

## **Chromosome numbers of plants collected during Iter Mediterraneum IV in Cyprus**

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### **Introduction**

The fourth OPTIMA expedition, Iter Mediterraneum IV (Cyprus, April 1991) resulted in the collection of c. 1000 numbers of vascular plants. During the excursion the authors collected seed material and fixed flower buds for the purpose of karyological studies. They succeeded in studying 112 taxa, belonging to 22 families and 85 genera. The results are summarized here, and present one of the first extensive karyological contributions to the flora of Cyprus.

### **Material and methods**

The seed material and the fixations of flower buds used for this study were collected during the 4th OPTIMA expedition to Cyprus. Samples are indicated in the text and in Table 1 by the locality plus collection number of Iter Mediterraneum IV. Additional seed material and flower buds gathered without a corresponding "official" collection number is cited with the personal collection number of the authors, again preceded by the locality number. Herbarium vouchers are deposited in SEVF (Aparicio) and B (Vogt), respectively.

Studies on diploid chromosome numbers were carried out in the Botanic Garden and Botanical Museum Berlin-Dahlem. Plants for karyological study were raised at the Berlin Botanic Garden and vouchers of cultivated plants are deposited in the herbarium of the Botanical Museum (B). Chromosome numbers have been obtained from somatic mitoses of root tips of plants raised from seed. Root tips were pretreated with hydroxyquinoline (0.002 molar aqueous solution) for 2 hours, fixed in 96% ethanol/glacial acetic acid (3:1) and refrigerated. Hydrolyzation was carried out with 1-2N hydrochloric acid for 10-15 minutes at 60°C. For chromosome staining root tips were squashed in aceto-orcein. Chromosome counts were made from several plants of the same origin. When possible five to ten metaphase stages were examined for each plant.

Studies on haploid chromosome numbers from young flower buds fixed in 96% ethanol/glacial acetic acid (3:1) were carried out mainly in the Department of Plant Biology and Ecology, Sevilla University. The anthers were stained in cold alcoholic acid carmine (Snow 1963).

For most of the examined taxa a photograph of the mitotic or meiotic karyotype is provided.

Table 1. Chromosome counts of phanerogams from Cyprus. An asterisk (\*) indicates new or deviating counts, ● indicates taxa endemic to Cyprus.

Taxon	<i>n</i>	<i>2n</i>	Fig.	Coll no.
<b>Anacardiaceae</b>				
<i>Pistacia atlantica</i>	15		1	Aparicio CY 10-2
<b>Apiaceae</b>				
<i>Ainsworthia trachycarpa</i>	10		2	23-1059, Aparicio CY 5-2
<i>Bupleurum gracile</i>	7*		3	28-1308
<i>Daucus guttatus</i>	10		4	5-152
<i>Daucus involucreatus</i>	11		5	13-490
<i>Scaligeria napiformis</i>	10		6	Aparicio CY 22-5
<i>Tordylium syriacum</i>	10		7	11-337
<i>Zosima absinthiifolia</i>	5*		8	15-614
<b>Boraginaceae</b>				
<i>Onosma mitis</i>	8*		9	26a-1194
<b>Brassicaceae</b>				
<i>Alyssum cypricum</i>	16*		10	Aparicio CY 31-1
● <i>Alyssum troodi</i>	8*		11	Aparicio CY 31-2
● <i>Arabis purpurea</i>		16*	25	16-669
<i>Biscutella didyma</i>		16		Vogt 29-8808
<i>Enarthrocarpus arcuatus</i>		20*		3-31
<i>Matthiola longipetala</i> subsp. <i>bicornis</i>	7*		12	13-497
<i>Matthiola tricuspidata</i>		16*		3-33
<i>Moricandia spinosa</i> subsp. <i>maroccana</i>	14		13	17-756
<i>Sinapis alba</i>		22		13-510
<i>Torularia torulosa</i>	7*		14	13-509
<i>Turritis laxa</i>	6*		15	21-834
<b>Caryophyllaceae</b>				
<i>Cerastium comatum</i>	17		16	21-814
<i>Minuartia picta</i>	11*		17	21-827
<i>Petrorhagia dubia</i>		30	26	10-306
<i>Silene fruticosa</i>	12		18	29-1377
<i>Silene galataea</i>	12*			26a-1202
● <i>Silene gemmata</i>	12*		19	34-1591
● <i>Silene laevigata</i>		24*		34-1588
<i>Silene macrodonta</i>		20*	27	1-6
<i>Silene nocturna</i> var. <i>brachypetala</i>		24		35-1661
<i>Silene rubella</i>		24		4-90, 10-307
<i>Stellaria cilicica</i>	13*		20	21-835
<i>Helianthemum salicifolium</i>	10		21	16-652
<i>Helianthemum syriacum</i>	10		22	Aparicio CY 15-1
<i>Tuberaria guttata</i>	18		23	440, 26a-1233
<i>Tuberaria guttata</i>	24		24	12-440

Table 1. (continued).

Taxon	<i>n</i>	<i>2n</i>	Fig.	Coll no.
<i>Tuberaria plantaginea</i>	12		31	12-439, 26a-1232 Aparicio CY 23-4, 24-1, 24-2, 24-3, 24-4, 25-1, 26-1, 28-1
<b>Compositae</b>				
<i>Aetheorhiza bulbosa</i>		18	28	Vogt 28-9044
● <i>Anthemis tricolor</i>	9*			13-505
<i>Bellis annua</i> subsp. <i>minuta</i>		90*	29	28-1326
<i>Calendula arvensis</i>		44	30	13-503, 16-653, 11-347
<i>Carduus argentatus</i> subsp. <i>apicularis</i>	14*		32	23-1061
<i>Carduus pycnocephalus</i> subsp. <i>albidus</i>		60	37	28-1333
<i>Centaurea aegialophila</i>	11			Aparicio CY 2-4
● <i>Cephalorrhynchus cypricus</i>		18*	38	21-847
<i>Chlamydomphora tridentata</i>		18*	39	5-127, 8-276
<i>Chrysanthemum coronarium</i> var. <i>coronarium</i>		18	40	4-69
<i>Chrysanthemum coronarium</i>	9		33	13-465
<i>Chrysanthemum coronarium</i> var. <i>discolor</i>		18		4-85
<i>Chrysanthemum segetum</i>		18	41	Vogt 24-8641
<i>Cnicus benedictus</i>		22	42	30-1413
<i>Crepis foetida</i> subsp. <i>foetida</i>		10	43	Vogt 28-9040
<i>Crepis fraasii</i>	6		34	Aparicio CY 14-1
<i>Crepis fraasii</i>		12	44	26a-1193
<i>Crepis sancta</i>		10	45	6-207, 34-1579
<i>Crupina crupinastrum</i>		28	46	6-212
<i>Hedypnois rhagadioloides</i>		13	47	Vogt 28-9040bis
<i>Helichrysum italicum</i>	14		35	12-437
<i>Leontodon tuberosus</i>		8	48	23-1094
<i>Matricaria recutita</i> var. <i>coronata</i>		18*	49	6-189
<i>Notobasis syriaca</i>		34	50	4-82
<i>Phagnalon rupestre</i> subsp. <i>graecum</i>	9		36	8-278
<i>Phagnalon rupestre</i> subsp. <i>graecum</i>		18	51	6-185, 13-472
<i>Phagnalon rupestre</i> subsp. <i>rupestre</i>		18	52	3-30
<i>Picris pauciflora</i>		10	53	30-1412
<i>Pseudognaphalium luteo-album</i>		28*		35-1663
<i>Reichardia tingitana</i>		16	64	28-1300
<i>Scorzonera jacquiniana</i> var. <i>subintegra</i>		14*	55	9-285
<i>Scorzonera laciniata</i>		14	56	8-275
<i>Senecio leucanthemifolius</i> var. <i>vernalis</i>		20	57	34-1583
<i>Senecio vulgaris</i>		40	58	12-441
<i>Sonchus oleraceus</i>		32	59	26a-1209

Table 1. (continued).

Taxon	<i>n</i>	<i>2n</i>	Fig.	Coll no.
<i>Stiptorhamphus tuberosus</i>		16	60	26a-1211, 28-1330
<i>Tolpis barbata</i>	9		61	29-1390
<i>Tragopogon sinuatus</i>		12	67	6-183, 12-424
<i>Tyrimnus leucographus</i>	17		62	23-1060
<i>Urospermum picroides</i>		10	68	6-203
<i>Xeranthemum inapertum</i>	14		63	12-426
<b>Convolvulaceae</b>				
<i>Convolvulus oleifolius</i>	15*		64	5-175
<b>Dipsacaceae</b>				
<i>Pterocephalus brevis</i>	9*		65	31-1467
● <i>Pterocephalus multiflorus</i>	9*		66	12-436
<b>Ericaceae</b>				
<i>Arbutus andrachne</i>	13		73	Aparicio CY 17-3
<b>Fabaceae</b>				
● <i>Astragalus cyprius</i>	8*		74	25-1140
<i>Hedysarum spinosissimum</i>		16		5-122
<i>Hymenocarpus circinnatus</i>		16		Vogt 14-8359
<i>Lotus peregrinus</i>		28		31-1471
<i>Medicago truncatula</i>		14		31-1468
<i>Onobrychis crista-galli</i>		32		4-46
● <i>Onobrychis venosa</i>	7*			Aparicio CY 12-5
● <i>Onobrychis venosa</i>		14*	69	13-489
<i>Ononis ornithopodioides</i>		32	70	28-1292
<i>Ononis viscosa</i> subsp. <i>sicula</i>		32	71	31-1475
<i>Scorpiurus sulcatus</i>		28	72	8-277
<i>Vicia sativa</i> subsp. <i>sativa</i>		10	79	6-215
<b>Geraniaceae</b>				
<i>Erodium cicutarium</i>		20*	80	6-217
<b>Gramineae</b>				
<i>Avena ventricosa</i>		14		15-600
<i>Bromus caroli-henrici</i>		14*		28-1320
<i>Bromus rubens</i>		28	81	6-195
<b>Iridaceae</b>				
● <i>Gladiolus triphyllus</i>		60*	82	Vogt 23-8806
<i>Gynandrisis sisyrrinchium</i>		24	83	Vogt 29-8809



Table 1. (continued).

Taxon	<i>n</i>	<i>2n</i>	Fig.	Coll no.
<b>Lamiaceae</b>				
● <i>Phlomis cypria</i> var. <i>occidentalis</i>	10*		75	25-1143
<i>Salvia verbenaca</i>		c.42		13-478
<i>Salvia verbenaca</i>		56	84	34-1577
<i>Teucrium kotschyianum</i>		32*	85	20-772
<b>Liliaceae</b>				
<i>Allium junceum</i>	8		76	23-1081
<i>Allium trifoliatum</i>		14*	86	24-1120
<i>Bellevalia trifoliata</i>		8	87	11-358
<b>Orchidaceae</b>				
<i>Ophrys transhyrcana</i>	18*			Aparicio CY 10-3
<i>Orchis coriophora</i> subsp. <i>fragrans</i>	18*			14-541
<i>Platanthera chlorantha</i>	21		77	22-966
<b>Orobanchaceae</b>				
<i>Orobanche aegyptiaca</i>	12		78	27-1288
<b>Polygonaceae</b>				
<i>Emex spinosa</i>		20		4-81
<i>Rumex cyprius</i>		18	88	31-1477
<b>Primulaceae</b>				
● <i>Cyclamen cyprium</i>		30	89	Vogt 21-8530
<i>Cyclamen persicum</i>		48	90	11-313
<b>Scrophulariaceae</b>				
<i>Veronica persica</i>		28	91	33-1523
<b>Valerianaceae</b>				
● <i>Kentranthus calcitrapa</i> subsp. <i>orbicularis</i>		32*		20-779
<i>Valerianella orientalis</i>		16*	92	33-1522

## Results

The families, genera and species indicated below are arranged alphabetically. For all species the name adopted in the preceding check-list of plants collected during the fourth OPTIMA expedition (Alziar 1999) is given.

Short comments are provided for all taxa studied in this investigation. The results are summarized in Table 1.

*Anacardiaceae**Pistacia atlantica* Desf.

$n = 15$ . **Limassol:** Vouni, roadside, marls and limestones, 480 m, 17 Apr 1991, (Aparicio CY 10-2) (Fig. 1).

The genus *Pistacia* is known to have two different chromosome numbers with  $n = 12$  and  $n = 15$ . In *P. atlantica* one deviating number,  $2n = 28$  is cited by Zohary (1952) for *P. atlantica* var. *latifolia* DC.

*Apiaceae**Ainsworthia trachycarpa* Boiss.

$n = 10$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (Aparicio CY 5-2).

$n = 10$ . **Paphos:** Between Nata and Axylon, garrigue, limestone and marl-limestone, 350-400 m, 22 Apr 1991 (23-1059) (Fig. 2).

Several chromosome numbers of this E. Mediterranean taxon have been published previously;  $n = 7$  and  $n = 9$  are reported by Constance & al. (1976) from Israel and  $n = 10$  from Iraq,  $n = 8$  and  $2n = 16$  respectively by Al-Eisawi & Jury (1988) and Al-Eisawi (1989) from Jordan.

*Bupleurum gracile* d'Urv.

$n = 7$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (28-1308) (Fig. 3).

This is the first report of a chromosome number for this E. Mediterranean species.

*Daucus guttatus* Sm.

$n = 10$ . **Larnaka:** Cape Greco, limestone rocks (lower Miocene) and sand, 10-20 m, 12 Apr 1991 (5-152) (Fig. 4).

According to previous studies this species seems to be represented by two different chromosome numbers. Our count of  $n = 10$  is in accordance with the report of  $2n = 20$  made by Česchmedjiev (1983) who studied Bulgarian plant material.  $2n = 22$  chromosomes are cited by Engstrand (1970) and  $n = 11$  by Constance & al. (1976) and Strid & Franzén (1981) respectively who studied plants of Greek provenance.

*Daucus involucratus* Sm.

$n = 11$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-490) (Fig. 5).

Our result corresponds with the report of  $2n = 22$  for this taxon cited in Engstrand (1970) for material from the Aegean region.

*Scaligeria napiformis* (Spreng.) Grande

$n = 10$ . **Paphos:** Junction of the track to Ayia (Panayi), valley of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (*Aparicio CY 22-5*) (Fig. 6).

With the corresponding result of  $2n = 20$  this species distributed in the eastern Mediterranean region has previously been studied by Engstrand (1970) using plant material of Greek provenance.

*Tordylium syriacum* L.

$n = 10$ . **Limassol:** Amathus, stony slopes, edge of agricultural land, walls, garrigue, marl and limestone, 10-40 m, 14 Apr 1991 (*11-337*) (Fig. 7).

This is the first count based on authentic plant material of this species endemic to Asia Minor. Previous reports of  $2n = 20$  and  $n = 10$  have been given by Gardé & Malheiros-Gardé (1954), and Bell & Constance (1960) using plant material of unknown origin.

*Zosima absinthiifolia* (Vent.) Link

$n = 5$ . **Limassol:** Vouni, roadside, limestone and marl, 480 m, 17 Apr 1991 (*15-614*) (Fig. 8).

