Scale bars = 10 μm.

Previously the same number (*n* = 8 or 2*n* = 16) was determined for the plants from Palaestina, Greece, Iraq, Jordan, Spain (see, Pimenov & al. 2003) and also from Turkey (Pimenov & al. 1998).

1777. *Oenanthe pimpinelloides* L. **—** 2*n* = 22 (Fig. 9).

Tu: Turkey, B3 Bilecik, Uludağ, E. part, Murat Dere, 39° 26’ N, 29° 50’ E, 07 Aug 2008, *Pimenov & Kljuykov19* (MW).

This species has been studied at least 18 times with identical result – $n = 11$ or $2n = 22$ (see Pimenov & al. 2003). Determination based on Turkish material is unknown.

1778. *Prangos heyniae* H. Duman & M. F. Watson — $2n = 44$ (Fig. 10).

Tu: Turkey, C4 Konya, Toros Dağlari, near Hadim, 36° 59' N, 32° 27' E, 1430 m a.s.l., 15 Aug 2008, *Pimenov & Kljuykov s.n.* (MW).

This is the first chromosome number determination for the species. *P. heyniae* is a recently described species from Southern Turkey, being a narrow endemic to Toros Dağlari in Konya vilayet (Duman & Watson 1999). Our collection was made in material from the *locus classicus* of the species.

1779. *Scaligeria napiformis* (Willd. ex Spreng.) Grande — $2n = 20$ (Fig. 11).

Tu: Turkey, C3 Isparta, near Sütçüler, S of Sütçüler, Yeçilder, 37° 25' N, 30° 49' E, 790 m a.s.l., 06 Jul 2007 *Pimenov & Kljuykov s.n.* (MW).

There are two known chromosome numbers for the species – $2n = 20$ from Greece (Engstand 1970) and Cyprus (Vogt & Aparicio 1999) and $2n = 22$ from Turkey (Pimenov & al. 1998). The same number $2n = 20$ was also determined for allied species *S. halophila* (Rech.f.) Rech.f. (Engstand 1970).

1780. *Seseli resinosum* Freyn & Sint. — $2n = 20$ (Fig. 13).

Tu: Turkey, A4 Karabük, vicinity of Safranbolu, Peijit Mts, near Bulak Magares, 41° 16' N, 32° 37' E, 750-900 m a.s.l., 23 Aug 2008, *Pimenov & Kljuykov 120* (MW).

This is the first chromosome number determination for the species. For the closely related species *S. gummiferum* Sm. from Krimea two numbers $2n = 20$ (Retina & al. 1977) and $2n = 22$ (Alexeeva & al. 1994) were determined on the basis of reliable materials, collected in the natural populations.

1781. *Torilis japonica* (Houtt) DC. — $2n = 12$ (Fig. 14).

Tu: Turkey, A4 Kastamonu, Küre, road to Inebolu, 41° 48' N, 33° 42' E, 600-900 m a.s.l., 21 Aug 2008, *Pimenov & Kljuykov 109* (MW).

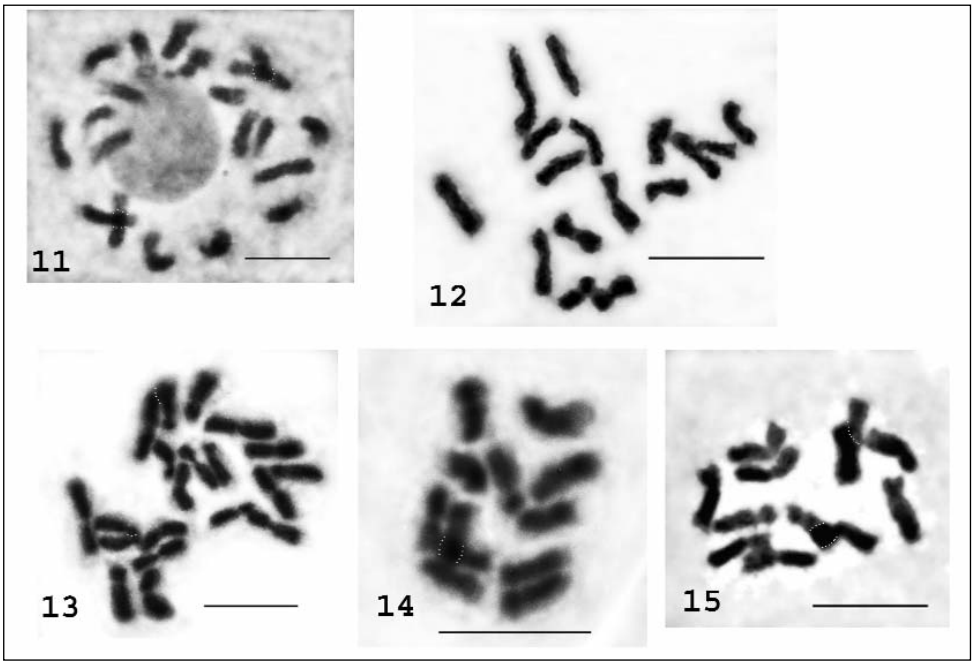
Four different chromosome cytotypes are known for this widely distributed species – $2n = 12$, $2n = 16$, $2n = 18$ and $2n = 22$. The number $2n = 16$ is the most frequently determined, whereas $2n = 22$ was counted once, from Byelorussia (Dmitrieva & Parfenov

1983). The number 2*n* = 12, identical to our count has also been determined for plants from the United States (Bell & Constance 1957), Ukraine (Kord'um 1967), Slovakia (Májovský & al. 1970) and FYR Macedonia (Šopova & Sekovski 1982), as well as for plants of unknown origin (Le Coq & al. 1978). In Eurasia distribution area of the species is disjunctive, composed by two big fragments – Sino-Himalayan and Euro-West Asian-North African. Variability of chromosome numbers does not correspond with this disjunction, as the cytotype with *n* = 8 is represented in both fragments. Morphometry of the karyotypes of *n* = 6 and *n* = 8 are similar – in both subacrocentric and acrocentric chromosomes prevail (Šopova & Sekovski 1982, Hamal & al. 1986).

1782. ***Torilis triradiata*** Boiss. & Heldr. — 2*n* = 16 (Fig. 15).

Tu: Turkey, C3 Isparta, near Sütçüler, S of Sütçüler, Yeçilder, 37° 25' N, 30° 49' E, 790 m a.s.l., 06 Jul 2007, *Pimenov & Kljuykov 80* (MW).

This is the first chromosome number determination for this rare species, being Turkish endemic. The locality in Isparta vilayet was not indicated in Flora of Turkey and the East Aegean Islands (Cullen 1972).



Figs 11-15. Contrasted microphotographs of mitotic chromosomes of: **11.** *Scaligeria napiformis*, 2*n* = 20; **12.** *Torilis ucrainica*, 2*n* = 16; **13.** *Seseli resinosum*, 2*n* = 20; **14.** *Torilis japonica*, 2*n* = 12; **15.** *Torilis triradiata*, 2*n* = 16. – Scale bars = 10 μm.

1783. ***Torilis ucrainica*** Spreng. **—** 2*n* = 16 (Fig. 12).

Tu: Turkey, A3 Eskişehir, Sakaryz valley, Mayislar, 40° 02' N, 30° 39' E, 250 m a.s.l., 30 Jul 2007, *Pimenov & Kljuykov 30* (MW).

This is the second determination of chromosome number for this species. Our determination confirms the previous one, made also on the basis of Turkish material by Shner & al. (2010).

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Reports (1784-1798) by J. Shner & M. Pimenov

1784. ***Astrantia carniolica*** W.D.J. Koch — $n = 7$ (Fig. 1a).

Ju (Sl): Slovenia, Julian Alpes, Bohinj lake, Ukanc, 46° 16' N, 13° 50' E, 13 Jul 2009, *Pimenov 7* (MW).

This chromosome number $n = 7$ ($2n = 14$) is in accordance with previously reported data from Slovenia (Lovka & al. 1972, Susnik & al. 1972). The same number has been reported also from Austria (Favarger & Huynh 1964, Favarger 1965, Wetschnig & Leute 1991). Andreev (1979) determined the number $2n = 28$, i.e. he revealed a tetraploid cytotype from Bulgaria; this information seems to be wrong, as the species is not recorded for Bulgarian flora (Assynov & Petrova 2006), and the chromosome number report is to be referred to *A. major*, the only representative of *Astrantia* in the country.

1785. ***Astrantia major*** L. — $n = 14$ (Fig. 1b).

Ju (Sl): Slovenia, Julian Alpes, Bohinj lake, Ukanc, 46° 16' N, 13° 50' E, 13 Jul 2009, *Pimenov 9* (MW).

The chromosome number $n = 14$ counted here agrees with previous, at least 16 different reports from Hungary, Switzerland, France, Austria, Germany, Slovakia,

Byelorussia, Ukraine and Czech Republic (see Pimenov & al. 2003). The same chromosome number has also reported from Slovenia for the type subspecies (Druškovič 1995) and for subsp. *carinthiaca* (Hoppe) Arcang. (Lovka & al. 1971). The count 2*n* = 28 for material from Bulgaria, which was referred as *A. carniolica* (see above), probably, belong to *A. major.*

1786. *Bupleurum dumosum* Coss. & Balansa — *n* = 16 (Fig. 1c).

