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The Nomenclature News of Flora Palaestina

Abstract

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During the preparation of the list of species in the Flora palaestina area, several hundred names have been changed, added or replaced. Due to the limited space in the scheduled first part of the second edition of Flora Palaestina, the author lists the comments concerning many of the new names in Flora Palaestina.

Introduction

The material presented here is based on the material reported by the author in the manuscript of "Distribution Atlas of plants in the Flora Palaestina area" which is the first part of the second edition of Flora Palaestina (The Israel Academy for Science and Humanities). However, since the information in the "Atlas" is limited to the actual name of the plant there is no information as to why names were changed or added, where it is published etc. The aim of the present source of information is to provide, whenever available, tools for the reader to read for himself the information which led the author to the nomenclature conclusions that are presented in Flora Palaestina. Field observations on ecological conditions and history of invasion of established aliens are presented as well. The information presented on 19 species reported in Danin (2000) is incorporated in the present article as well.

Content

List of the species "new to science" reported for the Flora Palaestina area.

List of species "new to" the Flora Palaestina area.

List of species which were mis-identified in Flora Palaestina.

List of species the names of which in Flora Palaestina are regarded at present as synonyms.

List of species, which were recorded in literature from the study area but are excluded from the "Distribution Atlas"

References

1. List of species "new to science" reported after the publication of Flora Palaestina

Allium daninianum Brullo, Pavone & Salmeri

Ref.: Brullo & al. (1996).

Fl. Pal.: "*Allium stamineum*". The plants that were used to be called *Allium stamineum* Boiss. in Flora Palaestina (IV) and in earlier studies of that area were regarded by Brullo & al., (1993, in Candollea 48: 279-290) as a complex. These authors regard the typical *A. stamineum* Boiss. to be confined to SW Turkey. Part of the complex named by Brullo & al., (1996) as the independent species depicting the cooperation in field trips of S. Brullo and A. Danin through OPTIMA expedition in Israel, 1989 (Boccone 3: 5-17).

Allium kollmannianum Brullo, Pavone & Salmeri

Ref.: Brullo & al. (1991).

Note: a rare plant, poorly collected, known from 3 locations or 3 specimens described by the authors. They regard it as confined to shrub-steppes on sandy-loess soils.

Allium tardiflorum Kollmann, Shmida & Cohen

Ref.: Kollmann & al. (1990).

Note: The only autumn-flowering *Allium* in Israel. Whereas all other species known from the area bloom in winter, spring, or early summer.

Amygdalus ramonensis Danin

Ref.: Danin (1980).

Type specimen: Israel, Central Negev Highlands, Nahal Eliav, 4 km SW of Har Ramon, 34°39'E/30°38'N banks of wadi with loessial alluvium, 16.iv.1979, Danin (HUJ, E, K).

Note: a rare tree confined to rock crevices and other rocky mesophytic microhabitats in steppe-forests of the Negev Highlands (Danin, 1999a, 1999b). A few specimens occur in banks of large wadis draining rocky terrain in the Negev Highlands. According to Browicz & Zohary (1996), who "summed up their views for tree breeders" (as D. Zohary explained the essence of their paper, pers. comm.) this taxon should be sunk into the complex of *Amygdalus communis* L. subsp. *microcarpa* (Post) Browicz & Zohary. I keep regarding this taxon as an independent species until more comprehensive study proves otherwise.

Hormuzakia negevensis (Danin) Danin & Hilger **comb. nov.**

Basionym.: *Anchusa negevensis* Danin

Ref.: Danin (1995), Danin & Hilger (2001).

Type specimen: Israel, Negev Highlands, Yamin Plain, 10 km SE of Dimona, sandy soil, 21.3.1994 Danin (holo. HUI; iso. E, K)

Note: This is the most rare endemic species known so far in Israel. It was not discovered, so far, outside its locus classicus, an area of ca. 1000 m² of weathered sandstone, ca 10 km S of Dimona, suffering from constant erosion by westerly winds and rain-drops falling in the same direction as a result of the prevailing winds at rainfall events. It was

discovered while the author looked for morphological diagnostic characters of desert psammophytes that grow in sites with constant wind erosion. Three other perennial desert *Boraginaceae* were known already, having the ability to produce shoots from wind-exposed roots ("Moltkiopsis ciliata type", Danin 1996). Such ability may protect the exposed roots from further exposure of the sand cover as the new adventitious stems locally decrease wind velocity and function as a sand trap. *Anchusa negevensis* shares the ability to produce root-borne shoots and grows on the rare combination of Neogene sandstone on the boundary of shrub-steppe and desert vegetation (Danin 1999a: p. 114; Fig. 5.13). Such a combination of old sandstone and climate may be searched for in S Jordan and Saudi Arabia, and *A. negevensis* may be found there.

During the summer of 2000, as a result of DNA sequencing of herbarium specimen of this taxon by H.H. Hilger, as part of broader research on *Boraginaceae*, interesting findings were revealed. Our conclusions there were: "Analysis of the *trnL*_(UAA) intron of chloroplast DNA corroborates the separate generic status of *Hormuzakia* Guşul. (*Boraginaceae*) apart from *Anchusa* L., and justifies the new combination of *Hormuzakia negevensis* (Danin) Danin & Hilger.

***Artemisia jordanica* Danin**

Ref.: Danin (1999c)

Type specimen: S Jordan, Ma'an district, 45 km N of Mudawwara, sandy wadi, 26.10.1997, Danin, 972901 (HUJ; isotypes B, BM, E, K).

Note: This species was regarded by botanists dealing with the floras of Jordan and Saudi Arabia as *Artemisia monosperma*. However, the latter, having pinnatisect glabrous leaves (with rare hairy individuals), grows west of the Arava rift valley, the Gulf of Elat-Aqaba and the Red Sea whereas *A. jordanica* is the vicariant, with almost always entire leaves having appressed whitish indumentum, growing in mobile and stable sandy soils of S Jordan, Saudi Arabia, and Iraq.

***Cyperus sharonensis* Danin & Kukkonen**

Ref.: Danin (1995).

Type specimen: Israel, Sharon Plain, 3 km S of Caesarea, 500 m N of Hadera Power Station, grid: 34°53'15"E/32°28'20"N, shallow dune on soil of ancient ruins, 27.5.1994, A. Danin (HUJ, H).

Note: This species was overlooked in the past being considered as part of the forms of *Cyperus capitatus* Vand., which grow sympatrically with *C. sharonensis*. Eig wrote in the 1930's a note on one specimen calling attention to its peculiar morphology. The new species may be easily distinguished by the tall inflorescence (peduncles up to 100 cm long) and thick rhizomes (8-10 mm in diam.) of *C. sharonensis* contrary to the short peduncle (5-15 cm long) and thin rhizomes (1-2 mm in diam.).

***Diplotaxis villosa* Boulos & Jallad**

Ref.: Boulos & Jallad (1975), Bot. Not. 128: 367.

***Kickxia petrana* Danin**

Ref.: Danin (1991), Willdenowia 21: 181-184.

Type specimen: Jordan, Edom, Aupstieg ed-Deir, 910 m, Ostern 1987, I. Künne 3488 (B, HJ)

Note: After studying 3 other closely related species: *K. acerbiana* (Boiss.) Täckh. & Boulos, *K. macilenta* (Decne.) Danin, and describing *K. judaica* Danin, I suspected that the *Kickxia* species found in the sandstone terrain of Edom (SW Jordan) differs from the other taxa in this group. Preparing scanning electron micrographs (SEM) of the seeds revealed its autonomous seed morphology.

Lathyrus golanensis Cohen & Plitmann

Ref.: Cohen & Plitmann, in Plitmann & al. (1995): 250-252.

Note: The type population is from herbaceous vegetation on dark brown alluvial heavy soil, inundated and muddy in winter, very dry in summer.

Lathyrus plitmannii Greuter & Burdet

Ref.: Greuter & Burdet in Greuter & Raus (1989): p. 32.

Note: The authors discovered that the name *L. lineatus* given first to this taxon, by Plitmann & Heyn, is not valid and renamed it after one of its authors.

Lathyrus hirticarpus Mattatia & Heyn

Ref.: Mattatia & Heyn (1976).

Lens odemensis Ladizinsky

Ref.: Ladizinsky (1986).

Note: Collected in Israel in herbaceous vegetation on basaltic slopes.

Micromeria danaensis Danin

Ref.: Danin (1997).

Type specimen: Jordan, Edom, Dana Reserve, Wadi Barra area, 2 km SE of the visitor center. In crevices of smooth-faced white sandstone outcrops, 14.5.1996, A. Danin 963013 (holo HJ; iso B).

Note: A narrow endemic growing in crevices of hard sandstone outcrops in steppes-forest area of SW Jordan (Danin 1999). It was not found so far out of Dana Nature Reserve. Its closest relative is *Micromeria serbaliana* Danin & Hedge, a narrow endemic of S Sinai, confined to crevices in smooth granite of a few mountaintops.