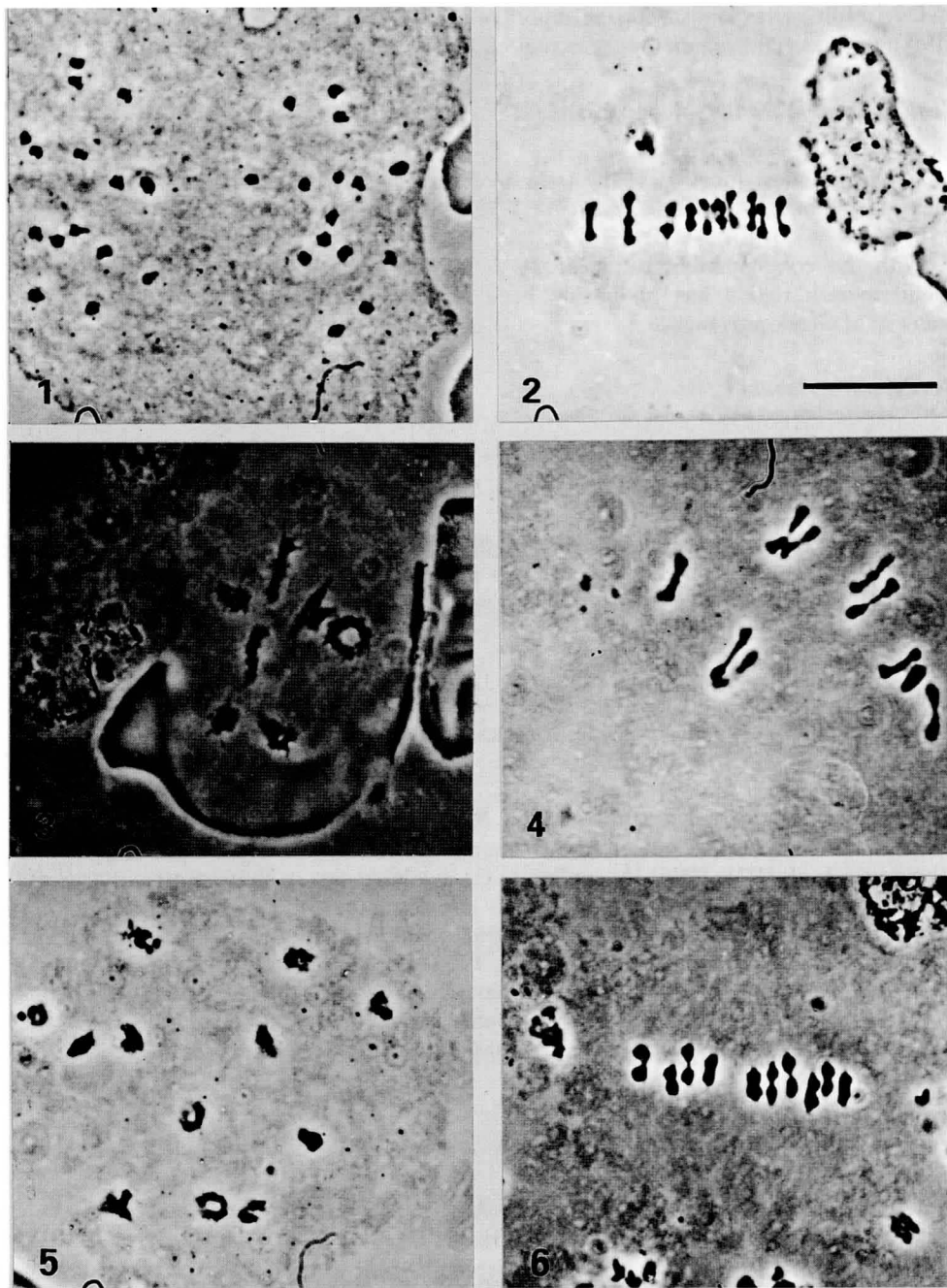
*Zosima absinthiifolia* is distributed in S. W. and C. Asia. Two previous chromosome counts have been carried out on plant material of Iranian provenance yielding  $n = 10$  (Constance & al. 1971, 1976). According to the available data in chromosome indices and karyological studies dealing with *Apiaceae* (e.g. Delay 1951, Cave 1959, 1960, 1963, 1964, Darlington & Wylie 1955, Ornduff 1968, Fedorov 1969, Moore 1970, 1971, 1972, 1974, 1977, Bell & Constance 1957, 1960, 1966, Constance & al. 1971, 1976, Queirós 1978, Pastor 1993) the family is known to have basic chromosome numbers from  $x = 6$  to  $x = 11$  at least in the Mediterranean area. Therefore our count of  $n = 5$  for *Z. absinthiifolia* is a new number for the species as well as for the whole family of *Apiaceae*.

*Boraginaceae*

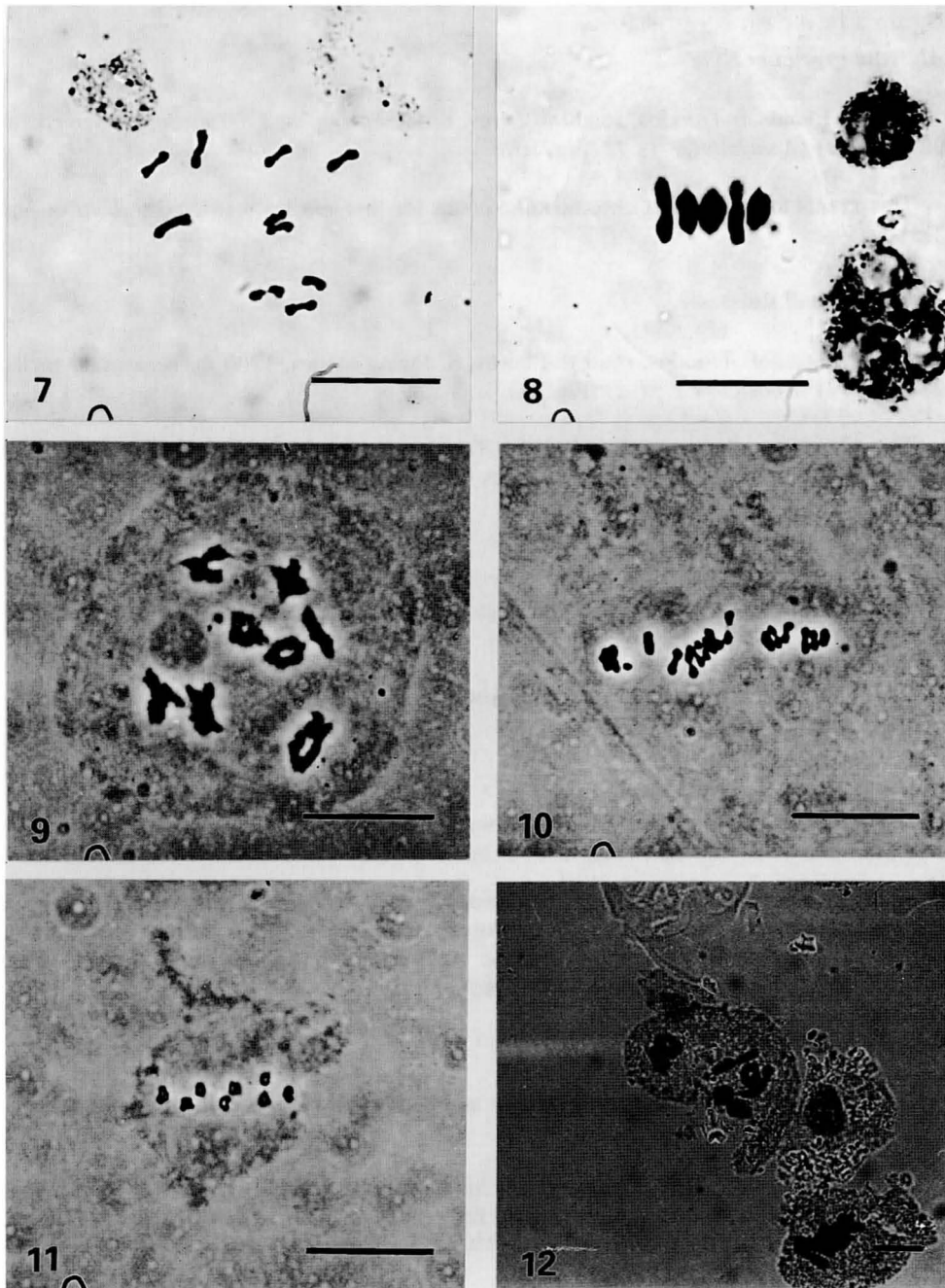
*Onosma mitis* Boiss. & Heldr.

$n = 8$ . **Paphos:** Junction of the track to Ayia (Panayi), valley of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (*26A-1194*) (Fig. 9).

This is the first karyological study of this species which is restricted to Turkey and Cyprus. The genus *Onosma* is known to represent basic chromosome numbers from  $x = 6$  to  $x = 11$  (for reference see Luque 1990).  $n = 8$  has been reported previously only for *O. sericeum* from Armenia (Tissot-Daguette 1972).



Figs. 1-6. PMC meiosis of: **1**, *Pistacia atlantica*,  $n = 15$ ; **2**, *Ainsworthia trachycarpa*,  $n = 10$ ; **3**, *Bupleurum gracile*,  $n = 7$ ; **4**, *Daucus guttatus*,  $n = 10$ ; **5**, *Daucus involucreatus*,  $n = 11$ ; **6**, *Scaligeria napiformis*,  $n = 10$ . — Scale bar = 10  $\mu\text{m}$ .



Figs. 7-12. PMC meiosis of: 7, *Tordylium syriacum*,  $n = 10$ ; 8, *Zosima absinthiiifolia*,  $n = 5$ ; 9, *Onosma mitis*,  $n = 8$ ; 10, *Alyssum cypricum*,  $n = 16$ ; 11, *Alyssum troodi*,  $n = 8$ ; 12, *Matthiola longipetala* subsp. *bicornis*,  $n = 7$ . — Scale bar = 10  $\mu\text{m}$ .

*Brassicaceae**Alyssum cypricum* Nyár.

$n = 16$ . **Limassol:** Troodos, road to Platres, S. facing slopes, 1700 m, serpentine rocks, 28 Apr 1991 (*Aparicio CY 31-1*) (Fig. 10).

This seems to be the first chromosome count for this species restricted to Cyprus and Turkey.

*Alyssum troodi* Boiss.

$n = 8$ . **Limassol:** Troodos, road to Platres, S. facing slopes, 1700 m, serpentine rocks, 28 Apr 1991 (*Aparicio CY 31-2*) (Fig. 11).

This Cyprian endemic confined to the Troödos Range is a member of the group of diploid species in the genus. This is as far as we know the first karyological study.

*Arabis purpurea* Sm.

$2n = 16$ . **Limassol:** Ayia Mavri, Kilani, stony slopes, marl and limestone, 17 Apr 1991 (*16-669*) (Fig. 25).

Our count is the first report of a chromosome number for this endemic Cyprian species.

*Biscutella didyma* L.

$2n = 16$ . **Paphos:** Near Dhroushia and Inia, W. of mount Lara, meadows and big rocks of triassic sandstone, 550 m, 24 Apr 1991 (*Vogt 29-8808*).

Plants of Cyprian provenance of this widespread Mediterranean weed have not been studied before. Our finding of  $2n = 16$  corroborates former results from Italy (Raffaelli & Fiorini 1985), Spain, Egypt and Greece (Olowokudejo & Heywood 1984), Crete (Montmollin 1984), and Iraq (Al-Shehbaz & Al-Omar 1982).

*Enarthrocarpus arcuatus* Labill.

$2n = 20$ . **Larnaka:** Between Xylophagou and Ayia Thékla, beach, 0-5 m, 12 Apr 1991 (*3-31*).

The cytology of this E. Mediterranean taxon has not been studied previously. Our count of  $2n = 20$  is in accordance with reports for other species of *Enarthrocarpus*, e.g. *E. lyratus*, *E. strangulatus* (Sharma & Sikka 1976), *E. clavatus* (Guittonneau 1978), and *E. pterocarpus* (Harberd 1972).

*Matthiola longipetala* subsp. *bicornis* (Sm.) P. W. Ball

$n = 7$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (*13-497*) (Fig. 12).

This first count based on Cyprian plant material is in accordance with reports of Ghaffari (1988) and Aryavand (1977b) from Iran, and Al-Shehbaz & Al-Omar (1982, 1983) from Iraq. The deviating number  $n = 6$  has been found by Maassoumi (1980) who used Iranian plant material.

***Matthiola tricuspida*** (L.) R. Br.

$2n = 16$ . **Larnaka:** Between Xylophagou and Ayia Thekla, beach, 0-5 m, 12 Apr 1991 (3-33).

Our count of  $2n = 16$  for this species which is widespread in the Mediterranean region differs from former reports of Miège & Greuter (1973), Brullo & Pavone (1977), and Renzoni (1969) who found  $2n = 14$  chromosomes in plants of Cretean and Italian provenance.

***Moricandia spinosa*** Pomel subsp. ***maroccana*** Sobrino

$n = 14$ . **Larnaka:** Kato Lefkara, track to Vavla, marls and limestone, garrigue and meadows, 520 m, 18 Apr 1991 (17-756) (Fig. 13).

This species was collected for the first time in Cyprus during Iter Mediterraneum IV. Our count of  $n = 14$  seems to be the first karyological study of this taxon.

***Sinapis alba*** L. subsp. ***alba***

$2n = 24$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-510).

The result of  $2n = 24$  is in accordance with many previous reports from different regions of the wide range of this species.

***Torularia torulosa*** (Desf.) O. E. Schulz

$n = 7$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-509) (Fig. 14).

This is the first karyological study of this species distributed in N. Africa and the eastern Mediterranean region.

***Turritis laxa*** (Sm.) Hayek

$n = 6$ . **Paphos:** Mount Tripilos and Cedar valley, forest with *Cedrus brevifolia* and *Quercus alnifolia*, 1080-1360 m, 20 Apr 1991 (21-834) (Fig. 15).

This seems to be the first chromosome count for this C. and E. Mediterranean taxon.

*Caryophyllaceae**Cerastium comatum* Desv.

$n = 17$ . **Paphos:** Mount Tripylos and Cedar valley, forest with *Cedrus brevifolia* and *Quercus alnifolia*, 1080-1360 m, 20 Apr 1991 (21-814) (Fig. 16).

Our count is in accordance with the reports of Sölner (1954) and Favarger (1969, sub *Cerastium illyricum* subsp. *comatum*) who studied material of Greek and Corsean provenance of this taxon distributed in the C. and E. Mediterranean area.

*Minuartia picta* (Sm.) Bornm.

$n = 11$ . **Paphos:** Mount Tripylos and Cedar valley, forest with *Cedrus brevifolia* and *Quercus alnifolia*, 1080-1360 m, 20 Apr 1991 (21-827) (Fig. 17).

Previous reports for this E. Mediterranean taxon are not known.

*Petrorhagia dubia* (Rafin.) G. López & Romo (*P. velutina* (Guss.) P. W. Ball & Heywood).

$2n = 30$ . **Larnaka:** Cape Kiti, stony slopes and fallow land, 13 Apr 1991 (10-306) (Fig. 26).

Our count of  $2n = 30$  chromosomes is in accordance with the indications given by Blackburn & Morton (1957, sub *Kohlrauschia velutina*), Thomas & Murray (1983, sub *Petrorhagia velutina*), Colombo & Trapani (1990, sub *Petrorhagia velutina*), and Montmollin (1986). This species is widely distributed in the Mediterranean area.

*Silene fruticosa* L.

$n = 12$ . **Paphos:** Near Dhroushia and Inia, west of mount Lara, meadows and big rocks of triassic sandstones, 550 m, 24 Apr 1991 (29-1377) (Fig. 18).

Our count corroborates the report of a somatic number of  $2n = 24$  given by Blackburn (1928), Damboldt & Phitos (1966) and Kramer & al. (1972) who studied material of Maltesian and Greek provenance.

*Silene galataea* Boiss.

$n = 12$ . **Paphos:** Junction of the track to Ayia (Panayi), Valley of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (26A-1202).

This is the first karyological study of this species endemic to the flora of Cyprus.

*Silene gemmata* Meikle

$n = 12$ . **Limassol:** Between Mandria and Ayios Nikolaus, roadsides and garrigue, gabbro and limestone, 27 Apr 1991 (34-1591) (Fig. 19).



This seems to be the first karyological study of this Cyprian endemic.

***Silene laevigata* Sm.**

$2n = 24$ . **Limassol:** Between Mandria and Ayios Nikolaus, roadsides and garrigue, gabbro and limestone, 27 Apr 1991 (34-1588).

This seems to be the first report of a chromosome number for this endemic Cyprian species confined to dry igneous mountainsides of the Troödos range.

***Silene macrodonta* Boiss.**

$2n = 20$ . **Larnaka:** Perivolía, beach and sandy rubble piles, 0-5 m, 10 Apr 1991 (1-6) (Fig. 27).

*Silene macrodonta* has not been studied cytologically previously. Our result of  $2n = 20$  agrees with reports for other taxa of *S.* sect. *Conimorpha* Otth.

***Silene nocturna* var. *brachypetala* (DC.) Benth.**

$2n = 24$ . **Paphos:** Kidhasi, valley of Dhiarizos, river bank and meadows, 27 Apr 1991 (35-1661).

*Silene nocturna*, a widespread Mediterranean species, has been studied cytologically in many countries but a chromosome number for var. *brachypetala* was reported only once by Kramer & al. (1972) who studied Maltese plant material and obtained the same result.

***Silene rubella* L.**

$2n = 24$ . **Larnaka:** Between Xylophagou and Ayia Thekla, fallow land and pseudosteppe with *Sarcopoterium*, c. 5 m, 12 Apr 1991 (4-90).