Ma: Marrakech-Tensift-El-Haouz region, Great Atlas, near Asni, 31° 15' N, 07° 58' W, 1100-1200 m alt., 30 Apr 2010, *Pimenov 34* (MW).

This is an endemic species to Morocco, growing on limestones of Atlas foothills. Our determination is in accordance with three previous reports (Cauwet-Marc 1976, 1978, 1979). The tetraploid chromosome number *n* = 16 is rather common in the genus *Bupleurum*, being found at least in 22 species (see, Pimenov & al. 2003); in several of these species *n* = 16 is a part of polyploid series with x = 8. *B. dumosum* found to have, however, only tetraploid populations, what is usual for the shrubby species of subgenus *Tenoria*, as well as for *B. aciphyllum* Webb & Bertel., *B. acutifolium* Boiss., *B. album* Maire, *B. balansae* Boiss. & Reut., *B. canescens* Shousb., *B. faurelii* Maire, *B. oligactis* Boiss., *B. salicifolium* R. Br., *B. spinosum* Gouan, and *B. subspinosum* Maire & Weiller. All these species are distributed in North Africa, the Canary Islands and SW Europe; out of the region *n* = 16 in *Bupleurum* is rare.

1787. *Daucus halophilus* Brot. (*D. carota* L. subsp. *halophilus* (Brot.) A. Pujadas) — 2*n* = 18.

Lu: Estremadura, Parque National Sintra-Cascais, Cabo da Roca, 38° 46' N, 9° 29' W, 11 Oct 2008, *Pimenov s.n.* (MW).

The species usually is treated as one of the subspecies of *Daucus carota*, endemic to coastal SW Portugal (Pujadas Salvá 2003). According to this limitation, only two chromosome number determinations (Queirós 1974, 1978), both identical to our, can be referred to the taxon.

1788. *Dichoropetalum carvifolia* (Vill.) Pimenov & Kljuykov (*Peucedanum carvifolia* Vill. = *Holandrea carvifolia* (Vill.) Reduron & al.) — *n* = 11 (Fig. 1d).

Ju (Sl): Slovenia, Julian Alpes, Bohinj lake, Ukanc, 46° 16' N, 13° 50'E, 13 Jul 2009, *Pimenov 8* (MW).

This is the first karyological study on Slovenian material of the species, and confirms previous data from Bulgaria (Kuzmanov & al. 1977, 1987), Slovakia (Vachova &

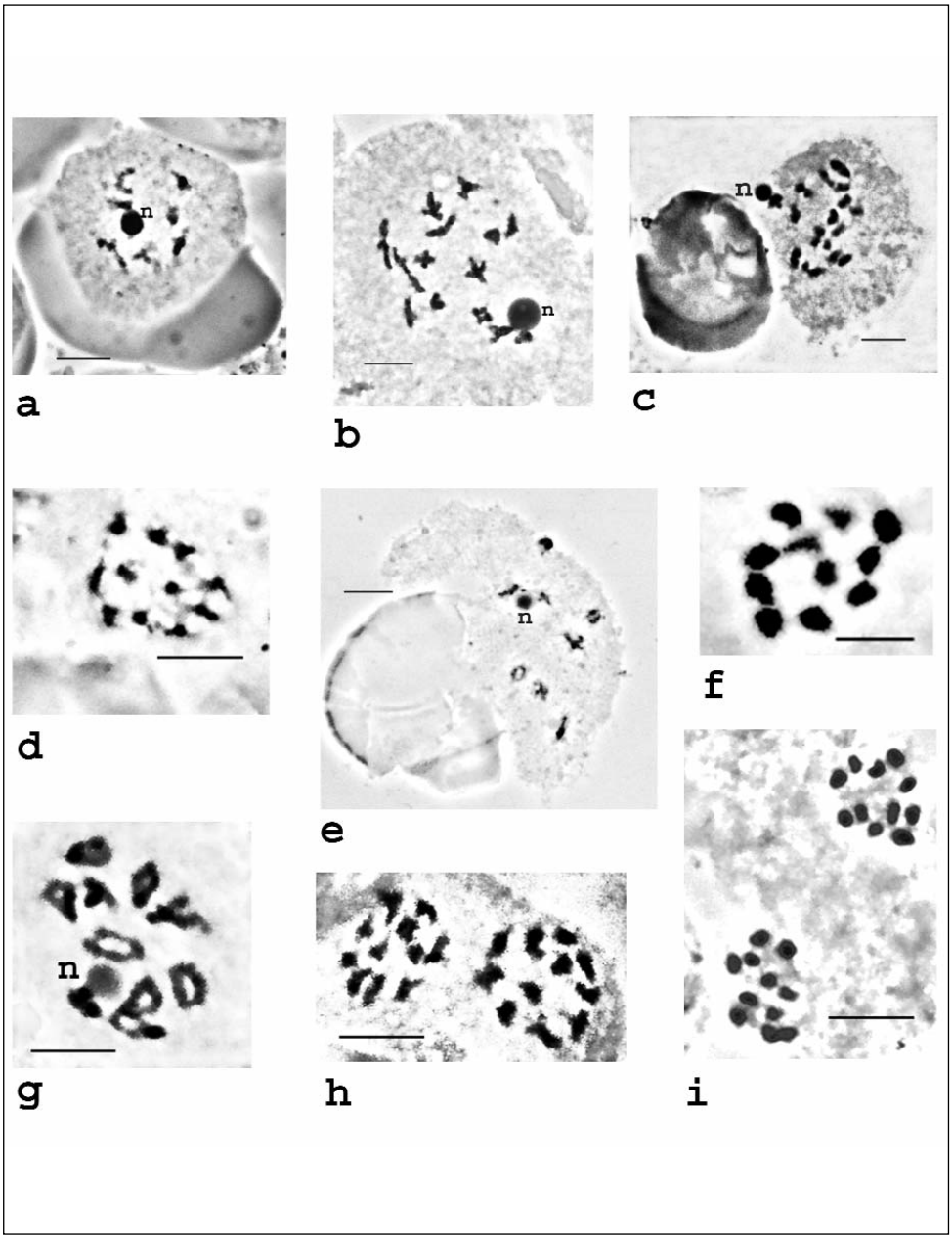

Fig. 1. Contrasted microphotographs of: **a.** *Astrantia carniolica*, *n* = 7 (meiosis, diplotene); **b.** *Astrantia major*, *n* = 14 (meiosis, diplotene); **c.** *Bupleurum dumosum*, *n* = 16 (meiosis, diakinesis); **d.** *Dichoropetalum carvifolia*, *n* = 11 (meiosis, metaphase II); **e.** *Eryngium ilicifolium*, *n* = 8 (meiosis, diplotene - diakinesis); **f.** *Heracleum sphondylum* subsp. *embergeri*, *n* = 11 (meiosis, metaphase II); **g.** *Pimpinella major*, *n* = 10 (meiosis, diakinesis); **h.** *Laserpitium peucedanoides*, *n* = 11 (meiosis, metaphase II); **i.** *Laserpitium siler*, *n* = 11 (meiosis, metaphase II). – **n.** indicate nucleolus; scale bars = 10 μm.

Lhotska 1980), Ukraine (Solov'eva & al. 1985), Czech Republic (Mesicek & Javùrková-Jarolinova 1992), Spain (Silvestre 1990), and Austria (Dobes & al. 1997). The karyotype formula was determined twice as $2n = 2x = 16m + 6sm$ (Solov'eva & al. 1985) and $2n = 2x = 4m + 16sm + 2st$ (Kuzmanov & al. 1987); in both cases with two submetacentric SAT-chromosomes.

1789. *Eryngium ilicifolium* Lam. — $n = 8$ (Fig. 1e).

Ma: Marrakech-Tensit-El-Haouz region, Marrakech, western part, stony hills, 31° 37' N, 07° 55' W, 28 Apr 2010, *Pimenov 20* (MW).

Endemic species of Western Mediterranean (Tunisia, Algeria, Morocco and S Spain) (Wörz 2011). Our record confirms the earlier counts from North Africa (Gardé & Malheiros-Gardé 1954, Reese 1957, Arista & Ortiz 1993), whereas in Spain the species has referred $2n = 18$ (Perdigó & Llauradó 1984, 1985).

1790. *Heracleum sphondylium* L. subsp. ***embergeri*** Maire — $n = 11$ (Fig. 1f).

Ma: Meknès-Tafilaret region, Middle Atlas, Ifrane, Cedrus atlantica forest, 33° 32' N, 05° 00' W, alt. 1700 m, 26 Apr 2010, *Pimenov 15* (MW).

Endemic to Morocco *H. sphondylium* subsp. *embergeri* is one of two subspecies of this widely distributed and variable palearctic species in the country. Our record from Middle Atlas confirms the only previous chromosome number determination (Quezel 1957) and is in agreement of numerous karyological data on this species *sensu lato* (see Pimenov & al. 2003).