Origanum petraeum Danin

Ref.: Danin (1990).

Type specimen: Jordan, Edom, ca. 20 km S of Petra, Wadi Umm el Alla, 700-800 m, at the foot of sandstone cliff, 28.9.1988, I. Künne 21.8.4 (HJ)

Note: Several additional populations of *O. petraeum* were discovered in the sandstone outcrops of SW Jordan, at elevation above 1000 m in Dana Nature Reserve, and north and south of Petra.

Origanum punonense Danin

Ref.: Danin (1990).

Type specimen: Jordan, Karak (Edom), Wadi Ghuweir, SE of Fenan (the Biblical Punon), 450 m, in sandstone crevices, 7.3.1986, Baierle & Kürschner 86-193 (BSB!).

Note: A few additional populations of *O. punonense* were discovered in the sandstone outcrops of SW Jordan, at elevation above 1000 m in Dana Nature Reserve, and north of Petra.

***Origanum jordanicum* Danin & Künne**

Ref.: Danin & Künne (1996).

Type specimen: Jordan: Edom, 8 km south of Petra, 1 km west of Et Taiyiba, Qseir el Anajil, 1180 m above sea level, coordinates: 30°26'E/30°15'N., in crevices of Ordovician sandstone cliff, eastern exposure, 30.9.1994, I. Künne 94-09-19 (HUI).

Note: A specimen collected at the NW slopes of Jebel Umm Adami, S. Jordan (12.10.1998, Danin 981002) is more hairy than the type. Inquiry on vernacular names among Bedouin of Wadi Rum area reveal that they call this species ZA'ATARAN, whereas the name ZA'ATAR is applied to *Satureja nabateorum* Danin & Hedge. This means that there are more populations of *O. jordanicum*, unknown to scientists, which should be searched for and studied morphologically.

***Paronychia jordanica* Chaudhri**

Note: This species was published as a result of a study at the herbarium. The author (Chaudhri 1968) did not have a chance of observing populations of this species. He was not aware of the geography and named a plant growing in Nazareth, Israel (or if using an old geographical name "Palestine") after Jordan. This species should be thoroughly and critically investigated.

***Polygala negevensis* Danin**

Ref.: Danin (1987).

Type specimen: Israel, southern Negev, 22 km north-northwest of Elat, crevices of hard limestone in a wadi, 1.7.1986, Danin (HUI).

Note: Boulos (pers. comm. 8/2000) in his manuscript of the Flora of Egypt (in press) intends to sink this taxon into a synonym of the hairy species (with patent hairs) *Polygala sinaica* Botsch. When describing this taxon as an independent species I based my decision on plenty of morphological, ecological, and phytosociological observations in the field, which correlate perfectly with the morphology and ecology of the two taxa. I assume that Prof. L. Boulos could not have the opportunity to critically observe the plants in the field and based his decision on herbarium observations, which I am sure insufficient in this case. I keep the two taxa separate and independent at a specific rank.

***Pycnocycla saxatilis* Danin, Hedge & Lamond**

Ref.: Danin & al. (2000).

Type specimen: Jordan, Edom: Rum area, 10 km SSE of Wadi Rum rest house, 35° 29' E 29° 31' N; in crevices of hard sandstone outcrops, N-facing, 1100 m, 12.10.1998, Danin 981101 (holo HUI; iso E, B).

Note: Small populations of this species occur in crevices of the sandstone inslebergs of

Wadi Rum, S Jordan, and continue in the same habitat without any recognition of political borders in Saudi Arabia. Most of the year this plant looks like a stem assimilated and resembles *Deverra triradiata* in its general appearance.

***Rubia danaensis* Danin**

Ref.: Danin (1997).

Type specimen: Edom, Dana Reserve, a limestone cliff above the visitor center, 13.5.1996, Danin 962509. (holo HUJ; iso B, E, K, W).

Note: *Rubia danaensis* is a narrow endemic (so far known) restricted to limestone cliffs of Edom - SW Jordan. It was found so far along a narrow strip less than 10 km wide and ca 60 km long at the edge of the S Jordanian plateau between Dana and Basta. It is closely related, morphologically, to the widely distributed vine of the Mediterranean maquis – *Rubia tenuifolia* D'Urv. Both species share the same slopes but differ in the habitat they grow, in functional morphology, and in phenology. Whereas *R. tenuifolia* may grow as a vine, climbing trees or shrubs on stony slopes or as a chasmophyte in crevices of limestone and sandstone, *R. danaensis* grows only as a chasmophyte on limestone cliffs. The differential morphological character is the teeth at leaf margins. Whereas the leaf margin of *R. tenuifolia* is always with pairs of sharp hooked teeth directed towards leaf base and towards its tip, the leaf margin of *R. danaensis* is completely smooth. The function of the hooked teeth is assistance to the climbing stems. If the two species look similar as derivatives of a common ancestor, the vine has a biological advantage by having hooked teeth. Smooth leaf margins may not harm the chasmophyte and having hooked teeth seems of no biological advantage in the limestone cliffs. *Rubia tenuifolia* blooms earlier than *R. danaensis*, and at first observations they seem to be isolated from each other phenologically by the flowering time.

***Satureja nabateorum* Danin & Hedge**

Ref.: Danin & Hedge (1998).

Type specimen: Jordan, Edom: 10 km E of Risha to Jebel Masúda, in crevices of smooth-faced white sandstone (Disi Formation), 650 m, 19.v.1997, Danin 970201 (holo HUJ; iso B, E, K)

Note: The closest relative of *S. nabateorum* is *S. thymbrifolia* Hedge & Feinbrun, described in 1968 (both are in Sect. *Zatarioideae* Boiss.). The authors of *S. thymbrifolia* asked me, being the collector of the blooming holotype, to add a description of its habitats (Danin 1968). The discovery of the two species has a similar history; both were collected in the 1930's as incomplete vegetative summer branches, which resembled each other. The resemblance of summer leaves of the two species caused the confusion and the inclusion of specimens of *S. nabateorum* in the description of *S. thymbrifolia*. The finding of fully developed plants of the second species led Danin & Hedge (1998) to recognize the significant morphological differences as sufficient between two species. The completely different ecological conditions, the long distance between the main populations of the two (150 km), and the morphological differences are further discussed by Danin & Hedge (1998). The occurrence of this species in adjacent location in Saudi Arabia, was cryptical-

ly reported in Danin & al. (2000). This report is based on specimens collected by Mrs. S. Collenette, observed by Mr. I.C. Hedge (pers. comm.), and deposited at the herbarium in Edinburgh (E). Their details are: Saudi Arabia: S of Tayma, Medinah road, shallow sand over white sandstone slabs, 3500 ft, Collenette 7814 (450 km SE of the southern collection site at Jebel Umm Adami in Jordan); off the Duba-Tabuk road, in crevices of white Rhum sandstone in red sand and thin basalt, Collenette 9059 (150 km SE of Jebel Umm Adami).

Scandix verna O. Cohen

Ref.: Cohen (2000).

Note: All the herbarium specimens of "*Scandix iberica*" from Israel were found to belong to the new taxon. However, one specimen from Edom seems to be the authentic *S. iberica* M.Bieb., and therefore the comment (p.p.) is presented in the Distribution Atlas.

Silene danaensis Danin

Ref.: Danin (1997).

Type specimens: Jordan, Edom, Dana Reserve, a limestone cliff 500 m above and east of the visitor center 9.7.1996, Danin 963502 (holo HUJ; iso B, E, K).

Note: The morphological similarity of *S. danaensis* to other species of Sect. *Sclerocalycinae* (Boiss.) Schischk. is compared and differentiated in the original description of the species (Danin 1997). *S. danaensis* grows in small extent in crevices of limestone outcrops. It is much more common in crevices of hard sandstone outcrops, where it grows from the area of Dana in the north, through most sandstone outcrops of Petra and Ras en Naqb area, to Jebel Umm Adami on the border of Jordan/Saudi Arabia and seems to grow in the Saudi Arabian sandstones although not reported from there yet.

Teucrium leucocladum Boiss. subsp. *jordanicum* Danin

Ref.: Danin (1997).

Type specimens: Jordan: Edom, Dana Reserve, Wadi Barra, sandstone crevices, 9.7.1996, Danin 63601 (holo. HUJ, iso. B, E, K).

Note: The two most common species of *Teucrium* growing in semi-shrub communities of the bathas, steppes, and deserts of the Near East are *T. capitatum* L., which has forked or branched hairs, and *T. leucocladum* which has simple hairs. Both species have glandular hairs of various kinds. The typical subspecies of *T. leucocladum* is whitish and confined to warm lowlands of extreme desert areas in Israel, SW Jordan and S Sinai. subsp. *jordanicum* is brown-green and confined to rock crevices, mainly of sandstones in steppe areas. *T. leucocladum* subsp. *sinaicum* Danin (Danin 1997) is gray-green and grows in steppe areas of S Sinai, mainly in crevices of granite and other magmatic rocks. All the three subspecies have mostly globular inflorescences and hard branches, depending in the degree of their spinescence on the local grade of dryness.

