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Chromosome counts of some plants from Cyprus

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ZUSAMMENFASSUNG

SLAVÍK, B., V. JAROLÍMOVÁ & J. CHRTEK (1993). Chromosomenzahlen einiger Pflanzen aus Zypern. *Candollea* 48: 221-230. Auf Englisch, deutsche und englische Zusammenfassungen.

Die Chromosomenzahlen der 48 in Zypern gesammelten Pflanzenarten werden angegeben; die absolute Mehrheit von diesen Zahlen wurde für Zypern zum erstenmal festgestellt worden. Kurze Bemerkungen zu einigen interessanten Arten sind beigefügt.

ABSTRACT

SLAVÍK, B., V. JAROLÍMOVÁ & J. CHRTEK (1993). Chromosome counts of some plants from Cyprus. *Candollea* 48: 221-230. In English, German and English abstracts.

Chromosome numbers of 48 plant species from Cyprus are reported, most of them new for the island. Brief comments on some interesting taxa are given.

KEY-WORDS: Chromosome numbers — Vascular plants — Cyprus.

Introduction

Florogenetically, Cyprus is an important part of the Eastern Mediterranean. Its flora is most closely related to that of southern Asia Minor and Syria. Strangely, little is known of the karyology of the Cyprian flora. We report here chromosome counts for 48 species of vascular plants, some of them from more stations (total, 58 localities). Most of the karyological material was collected by J. Chrtek and B. Slavík during their trip to Cyprus in 1978 (cf. CHRTEK & SLAVÍK, 1981). We also made use of the material gathered by Professor J. Dostál in 1982 and R. Neuhäusl & Z. Neuhäuslová in 1981. The majority of samples were studied in 1979-1982, partly from seed collected in the wild, partly from plants grown in the experimental garden of the Department of Biosystematics, Botanical Institute of the Czechoslovak Academy of Sciences at Průhonice. Additional seed material was taken from herbarium specimens in 1991. Some of the seeds proved viable and the seedling were examined karyologically. This is of some interest from the view point of carpobiology: after nine years of storage in herbarium, seeds of *Crupina crupinastrum*, *Geranium rotundifolium*, *Hedysarum spinosissimum*, *Hippocrepis ciliata*, *Medicago littoralis*, *Medicago rugosa*, *Notobasis syriaca*, *Onobrychis caput-galli*, *Trifolium clypeatum*, *Vaccaria pyramidata* and *Vicia palaestina* germinated. *Euphorbia peplus*, *Plantago afra* and *Rumex cyprius* did so after 13 years.

The arrangement of species and nomenclature follows mostly MEIKLE (1977, 1985). Observations on *Stellaria media* agg., *Papaver rhoeas* subsp. *cyprium*, *Vicia palaestina* and *Rumex cyprius* are provided.

Methods

Root tips (young seedlings or adventitious roots of cultivated plants) were pretreated with p-dichlorobenzene, fixed in alcohol-acetic acid 3:1 mixture and stained with lacto-propionic-orceine. Drawings were made using camera lucida. Vouchers are deposited in the herbarium of the National Museum in Prague (PR).

Results and discussion

CUPRESSACEAE

Cupressus sempervirens L. ($2n = 22$)

Limassol, Castle Kolossi, leg. *J. Chrtek & B. Slavík*, 701, 10.4.1978.

RANUNCULACEAE

Ranunculus chius DC. var. **chius** ($2n = 14$)

Fontana Amorosa, edge of the fountain, leg. *J. Chrtek & B. Slavík*, 279, 5.4.1978.

Ranunculus marginatus Urv. var. **trachycarpus** (Fisch. & Mey.) Azn. ($2n = 32$).

Akhelia, moist fields near the river Ezousas W. of the village by the coast, leg. *J. Chrtek & B. Slavík*, 301, 8.4.1978.

PAPAVERACEAE

Papaver rhoeas L. subsp. **cypricum** Chrtek & Slavík ($2n = 14$).

Paphos, on coastal sand-dunes 2 km S.E. of the town, leg. *J. Chrtek & B. Slavík*, 153, 9.4.1978.