1791. *Laserpitium peucedanoides* L. — $n = 11$ (Fig. 1h).

Ju (Sl): Slovenia, Julian Alpes, Bohinj lake, Vogel, 46° 16' N, 13° 51' E, 13 Jul 2009, *Pimenov 12* (MW).

Laserpitium peucedanoides is an endemic species of Eastern Alpes and the adjacent part of Balkan Peninsula. Three previous chromosome number determinations are known; one of them from Slovenia (Druškovič 1995) and the other two from the neighboring countries Italy (Favarger 1959) and Austria (Wetschnig & Leute 1991). All the determinations, show the species to be diploid with $x = 11$ chromosomes.

1792. *Laserpitium siler* L. — $n = 11$ (Fig. 1i).

Ju (Sl): Slovenia, Julian Alpes, Bohinj lake, Ukanc, 46° 16' N, 13° 50' E, 13 Jul 2009, *Pimenov 10* (MW).

This is the first chromosome record of *Laserpitium siler* from Slovenia. Our count confirms previous records from France (Cauwet 1968), Austria (Leute 1973, Wetschnig & Leute 1991), Bulgaria (Peev & Andreev 1978) and Italy (Löve & Löve 1982). All chromosome counts show that the species is diploid with x = 11, as all the other species of the genus, studied up to now.

1793. *Melanoselinum decipiens* (Schrad. & J. C. Wendl.) Hoffm. — $2n = 22$.

Lu: Portugal, Madeira, vicinity of Funchal, road to Curral das Freiras, Chamorra, 23 Oct 2008, *Pimenov s.n.* (MW).

This species, endemic to Madeira and the Azores, belong to the genus, spread in Macaronesia only. It is cultivated in his homeland as cattle feed and abroad in botanical gardens. From the four previously chromosome counts, three are from cultivated plants. The only native accession (Dalgaard 1986) with $2n = 22$ is from Madeira. The remaining records are also $2n = 22$ (Wanscher 1933) or $n = 11$ (Bell & Constance 1966); the only exclusion with $2n = 20$ is reported by Larsen (1962), requires a reexamination.

1794. *Oreoselinum nigrum* Delarbre **(***Peucedanum oreoselinum* (L.) Moench) — $n = 11$, 11+1B (Fig. 2a, 2b).

Ju (Sl): Slovenia, region of Postojna, Predjamski Grad (Predjama castle, Felsenbung), 45° 48’ N, 14° 07’ E, 11 Jul 2009, *Pimenov 5* (MW).

This is the first chromosome number report, of the widely distributed European species *O. nigrum*, from Slovenia. At least 18 previous determinations are known from Hungary, Sweden, Ukraine, Slovakia, France, Spain, Poland, Byelorussia, Austria, Czech Republic and from plants cultivated in Botanical Gardens (see Pimenov & al. 2003). All counts are $n = 11$ or $2n = 22$. Accessory b-chromosomes are found for the species for the first time. The karyotype morphology has been studied twice and showing rather to be symmetrical (Ic = 41.0-42.5). Plants from Slovakia have show karyotype formula as $2n =$ 16m + 6sm = 22 with two submetacentric SAT-chromosomes (Hindáková & Činčura 1967) and those from Ukraine have formula $2n = 20$m + 2sm = 22 chromosomes (Solov’eva & al. 1985).

1795. *Pimpinella major* (L.) Huds. (*P. magna* L.) — $n = 10$ (Fig. 1g).

Ju (Sl): Slovenia, Julian Alpes, Bohinj lake, Ukanc, 46° 16’ N, 13° 50’ E, 13 Jul 2009, *Pimenov 11* (MW).

We count $n = 10$ at meiosis. Our report agrees with considerable part of previous data ($n = 10$ or $2n = 20$) on this widely distributed and variable species. The same number has also been reported on material from Hungary (Baksay 1957), Sweden (Lovkvist 1963), Poland,

Switzerland, France & Germany (Hunkeler & Favarger 1967), Austria (Hunkeler & Favarger 1967, Wetschnig & Leute 1991, Dobes & al. 1997), Slovakia (Hunkeler & Favarger 1967, Vachova & Ferakova 1980), Czech Republic (Javùrková 1979, 1981), Byelorussia (Dmitrieva 1985), Ukraine (Jurtzeva 1988), Spain (Silvestre 1993) and Sweden (Lovkvist & Hultgard 1999). However, counts of $n = 9$ or $2n = 18$ have also found for other populations of Poland (Gawlowska 1967, Pogan & al. 1982), France (Cauwet 1968), Slovakia (Majovsky & al. 1970). The only count determined from Slovenia so far (Druškovič 1995) appeared to be unique for the species $2n = 36$, being tetraploid with x = 9. The infraspecific chromosome variability is not in accordance to its geographical distribution.

1796. *Pimpinella villosa* Schousb. — $2n = 20$ (Fig. 2c).

Lu: Estremadura, Parque National Sintra-Cascais, Cabo da Roca 38° 46' N. 9° 29' W, 11 Oct 2008, *Pimenov s.n.* (MW).

The species spread in Iberian Peninsula, Azores, and NW Africa. Our counting, $2n = 20$, is the seventh one for this species. The most counts, from Portugal (Queiros, 1972, 1974, 1976) and Spain (Silvestre 1976, Mayol & Rosselló 1998) are the same. One exception is the earliest count ($2n = 18$) by Gardé & Malheiros-Gardé (1949), based on cultivated material from Botanical Garden and it requires a reexamination.

1797. *Pteroselinum austriacum* (Jacq.) Rchb. [=*Peucedanum austriacum* (Jacq.) W. D. J. Koch] — $n = 11$ (Fig. 2d).

Ju (Sl): Slovenia, Julian Alpes, Bohinj lake, near Rybžev Laz., 46° 16' N, 13° 53' E, 17 Jul 2009, *Pimenov 17* (MW).

— Julian Alpes , the lake of Bled, near Grad (castle), 46° 21' N, 14° 06' E, 15 Jul 2009, *Pimenov 16* (MW).

Our count, $n = 11$, agrees with two previous ones from Slovenia (Lovka & al. 1972, Druškovič 1995) and seven others determinations from Austria, Bulgaria, Greece (Polatschek 1966, Kuzmanov & al. 1977, 1987, Strid & Franzen 1983, Dobes & al. 1997), as well as from Botanical Gardens (Zhukova 1967, Solov'eva & al. 1985). The karyotype of the species is rather symmetrical with $2n = 18m + 4m = 22$ (Solov'eva & al. 1985) or $2n = 8m + 14$ sm = 22 (Kuzmanov & al. 1987); in both two submetacentric SAT-chromosomes were revealed. *Peucedanum austriacum* subsp. *rablense* (Wulfen) Celak. from Austria also have $n = 11$ (Leute 1973, Wetschnig & Leute 1991).

1798. *Ridolfia segetum* Moris — $n = 11$ (Fig. 2e).

Ma: Morocco, Chaouia-Ouardigha region, road Casablanca-Marrakech, near Settat, 32° 59' N, 07° 37' W, alt. 450 m, 26 Apr 2010, *Pimenov 16* (MW).

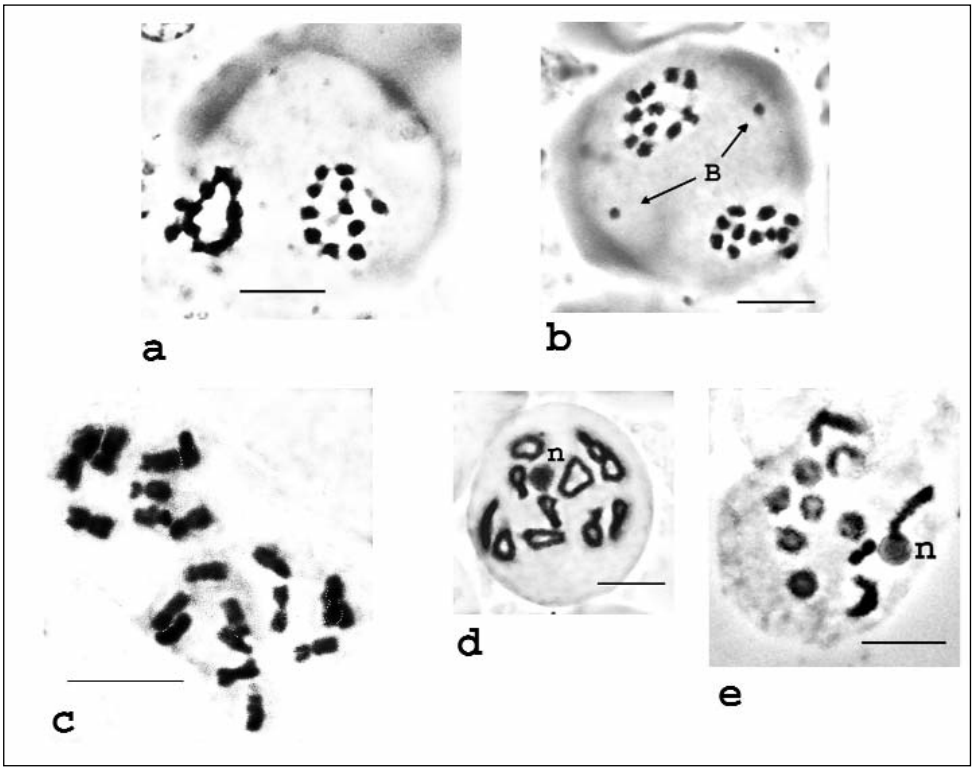

Fig. 2. Contrasted microphotographs of: **a.** *Oreoselinum nigrum*, *n* = 11 (meiosis, metaphase II); **b.** *Oreoselinum nigrum*, *n* = 11+1B (meiosis, metaphase II); **c.** *Pimpinella villosa*, 2*n* = 20 (mitosis); **d.** *Pteroselinum austriacum*, *n* = 11 (meiosis, diakinesis); **e.** *Ridolfia segetum*, *n* = 11 (meiosis, diakinesis). – **B.** indicate B-chromosomes; **n.** indicate nucleolus; scale bars = 10 μm.