Vicia basaltica Plitmann

Ref.: Plitmann (1987).

Note: Confined to moist soils on basalt.

2. Species "new to" the Flora Palaestina area

Acacia cyclops A. Cunn ex G. Don

Note: A plant of western Australian origin, planted in the arboretum near Kiryat Anavim as a possible afforestation tree. Following two events of "strong fire" in summers of 1987 and 1997, this presumably pyrophilous species became well-established on previously pine-afforested slopes. Following the two fire events this plant became one of the most prominent species in the area. It is assumed that additional wild fires in the Mediterranean mountainous area of Israel may open habitats for new establishment and possible naturalization of this species in Israel.

Acacia longifolia (Andr.) Willd.

Note: A plant of eastern Australian origin, planted in settlements and urban gardens, mainly in the desert parts of Israel. There are a few habitats with poor competition where seedlings and trees, which established without human assistance are found. Most places are at the vicinity of seed source in ornamental areas of inhabited areas. In the extreme desert areas of the Arava Valley, establishment of *A. longifolia* takes place in wadis, mainly near highways, where the ground was disturbed and water accumulation in the ground increase. Semi-spontaneous seedlings may populate irrigated areas with trickle-pipes in urban areas. Sandy soils in the sandy districts of the country in wadis near roads may support occasional trees as well.

Acacia saligna (Labill.) Wendl. f.

Ref.: Danin, in Greuter & Raus (1989): p. 29.

Note: A plant of western Australian origin, planted throughout the country as a fast growing shrub or tree. One of the main uses of the plant is in stabilization of the coastal sands. Pods with seeds derive from afforested areas and are blown by the wind. In the southern coastal plain, where dunes still exist, individual trees occur among sand dunes in habitats of sand deposition, mainly at the foot of the slip-face part of the dunes. This habitat is known also as "interdunes". *A. saligna* trees are also planted in large quantities along roads in Israel.

Wild fires of afforested pine woodlands 30 km west of Jerusalem (Sha'ar HaGai area), where *A. saligna* trees were planted as well, took place in the late 1990's. The nature of *A. saligna* as an aggressive colonizer (Stirton 1978) of burnt sites with low competition was prominent when the strong fire was followed by development of a green mantle of *A. saligna* seedlings in the first years after the fire. In summer 2000 this is the dominant plant of the slopes discussed above.

Spontaneously established *A. saligna* trees are found also on crushed rocks which make up the sides of newly constructed roads, on fresh cuts of hills near roads, and on heaps of waste material derived from buildings.

Adonis flammea Jacq.

Ref.: Baierle (1993).

Note: The specimen collected by Baierle was determined by the expert for *Adonis* in the Near East, C.C. Heyn (BSB!)

Aegilops cylindrica Host

Ref.: Danin & Scholz (1994).

Note: A small population of this adventive species was found in Jerusalem 500 m N of the entrance to the Givat Ram campus of the Hebrew University in the early 1990's. A few months after the first finding most of the land on which it grew was removed in the process of construction of a new road. It was not collected or observed again yet.

Agrostis stolonifera L.

Note: The specimens in HUJ: Golan: Bab el Hawa, 25.7.1967, Y. Parag, Dan Valley: Tel Dan, near the Roman bridge, 24.6.1973. Both determined by Feinbrun.

Ailanthus altissima (Mill.) Swingle

Note: A tree introduced from China as an ornamental tree during the 20th century. Often planted in urban areas as ornamental, and easily escapes by vegetative propagation from roots and from seeds by germination and establishment in disturbed ground. It often germinates in crevices of sidewalks, walls of old buildings and roadsides, sends efficient root system below asphalt cover and breaks it. It is a dangerous invader that is hard to control.

Alisma gramineum Lej.

Ref.: Fragman, in Greuter & Raus (1999): p. 64.

Alliaria petiolata (M. Bieb.) Cavara & Grande

Note: The first specimens in HUJ: Judean Mts., Jerusalem, The Hebrew University Campus, 15.3.1976 (possibly as an occasional alien); Golan, Tel Avital, 24.5.1987, Y. Or.

Aloe vera (L.) Burm. f.

Note: It is hard to state if the plant is an adventive synanthropic plant or spontaneous plant in the study area (cf. Shmida, 1995). It is known for a long time as a medicinal plant and could be brought here as such. The few populations found in Israel are confined to the proximity of Moslem cemeteries, where the *A. vera* was planted as ornamental. In Israel its flowers are mostly yellow. In SW Jordan there is a large population of *A. vera*, with dark orange-coloured flowers, within the area of the ancient city of Petra. It is confined there to crevices in sandstone outcrops near the museum and looks rather spontaneous. A small population was found along the path of ancient road from Petra to Jebel Baida, some 3 km north of the main location within Petra. Further investigations in the sandstone desert of Jordan and of Saudi Arabia may prove the actual status of this species in the study area.

Alyssum desertorum Stapf

Ref.: Al-Eisawi (1985b).

Alyssum szowitsianum Fisch. & C.A.Mey.

Note: I could not find the origin of this record for Edom; there are several herbarium specimens at HUJ from Mt. Hermon.

***Amaranthus blitum* L.**

Note: This is a very common weed in Israel and Jordan at present. It might be that it was present in the study area for a long time, but was overlooked because of the high similarity to *Amaranthus viridis* L. (syn.: *A. gracilis* Desf.), which is known from the study area for a long time (Zohary 1966). The two diagnostic characters are, seed surface (completely smooth and shiny in *A. blitum* versus opaque and minutely punctate (in high magnification) in *A. viridis*). The fruit surface is slightly rugose and the fruit distinctly exceeds the perianth in *A. blitum* whereas strongly muricate, equaling or slightly longer than the perianth in *A. viridis*.

***Amaranthus deflexus* L.**

Note: The first and only specimen in HUJ: Sharon, Hadera, orangerie, 7.10.1907, A. Aaronsohn. det. Liston.

***Amaranthus rudis* Sauer**

Ref.: Danin & Liston, in Greuter & Raus (1986): 414. For additional aspects see Dafni & Heller (1990).

Note: This species is confined to naturally disturbed ground, albeit being part of a genus, most of species of which are known in the study area as colonizers of human-disturbed ground. It was collected mainly from banks of watercourses, artificial water reservoirs, or at the largest water reservoir of Israel – the Kinnereth (the Sea of Galilee).

***Ambrosia confertiflora* DC.**

Ref.: Danin (1994).

Note: The population, which was sampled and discussed by Danin (1994), could not be detected after 1999. It is probably a case of non-successful establishment of an adventive plant.

***Ambrosia tenuifolia* Spreng.**

Ref.: Danin (1994); Danin, in Greuter & Raus (1995): p. 172.

Note: The first specimen collected so far continue to multiply vegetatively in the first collection site: Israel, Sharon Plain: near Hadera, roadside in muddy soil, 27.12.1991, Danin (HUJ).

***Ambrosia trifida* L.**

Note: The first specimen in HUJ: Akko Plain: Qishon bridge, 7.1987, Y. Marta.

***Anabasis oropetiorum* Maire**

Ref.: Danin, in Greuter & Raus (1982a): p. 38.

***Andrzeiowskia cardamine* Rchb.**

Ref.: Heller & Liston in Greuter & Raus (1985): p. 63.

Note: The first record in HUJ is: Golan: Dalhemiya, 7.4.1980, Y. Ivri.

Anoda cristata (L.) Schltdl.

Note: The first record in HUJ is: Pleshet, kibbutz Netzer Sereni, cotton field, July 1981, H.K. Mienis. For additional aspects see Mienis (1982) and Dafni & Heller (1990).

Arabidopsis thaliana (L.) Heynh.

Note: The first record in HUJ is: Golan: Masa'ada forest, 22.4.1973, Shmida, Dafni & Lerner. So far it was not collected elsewhere.

Araujia sericifera Brot.

Note: A vine, introduced from S Brazil as an ornamental plant in the late years of the 20th century. It escapes from cultivation and succeeds to establish itself in nearly abandoned citrus orchards and abandoned ones. It is wind-dispersed and being a vine it evidently has a biological advantage in germination and establishment at the shade of trees where not many competitors can survive. For additional aspects see Dafni & Heller (1990).

Artemisia scoparia Waldst. & Kit.

Note: A few casual specimens of this un-naturalized alien are deposited in HUJ: Coastal Plain: Ramat Gan, 8.4.1936, Eig, Zohary & Feinbrun, N Negev: Beer Sheva, 31.10.1949, Y. D'Angelis.

Asparagus plumosus Baker

Note: A common cultivated vine in ornamental gardens. It succeeds very well as a vine in abandoned, almost abandoned, or slightly managed citrus orchards of the coastal plain.

Asplenium scolopendrium L.

Ref.: Danin, in Greuter (1980a): p. 18.

Asplenium trichomanes L.