In his revision of *Papaver* sect. *Rhoeadium* Spach, KADEREIT (1988) considers Cyprian plants, designated as *P. rhoeas* subsp. *humile* Fedde in HOLMBOE (1914) as well as *P. rhoeas* subsp. *cypricum* Chrtek & Slavík to be *P. rhoeas* and recognizes no infraspecific taxa. He writes (p. 273): "As I have seen no material of *P. humile* from Cyprus, I suspect that HOLMBOE (1914) was dealing with impoverished sand forms of *P. rhoeas*. Such forms from Cyprus were described by CHRTEK & SLAVÍK (1981) as *P. rhoeas* subsp. *cypricum*, which I do not maintain as a separate taxon." Cultivation experiments have shown that subsp. *cypricum* is no ecomorphosis. Plants were grown several years in normal garden soil in the experimental plot of the ČSAV at Průhonice. All the characteristic features mentioned in the description, including low and branched habit (see photo in CHRTEK & SLAVÍK, 1981, tab. 3, 5) were retained. In natural habitats, homogenous populations of numerous individuals are found, mainly in batha formations, in associations *Sarcopoterietum spinosi* and *Corydorthymetum capitati*. Associated species include *Asphodelus aestivus* Brot., *Evax contracta* Boiss., *Fumana thymifolia* (L.) Verlot, *Helianthemum obtusifolium* Dunal, *Lotus halophilus* Boiss. & Spruner and *Phagnalon graecum* Boiss. *P. rhoeas* subsp. *cypricum* is well defined both morphologically and ecologically. The type subspecies of *P. rhoeas* also occurs in Cyprus but no transitional forms were observed.

CRUCIFERAE

Alyssum minus (L.) Rothm. ($2n = 16$).

Amathus, on dry stony slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 351, 15.4.1978 (cf. CHRTEK & SLAVÍK, 1981: 51).

Alyssum strigosum Banks & Sol. ($2n = 16$).

Yermasoyia, on dry stony stream bed of the river Yermasoyia S. of the village, leg. *J. Chrtek & B. Slavík*, 222, 15.4.1978.

Cardamine hirsuta L. ($2n = 16$).

Kato Platres, in moist guilles in the village, leg. *J. Chrtek & B. Slavík*, 62, 7.4.1978.

CISTACEAE

Cistus creticus L. ($2n = 18$).

Kato Platres, on rocky slopes W. of the village, leg. *R. Neuhäusl & Z. Neuhäuslová*, S 1165, 1981.

Helianthemum salicifolium (L.) Mill. ($2n = 20$).

Paphos, dry brook bed N. of the Paphos Beach Hotel, leg. *J. Chrtek & B. Slavík*, 700, 6.4.1978.

CARYOPHYLLACEAE

Kohlrauschia velutina (Guss.) Reichb. ($2n = 30$).

Amathus, dry grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 96, 10.4.1978.

Vaccaria pyramidata Medik. var. **pyramidata** ($2n = 30$, Fig. 1/3).

Paralimni, cultivated field near Pernera between Dherinia and the town, leg. *J. Dostál*, D 41699, 25.4.1982.

Silene gallica L. ($2n = 24$).

Yermasoyia, on dry stony stream bed of the river Yermasoyia S. of the village, leg. *J. Chrtek & B. Slavík*, 280, 15.4.1978.

Stellaria media agg.

MEIKLE (1977: 259-261) distinguishes three subspecies of *Stellaria media* in Cyprus: subsp. *media*, subsp. *cupaniana* (Jord. & Fourr.) Nyman and subsp. *apetala* Čelak. Based on our own studies of morphology and karyology, and considering results published in recent European literature (e.g. CHATER & HEYWOOD, 1964; WHITEHEAD & SINHA, 1967; GUINOCHET & VILMORIN, 1973; PIGNATTI, 1982; GREUTER & al., 1984; DVOŘÁKOVÁ, 1990), we concluded that these taxa represent microspecies of *S. media* agg. The following microspecies were found in Cyprus: *Stellaria media* (L.) Vill. s.s., *S. postii* (Holmboe) comb. nova and *S. pallida* (Dumort.) Piré.

Stellaria media (L.) s.s. ($2n = 44$).