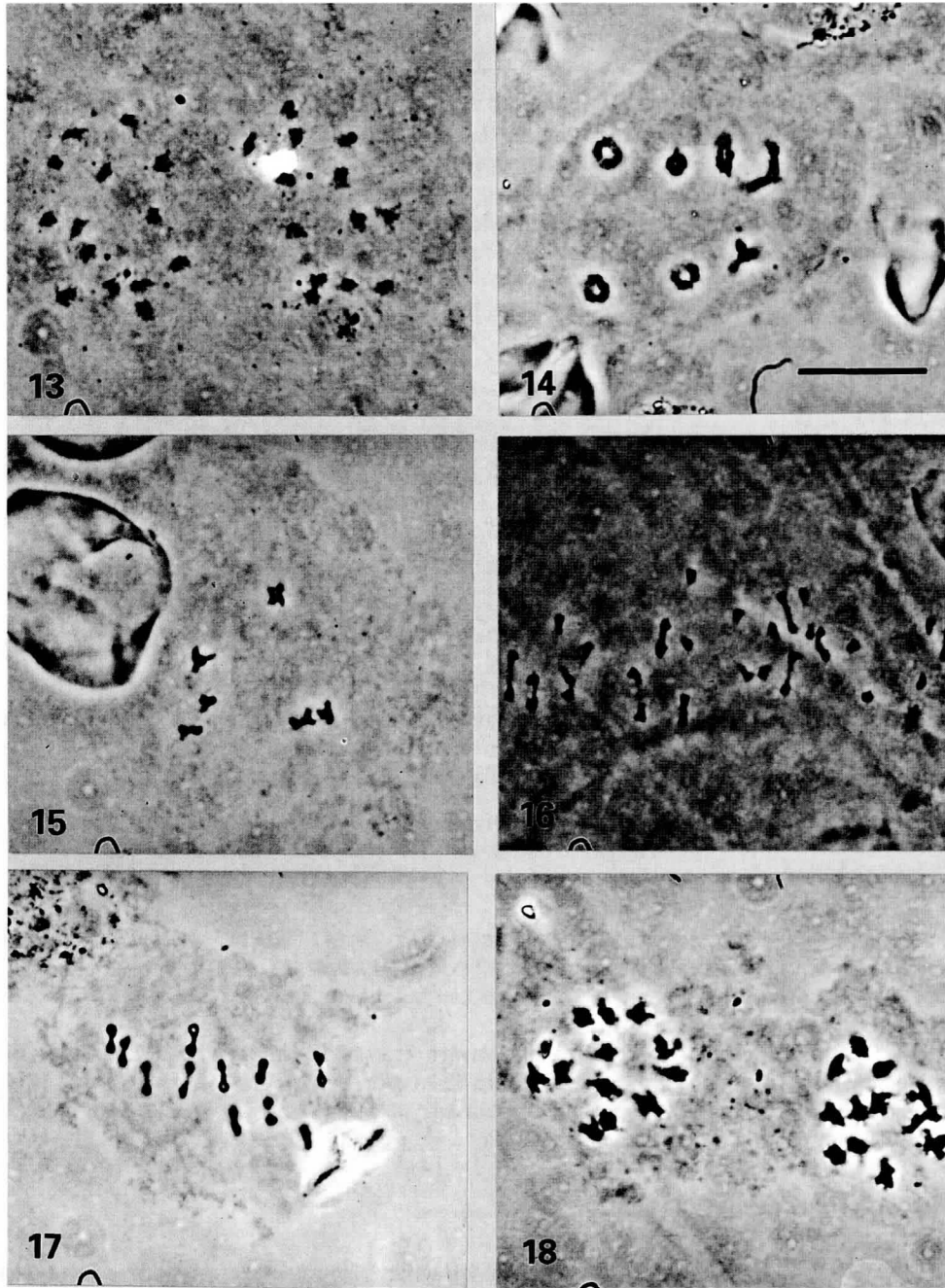
$2n = 24$ . **Larnaka:** Cape Kiti, stony slopes and fallow land, 13 Apr 1991 (10-307).

Our counts of  $2n = 24$  confirm all former reports from many countries for this widespread species, e.g. Portugal (Blackburn & Morton 1957, Fernandes & Leitao 1971), Algeria (Reese 1957, Podlech 1987), the Balearic Islands (Dahlgren & al. 1971), and the Spanish mainland (Talavera & Bocquet 1976, Lidén 1980).

***Stellaria cilicica* Boiss. & Balansa**

$n = 13$ . **Paphos:** Mount Tripylos and Cedar valley, forest with *Cedrus brevifolia* and *Quercus alnifolia*, 1080-1360 m, 20 Apr 1991 (21-835) (Fig. 20).

No former reports of a chromosome number of this E. Mediterranean taxon are known.



Figs. 13-18. PMC meiosis of: **13**, *Moricandia spinosa* subsp. *maroccana*,  $n = 14$ ; **14**, *Torularia torulosa*,  $n = 7$ ; **15**, *Turritis laxa*,  $n = 6$ ; **16**, *Cerastium comatum*,  $n = 17$ ; **17**, *Minuartia picta*,  $n = 11$ ; **18**, *Silene fruticosa*,  $n = 12$  — Scale bar = 10  $\mu\text{m}$ .

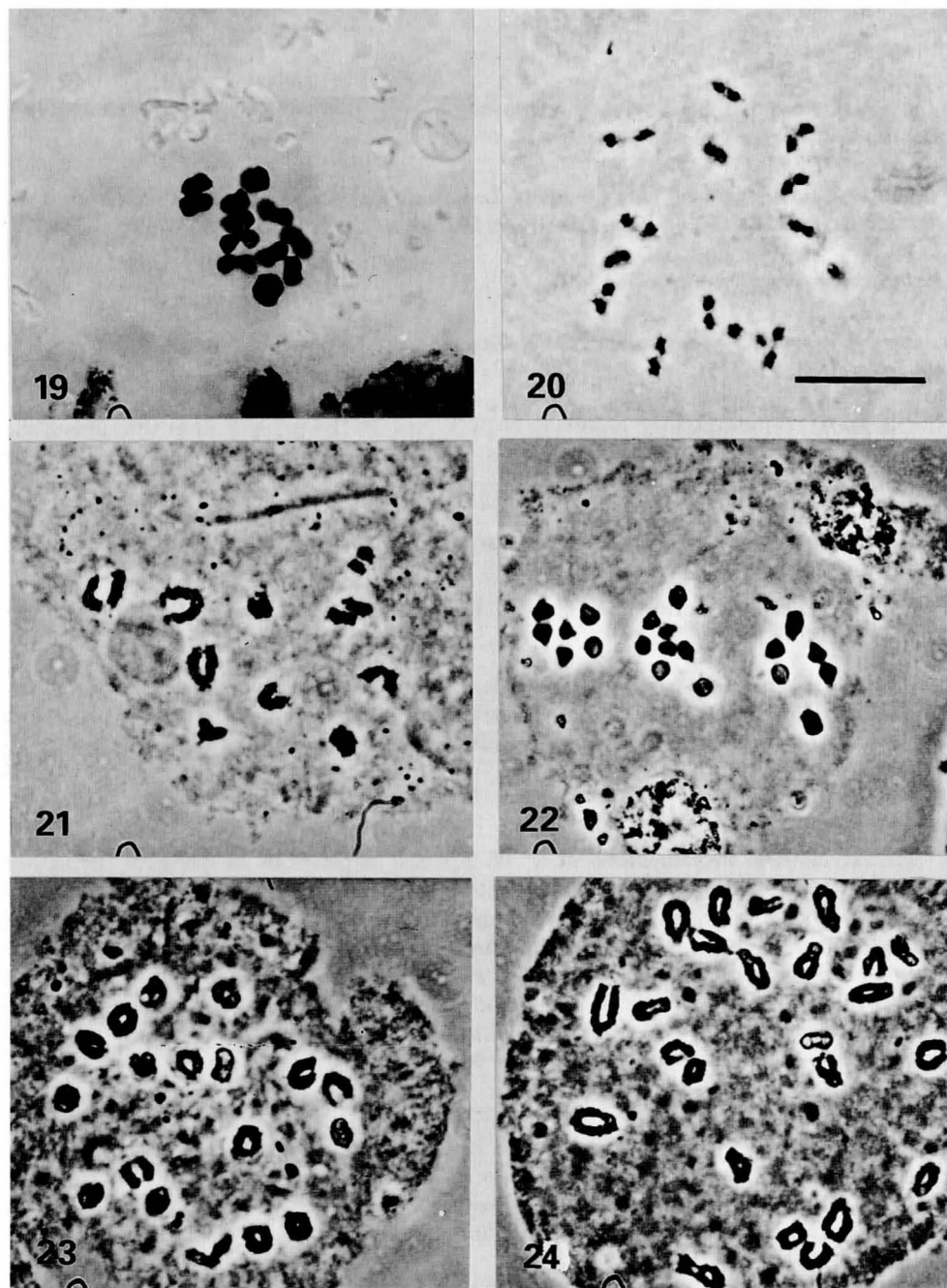


Fig. 19-24. PMC meiosis of: **19**, *Silene gemmata*,  $n = 12$ ; **20**, *Stellaria cilicica*,  $n = 13$ ; **21**, *Helianthemum salicifolium*,  $n = 10$ ; **22**, *Helianthemum syriacum*,  $n = 10$ ; **23**, *Tuberaria guttata*,  $n = 18$ ; **24**, *Tuberaria guttata*,  $n = 24$ . — Scale bar = 10  $\mu\text{m}$ .

*Cistaceae**Fumana arabica* (L.) Spach

$n = 16$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-418).

Our result coincides with the counts of  $2n = 32$  reported by Chiarugi (1925) from Italy, Atsmon & Feinbrun (1960) from Israel, and Markova (1972, 1975) from Bulgaria.

*Helianthemum salicifolium* (L.) Mill.

$n = 10$ . **Limassol:** Ayia Mavri, Kilani, stony slopes, marls and limestone, 700 m, 17 Apr 1991 (16-652) (Fig. 21).

Our count corroborates the reports ( $n = 10$  or  $2n = 20$ ) by many authors throughout the Mediterranean distribution range. Material of Cyprian provenance has already been studied and the same result was published by Slavík & al. (1993).

*Helianthemum syriacum* (Jacq.) Dum. Cours. (= *H. lavandulifolium* auct.)

$n = 10$ . **Larnaka:** Between Vavla and Kirokitia, limestones, 520 m, 18 Apr 1991 (Aparicio CY 15-1) (Fig. 22).

Previous counts ( $n = 10$  and  $2n = 20$ ) for this Mediterranean taxon reported by Coutinho & Lorenzo-Andreu (1948), Valdés & al. (1978), Valdés-Bermejo (1980) from Spain and Atsmon & Feinbrun (1960) from Israel yielded the same result.

*Tuberaria* (Dunal) Spach

As karyological investigations in S. W. Spanish populations of different species of *Tuberaria* have shown (Gallego & Aparicio 1993) this genus is taxonomically very complicated due to hybridization and backcrossing among the taxa. A considerable morphological variation is leading to enormous difficulties in species delimitation. Our karyological study of Cyprian material gives raise to the assumption that hybridization and polyploidy also occurs in this part of the distribution range. *T. plantaginea* represents the tetraploid level ( $2n = 24$ ) and *T. guttata* the hexaploid level ( $2n = 36$ ), with some, probably allo-octoploid, hybrid forms ( $2n = 48$ ).

*Tuberaria guttata* (L.) Fourr.

$n = 18$ . **Paphos:** Junction of the track to Ayia (Panayi), valley of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (26A-1233) (Fig. 23).

$n = 24$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-440) (Fig. 24).

The polymorphic *Tuberaria guttata* is a species widespread in the W. Mediterranean but rare in the eastern part. It has been studied karyologically in its whole distribution range always showing the same ploidy levels (for previous chromosome counts see Gallego & Aparicio 1993).

*Tuberaria plantaginea* (Willd.) Gallego

$n = 12$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-439).

$n = 12$ . **Paphos:** Junction of the track to Ayia (Panayi), Valley of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (26A-1232).

$n = 12$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (Aparicio CY 23-4).

$n = 12$ . **Paphos:** Near Dhroushia and Inia, west of mount Lara, meadows and big rocks of triassic sandstones, 550 m, 24 Apr 1991 (Aparicio CY 24-1, 24-2, 24-3, 24-4).

$n = 12$ . **Nikosia:** Ayia Irini, edge of agricultural land, gabbro and diorite, 950 m, 26 Apr 1991 (Aparicio CY 25-1).

$n = 12$ . **Nikosia:** N. E. of Ayios Yeoryios Kavkalou (road to Vyzakia), roadside and agricultural land, sand and rubble (basalt), 390 m, 26 Apr 1991 (Aparicio CY 26-1).

$n = 12$ . **Nikosia:** Alona, steep slopes, garrigue, diabase, 940 m, 26 Apr 1991 (Aparicio CY 28-1) (Fig. 31).

*Composite**Aetheorhiza bulbosa* (L.) Cass.

$2n = 18$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (Vogt 28-9044) (Fig. 28).

Our count of  $2n = 18$  agrees with former reports given by Pavone & al. (1981b) for Italy, Nordenstam (1972) for Egypt, Dahlgren & al. (1971) for the Balearic Islands, Delay & Petit (1972, sub *Crepis bulbosa* L.) for France, Fernandes & Queirós (1971a) for Portugal, and Castroviejo (1983) for Spain.

Mori (1957) found a different number of  $2n = 32$  in plant material of Italian provenance.

*Anthemis tricolor* Boiss.

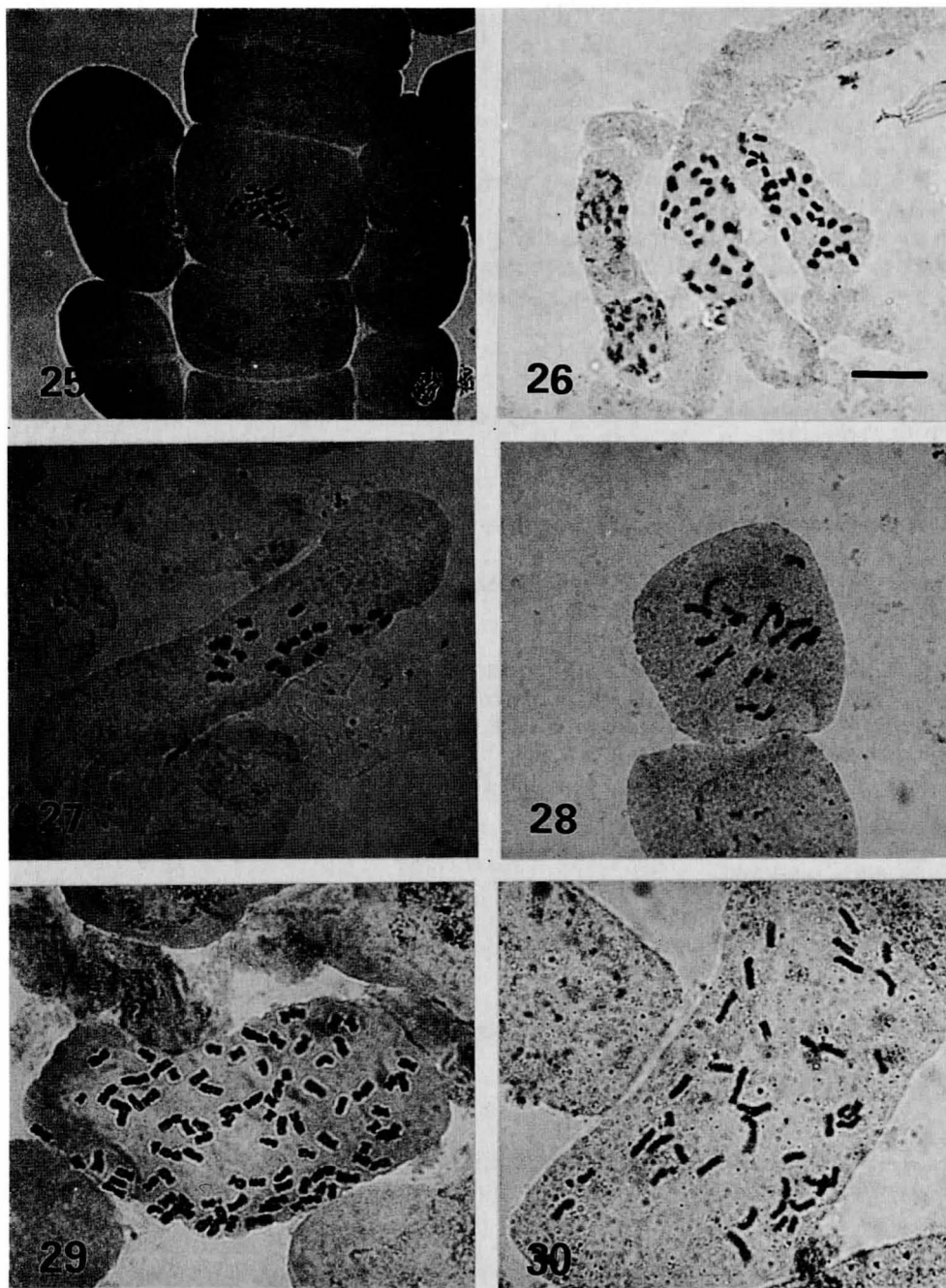
$n = 9$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-505).

This is the first report of a chromosome number of this species endemic to Cyprus.