This is a rather widely distributed Mediterranean weed species, evidently more frequent in western part of its range. Our determination, the third from Morocco (see also Molero & Monteserat Marti 1986, Elalaoui Faris 1989) agrees with all previously published data from Portugal (Malheiros-Garde & Garde 1950, 1951, Queiros 1972), Spain (Silvestre 1976), Algeria (Elalaoui Faris 1989), Jordan (Al-Eisawi 1989) and Morocco, as well as based on materials from Botanical Garden (Bell & Constance 1960). Elalaoui Faris (1989) described the karyotype of *R. segetum* in the wild plants from Algeria as 2*n* = 16m + 4sm + 2st= 22 chromosomes and found two accessory chromosomes (2*n* = 22 + 2B) for cultivated plants.

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Reports (1799-1804) by E. Akalın, S. Demirci & E. Kaya

1799. ***Arum rupicola*** Boiss. var. ***virescens*** (Stapf) P. C. Boyce — 2*n* = 28 (Fig. 1).

Tu: C5: Mersin; above Fındıkpınarı, alt. 1273 m, 9 Dec 2010, *E. Kaya 1189* (ISTE).

Arum rupicola var. *virescens* is a tuberous perennial herbs, flowering in spring between April and June. It is an Irano-Turanian element distributed in the Northern Iran and Inner Anatolia (Davis & al. 1988).

The diploid chromosome number 2*n* = 28 counted here, is the first record of the taxon based on Turkish material. The karyotype is symmetrical consisting of mostly metacentric (m) and submetacentric (sm) choromosomes.

1800. ***Biarum bovei*** Blume — 2*n* = 26 (Fig. 2).

Tu: C3 Antalya; Kalkan-to Elmalı, alt. 275 m, 5 Oct 2010, *E. Kaya 1116* (ISTE 9*3266* & *93259*).

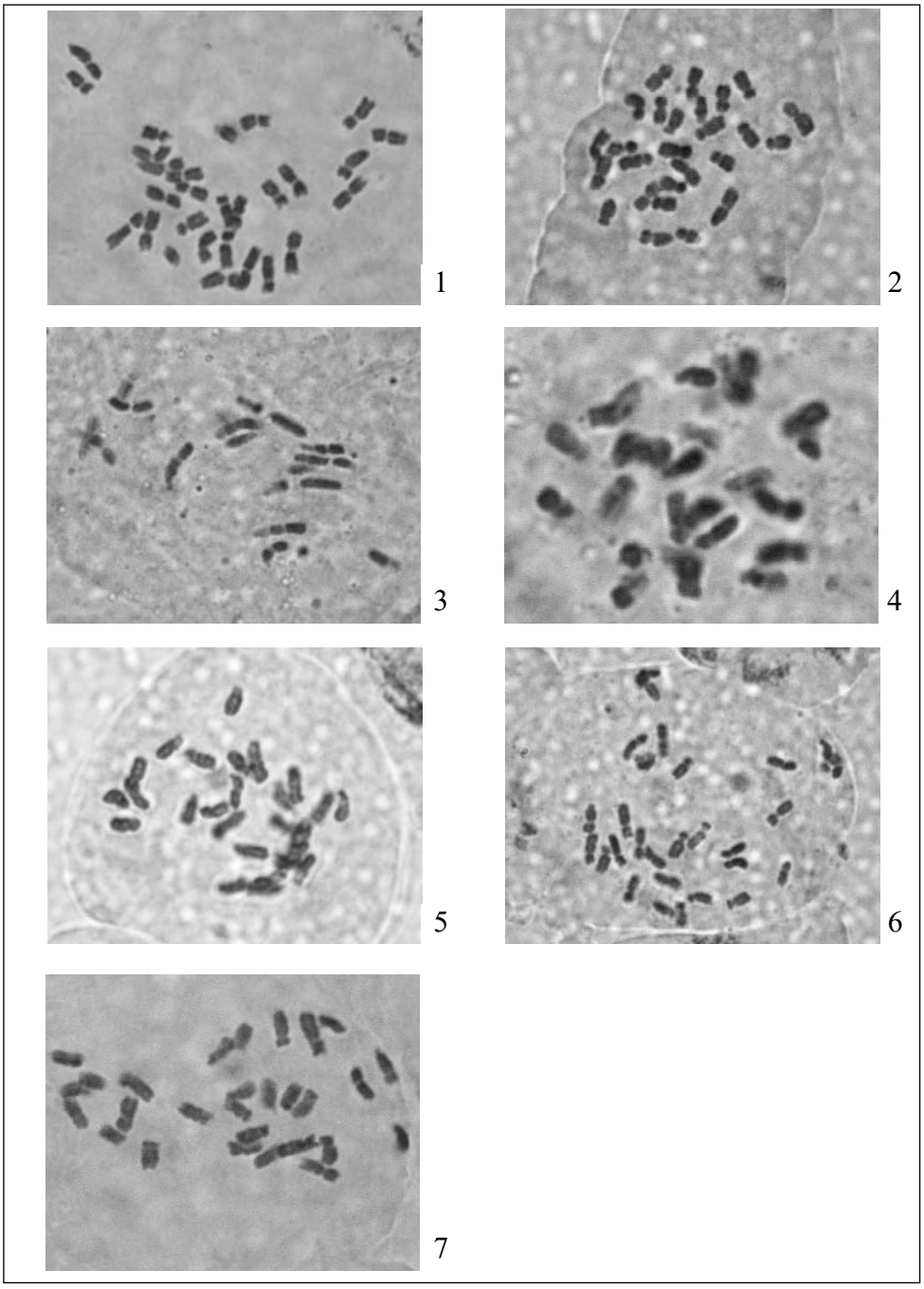
Biarum bovei is a tuberous perennial herbs, flowering in autumn between November and December. It is an Irano-Turanian element and distributed in the Lebanon, Palestine and Inner and Southern Anatolia (Mill 1984).

The diploid chromosome number 2*n* = 26, is the first record based on Turkish material.

1801. ***Biarum carduchorum*** (Schott) Engler — 2*n* = 16 (Fig. 3).

Tu: C5 Adana; Adana-Saimbeyli around Himmetli village, alt. 722 m, 8 Dec 2010, *E. Kaya 1159* (ISTE).

Biarum carduchorum is a tuberous perennial herbs, flowering in autumn between August and December. It is an Irano-Turanian element and distributed in the Syrian Desert, W and SW Iran, S and E Anatolia (Mill 1984).



Figs 1-7. Microphotographs of roots tip mitosis of: **1**. *Arum rupicola* var. *virescens*, 2*n* = 28; **2**. *Biarum bovei*, 2*n* = 26; **3.** *B. carduchorum*, 2*n* = 16; **4-5.** *B. tenuifolium*, *2n* = 26; **6.** *Eminium intortum*, 2*n* = 28; **7.** *E. spiculatum*, 2*n*=28.

The diploid chromosome number 2*n* = 16 counted here, is the first record of the taxon based on Turkish material.

1802. *Biarum tenuifolium* (L.) Schott subsp. ***zeleborii*** (Schott) P.C. Boyce — 2*n* = 26 (Figs 4-5).

Tu: C2 Muğla; Köyceğiz, Sandras mountain, Pankuduz, Çakmak Tepe, alt. 1054 m, 13 Feb 2011, *E. Kaya 1329* (ISTE).
— C1 Aydın; North slopes of Samsun Mountain, alt. 617 m, 10 Feb 2011, *E. Kaya 1249* (ISTE).

Biarum tenuifolium is a tuberous perennial herbs, flowering in spring between April and June. It is an East Mediterranean element and is distributed to SW Turkey and East Aegean Islands (Mill 1984).

The diploid chromosome number counted here is 2*n* = 26; this count is the first record of the taxon.

1803. *Eminium intortum* (Banks & Sol.) O. Kuntze — 2*n* = 28 (Fig. 6).

Tu: B7 Erzincan; Erzincan- to Kelkit near Davarlı Köyü river side, alt. 1478 m, 12 May 2011, *E. Kaya 2294* (ISTE).