Note: According to Zohary (1976): p. 70, this species is known from the Galilee and the Golan. There are no herbarium specimens at HUJ to verify this note.

Astragalus brachystachys DC.

Ref.: Danin & Liston, in Greuter & Raus (1986): 427.

Astragalus camelorum Barbey

Ref.: Baierle (1993): p. 224.

Astragalus eremophilus Boiss.

Ref.: Danin & Liston, in Greuter & Raus (1986): p. 427.

Astragalus ehrenbergii Bge.

Ref.: Baierle (1993): p. 224.

Atractylis mernepthae Asch., Schweinf. & Letourn.

Note: First specimen in HUJ: Arava Valley: near Hazeva, sandy wadi, 1.1.1975, Danin, det. K. Schmid (M).

Atriplex holocarpa F. Muell.

Ref.: Danin, in Greuter & Raus (1982a): 40. Reported as *Senniella spongiosa* (F. Mueller) Aellen. For additional aspects see Dafni & Heller (1990).

Atriplex muelleri Benth.

Ref.: Danin, in Greuter & Raus (1982a): p. 38.

Atriplex nummularia Lindl.

Note: An indigenous Australian shrub, naturalized in California, introduced to Israel as a fodder during the 2nd half of the 20th century. There is but a few places where *A. nummular* established itself. However, since it resembles *A. halimus* in its general morphology it is possible that many individuals of *A. nummularia* were overlooked.

Atriplex suberecta Verd.

Ref.: Danin, in Greuter & Raus (1982b): p. 191.

Note: This species was first recorded by Danin (1982b) as *A. microcarpa* Benth. A more proper was found after the publication of the Chenopodiaceae in the Flora of Australia (Wilson 1984: p. 113).

Azolla filiculoides Lam.

Note: Specimens collected by M. Chaouat in the Golan without a specified location, nor with herbarium specimen were raised in the botanical garden at Mt. Scopus for a few years.

Barbarea brachycarpa Boiss.

Note: According to Zohary (1976): p. 156, known from the Golan.

Bassia scoparia (L.) A. J. Scott

Note: The first specimen at HUJ: Bet Shean Valley: Tirat Zvi, near ponds, 6.10.1970. For additional aspects see Dafni & Heller (1990).

Biarum auraniticum Mouterde

Ref.: Cohen (1999): p. 229.

Note: The first specimen in HUJ: Golan, Rujm el Hiri, 2.11.1996, O. & M. Cohen.

Borrchia frutescens (L.) DC.

Note: The first record in HUJ: Israel, the Philistean Plain, Tel Aviv coast, 1 km S of Reading Power Station. Crevices of side walk at the spray zone, 6.6.2000, Danin, det. D.J.N. Hind (K).

A native of the USA, found from Virginia to Florida and Texas. It is apparently common on sandy sea-shores and in salt marshes. It has one obvious common name, of

'Sea Ox-eye'. The mode of its introduction into Israel is not known. It is not listed as an ornamental plant. It has a high potential of becoming an established alien. Being resistant to the sea-spray, evidenced by its origin and by the robust tufts with somewhat succulent leaves seen on the first collection site, there is a good chance that it will occupy more and more of this habitat in years to come.

***Bothriochloa saccharoides* (Sw.) Rydb.**

Note: This plant is known so far only from the campus of the Hebrew University of Jerusalem, at Givat Ram, Jerusalem. It grows mainly as a weed in ornamental beds of small shrubs irrigated, but not frequently, in summer.

***Brassica cretica* Lam. subsp. *aegea* (Heldr. & Halácsy) Snogerup**

Ref.: Heller & Liston in Greuter & Raus (1985): p. 64.

Note: The first record in HJ: Carmel: Nahal Mearot, N exposure, cliffs, 10.6.1976, H. Lahav.

***Brassica napus* L.**

Note: A common crop plant in Europe, where it is raised for its seeds, used for obtaining food oil. Thousands of tons of these seeds are imported by boats to Israel. Trucks transfer the seeds to the oil-factories destinations. Occasional seeds fall at the roadsides where no competitors exist as a result of roadside management practiced in Israel. It is impossible to call it an established alien, but it is constantly found at the roadsides.

***Bromus chrysopogon* Viv.**

Ref.: Danin (1992): p. 72.

***Bromus haussknechtii* Boiss.**

Ref.: Baierle & al. (1988): p. 465

***Bromus intermedius* Guss.**

Specimen seen: Lower Galilee, near Iblin, stony hills, 10.5.1967, Danin (HJ), det. H. Scholz.

***Bromus pseudobrachystachys* H. Scholz**

Ref.: Danin (1992): p. 74.

***Bromus secalinus* L. subsp. *decipiens* Bomble & H. Scholz**

Ref.: Recorded first as *B. commutatus* Schrad. (Danin & Scholz 1994), and changed into the present epithet (by the courtesy of Prof. H.Scholz).

***Bromus sericeus* Drobov**

Ref: Danin (1992): p. 74.

***Bupleurum libanoticum* Boiss. & Blanche**

Note: The first specimen in HUJ: Golan, between Buqata and Mas'ada, maquis on basalt rocks, 31.3.1967, M. Zohary, det. O. Cohen.

Calystegia soldanella (L.) Roemer. & Schult.

Note: First specimen in HUJ: Coast of Galilee, near Rosh Haniqra, 7.5.1976, Y.Cohen.

Campanula peregrina L.

Note: First specimen in HUJ: Upper Galilee, Nahal Keziv, Ein Tamir, 12.7.1985, A. Aaroni, det. O. Cohen.

Caralluma tuberculata N. E. Br.

Ref.: Baierle (1993): p. 215.

Castellia tuberculosa (Moris) Bor

Note: First record in HUJ: Dead Sea, low ground, alt. (-)394 m, 26.3.1912 Meyers & Dinsmore 72991; det. F. Scholz, 2000. Prof. H. Scholz discovered a small specimen of this rare species on a herbarium sheet of *Bromus pseudobrachystachys* H. Scholz.

Centaurea eriophora L.

Ref.: Witztum (1989).

Centranthus longiflorus Steven

Note: In moister Mediterranean countries, such as S France, Languedoc, this plant is a well-known colonizer of scree and other naturally disturbed habitats. In Israel it is planted in ornamental gardens, escapes from cultivation in urban areas and occasionally found in crevices in sidewalks and stone steppes in towns of the Mediterranean territories.

Chenopodium ficifolium Sm.

Ref.: Garve, in Greuter & Raus (1989): p. 28.

Chenopodium urbicum L.

Specimens examined: Israel: Kinnroth Valley, environs of Almagor, 8.9.1967, Danin & Zohary (HUJ!).

Ref.: Danin & Uotila, in Greuter & Raus (1989): p. 53.

Note: An important colonizer of the newly exposed shores of the coast of the Sea of Galilee, resulting from consequent drought years. Following several consequent dry years, this weed became the dominant and only species of many muddy areas, which were exposed in the long summer of 2000.

Chloris barbata Sw.

Specimen examined: Jordan, Ammon: Wadi Zarqa Ma'in, near the hot springs, an alluvial terrace, 18.xii.1997, Danin. 974301 (HUJ!), det. H. Scholz.

Note: The only place in the study area this plant is known of is the area near the hotel by the hot springs of Wadi Zarqa Ma'in. The plant grows in opened habitats of both

natural and anthropogenic habitats. These are dry wadis that may flow temporarily in rainy years and in abandoned seasonal flowerbeds.

***Chloris pycnothrix* Trin.**

Ref.: Danin & Cope, in Greuter & Raus (1995): p. 176.

Note: The only specimens available at the herbarium of the Hebrew University (HUJ) are those reported from the Philistean Plain from 1989.

***Ciclospermum leptophyllum* (Pers.) Sprague**

Ref.: Danin, in Greuter & Raus (1995): p. 175.

Note: Reported as *Apium leptophyllum* (Pers.) Benth., its older synonym from: Israel, Judean Mts. Jerusalem, irrigated lawn, 24.5.1990. This minute annual kept growing for additional two years in the small collection site and was not found there or anywhere else any more.

***Cirsium vulgare* (Savi) Ten.**

Ref.: Liston, in Greuter & Raus (1987): p. 440.

***Commicarpus sinuatus* Meikle**

Ref.: Greuter, in Greuter & Raus (1987): p. 448.

Note: Greuter (1987) writes that *C. sinuatus* is presented in Zohary (1966) from the southern Negev and Arava Valley as *C. africanus* var. *viscosus*.

***Consolida coelesyriaca* Mouterde**

Note: Baierle (1993): p. 233.

***Consolida hispanica* (Costa) Greuter & Burdet**

Note: The first specimen in HUJ: Golan, Qubet-Qarah, 6.5.1973, Didi & Edit. For nomenclature see Greuter in Greuter & Raus (1989): p. 43.

***Consolida tomentosa* (Aucher) Schrödgr. subsp. *oligantha* (Boiss.) Davis**

Note: Boulos & al., (1975): p. 369.