- a) Kato Platres, roadside in the village, leg. *J. Chrtek & B. Slavík*, 239, 7.4.1978.
- b) Kykko monastery, ruderal places, leg. *J. Chrtek & B. Slavík*, 218, 219, 7.4.1978.
- c) Pano Panaia, in the village, leg. *J. Chrtek & B. Slavík*, 235, 5.4.1978.

In Cyprus, this taxon is confined to the higher altitudes of the Troodos Mts. (from 700 m above sea level). All the plants examined had $2n = 44$. Numbers $2n = 40$ and 42 have been reported from other parts of the distribution area. We found $2n = 40$ e.g. in Bulgarian material (Burgas, road side in the town, leg. *B. Slavík*, 1.8.1979). In the Eastern Mediterranean, $2n = 44$ has been reported from Mt. Olimbos in Greece (STRID, 1986: 108). Chromosome numbers of this taxon have been studied mainly on material from Central, Western and Northern Europe (e.g. PETERSON, 1935,

1936; SINHA & WHITEHEAD, 1965; WHITEHEAD & SINHA, 1967; SCHOLTE, 1978; POGAN & al., 1982). The map (Fig. 2) shows our localities examined cytologically and two localities from MEIKLE (1977: 259): Stavros tis Psokas and Prodhromos.

Stellaria postii (Holmboe) Slavík, Jarolímová & Chrtek, **comb. nov.** ($2n = 22$).

Bas.: *Stellaria media* (L.) Vill. subsp. *postii* Holmboe, Berg. Mus. Skr. 1(2): 70, 1914.

Syn.: *S. neglecta* Weihe subsp. *postii* (Holmboe) Sam., Ark. Bot. 26A(5): 8, 1934.

a) Ayios Neophytos, ruderal place in the monastery, leg. *J. Chrtek & B. Slavík*, 214, 5.4.1978.

b) Fontana Amorosa, waste place near the restaurant, leg. *J. Chrtek & B. Slavík*, 215, 5.4.1978.

c) Paphos, roadside in the town, leg. *J. Chrtek & B. Slavík*, 102, 4.4.1978.

This is a characteristic Eastern Mediterranean taxon described from Cyprus. It has also been reported from Turkey and Palestine (Coode in DAVIS, 1967: 70), Lebanon (MOUTERDE, 1966: 475) and mountains of Greece (STRID, 1986: 108). MEIKLE (1977: 259) identified this taxon with *Stellaria media* (L.) Vill. subsp. *cupaniana* (Jord. & Fourr.) Nyman and GREUTER & al. (1984: 286) with *Stellaria cupaniana* (Jord. & Fourr.) Béguinot. We disagree with these treatments (see CHRTEK & SLAVÍK, 1981: 53) and maintain the Eastern Mediterranean *S. postii* and the Central and Western Mediterranean *S. cupaniana* as two separate species. CHATER & HEYWOOD (1964: 134) recognize distinguish these taxa at the subspecific level. They differ not only morphologically but, very likely, also cytologically. Only one chromosome number report has so far been available for *S. postii* ($2n = 22$, Taygetos Mts., Greece, STRID, 1986: 108). We found the same number in material from three localities in Cyprus mentioned above. For *S. cupaniana* only $2n = ? 44$ has been reported from Palermo, Sicily (as *S. neglecta* Weihe var. *cupaniana* (Jord. & Fourr.) Nym.; see PETERSON, 1936: 286, 291). PETERSON (l.c., p. 416) supposed var. *cupaniana* to be an "autotetraploid of *S. neglecta*", with $2n = 22$. Recent authors refer *S. cupaniana* to the relationships of *S. media* s.s. with the chromosome number of $2n = 40, 42$ (e.g. GUINOCHET & VILMORIN, 1973; PIGNATTI, 1982), which seems to be in agreement with karyological evidence. As demonstrated by HOLMBOE (1914: 71), *S. postii* is most closely related to *S. neglecta*. It is unjust to merge these two taxa, as did ZOHARY (1966: 118). Further biosystematic studies of material from all parts of the Mediterranean are required to solve the taxonomy of *S. neglecta*, *S. cupaniana* and *S. postii*.