*Bellis annua* subsp. *minuta* (DC.) Meikle

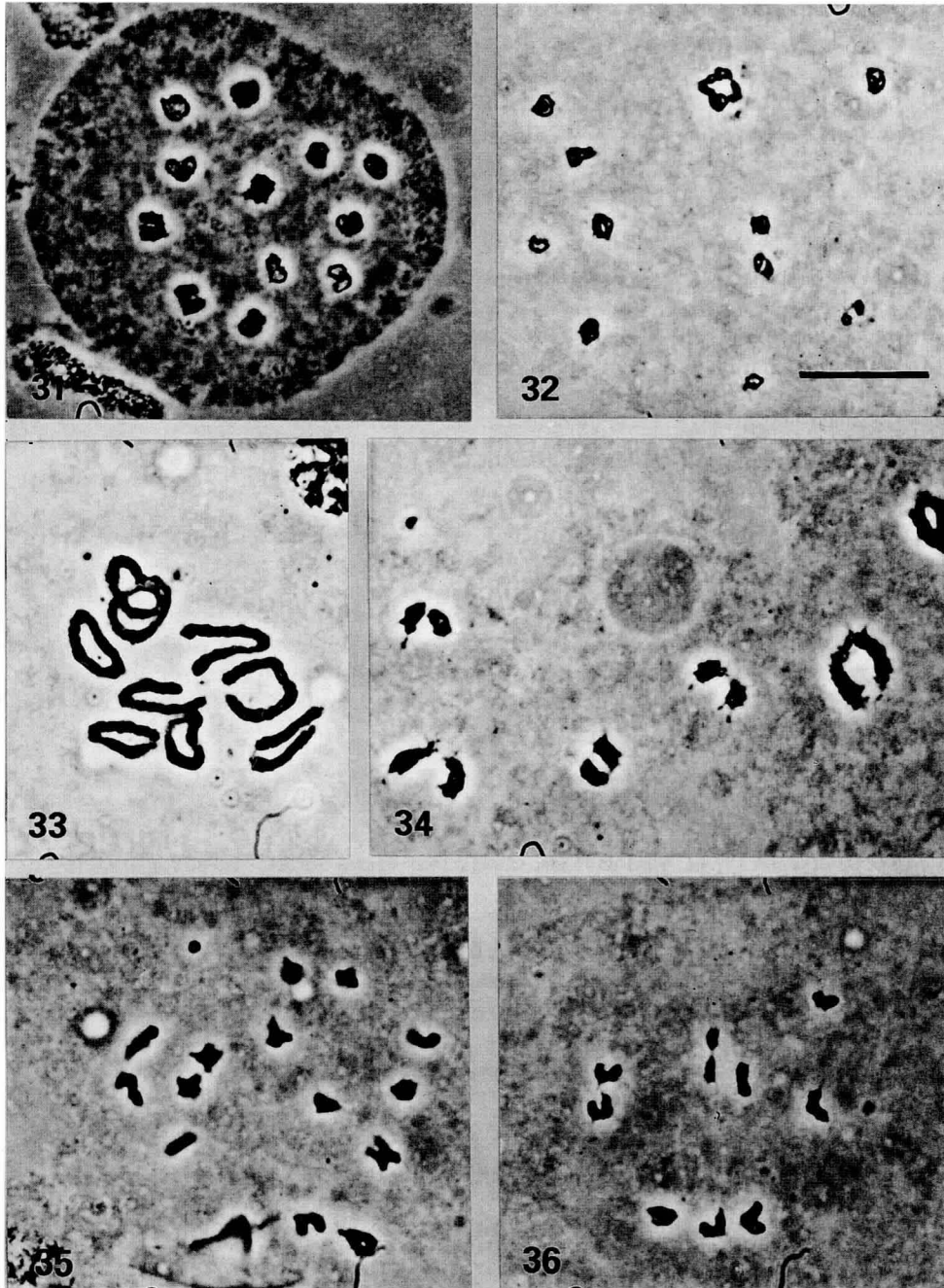
$2n = 90$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (28-1326) (Fig. 29).

*Bellis annua* L. subsp. *minuta* has not been studied cytologically before and the decaploid number of  $2n = 90$  has been found for the first time in the genus *Bellis*. Previous counts in *B. annua* resulted exclusively in the diploid number  $2n = 18$  or  $n = 9$  respectively and were reported by Ruíz de Clavijo Jiménez (1988) from Spain, Pavone & al. (1981a) from Italy, and Fernandes & Queirós (1971a, 1971b) from Portugal.



Figs. 25-30. Metaphases of root-tip mitoses of: **25**, *Arabis purpurea*,  $2n = 16$ ; **26**, *Petrorrhagia dubia*,  $2n = 30$ ; **27**, *Silene macrodonta*,  $2n = 20$ ; **28**, *Aetheorhiza bulbosa*,  $2n = 18$ ; **29**, *Bellis annua* subsp. *minuta*,  $2n = 90$ ; **30**, *Calendula arvensis*,  $2n = 44$ . — Scale bar = 10  $\mu\text{m}$ .





Figs. 31-36. PMC meiosis of: **31**, *Tuberaria plantaginea*,  $n = 12$ ; **32**, *Carduus argentatus* subsp. *apicularis*,  $n = 14$  (10ll + 08); **33**, *Chrysanthemum coronarium* var. *coronarium*,  $n = 9$ ; **34**, *Crepis fraasii*,  $n = 6$ ; **35**, *Helichrysum italicum*,  $n = 14$ ; **36**, *Phagnalon rupestre* subsp. *graecum*,  $n = 9$ . — Scale bar = 10  $\mu\text{m}$ .

*Calendula arvensis* L.

$2n = 44$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-503).

$2n = 44$ . **Limassol:** Amathus, stony slopes, edge of agricultural land, walls, garrigue, marl and limestone, 10-40 m, 14 Apr 1991 (11-347).

$2n = 44$ . **Limassol:** Ayia Mavri, Kilani, stony slopes, marls and limestone, 17 Apr 1991 (16-653) (Fig. 30).

Material from three Cyprian populations of this widespread Mediterranean annual proved to have chromosome numbers of  $2n = 44$ . This result corroborates reports from numerous countries cited in Oberprieler & Vogt (1993).

Deviating counts made by Humphries & al. (1978,  $2n = 18$ ) and Borgen (1974,  $2n = 42$ ) are attributed to misidentification or miscounts respectively (see Oberprieler & Vogt 1993 for discussion).

*Carduus argentatus* subsp. *apicularis* (Bertol.) Meikle

$n = 14$  (10ll+ 08). **Paphos:** Between Nata and Axylon, garrigue, limestone and marl-limestone, 350-400 m, 22 Apr 1991 (23-1061) (Fig. 32).

This is the first publication of a chromosome number for this E. Mediterranean species. The chromosomes during diakinesis and metaphase show ten bivalents as well as a ring of eight chromosomes, probably due to the existence of translocation heterozygosity. As far as we know this is the first time that this kind of chromosome rearrangements has been found in *Carduus*.

*Carduus pycnocephalus* subsp. *albidus* (M. Bieb.) Kazmi

$2n = 60$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (28-1333) (Fig. 37).

Our count of  $2n = 60$  agrees with reports from many countries cited in Oberprieler & Vogt (1993) and from Palestine (Díaz Lifante & al. 1992). A comprehensive discussion of numerous deviating counts is given in Oberprieler & Vogt (1993).

*Centaurea aegialophila* Wagenitz (*Aegialophila cretica* Boiss. & Heldr.)

$n = 11$ . **Larnaka:** Cape Greco, limestone rocks (lower Miocene) and sand, 10-20 m, 12 Apr 1991 (Aparicio CY 2-4).

Our count is in accordance with the diploid number  $2n = 22$  reported by Runemark (1967) who studied plants from Crete.

*Cephalorrhynchus cypricus* (Beauverd) Rech. f.

$2n = 18$ . **Paphos:** Mount Tripylos and Cedar valley, forest with *Cedrus brevifolia* and



*Quercus alnifolia*, 1080-1360 m, 20 Apr 1991 (21-847) (Fig. 38).

Our count is the first report for this endemic Cyprian species growing on shady mountainsides or streamsides at high altitudes of the Troödos Range.

*Chlamydomphora tridentata* (Delile) Ehrenb. ex Less.

$2n = 18$ . **Larnaka:** Between Meneou and Meneou beach, 5-10 m, 13 Apr 1991 (8-276).

$2n = 18$ . **Larnaka:** Cape Greco, limestone rocks (lower Miocene) and sand, 10-20 m, 12 Apr 1991 (5-127) (Fig. 39).

Material from two Cyprian populations of this ephemeral species proved to have chromosome numbers of  $2n = 18$ . There are no previous indications for the monotypic genus *Chlamydomphora* distributed from North Africa (Tunisia and Egypt) to Crete and Cyprus.

*Chrysanthemum coronarium* var. *coronarium*

$2n = 18$ . **Larnaka:** Between Xylophagou and Ayia Thekla, fallow land and pseudosteppe with *Sarcopoterium*, c. 5 m, 12 Apr 1991 (4-69) (Fig. 40).

$n = 9$ . **Larnaka:** Ayia Anna, dry slopes, limestone and marl, ca. 150 m, 15 Apr 1991 (13-465) (Fig. 33).

*Chrysanthemum coronarium* L. var. *discolor* d'Urv.

$2n = 18$ . **Larnaka:** Between Xylophagou and Ayia Thekla, fallow land and pseudosteppe with *Sarcopoterium*, c. 5 m, 12 Apr 1991 (4-85).

Our counts of three Cyprian populations corroborate the numerous former reports for the two varieties of this common Mediterranean weed from other countries all having  $2n = 18$  or  $n = 9$  respectively and being cited in Oberprieler & Vogt (1993).

*Chrysanthemum segetum* L.

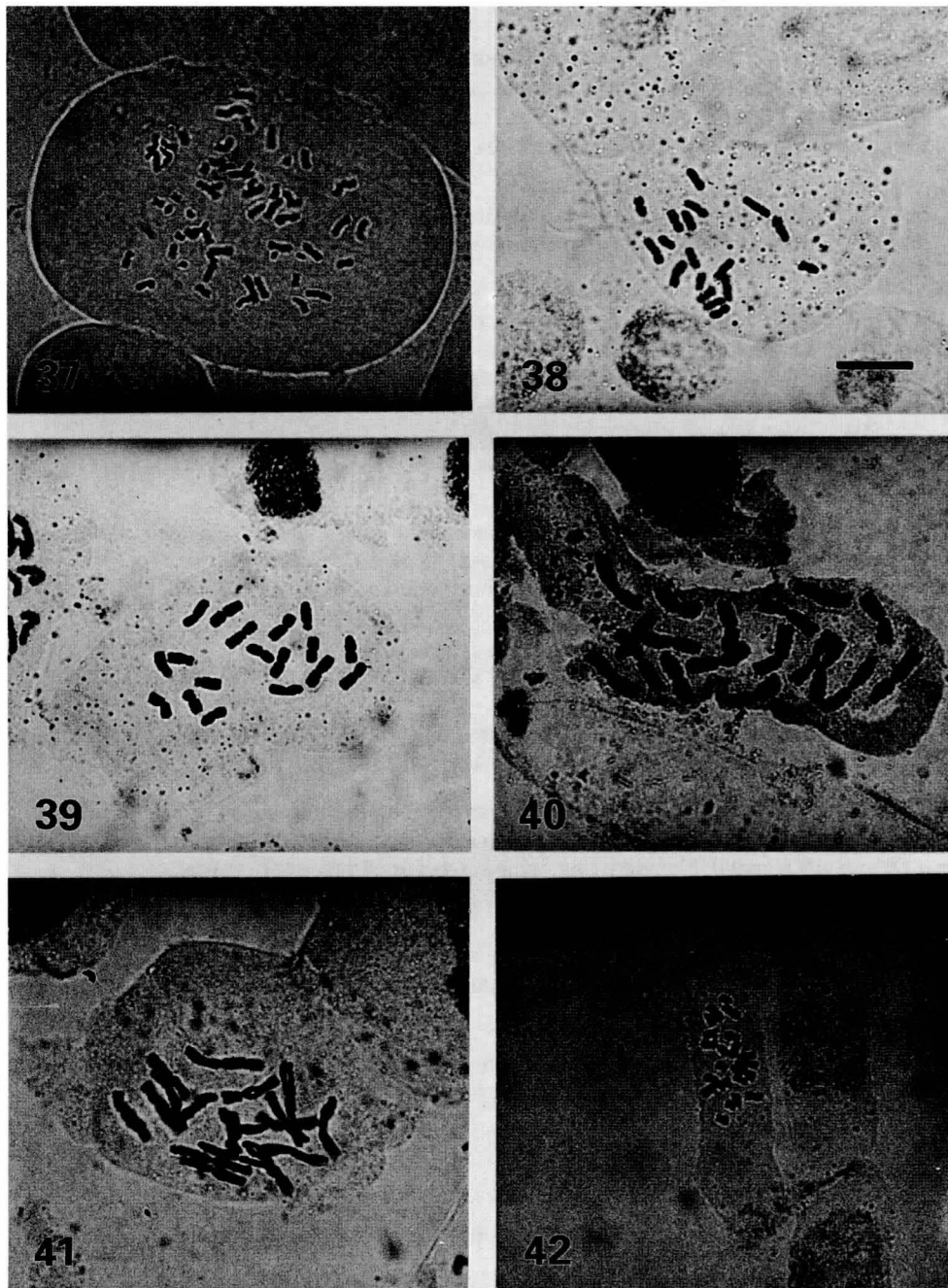
$2n = 18$ . **Paphos:** Between Eledhiou and Amargeti, gypsum, 360 m, 22 Apr 1991 (Vogt 24-8641) (Fig. 41).

This first report of a chromosome number for Cyprian plant material of this species corroborates previous counts in the Mediterranean area cited in Vogt & Oberprieler (1993).

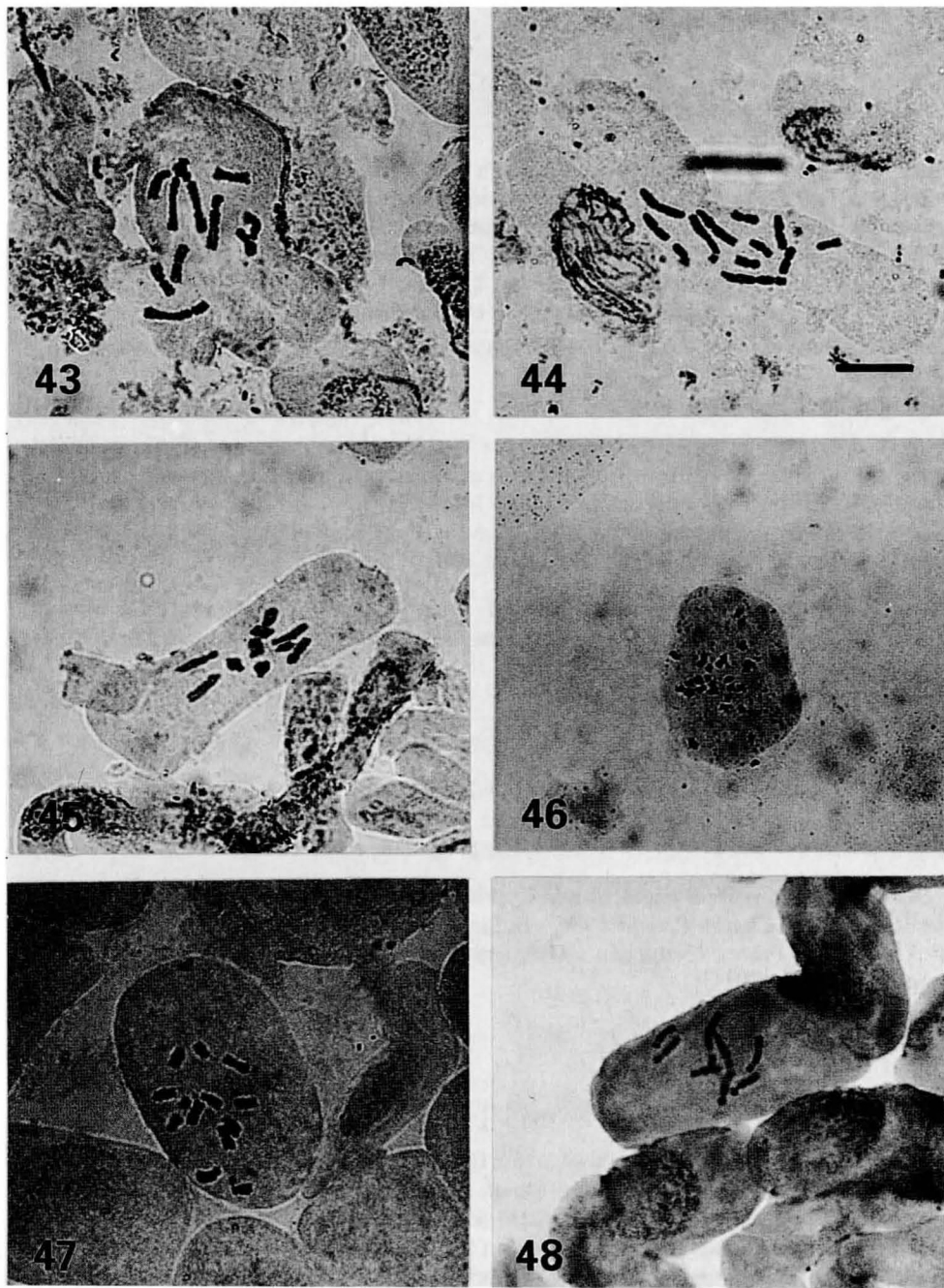
*Cnicus benedictus* L.