***Cornulaca monacantha* Delile**

Ref.: Danin, in Greuter & Raus (1982a): p. 39.

***Corydalis triternata* Zucc.**

Note: The first specimen in HUJ: Golan, near Mas'ade, 1000m, maquis, 27.2.1968, M. Livneh.

***Cotoneaster nummularius* Fisch. & C. A. Mey.**

Ref.: Baierle & al., (1988): p. 466.

***Crassula vaillantii* (Willd.) Roth**

Ref.: Witzum & Raviv (1988).

Cupressus semperinens* L. var. *sempervirens

Note: Mediterranean tree, domesticated from *C. sempervirens* L. var. *horizontalis* (Mill.) Aiton. Introduced as ornamental hundreds of years ago. The cultivar is found in the mountains of the Mediterranean territories of Israel near roads where extreme disturbance of the natural environment took place. Such places are parts of the roads where hills were cut in order to level mountains for preparing path for the asphalt road. Close source of seeds seems to be essential for semi-spontaneous establishment of the tree. There are a relatively higher number of trees in sites where rocks are of soft layers interbedded with fissured hard ones.

Another habitat where self-establishment of this variety of *C. sempervirens* takes place is abandoned quarries of limestone where heaps of crushed rocks occur. In the two habitats individuals of *Cupressus sempervirens* var. *horizontalis* and *A. arizonica* Green occur as well. The origin of their seeds is also from planted forests. However, in order to avoid confusion with the relict *C. sempervirens* var. *horizontalis* populations found in Edom, Jordan (Danin 1999) this taxon is not discussed here.

***Dalbergia sissoo* Roxb.**

Ref.: Danin, in Greuter & Raus (1989): p. 31.

Note: The record of this plant from the waterfalls of En Gedi is based on flowers and leaflets I saw (and did not properly collect) floating on the water below the trees, which are extremely hard to access. After 1996 it was observed by Israeli visitors in a spring near Safi, Jordan, but not collected yet.

***Damasonium polyspermum* Coss.**

Note: First specimen in HUJ: Lower Galilee, Kibbutz Khaquq, stagnant water, 22.4.1976, Rabinowitz.

***Datisca cannabina* L.**

Ref.: Danin, in Greuter & Raus (1989): p. 28.

Note: No specimen of this species was collected in Israel after the report of the single specimen of this species reported as cited.

***Digitaria ciliaris* (Retz.) Koeler**

Note: The first specimen in HUJ: Pleshet, Bar Ilan University campus, 20.9.1992, Y. Melamed.

***Diplotaxis tenuifolia* (L.) DC.**

Ref.: Danin, in Greuter & Raus (1987): p. 440.

Note: In agreement with the note of 1987, this plant is not found yet out of Jerusalem area.

***Ducrosia flabellifolia* Boiss.**

Note: Boulos & Al-Eisawi (1977b): p. 274.

***Ehrharta erecta* Lam.**

Ref.: Danin & Scholz, in Greuter & Raus (1999): p. 65.

Specimens seen: Israel, Sharon Plain: Hanniel, 12 km E of Natanya, annual weed in irrigated orange grove, in the shade of trees, 10.4.1999, Danin.

Note: It is a recently introduced adventive weed, confined to sandy soils and partly shaded, summer-moist habitats.

***Einadia nutans* (R. Br.) A. J. Scott**

Ref.: Danin & Heller, in Greuter & Raus (1998): p. 164.

Note: An indigenous lignified vine of S Australia and New South Wales, introduced as a potential ornamental plant for dry lands during the 2nd half of the 20th century. Escaped from experimental plots of plant introduction at a research institute in Beer Sheva, the N Negev. It has juicy and coloured small diaspores and is possibly distributed by small birds through endozoochory. It establishes itself in hedges mainly in the urban areas of Beer Sheva.

***Enchylaena tomentosa* R. Br.**

Ref.: Danin & Heller, in Greuter & Raus (1998): p. 164.

Note: An indigenous subshrub to shrub of Australia, introduced as a potential fodder or an ornamental plant for dry lands during the 2nd half of the 20th century. Escaped from experimental plots of plant introduction at a research institute in Beer Sheva, the N Negev. Most individuals observed were in abandoned gardens in the urban areas of Beer Sheva. Its fruits resemble bird-dispersed diaspores, which may be dispersed through endozoochory.

***Ephedra pachyclada* Boiss. subsp. *sinaica* (H.Riedl) Freitag & Maier-Stolte (1994).**

Note: The occurrence of *E. pachyclada* in the Near East was reported first from Sinai (Danin 1973: p. 25 and Danin & Hedge 1973: p. 264). I collected the type specimen of subspecies *sinaica* (H.Riedl) Freitag & Maier-Stolte in Sinai in smooth-faced granite cliffs. Riedl (1980) described *Ephedra sinaica* and based it on my specimens deposited in the herbarium at Edinburgh (E). Freitag & Maier-Stolte, (1994) sunk *E. sinaica* into a subspecies and reported a few specimens found in SW Jordan. It is rather common in steppes of Edom (SW Jordan) on stony slopes.

***Eragrostis virescens* J. Presl**

Syn.: *Eragrostis mexicana* (Hornem.) Link subsp. *virescens* (J. Presl) Koch & Sanchez.

Note: The first specimen was collected in Jordan, at the lowlands of Edom: Ain Fidan, 40 km S of Safi, near a stream of fresh water, 17.7. 2000, Danin 2K0316, det. H. Scholz (HUJ, B). It is a S American species in origin, but now distributed to warmer countries throughout the globe (Martin & Scholz, in Willdenowia 28:59-63 [1998]).

***Eucalyptus camaldulensis* Dehn.**

Note: A tree introduced from W. Australia as an ornamental- and forest-tree at the 1880's. Rarely germinating and establishing itself spontaneously in Israel. For many years *E. camaldulensis* was one of the most common trees used in afforestation on various soils types. At its area of origin it dominates riparian vegetation (its common name in Australia is "river red gum"). The common habitat where germination and

establishment of this tree takes place in ditches along the highway in areas of deep clayey soil (Grumusol) where irrigated agriculture is practiced near the road. Functioning as drainage canals, the ditches may have wet ground throughout the summer. Meeting the germination demands of *E. camaldulensis* in this habitat may be a result of the existence of moist soil in summer. Millions of seeds produced by the adult trees every year are wind-disperses.

A nearly natural establishment of *E. camaldulensis* took place in watercourses of the N. Negev following the rainy year 1990-91. In that year much of Israel, including the northern Negev received ca 200% the average annual rainfall. During the following three years wadis which were sometimes streaming in winter drained water the year round. In such wadis *E. camaldulensis* germinated and established themselves spontaneously as well.

***Euphorbia bivonae* Steud. var. *sinaica* Hadidi**

Ref.: Al-Eisawi & al., (1996) recorded it from rocky ground, Wadi Rum, S Jordan.

***Euphorbia lasiocarpa* Klotzsch, *E. serpens* Kunth, and *E. supina* Raf.**

Note: The three species of *Euphorbia* listed above belong to the group of adventive and naturalized species which develop mainly in summer, in garden plots irrigated with trickle pipes. Thanks are due to Mr. Radcliff-Smith, at Kew, for the determination of these species in the 1990's. That information was used by Feinbrun-Dothan & Danin (1991). For additional aspects see Dafni & Heller (1990).

***Fagonia schimperii* Presl**

Specimen examined: Jordan, Edom: Rum area, 8 km SE of Wadi Rum rest house, in crevices of smooth-faced granite outcrops, facing west, 13.10.1998, Danin 981304.

Ref.: Danin, in Greuter & Raus (1999): p. 64.

Note: This is one of the *Fagonia* species already known from Sinai and discovered recently from Jordan. In both areas it is confined to rocky terrain, magmatic in Sinai and sandstone in Jordan.

***Fallopia convolvulus* (L.) Á. Löve**

Ref.: Danin, in Greuter & Raus (1989): p. 41.

Note: An adventive weed, which grows in small quantities here and there in summer-irrigated ground.

***Galium ghilanicum* Stapf**

Ref.: Danin (1992): p.110.

***Galium spurium* L.**

Ref.: Danin & Liston, in Greuter & Raus (1984b): p. 308.

***Gamochaeta pensylvanica* (Willd.) Cabrera**

Ref.: Kilian & Danin, in Greuter & Raus (1999): pp. 53-54.

Specimens examined: Israel, Sharon Plain: Hanniel, 12 km E of Netanya, orange orchard,

21.4.1985, Raviv (HUJ!); Philistean Plain: Beerot Yitzhak, 24.4.1988, Flint (HUJ!).

Note: The ecological niche this adventive plant is occupying at present is disturbed, irrigated and shaded sandy soils of the coastal plain.

Gastridium phleoides (Nees & Meyen) C. E. Hubb.

Ref.: Scholz, in Greuter & Raus (1998): p. 171.