Stellaria pallida (Dumort.) Piré ($2n = 22$).

Paphos, roadside in the town, leg. *J. Chrtek & B. Slavík*, 63, 4.4.1978.

Our count of $2n = 22$ is in agreement with all previous reports, except one from Egypt (Bahariya) $2n = 40$ (AMIN, 1979: 73), in which case however some other taxon from the relationship of *S. media* agg. might have been counted.

MALVACEAE

Malva nicaeënsis All. ($2n = 42$).

Paphos, roadside between hotel Dionysos and Paphos Beach Hotel, leg. *J. Chrtek & B. Slavík*, 151, 6.4.1978.

Malva parviflora L. var. ***parviflora*** ($2n = 42$).

Mouttayaia, roadside S. of the village, leg. *J. Chrtek & B. Slavík*, 165, 15.4.1978.

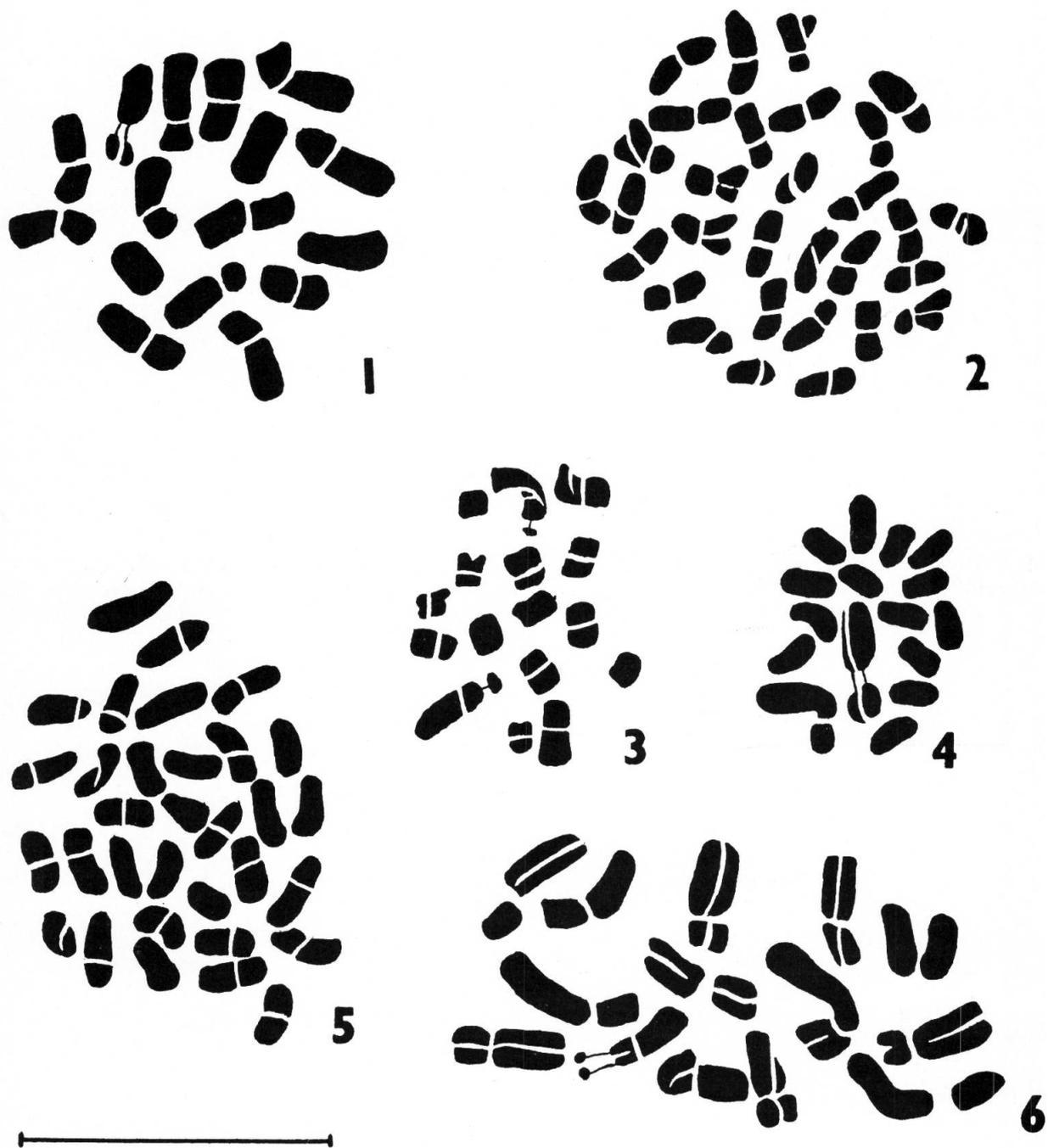


Fig. 1. — Somatic metaphases.

1, *Medicago marina* L.; 2, *Parietaria lusitanica* L.; 3, *Vaccaria pyramidata* Medik. var. *pyramidata*; 4, *Trifolium clypeatum* L.; 5, *Medicago rugosa* Desr. in Lam.; 6, *Vicia palaestina* Boiss. (scale: 10 μ m).

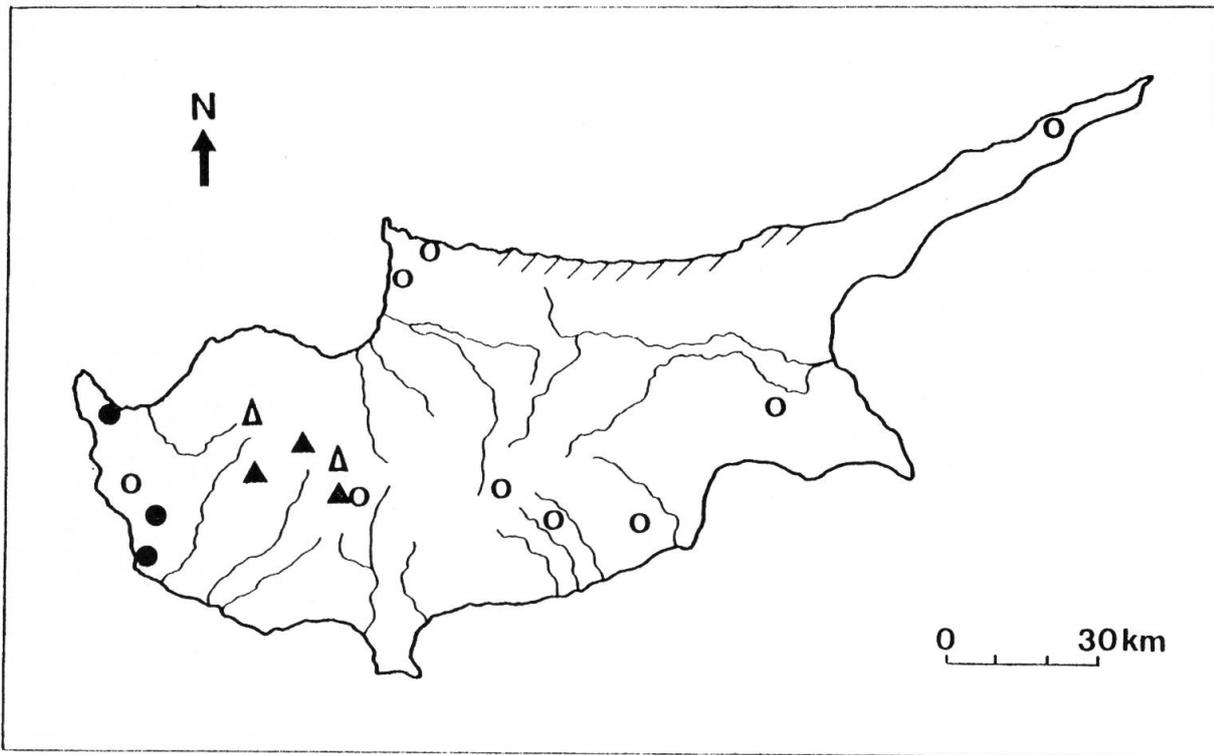


Fig. 2. — Distribution of *Stellaria media* s.s. (▲ our collections from which chromosome counts were made; △ literature reports) and *S. postii* (● our collections from which chromosome counts were made; ○ and // literature reports) in Cyprus.