$2n = 22$ . **Nikosia:** Ayia Irini, edge of agricultural land, gabbro and diorite, 950 m, 26 Apr 1991 (30-1413) (Fig. 42).

Our count of  $2n = 22$  chromosomes is a confirmation of former reports for the Mediterranean area made e.g. by Kuzmanov & Nikolova (1980), Ubera (1979), Fernández Casas (1977), and Fernandes & Queirós (1971a). This species is widely distributed in the Mediterranean region and eastwards to Iran and Afghanistan.



Figs. 37-42. Metaphases of root-tip mitoses of: **37**, *Carduus pycnocephalus* subsp. *albidus*,  $2n = 60$ ; **38**, *Cephalorhynchus cypricus*,  $2n = 18$ ; **39**, *Chlamydochloa tridentata*,  $2n = 18$ ; **40**, *Chrysanthemum coronarium* var. *coronarium*,  $2n = 18$ ; **41**, *Chrysanthemum segetum*,  $2n = 18$ ; **42**, *Cnicus benedictus*,  $2n = 22$ . — Scale bar = 10  $\mu\text{m}$ .



Figs. 43-48: Metaphases of root-tip mitoses of: **43**, *Crepis foetida* subsp. *foetida*,  $2n = 10$ ; **44**, *Crepis fraasii*,  $2n = 12$ ; **45**, *Crepis sancta*,  $2n = 10$ ; **46**, *Crupina crupinastrum*,  $2n = 28$ ; **47**, *Hedypnois rhagadioloides*,  $2n = 13$ ; **48**, *Leontodon tuberosus*,  $2n = 8$ . — Scale bar = 10  $\mu\text{m}$ .

*Crepis foetida* L. subsp. *foetida*

$2n = 10$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (Vogt 28-9040) (Fig. 43).

*Crepis foetida* is represented in the flora of Cyprus by subsp. *foetida* and subsp. *commutata*. Our count of  $2n = 10$  in a population of subsp. *foetida* agrees with all previous reports for this taxon (e.g. Mejías 1986 and Luque & Díaz Lifante 1991 for Spain; D'Ovidio 1986 and Bartolo & al. 1978 for Italy; Loon & Kieft 1980 and Gadella & Kliphuis 1972 for Yugoslavia; Fernandes & Queirós 1971a for Portugal; Kuzmanov & Nikolova 1980 and Kuzmanov & Kožuharov 1970 for Bulgaria; Strid & Franzén 1981 for Greece; Kliphuis & Wieffering 1972 for France; Májovský & al. 1970a for Slovakia).

*Crepis fraasii* Schultz-Bip.

$n = 6$ . **Larnaka:** Road from Lefkara to Vavatsina, 4-5 km from Vavatsina, volcanic rocks, 750 m, 18 Apr 1991 (Aparicio CY 14-1) (Fig. 34).

$2n = 12$ . **Paphos:** Junction of the track to Ayia (Panayi), Vallay of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (26A-1193) (Fig. 44).

This E. Mediterranean species has formerly been studied in Greece and Crete by Strid (1983), Strid & Andersson (1985), and Anagnostopoulos & Kamari (1992) with the corresponding result of  $2n = 12$ .

*Crepis sancta* (L.) Bornm.

$2n = 10$ . **Larnaka:** salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-207).

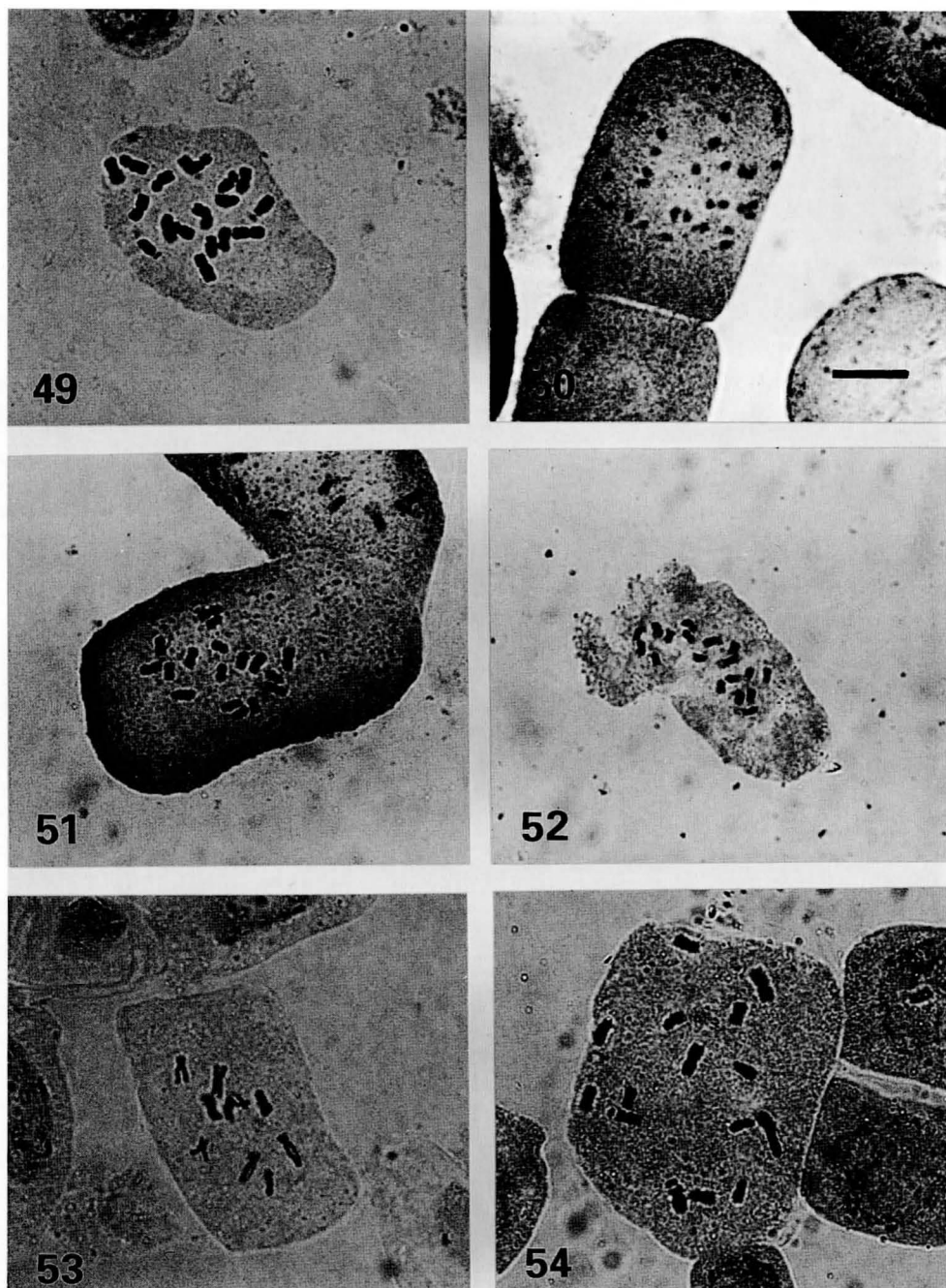
$2n = 10$ . **Limassol:** between Mandria and Ayios Nikolaos, roadsides and garrigue, gabbro and limestone, 27 Apr 1991 (34-1579) (Fig. 45).

Our count of  $2n = 10$  in plants of two Cyprian populations confirm former reports from Iran (Ghaffari & Chariat-Panahi 1985), Bulgaria (Kuzmanov & al. 1981, Kuzmanov & Jurukova 1977), France (Natarajan 1978), and Greece (Strid & Franzén 1981, Kamari & Anagnostopoulos 1991).

*Crupina crupinastrum* (Moris) Vis.

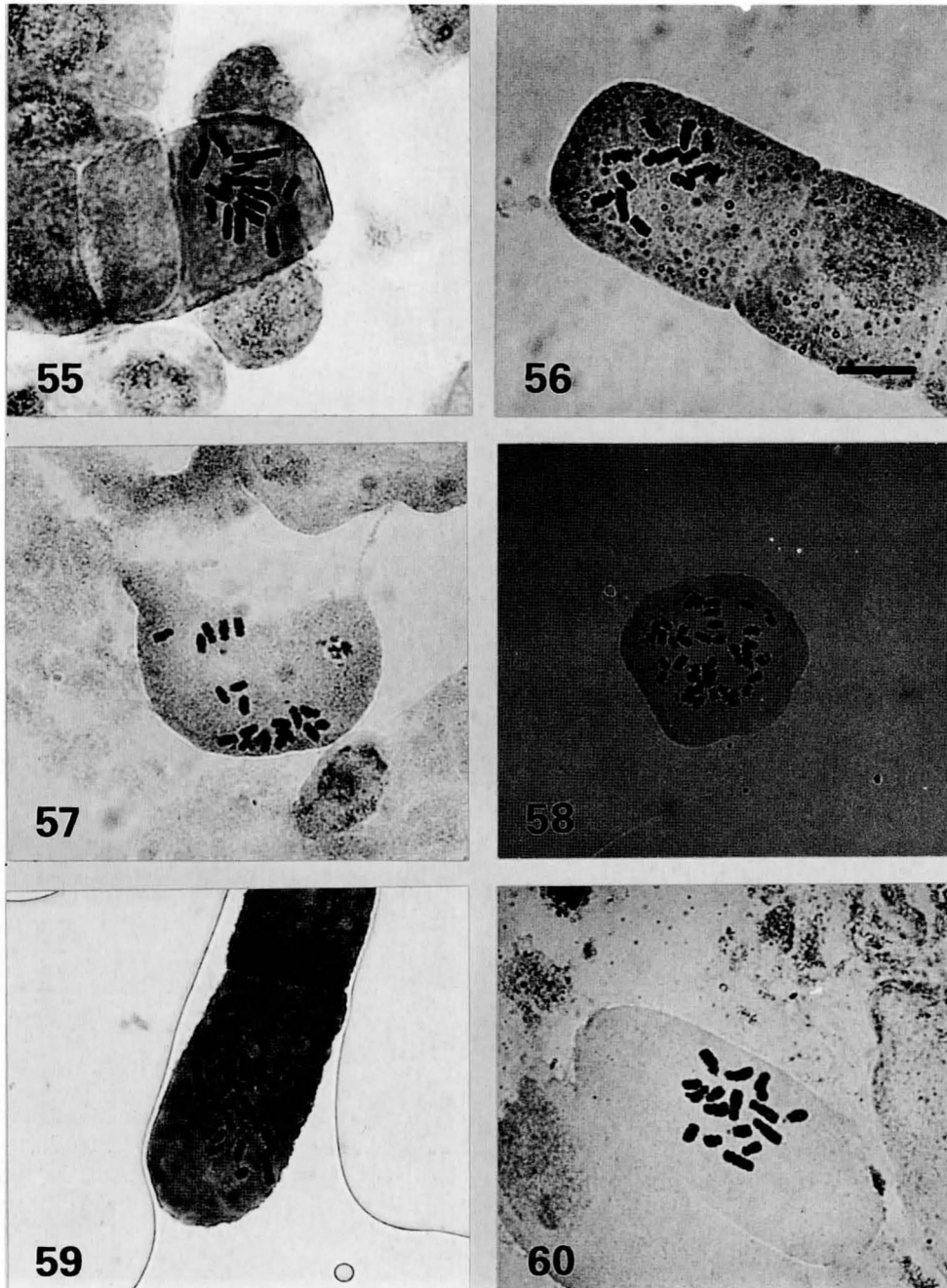
$2n = 28$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-212) (Fig. 46).

Our report of a chromosome number for this widespread mediterranean species is in accordance with the former reports of Slavík & al. (1993) for Cyprus, Kuzmanov & al. (1986) for Bulgaria, Loon (1980) and Strid & Franzén (1981) for Greece, Pavone & al. (1981b), Scrugli & Bocchieri (1976), Larsen (1956a), and Colombo & al. (1979) for Italy, Couderc (1979) for France, Kliphuis & Barkoudah (1977) for Syria, Dahlgren & al. (1971) for the Balearic Islands, Luque & Díaz Lifante (1991), and Ruíz de Clavijo Jiménez (1990) for Spain.



Figs. 49-54. Metaphases of root-tip mitoses of: **49**, *Matricaria recutita* var. *coronata*,  $2n = 18$ ; **50**, *Notobasis syriaca*,  $2n = 34$ ; **51**, *Phagnalon rupestre* subsp. *graecum*,  $2n = 18$ ; **52**, *Phagnalon rupestre* subsp. *rupestre*,  $2n = 18$ ; **53**, *Picris pauciflora*,  $2n = 10$ ; **54**, *Reichardia tingitana*,  $2n = 16$ . — Scale bar = 10  $\mu\text{m}$ .





Figs. 55-60. Metaphases of root-tip mitoses of: **55**, *Scorzonera jacquiniana* var. *subintegra*,  $2n = 14$ ; **56**, *Scorzonera laciniata*,  $2n = 14$ ; **57**, *Senecio leucanthemifolius* var. *vernalis*,  $2n = 20$ ; **58**, *Senecio vulgaris*,  $2n = 40$ ; **59**, *Sonchus oleraceus*,  $2n = 32$ ; **60**, *Steptorhamphus tuberosus*,  $2n = 16$ . — Scale bar = 10  $\mu\text{m}$ .

***Hedynois rhagadioloides* (L.) F. W. Schmidt (= *H. cretica* (L.) Willd.).**

$2n = 13$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (Vogt 28-9040bis) (Fig. 47).

Our count is the first report for this widespread mediterranean weed based on Cyprian plant material. *Hedynois rhagadioloides* shows an enormous aneuploid variation in chromosome numbers between  $2n = 8$  and  $2n = 18$ , even within single populations,  $2n = 8$  and  $2n = 13$  being the most frequent number (Fernandes & Queirós 1972; Nordenstam 1971). One deviating count of  $n = 3$ , given by Delay & Petit (1972, sub *H. cretica* (L.) Willd.), is attributed to misidentification of *H. arenaria* (see Oberprieler & Vogt 1993 for discussion).

***Helichrysum italicum* (Roth) G. Don**

$n = 14$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-437) (Fig. 35).

Our count confirms the diploid chromosome numbers of  $2n = 28$  reported by Queirós (1980), D'Amato (1971), Nilsson & Lassen (1971) and Mori & Contandriopoulos (cited in Fedorov 1969: 109) who studied plant material of Mediterranean provenance.

***Leontodon tuberosus* L.**

$2n = 8$ . **Paphos:** Between Nata and Axylon, garrigue, limestone and marl-limestone, 350-400 m, 22 Apr 1991 (23-1094) (Fig. 48).

This member of *Leontodon* (subg. *Leontodon*) sect. *Thrinchia* is the only representative of the genus in the flora of Cyprus. Our count of  $2n = 8$  agrees with former reports from Israel (Díaz Lifante & al. 1992, sub *Thrinchia tuberosa*) and from many other Mediterranean countries cited in Izuzquiza & Nieto Feliner (1991).

***Matricaria recutita* var. *coronata* (Boiss.) Fertig**

$2n = 18$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-189) (Fig. 49).

This seems to be the first chromosome count of *Matricaria recutita* var. *coronata*. Our result is in accordance with former reports for the species (mostly sub *M. chamomilla*) given by Peneva & al. 1988, Magulaev 1979, Rostovtseva 1979, Morton 1977, Gadella & Kliphuis 1973, Fernandes & Queirós 1971a, Gadella & Kliphuis 1966, Koul 1964, Madhusoodanan & Arora 1979 & 1984, Pogan & Rychlewsky 1980, Nagl & Ehrendorfer 1974, Turner & al. 1979, Murín 1978.

***Notobasis syriaca* (L.) Cass.**

$2n = 34$ . **Larnaka:** Between Xylophagou and Ayia Thekla, fallow land and pseudosteppe with *Sarcopoterium*, c. 5 m, 12 Apr 1991 (4-82) (Fig. 50).