Note: In addition to the specimen reported by Scholz from the Negev Highlands I collected, March 2000, additional specimens of this species (det. H. Scholz) at the Judean Mts., 15 km W of Jerusalem (HUJ, B).

Geranium libanoticum Schenk

Note: The first specimen in HUJ: Golan, east of Buq'ata, NE face of Har Varda, volcanic tuff, alt. 1160 m, 5.5.1991, O. Cohen.

Hedysarum* cf. *pogonocarpum Boiss.

Ref.: Baierle & al., (1988): p. 463.

Note: The plant recorded and illustrated by Baierle & al., (1988) is evidently new to the Flora Palaestina area. Its final determination anticipates further investigation.

Helianthus annuus L.

Note: The first specimen in HUJ: Bet Shean Valley, near Tirat Zevi, roadside near fishponds, 8.7.1971, M. Zohary & A. Shmida. The identity of the adventive *Helianthus* species in the Flora Palaestina area is not critically reviewed yet. For additional aspects see Dafni & Heller (1990).

Heliotropium lasiocarpum Fisch. & C. A. Mey.

First specimen: Jordan, Ammon: 25 km S of Amman, Loessial soil near the road 1 km N of Queen Alia Airport, 16.7. 2000, Danin 2K0102; det.: H. Foerther (M) and Nadja Diane (BSB).

Henrardia pubescens (Bertol.) C. E. Hubbard

Ref.: Baierle & al., (1988): p. 465

Hippocrepis biflora Spreng.

Note: Prof. P. Lassen (pers. comm., 2000) enlightened the following specimens determined by him: Sharon, Meyers & Dinsmore 6446 (E p.p.); Upper Galilee: W. el Qarn, Pabot s. n. (G!); Esdraelon Plain, 23.4.1931, Naftolsky (HUJ!); Davis 4153 (E!, K!); Moav, Meyers & Dinsmore M446 (G!, K p.p.).

Hohenackeria exscapa (Stev.) Kos.-Pol.

Ref.: Al-Eisawi et al., (1994).

Hypericum olivieri (Spach) Boiss.

Note: Boulos & al., (1975): p. 368.

***Hypericum perforatum* L.**

Ref.: Liston, in Greuter & Raus (1987): p. 441.

***Hypericum sinaicum* Hochst. & Steud. ex Boiss.**

Specimens seen: Edom, Dana Reserve, a limestone cliff 500 m above and east of the visitor center 13.5.1996, Danin 962609.

Note: Danin (1997) Willdenowia 27: p. 172. The population discovered in Jordan is very small. However, the limestone cliffs of SW Jordan are poorly investigated and it may be more common. The large distance of hundreds of kilometers between the populations known so far in Saudi Arabia and in Sinai may be regarded as discontinuity related to dispersal in the past when conditions enabled more continuous growth. Many species growing with *H. sinaicum* in Jordan are relicts of this kind (Danin, 1999a, 1999b).

***Ipomoea hederacea* Jacq.**

Note: The first specimen in HUJ: Dan Valley, Kibbutz Dafna, in cotton field, 20.9.1984, D. Yoel & A. Liston.

***Ipomoea indica* (Burm. f.) Merr.**

Ref.: Liston, in Greuter & Raus (1987): p. 440.

Note: Liston (1987) mentions a specimen collected by M. Zohary 19.3.1962 and states that the status of that species is not known. The status did not change to the present day.

***Ipomoea pes-caprae* (L.) R. Br.**

Note: Zohary (1976: p. 300) mentions the finding of this species in the coastal plain without an accurate location. There is no specimen of this species from the Flora Palaestina area in HUJ.

***Ipomoea triloba* L.**

Note: Dan Valley, Kibbutz Dafna, in cotton field, 20.9.1984, D. Yoel & A. Liston.

***Lactuca aculeata* Boiss.**

Note: First specimen in HUJ: Golan, near Nov, 23.9.1977, Golberson.

***Lantana camara* L.**

Note: An ornamental plant introduced from Tropical America at an unknown date but, following the general history recorded by Stirton (1978), it seems to have been introduced during the 20th century. *L. camara* is a noxious weedy plant, which is rated as one of the ten worst weeds in the world (Stirton 1978). It is dispersed by birds through endozoochory and easily establishes itself in cultivated crops that are not intensively managed. A prominent habitat of this plant is almost abandoned or abandoned citrus groves. *L. camara* is often transferred from ornamental gardens to these abandoned orchards by birds. The latter tend to stand on trees and drop seeds,

which passed in their intestine on soil poor in competing annuals, due to low light intensity. The weedy *L. camara* germinates and establishes itself in this habitat. *L. camara* often looks like a vine covering entirely dead citrus trees. Dafni & Heller (1990) discuss additional aspects of this species.

Another common habitat of *L. camara* is date-palm plantations irrigated by trickle-pipes. These are common along the Jordan-Dead Sea-Arava rift valley. In this area and especially in the oasis of En Gedi it threatens to outcompete local flora in natural habitats. In addition to these two clear habitats, *L. camara* is a common component of the wasteland vegetation in the lowlands of the Mediterranean territories of Israel.

***Lappula barbata* (M. Bieb.) Gürke**

Specimen examined: Edom, northern section of Dana Reserve, the *Cupressus sempervirens* reserve, sandy soil 15.v.1996, Danin 963106. Reported by Al-Eisawi (1983) from the same location.

***Lappula sinaica* (DC.) Asch. & Schweinf.**

Ref.: Baierle & al. (1988): p. 460.

Note: A common steppe and desert annual of S Sinai. Collected without a clear record in Elat area and in a steppe-forest of *Juniperus phoenicea* in Edom north of Wadi Musa.

***Lasiospermum brachyglossum* DC. var. *sinaicum* Asch. & P. Hoffm.**

Ref.: Al-Eisawi & al. (1996).

***Lathyrus annuus* L.**

Note: The first specimen in HUI: Sharon, E of Ma'agan Mikhael junction, abandoned field, 12.4.1994, Leon 71403.

***Lathyrus ciliolatus* Rech. f.**

Ref.: Mattatia (1977).

***Lathyrus palustris* L.**

Note: A single population was recorded from the Jerusalem Forest near Upper Motza. Possibly escaped from cultivation and established itself at the shade of forest trees and some wastewater derived from houses above it.

***Lathyrus sphaericus* Retz.**

Ref.: Mattatia (1974).

***Lavandula dentata* L.**

Ref.: Baierle & al., (1988): p. 463.

***Lavatera arborea* L.**

Note: Occasional individuals develop on highly disturbed ground, mainly in urban areas and near roads.

***Leopoldia tenuiflora* (Tausch) Heldr.**

Ref.: Baierle & al. (1988): p. 463.

***Leptochloa mucronata* (Michx.) Kunth**

Note: Danin & Scholz, in Greuter & Raus (1998): pp. 171-172, reported the occurrence of this species under its synonym: *Leptochloa filiformis* (Lam.) P. Beauv. For information concerning this synonymy see: Taxon 42: 413-417 (1993).

***Leptochloa uninervia* (J. Presl) Hitchc. & Chase**

Ref.: Danin & Scholz, in Greuter & Raus (1999): p. 66.

Note: This new adventive grass is confined to muddy soil of the newly exposed land at the beach around the Sea of Galilee. In the last few years, as a result of frequent droughts there is a considerable drop of water level of the lake during the summer. *L. uninervia* became one of the common colonizers of the expending land of moist soils of the beach.

***Lotus hispidus* DC. in Lam., Fl. Fr. ed. 3, 5 (=suppl.): 572 (1815)**

Ref.: Lassen, in Greuter & Raus (1987): p. 445 (as *L. subbiflorus* Lag.; Greuter & al., (1989): p. 133.

Note: Lassen (1987) saw and determined two herbarium specimens from Israel, the Sharon Plain (pers. comm.); Greuter & al., (1989) presented the epithet *L. hispidus* DC. (1805) suggesting that this is the correct specific epithet. However, Lassen does not agree with this statement (in litt., Sept. 2000) and communicated that whereas *L. hispidus* DC. (1805) is a mistake, De Candolle corrected the mistake in 1815 edition.

***Maireana brevifolia* (R. Br.) P. G. Wilson**

Ref.: Danin, in Greuter & Raus (1982a): p. 39.

Note: An Australian semishrub to shrub, introduced as an ornamental or fodder plant for dry lands during the 2nd half of the 20th century. Escaped from cultivation and established in roadsides where plants enjoy extra water supply as runoff from asphalt roads and low competition. It is also found in highly disturbed sites where soil was removed in the processes of road construction. The sites where it grows are mainly on slightly saline loessial soils.

***Medicago arborea* L.**

Ref.: Baierle & al., (1988): p. 461.

***Melia azedarach* L.**

Ref.: Danin, in Greuter & Raus (1989): p. 36.