GERANIACEAE

Geranium rotundifolium L. ($2n = 26$).

a) Episkopi, amphitheatre Curium, leg. J. Dostál, *D 41911*, 21.4.1982.

b) Paralimni, limestone rocky hill with the chapel Hagios Elias, leg. J. Dostál, *D 41810*, 17.4.1982.

LEGUMINOSAE

Trigonella monspeliaca L. ($2n = 16$).

Amathus, grassy slope N. of the hotel Amathus, leg. J. Chrtek & B. Slavík, 15.4.1978, *S 665*, cult. 11.7.1980.

Medicago marina L. ($2n = 16$, Fig. 1/1).

Paralimni, on coastal sand-dunes near the hotel Pernera, leg. J. Dostál, *D 41915*, 25.4.1982.

Medicago rugosa Desr. in Lam. ($2n = 32$, Fig. 1/5).

Paralimni, stony fields between Pernera and Hagios Elias, leg. J. Dostál, *D 41479*, 17.4.1982.

Medicago minima (L.) Bartal. ($2n = 16$).

Amathus, grassy slope N. of the hotel Amathus, leg. J. Chrtek & B. Slavík, 15.4.1978, *S 669a*, cult. 2.10.1981.

Medicago littoralis Rohde ex Lois.-Deslong. ($2n = 16$).

Paralimni, stony pasture-ground near the hotel Sunrise, leg. *J. Dostál*, *D 41288*, 18.4.1982.

Trifolium cherleri L. ($2n = 10$).

Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, *442*, 10.4.1978.

Trifolium clypeatum L. ($2n = 16$, Fig. 1/4).

Paralimni, on limestone rocky hillsides of Hagios Elias, leg. *J. Dostál*, *D 41482*, 17.4.1982.

Trifolium tomentosum L. ($2n = 16$).

a) Akhelia, dry grassy bank of the river Ezousas S. W. of the village, leg. *J. Chrtek & B. Slavík*, *612*, 8.4.1978.

b) Paphos, waste place near the harbour, leg. *J. Chrtek & B. Slavík*, *611*, 3.4.1978.

Chrysopsis campestris (Schreber in Sturm) Desv. ($2n = 14$).

Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, *289*, 14.4.1978 (cf. CHRTEK & SLAVÍK, 1981: 56-57).

Hippocrepis ciliata Willd. ($2n = 14$).

Paralimni, limestone rocky hill W. of the town, leg. *J. Dostál*, 24.4.1982 (*D 41833*).

Hedysarum spinosissimum L. ($2n = 16$).

Paralimni, stony fields between Perneria and Hagios Elias, leg. *J. Dostál*, *D 41833*, 24.4.1982.

Onobrychis caput-galli (L.) Lam. ($2n = 16$).

Paralimni, stony pasture-ground near the hotel Sunrise, leg. *J. Dostál*, *D 41295*, 18.4.1982.

Vicia palaestina Boiss. ($2n = 14$, Fig. 1/6).

Paralimni, limestone rocky hill W. of the town, leg. *J. Dostál*, *D 41832*, 24.4.1982.

Our count is in agreement with the only report from Iraq (Bekhal, Karsi) (AL-MAYAH & AL-SHEHBAZ, 1977: 439).

ROSACEAE

Sarcopoterium spinosum (L.) Spach ($2n = 28$).

Paralimni, rocky ground near the hotel Perneria, leg. *R. Neuhäusl & Z. Neuhäuslová*, 1981, *S 1178*, cult. 5.11.1983.

CUCURBITACEAE

Ecballium elaterium (L.) A. Rich. ($2n = 18$).

Paphos, waste place S. of the hotel Paphos, leg. *R. Neuhäusl & Z. Neuhäuslová*, 1981, *S 1185a*, cult. 5.11.1983.

DIPSACACEAE

Scabiosa prolifera L. ($2n = 18$).

Paphos, waste place S. of the hotel Paphos, leg. *R. Neuhäusl & Z. Neuhäuslová*, 1981, *S 1173a*, cult. 8.7.1982.