Eminium intortum is a tuberous perennial herbs, flowering in spring between April and May. It is an Irano-Turanian element and distributed in the Syrian Desert and South-East Anatolia (Mill 1984).

The diploid chromosome number 2*n* = 28 counted here is the first karyological result based on Turkish material.

1804. *Eminium spiculatum* (Blume) Schott — 2*n* = 28 (Fig. 7).

Tu: C6 Hatay; Antakya to Yayladağ, around Şenköy, alt. 844 m, 18 April 2012, E. Kaya *3307* (ISTE).

Eminium spiculatum is a tuberous perennial herbs, flowering in spring between April and May. It is an Irano-Turanian element, distributed in Palestine, Syrian Desert, Iraq (Mesopotamia) and South Anatolia (Mill 1984).

The diploid chromosome number counted here is 2*n* = 28; this count is the first record of the taxon based on Turkish material.

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Reports (1805-1808) by G. Ecevit Genç, N. Özhatay & E. Kaya

1805. ***Colchicum sieheanum*** Hausskn. ex Stef. — 2*n* = 4x = 36.

Tu: South of Turkey. Mersin-Fındıkpınar-Arslanköy, under the old way, rocky slopes, alt. 1433 m, 23 Oct 2008, *E. Kaya 96130* (ISTE).

The chromosome number of the species has been counted for the first time.

1806. ***Colchicum stevenii*** Kunth — 2*n* = 6x = 54.

Tu: South of Turkey. Antalya-Finike, Bondaburun hill, alt. 75 m, 13 Mar 2008, *E. Kaya 96101* (ISTE).

Colchicum stevenii is distributed in Turkey, Cyprus, W Syria and Greece.

The chromosome number reported here is the first record for *C. stevenii* in material from Turkey and agrees with previous report of Feinbrun (1958) in material from Jerusalem. Additionaly, a different chromosome number (2*n* = 14) was reported by Garbari & Crisman (1988) in material from Jordan.

1807. ***Colchicum burttii*** Meikle — 2*n* = 6x = 54.

Tu: South west of Turkey. Muğla-Kadyanda- Üzümlü, alt. 886 m, 23 Mar 2007, *E. Kaya* (Hort. coll. no: C4801).

Colchicum burttii is an endemic species, which is distributed in SW of Turkey.

The chromosome count confirms the data by Persson (2009). A different chromosome number of $2n = 60 + 2B$ is given by Şık & al. (2009).

1808. *Colchicum triphyllum* G. Kunze — $2n = 6x = 54$.

Tu: West of Turkey. İzmir-Kemalpaşa, Nif Mountain road is the turnoff, alt. 285 m, 24 Apr 2007, *Kaya 96133* (ISTE).

Colchicum variegatum is distributed in Turkey, Spain, Africa, Italy to Russia.

The chromosome count confirms the data of Lentini & al. (1988) from Italy. Morover, the chromosome number $2n = 44$ is given by Şık & Küçüker (1988) also in material from Turkey.

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Reports (1809-1812) by S. Yüzbaşıoğlu, S. Demirci & E. Kaya

1809. ***Crocus olivieri*** Gay subsp. ***istanbulensis*** Mathew — 2*n* = 6 (Fig. 1).

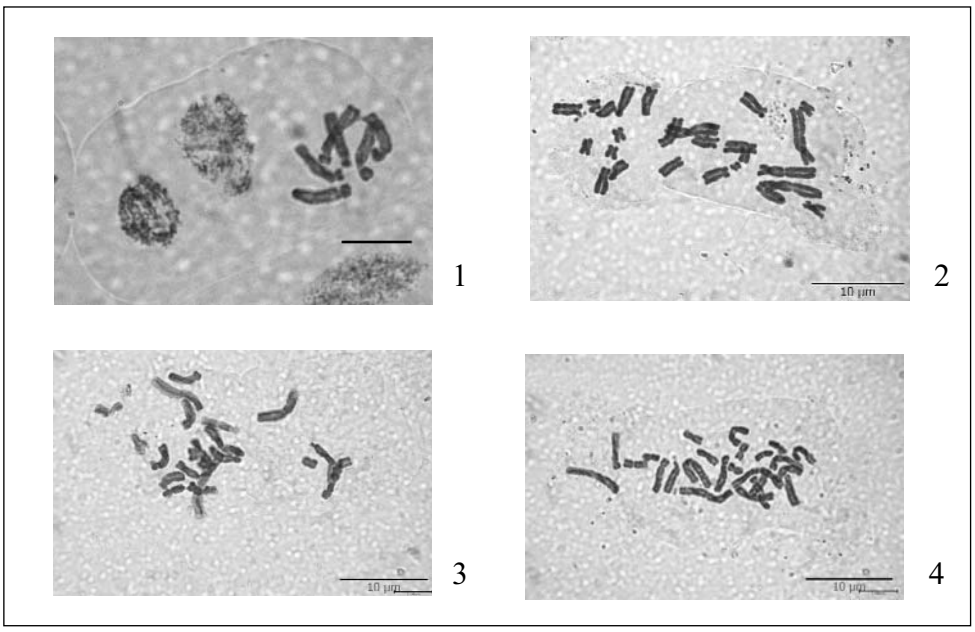
Tu: A2(A): İstanbul; Ümraniye, Taşdelen, alt. 240 m, 11 Mar 2012, *S. Yüzbaşıoğlu 3243* (ISTE 99254).

Crocus olivieri subsp. *istanbulensis* (*Iridaceae*) is small yellow flowered bulbous plant, adapted to overcome a dry dormant period in the form of an underground corm. Flowering in March. It is an Euro-Siberian element and endemic to North-West Turkey (Mathew 1982).

These are the karyological results based on the wild collected material of *Crocus olivieri* subsp. *istanbulensis.* The diploid chromosome number counted as 2*n* = 6 and karyotype of all chromosomes were subtelocentric. This count is the first record of the taxon.

1810. ***Galanthus koenenianus*** Lobin, C. D. Brickel & A. P. Davis — 2*n* = 24 (Fig. 2).

Tu: A8: Gümüşhane; Yağmurdere, Akocak village around, alt. 1695 m, 22 May 2012, *E. Kaya 3591* (ISTE 99253).



Figs 1-4. Microphotographs of root tip mitosis of: **1.** *Crocus olivieri* subsp. *istanbulensis*, 2*n* = 6; **2.** *Galanthus koenenianus*, 2*n* = 24; **3.** *G. trojanus*, 2*n* = 24; **4.** *G. x valentinei* nothosubsp. *subplicatus*, 2*n* = 24. – Scale bars = 10 µm.

Galanthus koenenianus (*Amaryllidaceae*) is a bulbous perennial herb, flowering in spring between March and April. It is an Euxine element and endemic to North-East Anatolia (Lobin & al. 1993, Davis 2000).

The diploid chromosome number counted as $2n = 24$, is the first record of the species. Its karyotype is symmetrical and consists mostly of metacentric (m) and submetacentric (sm) chromosomes.

1812. *Galanthus x valentinei* nothosubsp. ***subsplicatus*** (N. Zeybek) A. P. Davis — $2n = 24$ (Fig. 4).

Tu: A1 Edirne; Meriç, Meriç-Yenice, Görüce village road, 2. km, alt. 31 m, 28 April 2011, *E. Kaya 2057* (ISTE 96008).

Galanthus x valentinei nothosubsp. *subsplicatus* (*Amaryllidaceae*) is a bulbous perennial herb, flowering in spring between January and March. It is an endemic natural hybrid from North-Western Turkey (Davis & al. 2001).

The diploid chromosome number counted as $2n = 24$, is the first record of the hybrid. Its karyotype is symmetrical and consists of mostly of metacentric (m) and submetacentric (sm) choromosomes.

Acnowledgements

This report based on the specimens collected during the Geophyte Project (110G007), except *Crocus olivieri* subsp. *istanbulensis*, carried out in the Institution of Atatürk Centre Research (Yalova).

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Reports (1813-1814) by E. Di Gristina, G. Domina & A. Geraci

1813. ***Pilosella hoppeana*** subsp. ***macrantha*** (Ten.) S. Bräut. & Greuter — $2n = 4x = 36$ (Fig. 1).

It: L'Aquila, Magliano De′ Marsi, Monte Velino, 42° 08' 50.95" N, 13° 22' 04.98" E, stony pastures on limestone, 1835 m a.s.l., 22 Jul 2010, *E. Di Gristina s.n.* (PAL).
— Chieti, Majella, Blockhaus, 42° 08' 55.03" N, 14° 06' 53.11" E, carbonatic rocky slopes, 2050 m a.s.l., 23 Jul 2010, *E. Di Gristina s.n.* (PAL).

Pilosella hoppeana subsp. *macrantha* (Ten.) S. Bräut. & Greuter is an hemicryptophyte rosulate flowering between May and August. This taxon is probably an Italian endemic, restricted to the Central-Southern Apennines (Abruzzo, Basilicata, Calabria) and Sicily (Di Gristina & al. 2013). *P. hoppeana* subsp. *macrantha* was described for the first time by Tenore (1835-1838) as *Hieracium macranthum* and the original specimens were collected on Mt. Velino and Mt. Majella (Abruzzo, C-Italy).