Note: An ornamental tree of a SE Asian origin (the common names China-Tree or China-Berry may indicate its origin) which succeeds to establish itself in human disturbed habitats throughout the moist parts of the country. This tree produces fruits suc-

cessfully wherever it grows. The fruits are bat-dispersed and the ground below fruit bats "resting" places may be covered by huge quantities of *M. azedarach* stones, each containing many small seeds. *M. azedarach* trees may be found in mal-managed and abandoned citrus groves. Wasteland, where competition is low for a long period of time, also supports this tree.

***Melica canescens* (Regel) Lavr.**

Ref.: Baierle & al. (1988): p. 465

***Mentha suaveolens* Ehrh.**

Note: Specimens collected by M. Chaouat in the Golan without a specified location nor with herbarium specimen are raised in the botanical gardens of Jerusalem at Givat Ram and Mt. Scopus.

***Minuartia intermedia* (Boiss.) Hand.-Mazz.**

Ref.: Baierle & al. (1988): p. 460.

***Minuartia sinaica* (Boiss.) Danin**

Ref.: Danin (1987).

Note: This taxon was regarded as a synonym of *Minuartia picta* (Sm.) Bornm. (Greuter & al., 1984: p. 223). When the two taxa meet together (e.g., the Negev Highlands in a good rainy year – cf. Danin, 1987), they grow on different soil types and differ morphologically. Their petal size and their leaf and stem indumentum correlates with seed surface morphology (using SEM images). These are not geographical races, nor local variation in certain populations, but a constant assemblage of morphological and ecological conditions, and therefore deserve a species level recognition.

***Moenchia erecta* (L.) P. Gaertn. & al.**

Note: The first specimen in HUJ: Golan, clearing in forest near Mas'ada, basalt soil, 29.4.1968, M. Zohary.

***Morus alba* L.**

Note: A fruit tree, introduced from C & E China. It was planted in some places as food for butterfly caterpillars ("silkworms"). *Birds through endozoochory frequently disperse Morus alba*. A preferred position for birds is high places; thus standing and watching the area around them, birds often use orchard trees as their watching sites and enrich the soil below them with droppings. Whereas the area below the fruit trees is ploughed against weeds, the abandoned orchards, during the first years after cultivation ceased are not ploughed and the seeds transported and dropped by the birds germinate and the plants establish themselves.

***Myosotis refracta* Boiss.**

Note: The first specimen in HUJ: Jordan, 4 km S of Wadi Sabat, 2 km N of Jebel Umm Adami, 55 km ESE of Aqaba, 10.V.1998, Danin 980313.

***Myosurus minimus* L.**

Note: The first specimen in HUJ: Upper Galilee, Har Meron, Khirbet Zabad, 1.5.1966, Sagi.

***Najas guadalupensis* (Spreng.) Magnus**

Ref.: Witztum & Chaouat (1991): p.65-66.

***Nicandra physalodes* (L.) Gaertn.**

Note: The first specimens in HUJ: Akko Plain, Haifa Bay, entrance to Shemen Factory, 17.6.1986, Y. Marta. Dafni & Heller (1990) discuss additional aspects.

***Garidella nigellastrum* L.**

Note: Danin, in Greuter & Raus (1989): p. 44. See also the comment on *Garidella unguicularis* Poir.

***Nigella segetalis* M. Bieb.**

Note: Collected once in the Negev Highlands. In that population, which developed on loessial soil of an ancient agricultural terrace between Nahal Elot and Borot Lotz, at the shrub-steppe zone at an elevation of approximately 1000 m, there were young specimens. Mature specimens should be collected there to make this record clear beyond any reasonable doubt.

***Nitraria schoberi* L.**

Note: Recorded by Kislev & al., (1992) from 19,000 old site at the shores of the Kinnereth (Sea of Galilee). At present does not grow in the Flora Palaestina area, but east of the 36° longitude.

***Oenothera biennis* L.**

Note: The first and only specimen in HUJ: Pleshet, 0.5 km S of Masmiya junction, 25.8.1989, Dafni.

***Oenothera laciniata* Hill**

Note: Liston, in Greuter & Raus (1987): p. 448.

***Oenothera rosea* Aiton**

Ref.: Danin & Shmida, in Greuter 1980: p. 232.

***Ophioglossum polyphyllum* A. Braun**

Note: The first specimen in HUJ: Arava Valley, Hatzeva, Nahal Shezaf, sands, 11.3.1981, Shmida & Dagan.

***Ophrys flavomarginata* (Renz) H. Baumann & Künkele**

Note: Dafni & al., (1987): p. 146.

***Opopanax hispidus* (Friv.) Griseb.**

Note: Al-Eisawi (1983): p. 360.

***Panicum coloratum* L.**

Ref.: Danin & Scholz in Greuter & Raus (1998): p. 172.

***Papaver decaisnei* Hochst. & Steud. ex Elkan**

Note: Recorded from Jordan without specific location by Miller & Cope (1996): p. 344.

***Papaver glaucum* Boiss. & Hausskn.**

Note: Boulos & al. (1975): p. 368.

***Papaver somniferum* L.**

Note: There are occasional individuals of the cultivar growing at the roadsides of the mesic districts of the country. Their origin seems to be occasional seeds which fall off of the condiment "papaver seeds" transported by vehicles. The individuals are found in the belt of 3-5 m along the road sprayed with herbicides and support many other cultivars, e.g. *Secale cereale*, *Hordeum vulgare*, *Triticum aestivum* and many other plants mentioned in the present paper.

***Parapholis marginata* Runem.**

Note: First record: Israel, the Philistean Plain, Tel Aviv coast, 1 km S of Reading Power Station. Steep sandy slope at the spray zone, 6.6.2000, Danin, det. H. Scholz

***Parkinsonia aculeata* L.**

Ref: Danin, in Greuter & Raus (1989): p. 34.

Note: A central American tree, introduced during the 20th century as afforestation tree for dry lands. It is planted here and there as an ornamental tree all over Israel. It became one of the most aggressive colonizers at sides of roads sprayed with herbicides. It is growing as a dominant tree in savannas in Nicaragua and Costa Rica in deep clayey soils (known as Grumusols or Vertisols; Danin 1978). In Israel it constitutes rather dense stands on clayey soils, e.g., near the highway from Yagur to Tivon and east of Ben Gurion Airport, on the way to Jerusalem. Additional common habitats are wastelands, sites of demolished buildings material, and garbage collection heaps. In all these sites, and at the roadsides, poor competition to the establishing seedling prevails for some time.

***Paronychia capitata* (L.) Lam.**

Note: The specimen determined by the monographer (Chaudhari 1968) is: Judean Mts., Jerusalem, Matzleva, 6.5.1953, S. Leinkram. An older specimen is from Judean Mts., environs of Hartuv, 7.3.1924, Eig, det. Danin 1968. Zohary (1966): p. 131 thinks those earlier records of *P. capitata* from Flora Palaestina area "are most probably erroneous". However, most of Zohary's records of *P. sinaica* Fresen. from the Mediterranean territories of the study area seem to be of *P. capitata*.

***Paronychia macrosepala* Boiss.**

Note: Coast of Galilee, S of Gesher Haziv, sand hill, 3.5.1956, Orshan, det. M.N. Chaudhari 1968. This is the only specimen of this species in HUJ.

***Parthenium hysterophorus* L.**

Note: The first specimen in HUJ is: Bet Shean Valley, Tirat Zvi, 28.8.1979, Shmida. For additional aspects see Dafni & Heller (1990).

***Passiflora morifolia* Masters**

Note: Joel & Liston (1986): p. 219.

***Peltaria angustifolia* DC.**

Ref.: Baierle & al. (1988): p. 460.

Note: The status of *Peltaria angustifolia* in the Flora Palaestina area is discussed by Danin (1999: p.158).

***Pennisetum clandestinum* Chiov.**

Note: Although not reported before for Israel this plant is rather common in disturbed habitats, mainly in ditches along roads where the roadside management is practiced with herbicides and in heaps of remains of house construction. In my database it is listed from 25 squares of 5X5 km mainly in the Mediterranean territory of Israel. The record of this species from the Judean Desert is from the banks of Nahal Qidron (Wadi Nar), at present polluted and became an opened sewage canal which streams the year round.

***Phagnalon nitidum* Fresen.**

Note: The first specimen in HUJ is: Jordan, Jebel Umm Adami, 55 km ESE of Aqaba, a rocky wadi, 10.5.1998, Danin 980213.

***Phagnalon sinaicum* Bornm. & Kneuck.**

Note: The first specimen in HUJ is: Jordan, Jebel Umm Adami, 55 km ESE of Aqaba, a rocky wadi, 10.5.1998, Danin 980301.

***Phlomis chrysophylla* Boiss.**

Ref.: Danin, in Greuter & Raus (1982b): p. 198.

***Phyllanthus rotundifolius* Klein ex Willd.**

Note: The first specimen in HUJ is: Judean Mountains, Ramot, in a garden, 26.10.1978, H. Almagor, det. D. Heller.