COMPOSITAE

Phagnalon graecum Boiss. & Heldr. ($2n = 18$).

Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 705, 15.4.1978.

Senecio vulgaris L. ($2n = 40$).

a) Paphos, in the ruins of Saranda Kolones, leg. *J. Chrtek & B. Slavík*, 722, 3.4.1978.

b) Kykko monastery, by the monastery wall, leg. *J. Chrtek & B. Slavík*, 711, 7.4.1978.

c) Paphos, waste place N. of the Paphos Beach Hotel, leg. *J. Chrtek & B. Slavík*, 718, 6.4.1978.

Notobasis syriaca (L.) Cass. ($2n = 34$).

Paralimni, stony fields between Pernera and Hagios Elias, leg. *J. Dostál*, *D 41623*, 17.4.1982.

Crupina crupinastrum (Moris) Vis. ($2n = 28$).

a) Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 713, 10.4.1978.

b) Paralimni, stony fields between Paralimni and Hagios Elias, leg. *J. Dostál*, *D 41825*, 17.4.1982.

PLUMBAGINACEAE

Limonium sinuatum (L.) Mill. ($2n = ca. 16$).

Paphos, sandy sea-shore S. of the hotel Paphos, leg. *R. Neuhäusl & Z. Neuhäuslová*, 1981, *S 1186a*, cult. 3.11.1982.

PRIMULACEAE

Cyclamen persicum Mill. ($2n = 48$).

a) Paphos, Christian Catacombs, leg. *J. Chrtek & B. Slavík*, 702, 4.4.1978.

b) Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 743, 10.4.1978.

SOLANACEAE

Withania somnifera (L.) Dunal in DC. ($2n = 48$).

Paphos, roadside near the Paphos Beach Hotel, leg. *R. Neuhäusl & Z. Neuhäuslová*, *S 1172a*, 1981.

PLANTAGINACEAE

Plantago afra L. ($2n = 12$).

Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 746, 14.4.1978.

POLYGONACEAE

Rumex cyprius Murb. ($2n = 18$).

Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 852, 10.4.1978.

According to literature reports and herbarium specimens at our disposal this taxon has margins of the fruiting valves distinctly shortly spinulose (see illustrations of fruits from various Cyprian specimens in MEIKLE, 1985: plate 81/7, 8, 10, 11; SAMUELSSON, 1939: 513, fig. 1/d, e, g and MURBECK, 1907: tab. 1, fig. 12). All the plants collected by us in two localities near Paphos and Limasol (Amathus) have entire or subentire valves. This is characteristic of *R. vesicarius* but the distinct, thickened peripheral veins on the valves clearly refer our plants to *R. cyprius*. Five subspecies are distinguished within this species in the southern Mediterranean. Our plants from both localities correspond to subsp. *subinteger* Sam. (reported only from Algeria) rather than subsp. *cyprius*. Besides margins of the fruiting valves they remind subsp. *subinteger* usually by one flower from each ochrole. The possibility cannot be excluded that this is one more infraspecific taxon of *R. cyprius*.

EUPHORBIACEAE

Euphorbia peplus L. ($2n = 16$).

Paphos, Christian Catacombs, leg. *J. Chrtek & B. Slavík*, 780, 4.4.1978.

Ricinus communis L. ($2n = 20$).

Paphos, waste place by the Roman Theatre, leg. *R. Neuhäusl & Z. Neuhäuslová*, S 1177, 1981.

URTICACEAE

Parietaria lusitanica L. ($2n = 16$, Fig. 1/2).

Paphos, Christian Catacombs, leg. *J. Chrtek & B. Slavík*, 724, 4.4.1978.

GRAMINEAE

Avena ludoviciana Durieu ($2n = 42$).

Amathus, grassy slope N. of the hotel Amathus, leg. *J. Chrtek & B. Slavík*, 15.4.1978, S 658a, cult. 17.8.1981.

Polygomon monspeliensis (L.) Desf. ($2n = 28$).

Paphos, roadside S. of the hotel Paphos, leg. *R. Neuhäusl & Z. Neuhäuslová*, 1981, S 1168a, cult. 3.11.1982.

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