Our count confirms the previous reports given by Slavík & al. (1993) for Cyprus, Ghaffari (1987b) for Iran, Devesa (1979) for Spain, Kliphuis & Barkoudah (1977) for Syria, and Nordenstam (1972) for Egypt.

*Phagnalon rupestre* subsp. *graecum* (Boiss. ex Heldr.) Hayek

$n = 9$ . **Larnaka:** Between Meneou and Meneou beach, 5-10 m, 13 Apr 1991 (8-278) (Fig. 36).

$2n = 18$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-185).

$2n = 18$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-472) (Fig. 51).

All studied Cyprian populations proved to have  $2n = 18$  or  $n = 9$  chromosomes respectively. These counts for the E. Mediterranean *Phagnalon rupestre* subsp. *graecum* are in accordance with the former report given by Slavík & al. (1993).

*Phagnalon rupestre* (L.) DC. subsp. *rupestre*

$2n = 18$ . **Larnaka:** Between Xylophagou and Ayia Thekla, beach, 0-5 m, 12 Apr 1991 (3-30) (Fig. 52).

Our report of  $2n = 18$  chromosomes for this widespread Mediterranean chamaephyt is the first based on Cyprian plant material. It is in accordance with reports made for Spain (Löve & Kjellqvist 1974, Nielsson & Lassen 1971, Dahlgren & al. 1971, Luque & al. 1984), Egypt (Nordenstam 1972), Italy (Larsen 1956a), the Canary Islands (Borgen 1970, Loon 1974), and Morocco (Oberprieler & Vogt 1993).

*Picris pauciflora* Willd.

$2n = 10$ . **Nikosia:** Ayia Irini, edge of agricultural land, gabbro and diorite, 950 m, 26 Apr 1991 (30-1412) (Fig. 53).

This first count for *Picris pauciflora* from Cyprus corresponds with previous reports based on plant material from Bulgaria (Kuzmanov & al. 1986), the Caucasus (Nazarova 1984), Greece (Strid & Franzén 1981, Loon 1980), and France (Delay 1971).

*Pseudognaphalium luteo-album* (L.) Hilliard & B. L. Burt ( *Gnaphalium luteo-album* L.)

$2n = 28$ . **Paphos:** Kidhasi, valley of Dhiarizos, river bank and meadows, 27 Apr 1991 (35-1663).

This is the first report of a tetraploid chromosome number for this world-wide introduced species. The diploid number ( $2n = 14$ ) was reported from other Mediterranean countries by Fernandes & Queirós (1971a, Portugal), Björkqvist & al. (1969, Spain), Vogt & Oberprieler (1993, Morocco), Löve & Kjellqvist (1974, Spain), and Ruíz de Clavijo Jiménez (1990, Spain).



*Reichardia tingitana* (L.) Roth

$2n = 16$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (28-1300) (Fig. 54).

Our count of  $2n = 16$  chromosomes is considered to be the first report of a chromosome number obtained from Cyprian plant material. It corroborates earlier counts made by Gallego (1980), Aparicio (1989), Humphries & al. (1978), Snogerup (1980), Dalgaard (1986), Talavera & al. (1984), Šiljak-Yakovlev (1982), Brullo & Pavone (1978), Loon (1974), Borgen (1970), and Oberprieler & Vogt (1993).

*Scorzonera jacquiniana* var. *subintegra* Boiss.

$2n = 14$ . **Larnaka:** Between beach of Meneou and Cape Kiti, gravel beach, 13 Apr 1991 (9-285) (Fig. 55).

Our count is the first karyological study of this E. Mediterranean taxon.

*Scorzonera laciniata* L. (*Podospermum laciniatum* (L.) DC.)

$2n = 14$ . **Larnaka:** Between Meneou and Meneou beach, 5-10 m, 13 Apr 1991 (8-275) (Fig. 56).

Previous reports for plants of Cyprian origin are not known. Our result of  $2n = 14$  agrees with the results (mostly cited under *Podospermum laciniatum*) from Spain (Löve & Kjellqvist 1974, Díaz de la Guardia & Blanca López 1987, Luque & al. 1984), Portugal (Fernandes & Queirós 1971a), Italy (Brullo & al. 1977, Capineri & al. 1978), and other parts of the distributional range (e.g. Nazarova 1975, 1980, Rostovtseva 1983, Labadie 1976b, Löve & Kapoor 1967, Májovský & al. 1970b, Kuzmanov & Kožuharov 1967, Hindáková & Schwarzová 1977).

*Senecio leucanthemifolius* var. *vernalis* (Waldst. & Kit.) C. Alexander

$2n = 20$ . **Limassol:** Between Mandria and Ayios Nikolaos, roadsides and garrigue, gabbro and limestone, 27 Apr 1991 (34-1583) (Fig. 57).

Our result of  $2n = 20$  is in accordance with previous counts made on plant material from Iran (Ghaffari & Chariat-Panahi 1985 and Aryavand 1977a, sub *Senecio vernalis*), the Caucasus (Magulaev 1982, sub *S. vernalis*), Belorussia (Dmitrieva & al. 1977, sub *S. vernalis*), and Israel (Díaz Lifante & al. 1992, sub *S. vernalis*), as well as for all other subspecies of *S. leucanthemifolius*. A differing count of  $2n = 40$  was published by Májovský & al. (1970b) from Czechoslovakian plant material.

*Senecio vulgaris* L.

$2n = 40$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-441) (Fig. 58).

Our count of  $2n = 40$  confirms all former reports for this cosmopolitan species (see Alexander 1979 for discussion).

*Sonchus oleraceus* L.

$2n = 32$ . **Paphos:** Junction of the track to Ayia (Panayi), valley of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (26A-1209) (Fig. 59).

Cyprian material of this worldwide introduced weed has not been studied previously. Our finding of a tetraploid chromosome number ( $2n = 32$ ) corroborates the results from many regions all over the world.

*Steptorhamphus tuberosus* (Jacq.) Grossh.

$2n = 16$ . **Paphos:** Junction of the track to Ayia (Panayi), valley of Ezoussas, volcanic rocks, c. 450 m, 23 Apr 1991 (26A-1211).

$2n = 16$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (28-1330) (Fig. 60).

This species is found from the E. Mediterranean region to Iraq and Iran. It was studied before by Nazarova (1984) in the Caucasus and by Feráková & Murín (1976) and Phitos & Kamari (1974) in Crete.

*Tolpis barbata* (L.) Gaertn.

$n = 9$ . **Paphos:** Near Dhroushia and Inia, west of mount Lara, meadows and big rocks of triassic sandstones, 550 m, 24 Apr 1991 (29-1390) (Fig. 61).

This first count using Cyprian plant material is in agreement with previous reports from different Macaronesian and Mediterranean countries cited in Vogt & Oberprieler (1993).

*Tragopogon sinuatus* Avé-Lall.

$2n = 12$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-424).

$2n = 12$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-183) (Fig. 67).

These first counts based on plant material from two Cyprian populations confirm former reports based on European material (Löve & Kjellqvist 1974, Spain; Wilson 1983, France, Greece, Italy, Yugoslavia).

*Tyrimnus leucographus* (L.) Cass.

$n = 17$ . **Paphos:** Between Nata and Axylon, garrigue, limestone and marl-limestone, 350-400 m, 22 Apr 1991 (23-1060) (Fig. 62).

The chromosome number found in the Cyprian population of this Mediterranean species is in accordance with the indications of Talavera (1979) who studied Spanish plant material and with those of Kuzmanov & Nikolova (1980) and Kuzmanov & Georgieva (1983) who studied plants of Bulgarian origin.

*Urospermum picroides* (L.) Scop. ex F. W. Schmidt

$2n = 10$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-203) (Fig. 68).

This first count based on plant material from Cyprus confirms former reports from Iran (Ghaffari 1987a), Spain (Pastor 1983, Löve & Kjellqvist 1974), Greece (Strid & Andersson 1985), Italy (Brullo & al 1978, Capineri & al. 1978), Armenia (Nazarova 1975), Bulgaria (Kuzmanov & Jurukova 1977), Egypt (Nordenstam 1972), and Portugal (Fernandes & Queirós 1971a).

*Xerathemum inapertum* (L.) Mill.

$n = 14$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-426) (Fig. 63).

Our count corroborates the indications of Humphries & al. (1978) from Morocco, Brullo & al. (1977) from Italy, Strid & Anderson (1985) from Greece, and Luque & Díaz Lifante (1991) from Spain.

*Convolvulaceae*

*Convolvulus oleifolius* Desr.

$n = 15$ . **Larnaka:** Cape Greco, limestone rocks (lower Miocene) and sand, 10-20 m, 12 Apr 1991 (5-175) (Fig. 64).

This seems to be the first karyological study of this species which is found in the central and eastern part of the Mediterranean region.

*Dipsacaceae*

*Pterocephalus brevis* Coult.

$n = 9$ . **Nikosia:** N.E. of Ayios Yeoryios Kavkalou (road to Vyzakia), roadside and agricultural land, sand and rubble (basalt), 390 m, 26 Apr 1991 (31-1467) (Fig. 65).

Our count is differing from the previous report of  $2n = 16$  by Díaz Lifante & al. (1992) in plants from Israel.

*Pterocephalus multiflorus* Poech subsp. *multiflorus*

$n = 9$ . **Larnaka:** Stavrovouni, reforestation area, diabase, basalt and gabbro, 450-800 m, 15 Apr 1991 (12-436) (Fig. 66).

No former report of a chromosome number for this endemic Cyprian species is known.

### *Ericaceae*

#### *Arbutus andrachne* L.

$n = 13$ . **Paphos**: Mount Tripylos and Cedar valley, forest with *Cedrus brevifolia* and *Quercus alnifolia*, 1080-1360 m, 20 Apr 1991 (Aparicio CY 17-3) (Fig. 73).

Our study confirms the diploid number  $2n = 26$  formerly reported by several authors [see Darlington & Wylie (1955: 216) and Fedorov (1969: 265)] for this E. Mediterranean species.

### *Fabaceae*

#### *Astragalus cyprius* Boiss.

$n = 8$ . **Paphos**: Pano Panayia, limestones, garrigue and meadows, 820 m, 22 Apr 1991 (25-1140) (Fig. 74).

There are no former reports of a chromosome number for this endemic Cyprian species.

#### *Hedysarum spinosissimum* L.

$2n = 16$ . **Larnaka**: Cape Greco, limestone rocks (lower Miocene) and sand, 10-20 m, 12 Apr 1991 (5-122).

Our result confirms previous reports from Cyprus (Slavík & al. 1993), Malta (Kramer & al. 1972), Israel (Heyn 1964), Italy (Brullo & al. 1979), Spain (Dahlgren & al. 1971), and Algeria (Abdelguerfi-Berrekia & al. 1986).

#### *Hymenocarpos circinnatus* (L.) Savi

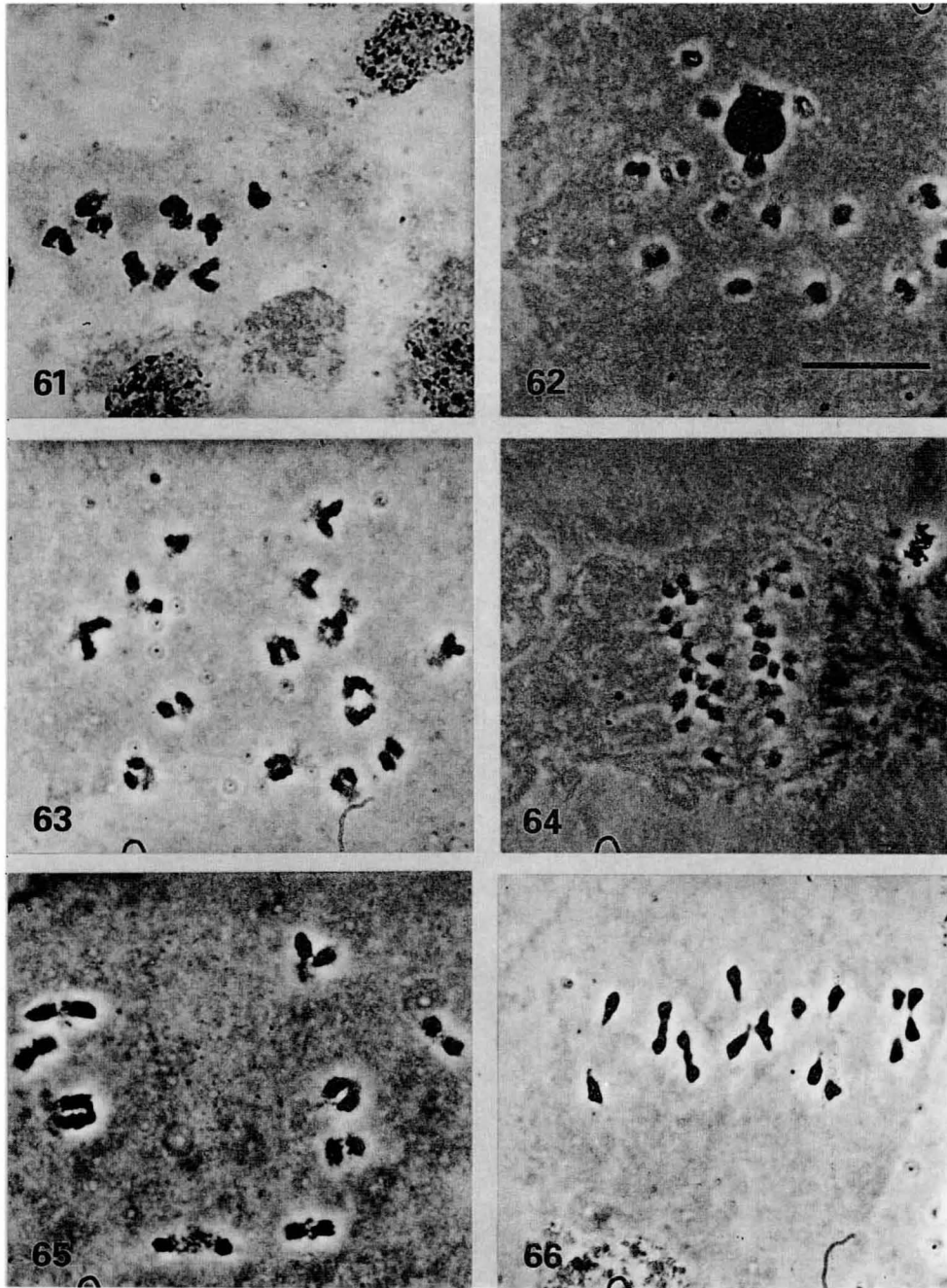
$2n = 16$ . **Limassol**: Between Kambou and Souni, garrigue, limestone and marl, 280 m, 17 Apr 1991 (Vogt 14-8359).

Our count of  $2n = 16$  is in accordance with reports given by Colombo & al. (1979) for Italy, Cartier (1976) for Syria, Al-Mayah & Al-Shehbaz (1977), and Díaz Lifante & al. (1992) for Israel.