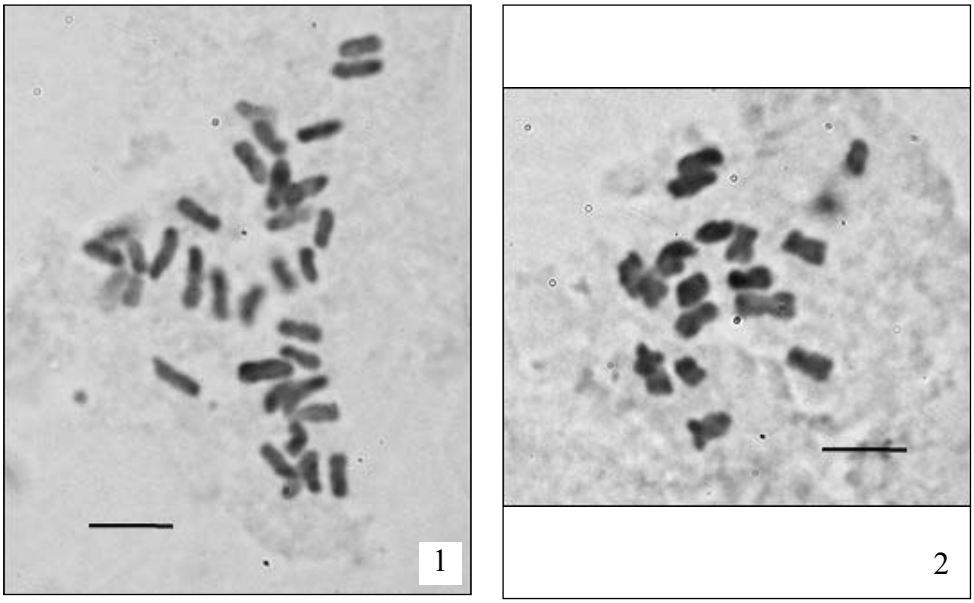
The chromosome number $2n = 4x = 36$ reported here, obtained by the observation of 60 metaphase plates of 30 individuals (15 from Mt. Velino and 15 from Mt. Majella), represents the first record for the taxon from the ditio classica. This number agrees with that reported for a population from the N. side of Mt. Pollino in Basilicata (Brullo & al. 1994) and other records from the Mavdonie and Nebrodi Mts in Sicily (Raimondo & al. 1983, Brullo & al. 2004, Di Gristina & al. 2013). The diploid number ($2n = 18$) reported by Rotreklová & al. (2005) for this taxon from Slovakia, probably, belong to *P. leucopsilon* (Arv.-Touv.) Gottschl (Di Gristina & al. 2013).

1814. ***Pilosella leucopsilon*** (Arv.-Touv.) Gottschl — $2n = 2x = 18$ (Fig. 2).

It: Reggio Calabria, Stilo, Bosco di Stilo, 38° 30' 47.01" N, 16° 21' 35.58" E, slope, 1180 m a.s.l., 6 Aug 2010, *E. Di Gristina s.n.* (PAL).

Pilosella leucopsilon (Arv.-Touv.) Gottschl (Syn.: *H. leucopsilon* Arv.-Touv., *H. macranthum* subsp. *testimoniale* (Peter) Gottschl., *P. hoppeana* subsp. *testimonialis* (Peter) P. D. Sell & C. West) is an hemicryptophyte rosulate flowering in Summer (July-August) and its distribution includes Germany, Slovakia, Austria, Hungary, Romania, Italy and Balkan Peninsula (Zahn 1923). In Italy *P. leucopsilon* occurs in Calabria (Di Gristina & al. 2013) and along the southern periphery of the E-Alps (Gottschlich & Pujatti 2002).

The chromosome number $2n = 2x = 18$ reported here, obtained by the observation of 30 metaphase plates of 15 individuals, represents the first record for *P. leucopsilon* from Italy. The diploid number coincides with the data obtained for *P. leucopsilon* by Grau &



Figs 1-2. Microphotographs of mitotic metaphase plates of: **1.** *Pilosella hoppeana* subsp. *macrantha* from Mt. Velino, 2*n* = 36; 2. *Pilosella leucopsilon*, 2*n* = 18. – Scale bars = 5 μm.

Erben (1988) and Buttler (1991) from Greece, Schuhwerk & Lippert (1997) from Germany and Krahulcová & al. (2009) from Bulgaria.

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Reports (1815-1816) by A. Troia, A. M. Orlando & R. Maria Baldini

1815. ***Narcissus obsoletus*** (Haw.) Steud. — $2n = 30$ (Fig. 1).

Si: Mazara del Vallo (province of Trapani), contrada "Critazzo", garigue with *Chamaerops humilis*, ca. 60 m a.s.l., 24 Oct 2013, *A. Troia s.n.* (PAL).

Díaz Lifante & Andrés Camacho (2007) carried out a detailed taxonomic study on morphological characters in *N. serotinus* L. s.l. and *N. elegans* (Haw.) Spach. They were able to separate *N. serotinus* in 2 taxa, one (*N. serotinus*) endemic to SW Iberian Peninsula and NW Morocco, the other one (*N. obsoletus*) widespread in the Mediterranean area. Díaz Lifante & al. (2009) completed the scenario, attributing different somatic chromosome numbers to the different taxa: $2n = 10$ to *N. serotinus*, $2n = 20$ to *N. elegans*, and $2n = 30$ to *N. obsoletus*. Finally, Aedo (2010) strengthen the taxonomy of this group with his typifications, and Santos-Gally & al. (2012) confirmed the genetic differences among taxa.

The presence of *N. obsoletus* (under *N. serotinus*) and *N. elegans* is well known in Sicily and peninsular Italy (cfr. Lojacono Pojero 1908-09, Fiori 1923-25, Webb 1980), whereas in Sardinia only *N. obsoletus* seems to occur according to Webb (1980) and Govaerts (2013) (but see Fig. 11 in Fernandes 1951, Zangheri 1976, Arrigoni 2006, Fig. 1A in Díaz Lifante & Andrés Camacho 2007); unfortunately, after Pignatti (1982) the two taxa were put together under *N. serotinus* (with some exceptions: e.g. Giardina & al. 2007). So that Conti & al. (2005), in the last checklist of the Italian vascular flora, list only "*N. serotinus*".

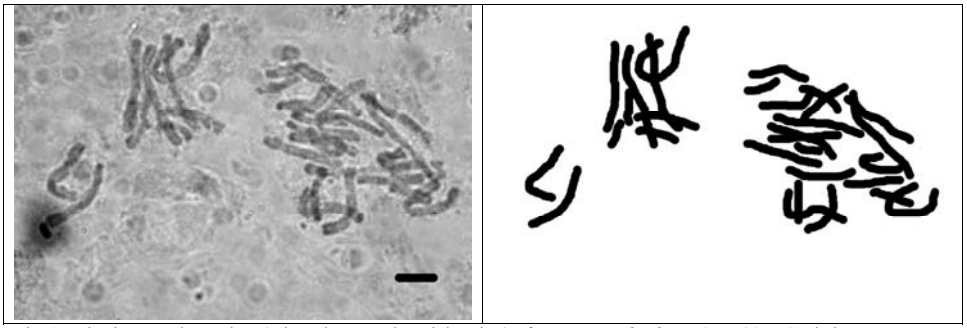

Fig. 1. Mitotic metaphase plate (microphotograph and drawing) of *Narcissus obsoletus*, 2*n* = 30. – Scale bar = 5 µm.

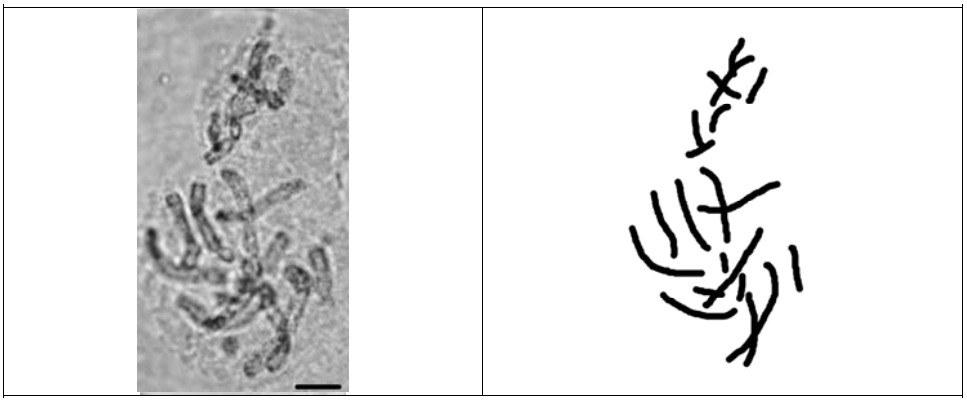

Fig. 2. Mitotic metaphase plate (microphotograph and drawing) of *Narcissus elegans*, 2*n* = 20. – Scale bar = 5 µm.

Recently, Carta & Peruzzi (2012) reported 2*n* = 30 for *N. obsoletus* from Pianosa Island (Tuscany), confirming previous counts for Italian populations made (under *N. serotinus*) by Frizzi (1984 - Apulia), Selvi & Fiorini (1995 - Tuscany), D'Amato (2004 - Latium and Tremiti Islands), and by Scrugli (1974) for Sardinia. This is the first count on plants from Sicily.

1816. *Narcissus elegans* (Haw.) Spach — 2*n* = 20 (Fig. 2).

Si: Mazara del Vallo (province of Trapani), contrada "Critazzo", garigue with *Chamaerops humilis*, ca. 60 m a.s.l., 24 Oct 2013, *A. Troia s.n.* (PAL).

Narcissus elegans has been found in a small population close to *N. obsoletus*, which is the dominant and widespread species in this open environment. See other information on this species in the comments to the previous one. The report by Garbari & al. (1973) for Sicilian plants of "*N. serotinus"* (collected in the same area of the present report) should be referred to *N. elegans*, as already suggested by Díaz Lifante & al. (2009); it seems to be the only previous report for this species in Sicily and Italy as a whole.

As to the infrageneric position of the two species here treated, current *Narcissus* subdivisions in subgenera and sections (e.g. Webb 1980) seem to be unsatisfactory: data shown in the recent work of Santos-Gally & al. (2012) support a close relationship between these species and the group of *N. tazetta* L., with chromosome numbers between $2n = 20$ and $2n = 22$ (see our previous reports in Baldini 1995).

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Reports (1817-1823) by S. Samaropoulou, P. Bareka & G. Kamari

1817. ***Allium ionicum*** Brullo & Tzanoud. **—** 2*n* = 16 (Fig. 1A).

Gr: Ionian Islands, Isl. Kephallinia, Poros, 38° 09' 00'' N, 20° 46' 14'' E, alt. 40 m, 07. Jun 2013, *Kamari*, *Samaropoulou & Spanou 27887*, *Samaropoulou* cult. *SK47* (UPA).

Allium ionicum is an endemic species of the Ionian Islands occurring in Lefkada, Kephalonia, Ithaki, Zakynthos and the islets Oxies. It grows on stony slopes and semi-deserted olive groves (Kamari & al. 1998).

The chromosome number is given for the first time for Kephalonia and agree with previous reports for the islands Lefkada and Ithaki (Brullo & Tzanoudakis 1994, Kriemadi & al. 2002).

The karyotype is symmetrical and diploid, consisting of 2*n* = 14m + 2 sm-SAT = 16 chromosomes. Satellites are observed on the short arm of the third in size chromosome pair. The chromosome size ranges between 7.7 and 12 μm (Fig. 1A).

1818. ***Cerastium candidissimum*** Correns **—** 2*n* = 4x = 36 (Fig. 1B).

Gr: Ionian Islands, Isl. Kephallinia, Mt. Ainos, 38° 08′ 23′′ N, 20° 39′ 31′′ E, alt. 1596 m, 12 Sept 2008, *Karagianni s.n.*, *Samaropoulou* cult. no *SK28* (UPA).

This taxon is a Greek endemic one, distributed on the mountains of south and central Greece, as well as on Kephalonia island (Mt. Ainos). Its habitat includes dry, rocky places, alpine pastures and limestone (Strid 1986, 1997). The taxon's population in Kephalonia is mainly threatened by the intense grazing and secondarily by parasitic insects (Karagianni 2010).

The chromosome number, according to our knowledge, is given for the first time from Kephalonia and agrees with previous reports for material from Peloponnisos (Mts Parnon, Menalon, Chelmos) by Persson (in Strid 1986). Moreover, the chromosome number 2*n* = 18 has been given by Favarger (1969) for material from Mt. Taygetos and by Söliner (1954) for cultivated material of unknown origin. The karyotype is tetraploid, symmetrical consisting of metacentric (m) and submetacentric (sm) chromosomes, ranging in size from 0.8 to 1.8 μm (Fig. 1B).

1819. ***Colchicum parlatoris*** Orph. **—** 2*n* = 6x = 54 (Fig. 1C).

Gr: Ionian Islands, Isl. Kephallinia, Faraklata, 38° 12′ 28′′ N, 20° 31′ 01′′ E, alt. 250 m, 01 Oct 2013, *Spanou s.n.*, *Samaropoulou* cult. *Z31* (UPA).

Colchicum parlatoris is a Greek endemic species which is distributed throughout NW and S Peloponnisos and the Ionian Islands Kephalonia, Zakynthos and Sapientza. It is generally located at open rocky slopes, olive terraces and limestone at an altitude of 0-900 m.

The karyotype is asymmetrical and hexaploid. The chromosome number 2*n* = 54 has been reported also for material from Zakynthos, Kephalonia and S Peloponnisos (Tan & Iatrou 2001), however the karyotype morphology is presented here for the first time (Fig. 1C). The chromosome size ranges between 0.8 and 4.8 μm.

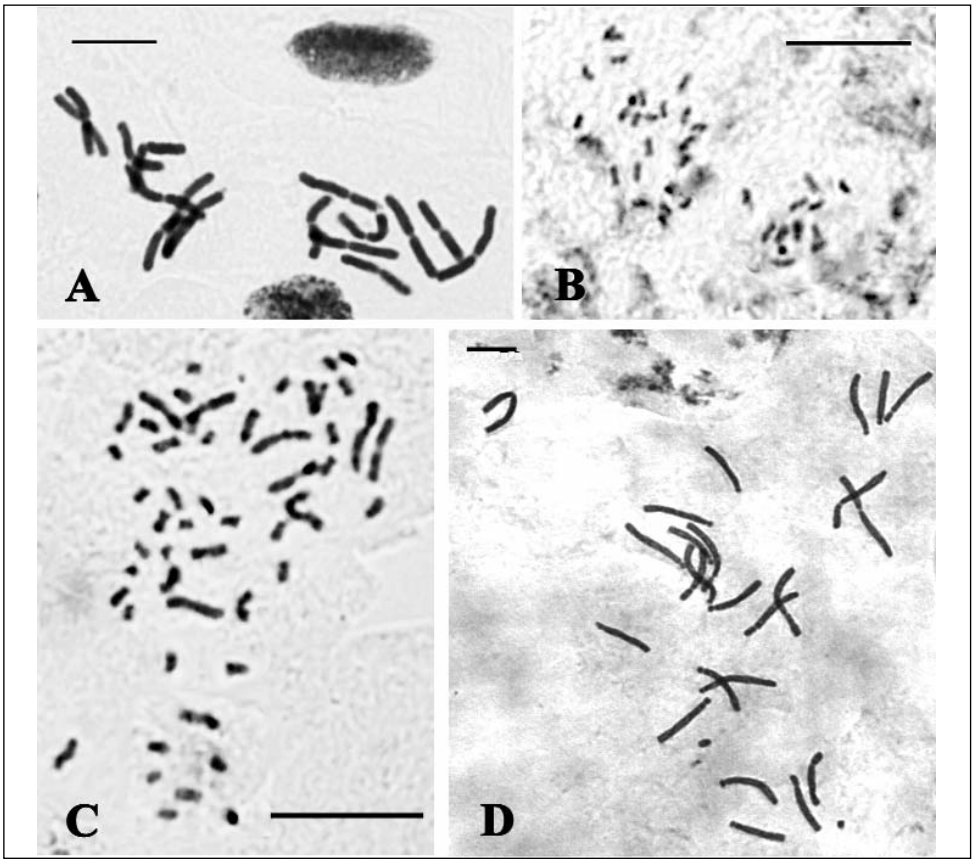

Fig. 1: Microphotographs of mitotic metaphase plates of: **A.** *Allium ionicum*, 2*n* = 16; **B.** *Cerastium candidissimum*, 2*n* = 4x = 36; **C.** *Colchicum parlatoris,* 2*n* = 6x = 54; **D.** *Fritillaria messanensis* subsp. *gracilis*, 2*n* = 24 + 1B. – Scale bars = 10 μm.

1820. ***Fritillaria messanensis*** subsp. ***gracilis*** (Ebel) Rix **—** 2*n* = 24 + 1B (Fig. 1D).

Gr: Ionian Islands, Isl. Kephallinia, Argostoli, in loco Phanari, in silva *Pinus halepencis*, 38° 11′ 28′′ N, 20° 28′ 04′′ E, alt. 10-50 m, 15 April 1975, *Phitos & Kamari 27001*, *Samaropoulou* cult. *SK48* (UPA).

The subspecies presents an Adriatic distribution, appearing in Greece, Albania and former Yugoslavia (Kamari & Phitos 2006). The populations of *Fritillaria messanensis* subsp. *gracilis* in Kephalonia are primarily threatened by intense grazing.