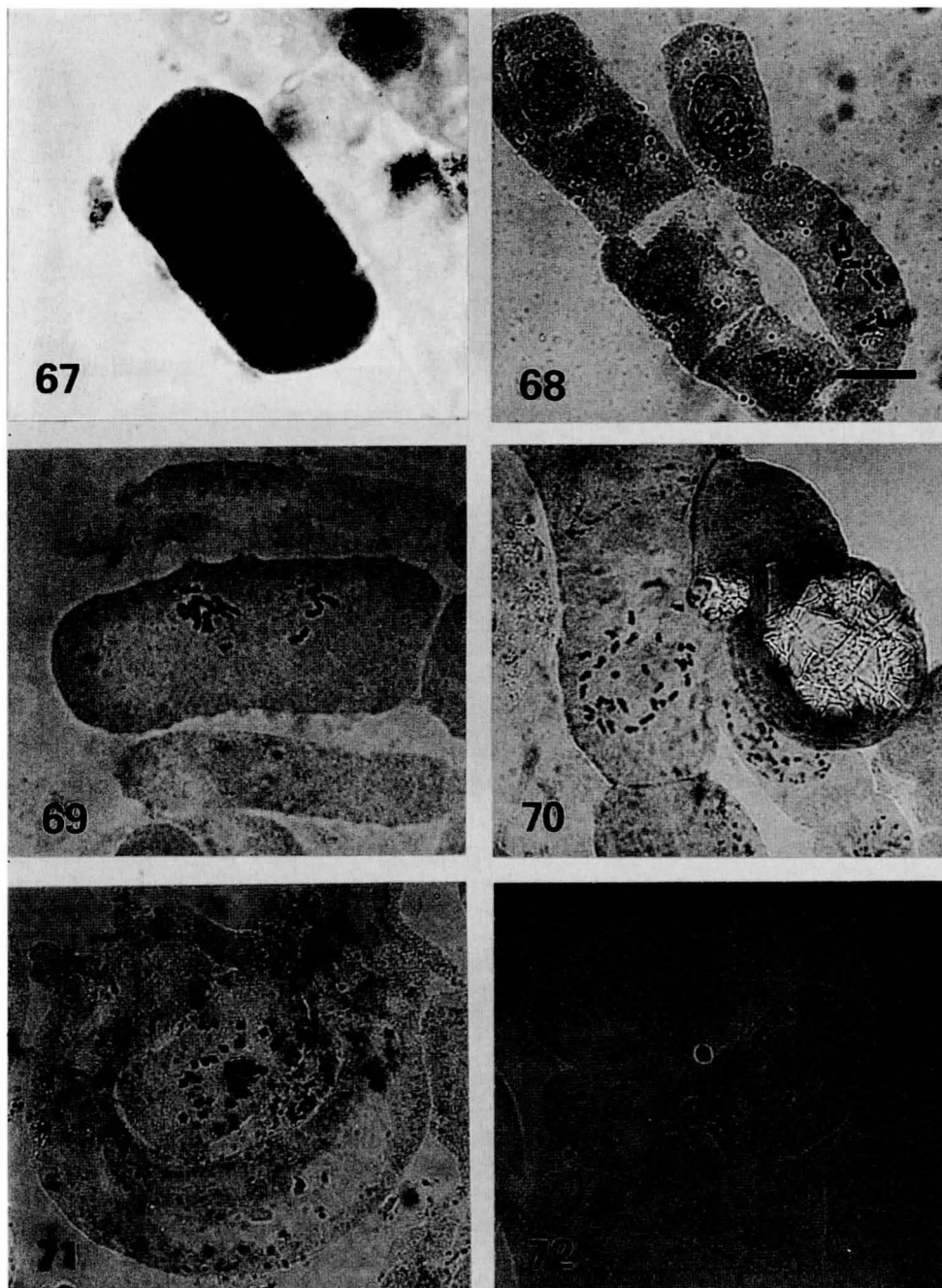
#### *Lotus peregrinus* L.

$2n = 28$ . **Nikosia**: N. E. of Ayios Yeoryios Kavkalou (road to Vyzakia), roadside and agricultural land, sand and rubble (basalt), 390 m, 26 Apr 1991 (31-1471).

This annual E. Mediterranean species of *Lotus* sect. *Xantholotus* was formerly studied with the same result by Bartolo & al. (1979) using Italian, and Larsen (1956b) using Palestinian plant material.



Figs. 61-66. PMC meiosis of: **61**, *Tolpis barbata*,  $n = 9$ ; **62**, *Tyrinnus leucographus*,  $n = 17$ ; **63**, *Xeranthemum inapertum*,  $n = 14$ ; **64**, *Convolvulus oleifolius*,  $n = 15$ ; **65**, *Pterocephalus brevis*,  $n = 9$ ; **66**, *Pterocephalus multiflorus*,  $n = 9$ . — Scale bar = 10  $\mu\text{m}$ .



Figs. 67-72. Metaphases of root-tip mitoses of: **67**, *Tragopogon sinuatus*,  $2n = 12$ ; **68**, *Urospermum picroides*,  $2n = 10$ ; **69**, *Onobrychis venosa*,  $2n = 14$ ; **70**, *Ononis ornithopodioides*,  $2n = 32$ ; **71**, *Ononis viscosa* subsp. *sicula*,  $2n = 32$ ; **72**, *Scorpiurus sulcatus*,  $2n = 28$ . — Scale bar = 10  $\mu\text{m}$ .

*Medicago truncatula* Gaertn.

$2n = 14$ . **Nikosia:** N. E. of Ayios Yeoryios Kavkalou (road to Vyzakia), roadside and agricultural land, sand and rubble (basalt), 390 m, 26 Apr 1991 (31-1468).

Our count of  $2n = 14$  is in accordance with Humphries & al. (1978) but differs from the reports of  $2n = 16$  by Agarwal & Gupta (1983), Abdelguerfi & Guittonneau (1980), Joon & Jong (1978), Fernandes & al. (1977), Clement (1962), Dahlgren & al. (1971), and Simon & Simon (1965).

*Onobrychis crista-galli* (L.) Lam.

$2n = 32$ . **Larnaka:** Between Xylophagou and Ayia Thekla, fallow land and pseudosteppe with *Sarcopoterium*, c. 5 m, 12 Apr 1991 (4-46).

This count of a tetraploid chromosome number for *Onobrychis crista-galli* confirms the count given by Oberprieler & Vogt (1994). The species has been studied previously in Uzbekistan (Baykabilov 1977), Iraq (Al-Mayah & Al-Shehbaz 1977), Syria (Kliphuis & Barkoudah 1977), Israel (Heyn 1962), and Morocco (Oberprieler & Vogt 1996) with the result of  $2n = 16$ . Following Heyn (1962), the tetraploid number of  $2n = 32$  is more likely to indicate the presence of the closely related tetraploid *O. squarrosa* Viv. On the island than the occurrence of a second ploidy level within *O. crista-galli*.

*Onobrychis venosa* (Desf.) Desv.

$2n = 14$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-489) (Fig. 69).

$n = 7$ . **Limassol:** Between Kambou and Souni, garrigue, limestone and marl, 280 m, 17 Apr 1991 (Aparicio CY 12-5).

These seem to be the first counts for this endemic Cyprian species.

*Ononis ornithopodioides* L.

$2n = 32$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (28-1292) (Fig. 70).

Our count of  $2n = 32$  is in accordance with the reports made by Colombo & al. (1980) and Scrugli & Bocchieri (1977) from Italy, and Sañudo & al. (1976 & 1979) from Spain. Bartolo & al. (1978) give a deviating count of  $2n = 20$  chromosomes found in plants of Italian origin.

*Ononis viscosa* subsp. *sicula* (Guss.) Hub.-Mor.

$2n = 32$ . **Nikosia:** N.E. of Ayios Yeoryios Kavkalou (road to Vyzakia), roadside and agricultural land, sand and rubble (basalt), 390 m, 26 Apr 1991 (31-1475) (Fig. 71).



This taxon has been the subject of cytological investigations only twice before. Our count of  $2n = 32$  confirms the counts given by Sañudo & al. (1976 & 1979, sub *Ononis sicula* Guss.), who studied plant material of Spanish origin.

***Scorpiurus sulcatus* L.**

$2n = 28$ . **Larnaka:** Between Meneou and Meneou beach, 5-10 m, 13 Apr 1991 (8-277) (Fig. 72).

The result of  $2n = 28$  chromosomes is in accordance with all former reports for this widespread species cited in Oberprieler & Vogt (1996).

***Vicia sativa* L. subsp *sativa***

$2n = 10$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-215) (Fig. 79).

For *Vicia sativa* chromosome numbers of  $2n = 10, 12, 14, 24$  and 48 are known,  $2n = 12$  being the most frequent one.

***Geraniaceae***

***Erodium cicutarium* (L.) L'Hér.**

$2n = 20$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-217) (Fig. 80).

*Erodium cicutarium*, widespread in Europe, the Mediterranean, Asia and as an alien in many other regions, normally is a tetraploid with  $2n = 40$  (Guittonneau 1972). Our Cyprian plants, determined by Prof. Guittonneau (Orléans), proved to be diploid with  $2n = 20$ , a chromosome number previously reported by Alves & Leitao (1976) for *E. cicutarium* subsp. *jacquinianum* (Fischer & al.) Briq. from Portugal, Guittonneau (1972) for subsp. *ontigolanum* Guittonneau from Spain, Devesa (1981) for subsp. *cutarium* from Spain, and Löve & Löve (1944), Warburg (1938), and Rottgardt (1956) without indication of a infraspecific taxon.

***Gramineae***

***Avena ventricosa* Balansa ex Coss.**

$2n = 14$ . **Limassol:** Vouni, roadside, limestone and marl, 480 m, 17 Apr 1991 (15-600).

This species has been studied only twice before by Ladizinsky & Zohari (1967, 1971). The diploid chromosome number of  $2n = 14$  is confirmed here.

***Bromus caroli-henrici* Greuter**

$2n = 14$ . **Paphos:** Peyia, road to Polis, open *Pinus brutia* forest, limestone, 250-300 m, 24 Apr 1991 (28-1320).



This is the first report of a chromosome number of this species which is closely related to *Bromus alopecuroides* Poir. Its distribution ranges in the eastern Mediterranean from Crete and the southern Aegean islands to S. Turkey, Syria and Palestina.

***Bromus rubens* L.**

$2n = 28$ . **Larnaka:** Salt lake near Larnaka, 1-2 m, 13 Apr 1991 (6-195) (Fig. 81).

Our count of  $2n = 28$  confirms the tetraploid nature of this species and is in accordance with all previous reports from many countries made e.g. by Humphries & al. (1978, Algeria), Reese (1957, Algeria), Björkqvist & al. (1969, Spain), Gould (1970), Ovadiahu-Yavin (1969, Palaestina), Dahlgren & al. (1971, Balearic Islands), Natarajan (1979, France), Kliphuis & Wieffering (1979, Aserbaidshan), and Sánchez Anta & al. (1986, 1988, Spain).

*I r i d a c e a e*

***Gladiolus triphyllus* (Sm.) Ker-Gawl.**

$2n = 60$ . **Paphos:** Between Nata and Axylon, garrigue, limestone and marl-limestone, 350-400 m, 22 Apr 1991 (Vogt 23-8575).

$2n = 60$ . **Paphos:** Near Dhroushia and Inia, W. of mount Lara, meadows and big rocks of triassic sandstone, 550 m, 24 Apr 1991 (Vogt 8806) (Fig. 82).

The cytology of this species has not been studied previously.

***Gynandris sisyrrinchium* (L.) Parl.**

$2n = 24$ . **Paphos:** Near Dhroushia and Inia, W. of mount Lara, meadows and big rocks of triassic sandstone, 550 m, 24 Apr 1991 (Vogt 29-8809) (Fig. 83).

This is the first chromosome count using Cyprian plant material of this widespread Mediterranean species. Our result is in accordance with former reports (mostly cited under *Iris sisyrrinchium* L.) by Garbari & Crisman (1988), Queirós (1980), Goldblatt (1971, 1980), Ricci (1970-71), Ruiz Rejón (1974), Delay & Petit (1971), Fernandes & Queirós (1971b), and Fernández Morales (1974).

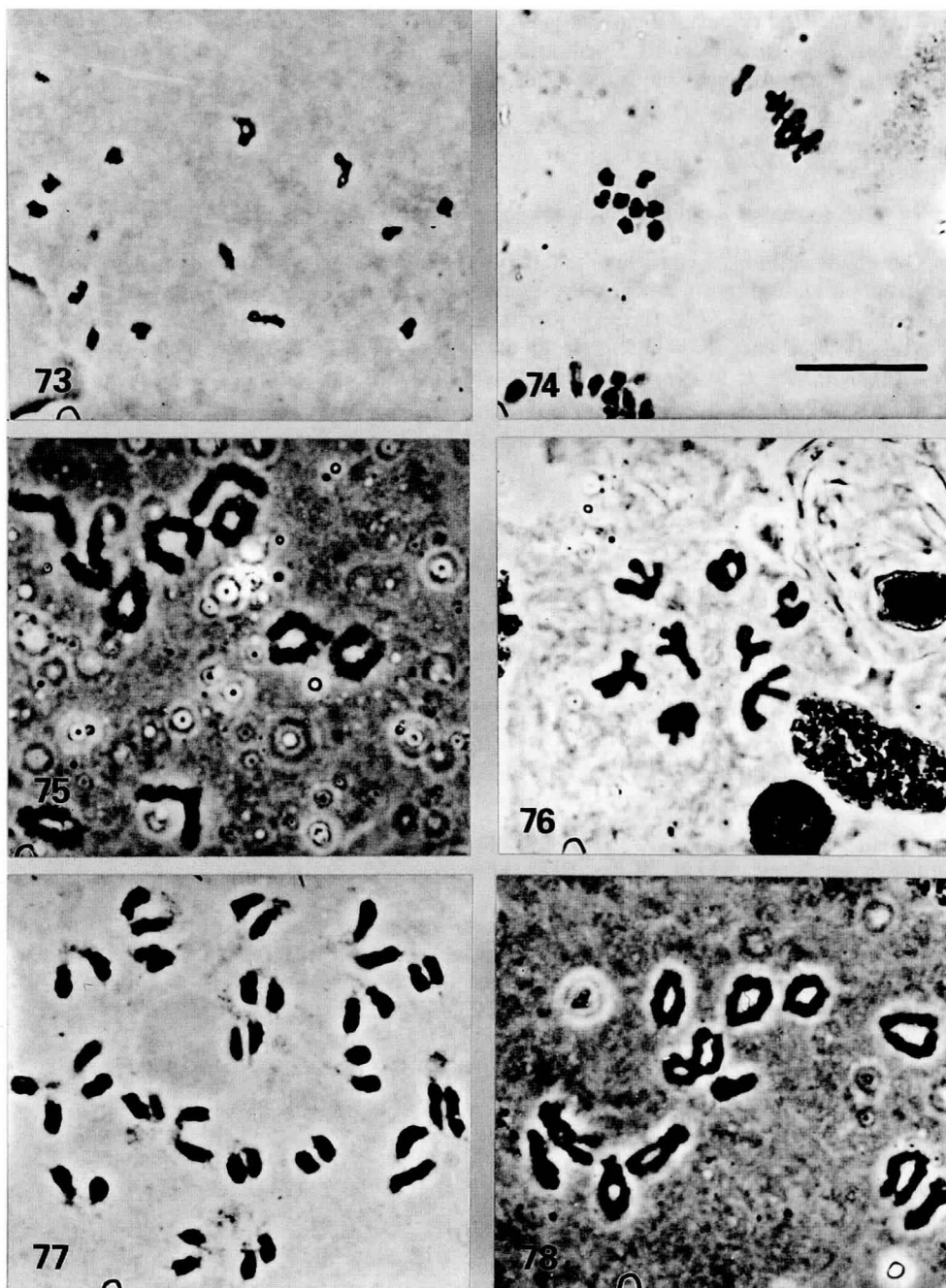
A deviating chromosome number of  $2n = 48$  is given by Montmollin (1986) who studied plant material of Cretan provenance.

*L a m i a c e a e*

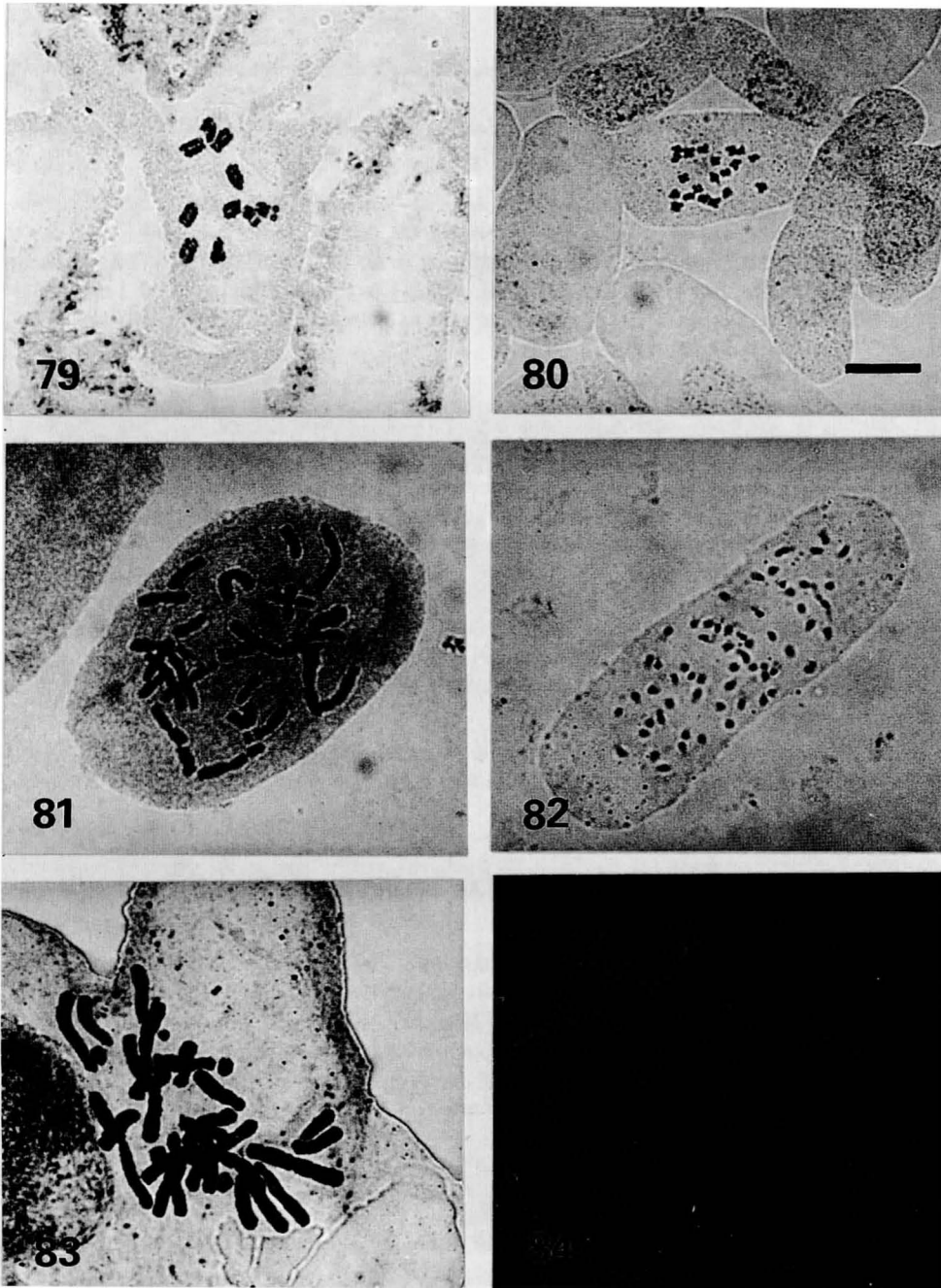
***Phlomis cypria* var. *occidentalis* Meikle**

$n = 10$ . **Paphos:** Pano Panayia, limestone, garrigue and meadows, 820 m, 22 Apr 1991 (25-1143) (Fig. 75).

There are no previous chromosome number reports for this taxon endemic to the flora of Cyprus.



Figs. 73-78. PMC meiosis of: 73, *Arbutus andrachne*,  $n = 13$ ; 74, *Astragalus cypricus*,  $n = 8$ ; 75, *Phlomis cypria* var. *occidentalis*,  $n = 10$ ; 76, *Allium junceum*,  $n = 8$ ; 77, *Platanthera chlorantha*,  $n = 21$ ; 78, *Orobanche aegyptiaca*,  $n = 12$ . — Scale bar = 10  $\mu\text{m}$ .



Figs. 79-84. Metaphases of root-tip mitoses of: **79**, *Vicia sativa* subsp. *sativa*,  $2n = 10$ ; **80**, *Erodium cicutarium*,  $2n = 20$ ; **81**, *Bromus rubens*,  $2n = 28$ ; **82**, *Gladiolus triphyllus*,  $2n = 60$ ; **83**, *Gynandriris sisyrinchium*,  $2n = 24$ ; **84**, *Salvia verbenaca*,  $2n = 56$ . — Scale bar = 10  $\mu\text{m}$ .

***Salvia verbenaca* L.**

$2n = 42$ . **Larnaka:** Ayia Anna, dry slopes, palaeogene limestone and marl, c. 150 m, 15 Apr 1991 (13-470).

$2n = 56$ . **Limassol:** Between Mandria and Ayios Nikolaus, roadside and garrigue, gabbro and limestone, 27 Apr 1991 (34-1577) (Fig. 84).

This species shows a enormous karyological variation and so far, chromosome numbers of  $2n = 14, 16, 42, 44, 48, 54, 56, 58, 59, 60, 62, 64, 72$  are reported (Afzal-Rafii 1979, Amin 1972, Björkqvist & al. 1969, Dahlgren & al. 1971, Gadella & al. 1966, Haque 1982, Haque & Ghoshal 1980, Kramer & al. 1972, Löve & Kjellqvist 1974, Loon & al. 1971, Markova & Ivanova 1982, Natarajan 1981, Patudin & al. 1975, Queirós 1983, Reese 1957, Strid & Franzén 1981).

***Teucrium kotschyanum* Poech**

$2n = 32$ . **Larnaka:** Vavatsinia, road to Lythrodhonda, roadside, vulcanic rocks, 770 m, 19 Apr 1991 (20-772) (Fig. 85).

The cytology of this Cyprian endemic has not been studied previously.

***Liliaceae******Allium junceum* Sm.**

$n = 8$ . **Paphos:** Between Nata and Axylon, garrigue, limestone and marl-limestone, 350-400 m, 22 Apr 1991 (23-1081) (Fig. 76).

Our count of  $n = 8$  is in agreement with the former report of a diploid number ( $2n = 16$ ) by Karavokyrou & Tzanoudakis (1991) who studied plant material of Greek provenance.

***Allium trifoliatum* Cirillo**

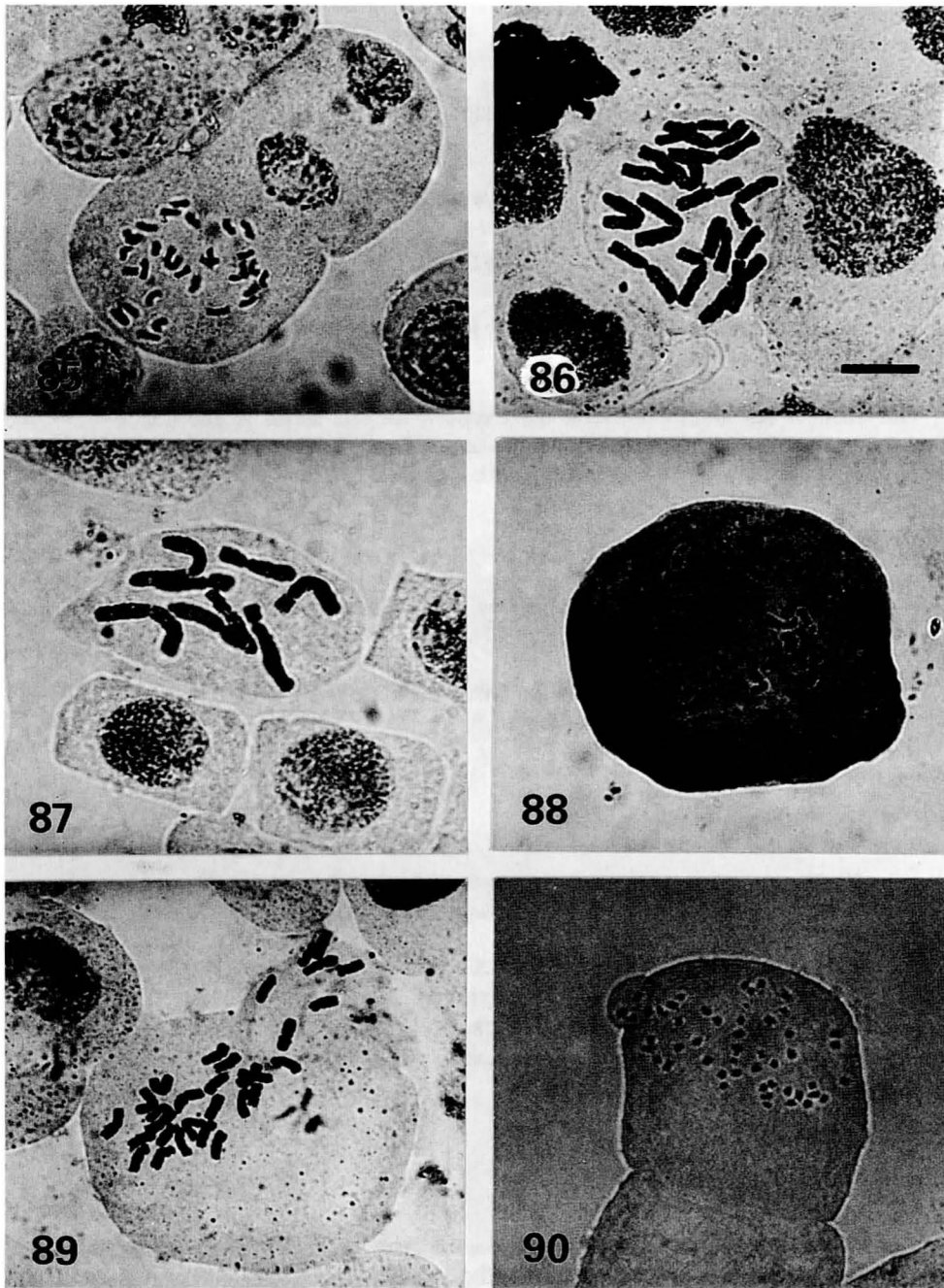
$2n = 14$ . **Paphos:** Between Eledhiou and Amargeti, gypsum, 360 m, 22 Apr 1991 (24-1120) (Fig. 86).

*Allium trifoliatum*, a member of *A. sect. Molium* is found in the Mediterranean region from S. Italy eastwards. Diploid plants of this species have been reported previously only once by Tzanoudakis & Karavokyrou (1992) from Cyprus. *A. trifoliatum* normally is a triploid with  $2n = 3x = 21$  chromosomes (Tzanoudakis & Vosa 1988, Tzanoudakis 1986, Micheli & al. 1981, 1984, Bartolo & al. 1981) and a possible hybrid origin involving di- and tetraploid *A.* of the “*subvillosum*–*subhirsutum*”-complex was suggested by Micheli & al. (1984).

***Bellevalia trifoliata* (Ten.) Kunth**

$2n = 8$ . **Limassol:** Amathus, stony slopes, edge of agricultural land, walls, garrigue, marl and limestone, 10-40 m, 14 Apr 1991 (11-358) (Fig. 87).

Our count of  $2n = 8$  confirms the former reports by Bothmer & Bentzer (1973) and Bothmer & Wendelbo (1981) who studied Greek and Turkish plant material. It also confirms the studies on plants of unknown origin by Feinbrun (1938) and Garbari & Tornadore (1972).



Figs. 85-90. Metaphases of root-tip mitoses of: **85**, *Teucrium kotschyannum*,  $2n = 32$ ; **86**, *Allium trifoliatum*,  $2n = 14$ ; **87**, *Bellevalia trifoliata*,  $2n = 8$ ; **88**, *Rumex cypricus*,  $2n = 18$ ; **89**, *Cyclamen cypricum*,  $2n = 30$ ; **90**, *Cyclamen persicum*,  $2n = 48$ . — Scale bar = 10  $\mu\text{m}$ .

*Orchidaceae**Ophrys transhyrcana* Czernjak.

$n = 18$ . **Limassol:** Vouni, marls and limestones, 480 m, 17 Apr 1991 (*Aparicio CY 10-3*).

As far as we know this is first karyological study of this rare Irano-Turanian species.

*Orchis coriophora* subsp. *fragrans* (Pollini) Camus

$n = 18$ . **Limassol:** Between Kambou and Souni, garrigue, limestone and marl, 280 m, 17 Apr 1991 (*14-541*).

Our count is deviating from most other reports for this taxon. While Labadie (1976a) found  $n = 10$  in French plants other authors report  $2n = 38$  from Spain (Löve & Kjellqvist 1973), and from Italy (Scrugli & al. 1976, Bianco & al. 1987).

*Platanthera chlorantha* (Custer) Rehb.

$n = 21$ . **Paphos:** Surroundings of Stavros tis Psokas, *Pinus brutia* forest on volcanic rocks, 750 m, 21 Apr 1991 (*22-966*) (Fig. 77).

Previous reports for plants of Cyprian provenance are not known. Our result of  $n = 21$  agrees with all former results for this taxon.

*Orobanchaceae**Orobanche aegyptiaca* Pers.

$n = 12$ . **Paphos:** Ayia, forest station, wet and nitrophilous locality under *Platanus orientalis* (parasitizing on *Smyrniium olusatrum*), 600 m, 23 Apr 1991 (*27-1288*) (Fig. 78).

*Orobanche aegyptiaca* is found from S.E. Europe to C. and S.W. Asia. Our count corresponds with the reports of  $2n = 24$  given by Čukov (cited in Fedorov 1969: 477 and Moore 1982: 215), from Russia and  $n = 12$  by Bir & Sidhu (1974) from India. There is a deviating count of  $2n = 38$  reported by Srivastava (cited in Darlington & Wylie 1955: 316 and Fedorov (1969: 477) from Egypt.

*Polygonaceae**Emex spinosa* (L.) Campd.

$2n = 20$ . **Larnaka:** Between Xylophagou and Ayia Thekla, fallow land and pseudosteppe with *Sarcopoterium*, c. 5 m, 12 Apr 1991 (*4-81*).

Our count of  $2n = 20$  for this widespread weed agrees with former reports made by Dalgaard (1986) from Macaronesia, Queirós (1983) from Portugal, and Delay & Petit (1971) from France.



***Rumex cyprius*** Murb.

$2n = 18$ . **Nikosia:** N.E. of Ayios Yeoryios Kavkalou (road to Vyzakia), roadside and agricultural land, sand and rubble (basalt), 390 m, 26 Apr 1991 (31-1477) (Fig. 88).

Our count confirms the former results for this species given by Díaz Lifante & al. (1992) and Slavík & al. (1993) who studied plants of Palestinian and Cyprian provenance respectively.

*P r i m u l a c e a e****Cyclamen cyprium*** Sibth.

$2n = 30$ . **Paphos:** Mount Tripilos and Cedar valley, forest with *Cedrus brevifolia* and *Quercus alnifolia*, 1080-1360 m, 20 Apr 1991 (Vogt 21-8530) (Fig. 89).

This first count based on authentic plant material confirms the hexaploid nature of this endemic Cyprian species which is flowering in autumn. It agrees with the former reports by Lepper (in Schwarz 1964), Legro (1959), and Haan & Doorenbos (1951) based on plants of unknown origin.

***Cyclamen persicum*** Mill.

$2n = 48$ . **Limassol:** Amathus, stony slopes, edge of agricultural land, walls, garrigue, marl and limestone, 10-40 m, 14 Apr 1991 (11-313) (Fig. 90).

The cytology of this species was previously studied by Slavík & al. (1993) using Cyprian plant material and Lepper (in Schwarz 1964), Legro (1959), and Haan & Doorenbos (1951) using plant material of unknown origin. Our count of  $2n = 48$  confirms the octoploid nature of this species which is flowering in spring. It grows in the E. Mediterranean area.

*S c r o p h u l a r i a c e a e****Veronica persica*** Poir.

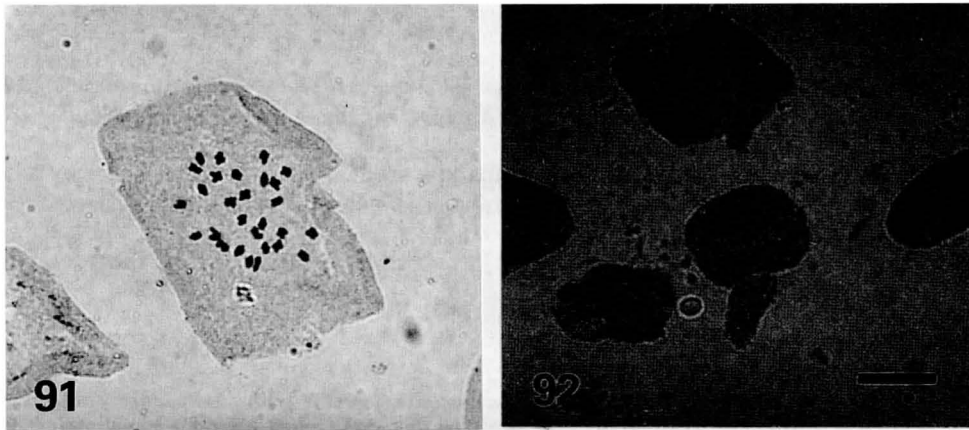
$2n = 28$ . **Nikosia:** Alona, steep slopes, garrigue, diabase, 940 m, 26 Apr 1991 (33-1523) (Fig. 91).

Our count of  $2n = 28$  is in accordance with all former reports from many areas of this species nowadays widespread in most temperate regions of the world.

*V a l e r i a n a c e a e****Centranthus calcitrapae*** (L.) Dufr. subsp. ***orbiculatus*** (Sm.) Meikle

$2n = 32$ . **Larnaka:** Vavatsinia, road to Lythrodhonda, roadside, volcanic rocks, 770 m, 19 Apr 1991 (20-779).





Figs. 91-92. Metaphases of root-tip mitoses of: **91**, *Veronica persicum*,  $2n = 28$ ; **92**, *Valerianella orientalis*,  $2n = 16$ . — Scale bar = 10  $\mu$ m.

The first count for this subspecies probably endemic to Cyprus. Our result of  $2n = 32$  agrees with reports for the species made by Luque & Díaz Lifante (1991), Dahlgren & al. (1971), Engel (1976), Tucci & Ricciardi (1978), Contandriopoulos & al. (1987), and Montmollin (1986) for Spain, Italy, Corsica and Crete.

#### *Valerianella orientalis* (Schldl.) Boiss. & Balansa

$2n = 16$ . **Nikosia**: Alona, steep slopes, garrigue, diabase, 940 m, 26 Apr 1991 (33-1522) (Fig. 92).

This is the first count of a chromosome number of this species.

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