The karyotype is diploid and asymmetrical, consisting of 2*n* = 2m + 2sm + 8st + 2st-sat + 10t + 1B = 24 + 1B chromosomes. The results agree with previous reports by Kamari (1991), Kamari & Phitos (2006) for material from other populations of Ionian Islands (Zakynthos, Kefalonia, Ithaki, Lefkada). The same chromosome number, 2*n* = 24, has also been published for *Fritillaria messanensis s.l.*, based on material from former Yugoslavia (Lovka 1975), Italy (Gori 1958) and Greece (Zaharof 1987, 1989 from Mt. Olimbos) and by Kamari & Phitos (2006) from several others Greek populations. In the present study we observed an additional, almost telocentric, satellite-bearing pair of chromosomes. However, usually two or three satellites are visible, which is in accordance with our results. Moreover, the appearance of a B-chromosome has been again reported in material from Kephalonia and Zakynthos (Kamari 1991, Kamari & Phitos 2006). The chromosomes range in size between 10.5 and 18.9 μm (Fig. 1D).

1821. ***Narcissus papyraceus*** Ker Gawl. **—** 2*n* = 22 (Fig. 2B).

Gr: Ionian Islands, Isl. Kephallinia, close to the village Spartia, , 38° 06’ 47” N, 20° 33’ 24” E, ca. 400 m alt., 16 Dec 2012, *Phitos & Kamari 27953*, *Samaropoulou* cult. *SK27* (UPA).

Narcissus papyraceus is a species of a wide distribution around the Mediterranean region and SW Europe (Webb 1980).

This is the first study concerning material from Greece and the results agree with reports from Spain and Italy (Scrugli 1973 & 1977, Casas & al. 1979, Valdes-Bermejo 1980, D’Amato 2004). The chromosome number is 2*n* = 22 and the karyotype is diploid and asymmetrical, consisting mostly of submetacentric (sm) and acrocentric (st) chromosomes, except from a metacentric and two telocentric pairs. Their size ranges from 3.5 to 11.3 μm (Fig. 2B).

1822. ***Narcissus serotinus*** L. s. l. **—** 2*n* = 20 (Fig. 2A).

Gr: Ionian Islands, Isl. Zakynthos, close to the village Keri, 37° 39’ 39” N, 20° 48’ 58” E, alt. 150 m, 13 Oct 2013, *Kamari & Samaropoulou 27944*, *Samaropoulou* cult. *Z26* (UPA).

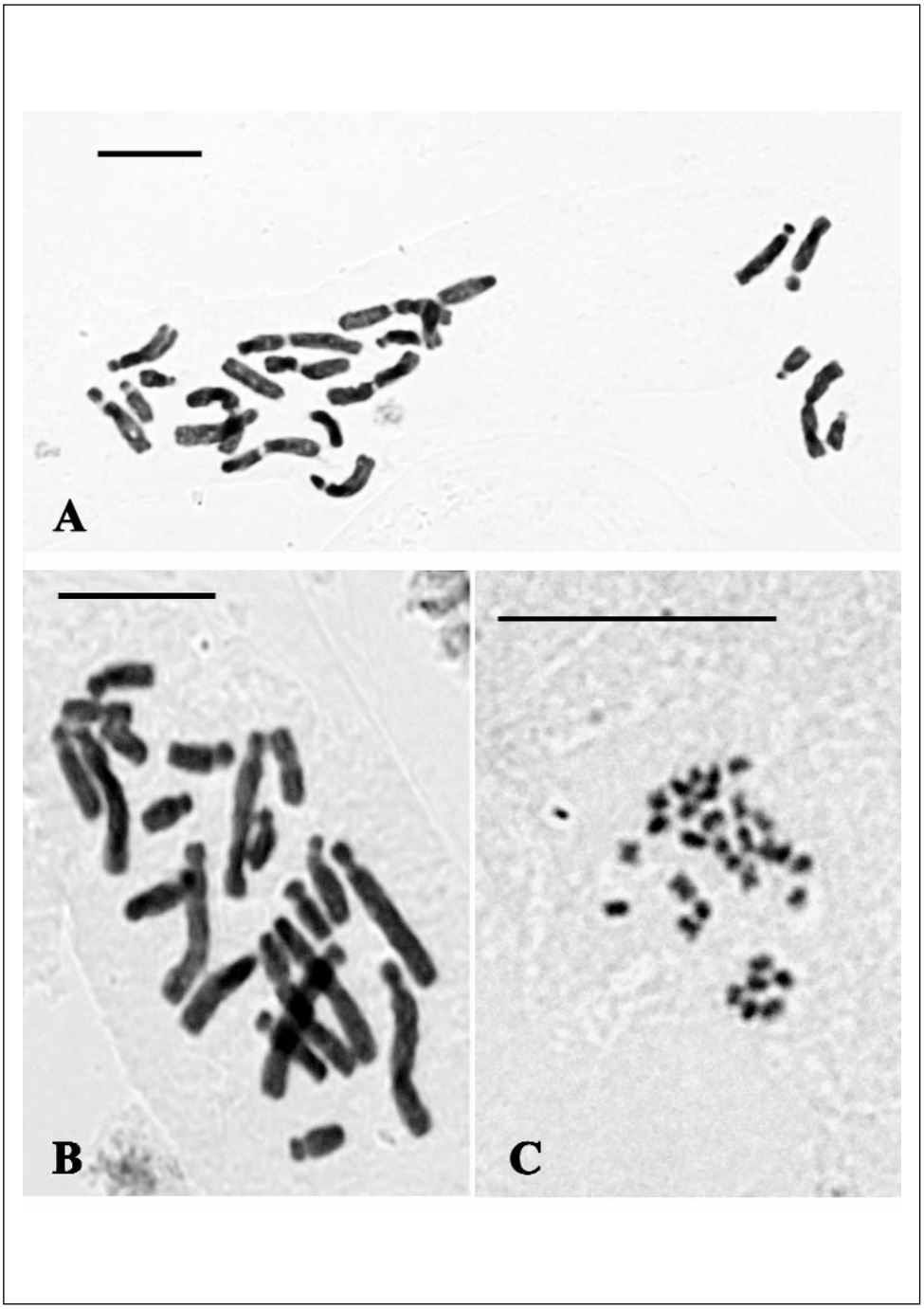

Fig. 2: Microphotographs of mitotic metaphase plates of: **A.** *Narcissus serotinus s.l.*, 2*n* = 20; **B.** *Narcissus papyraceus*, 2*n* = 22; **C.** *Thymus holosericeus*, 2*n* = 4x = 28. – Scale bars = 10 µm.

Narcissus serotinus L. s. l. is distributed around the Mediterranean region and Portugal. It is located on dry places and stony hillsides (Webb 1980).

Díaz Lifante & Andrés Camacho (2007), initially based on morphological characters, and later on karyological ones, split *N. serotinus* s. l. in two species: the typical one, endemic to W Iberian Peninsula and NW Morocco, with $2n = 2x = 10$ chromosomes, and *N. obsoletus* (Haw.) Steud., with $2n = 6x = 30$ chromosomes, widespread in the Mediterranean area (for more details see the reports 1815-1816, by Troia & al. 2013).

The chromosome number $2n = 20$ has also been counted by Phitos & Kamari (1974) on material from Crete, as well as by Garbari & al. (1973) from Sicily, under *N. serotinus*. However, in Crete (Phitos & Kamari 1974) and in Sicily (Troia & al. 2013) both cytotypes of *Narcissus* with $2n = 4x = 20$ & $2n = 6x = 30$ occur. The chromosome number $2n = 30$ is the most frequent in all the Mediterranean area (see Troia & al. 2013 for references).

The same chromosome number, $2n = 4x = 20$, is further reported for *N. elegans* (Haw.) Spach., which is distributed in the west & central Mediterranean area (Díaz Lifante & al. 2009). However, their karyotype morphology is totally different, since in *N. elegans* only one metacentric (m) chromosome pair occurs, while in *N. serotinus* s. l., with the same chromosome number, four such chromosome pairs are observed (Fig. 2A).

The karyotype presented here is tetraploid, rather asymmetrical and the chromosome size ranges from 4.5 to 12.5 μm (Fig. 2A).

1823. *Thymus holosericeus* Čelak. — $2n = 4x = 28$ (Fig. 2C).

Gr: Ionian Islands, Isl. Kephallinia, Mt. Roudi, 38° 11′ 37′′ N, 20° 37′ 37′′ E, alt. 873 m, 06 Aug 2008, *Karagianni s.n.*, *Samaropoulou* cult. no *SK9* (UPA).

Thymus holosericeus is an endemic species of the Ionian Islands that is only distributed on Kephalonia, Zakynthos and Lefkada. The species is mainly located at medium altitude (500-1130 m), in open and rocky places (Phitos & Damboldt 1985). Even though the taxon is not severely threatened by the intense grazing of the area, there has been a small size reduction of some of its subpopulations due to the widening of the mountain roads (Karagianni 2010).

The chromosome number $2n = 4x = 28$ agrees with previous reports by Damboldt (1976). The size of the chromosomes, ranging from 0.85 to 1.15 μm, is too small to distinguish their morphology, but the karyotype is tetraploid and symmetrical, as far as the size is concerned (Fig. 2C).

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