***Physalis angulata* L.**

Note: The first specimens in HUJ: Esdraelon Plain, Nahalal, a weed in a garden, 10.3.1977, A. Dafni, det. W.G. D'Arcy.

***Picris babylonica* Hand.-Mazz.**

Note: A few specimens previously determined as *Picris cyanocarpa* Boiss. in HUJ were renamed in 1999 as *P. babylonica* by M. Sualla (B) who studies this group from the Middle East.

***Pinus brutia* Ten.**

Note: A tree of Mediterranean countries north and west of Israel, introduced for afforestation during the 20th century. It has casual occurrences near areas planted with *P. brutia*. Hybrids with *Pinus halepensis* occur occasionally throughout the Mediterranean part of the country. *Pinus halepensis* is the pine species most frequently planted in the Mediterranean mountains of Israel. A few spontaneous small populations of the latter occur in the Judean and Samarian Mountains. Large populations of it occur in Mt. Carmel and the Upper Galilee. Both pine species establish themselves in areas where dwarf-shrub and shrub communities cover the area. During the processes of plant succession the dwarf-shrubs discard the annual associations typical to the early stages of plant succession on old fields (Danin 1995). Casual trees of *Pinus brutia* and hybrids *Pinus halepensis* X *brutia* occur among trees of *P. halepensis* in such shrub and semishrub associations. It also occurs in roadsides on fissured limestone outcrops where hills were cut during the preparation of the road and planted forests occur in the vicinity.

***Plantago sinaica* (Barnéoud) Decne.**

Specimens seen: Edom, Dana Reserve, Wadi Barra area, below the forest-ranger station, 2 km SE of the visitor center, in crevices and near smooth-faced white sandstone outcrops, 14.5.1996, Danin 963020.

Ref.: Danin (1997) 27: p. 172.

Note: This is a common component of the rock vegetation of the smooth-faced granite at the high elevation belt of S Sinai. In SW Jordan only a few specimens were found so far and only at the collection site of the above specimen.

***Polygonum argyrocoleum* Steud. ex G. Kunze**

Ref: Danin, in Greuter & Raus (1989): p. 41.

***Polygonum aviculare* L.**

Ref: Danin, in Greuter & Raus (1989): p. 41.

***Potentilla supina* L.**

Note: First specimen in HJ: Negev Highlands, near Yeroham, wet soil in banks of the (artificial) lake, 15.7.1971, Danin.

***Pteridium aquilinum* (L.) Kuhn**

Ref.: Danin, in Greuter (1980): p. 21.

***Ranunculus lateriflorus* DC.**

Note: Danin, in Greuter & Raus (1989): p. 46.

***Robinia pseudoacacia* L.**

Note: An adventive tree of N American origin, planted as an ornamental tree. Occasionally

germinates and establishes itself in disturbed ground of urban areas and roadside in the Mediterranean territories of the study area.

Rorippa prostrata (J. P. Bergeret) Schinz & Thell.

Note: An adventive plant which invaded Israel during the late 1980's by roots attached to bulbs which were introduced from The Netherlands (Feinbrun-Dothan & Danin 1991). Multiplies mainly vegetatively. The present status and distribution is not clear.

Sageretia thea (Osbeck) M. C. Johnst.

Note: Künne in Greuter & Raus (1989): p. 48.

Sagina maritima G. Don

Ref.: Danin (1992): p. 178.

Salsola cyclophylla Baker

Note: Danin (1973): p. 22.

Salsola gaetula (Maire) Botsch.

Ref.: Danin, in Greuter & Raus (1982a): p. 40.

Salsola orientalis S. G. Gmel.

Ref.: Danin, in Greuter & Raus (1982a): p. 40.

Salvinia natans (L.) All.

Note: The first specimen in HUJ: Sharon, Netanya, Dora's Pool, 5.9.1988.

Sambucus ebulus L.

Note: Liston, in Greuter & Raus (1987): p. 439.

Sambucus nigra L.

Note: First specimen in HUJ: Upper Galilee, Ein Zeitim near Safad, wadi, 23.6.1925, Naftolsky.

Scandix australis L.

Note: Danin, in Greuter & Raus (1989): p. 48.

Scandix grandiflora L.

Note: Danin, in Greuter & Raus (1989): p. 48.

Schinus molle L.

Ref.: Danin, in Greuter (1981): p. 29.

Note: Introduced as an ornamental tree from S. America, Andes. Although being used as an ornamental plant much more than *Schinus terebinthifolius*, *S. molle* is much less common as growing independently in places where it was not actually planted. It is found casually in roadsides and wastelands.

***Schinus terebinthifolius* Raddi**

Ref.: Danin, in Greuter & Raus (1989): p. 28.

Note: A tree that was introduced from Brazil to Europe as an ornamental plant during the 19th century. It is not clear when it was introduced to Israel. It has a constant occurrence in human-managed habitats in lowlands but in small quantities. The kind of habitats *S. terebinthifolia* occupies is similar to those of *Lantana camara*, but the frequency is lower. It is found in lowlands in almost abandoned and abandoned citrus groves, trickle-pipe-irrigated date palm plantations, and in wastelands. It has small red fruits and is likely to being dispersed by small birds through endozoochory.

***Schoenefeldia gracilis* Kunth**

Note: First specimen in HJ: Pleshet, Kvouzat Schiler, a weed in irrigated lawn, 5.12.1998, B. Rubin, det. Danin & Scholz.

***Scleranthus orientalis* Roessler**

Note: The first specimen in HJ: Golan, Mas'ada forest, among basalt rocks, 4/1973, Shmida.

***Secale cereale* L.**

Note: Found casually at the herbicides-sprayed roadsides of the Mediterranean territories. The origin of the specimens may be from grains transferred for various reasons in these highways. The individuals in the roadsides do not tend to grow in-groups and may indicate new contamination annually.

***Seidlitzia cinerea* (Moq.) Bge. ex Botsch.**

Note: The first and only specimen in HJ: Edom, environs of Aneze, 22.7.1942, Zohary & Feinbrun, det. Botschantzev.

***Senna obtusifolia* (L.) Irwin & Barneby**

Ref.: Joel & Liston (1986).

***Sesbania sesban* (L.) Merr.**

Ref.: Dafni & Heller (1990).

***Setaria verticillata* (L.) P. Beauv.**

Specimens seen: Israel: Kiryat Anavim, 6.vii.1996, Danin, Jerusalem. Jordan, Edom: 1 km W of Adhruh, Irrigated fruit trees plantation, 26.x.1997, Danin 972704 (HJ).

Ref.: Danin & Scholz (1997): pp. 177-179.

Note: The two taxa in the *Setaria verticillata* complex are clearly recognized in Israel and Jordan. There is no transition in the diagnostic morphological characters of the common *Setaria adhaerens* (Forssk.) Chiov., and the newly introduced and relatively rare *S. verticillata*.

***Sida acuta* Burm. f.**

Note: First specimen at HJ: Beit Shean Valley, Tirat Zevi, near fishponds, 29.6.1980, Dafni.

***Siebera nana* (DC.) Bornm.**

Ref.: Baierle & al., (1988).

***Silene libanotica* Boiss.**

Note: A specimen of this species, collected by E. Boissier in Hebron is deposited at Boissier Herbarium in Geneve (!).

***Solanum dulcamara* L.**

Note: The first specimen in HUJ is ex herbarium Postianum: Plantae Giladenses, 4.5.1886 (the exact location is not clear). At present it is a rather common plant in the spring vegetation of the Banyas springs at the meeting zone of the Golan, the Hermon, and the Hula-Dan Valleys.

***Solanum laciniatum* Aiton**

Note: The first specimens in HUJ: Golan, Chispin, drainage channel, escaped from cultivation, 15.5.1985, O. Cohen. At the same year R. Ducas collected it from a few locations with disturbed ground.

***Sonchus microcephalus* Mejias**

Ref.: Danin (1992): p.193.

***Sterigmotemum sulphureum* (Banks & Sol.) Bornm.**

Note: Al-Eisawi (1985b): p. 953.

***Stipa ehrenbergiana* Trin. & Rupr.**

Ref.: Freitag (1985).

***Stipa holosericea* Trin.**

Ref.: Freitag (1985).

***Stipagrostis drarii* (Täckh.) de Winter**

Ref.: Baierle & al., (1988): p. 465; Danin (1994): pp. 59-61

***Stipagrostis uniplumis* (Licht.) de Winter**

Ref.: Al-Eisawi (1985a).

***Tagetes minuta* L.**

Ref.: Dafni & Heller (1990).

***Teesdalia coronopifolia* (J. P. Bergeret) Thell.**

Note: The first record in HUJ is: Golan: nr Masa'ada, shade among oaks, 7.4.1987, Danin.

***Thalictrum isopyroides* C. A. Mey.**

Ref.: Boulos & al. (1975): p. 369 (for Jordan), Danin, in Greuter & Raus (1984a): p. 54 (for Israel).

Note: This rare steppe plant was observed and collected in the Negev Highlands a few more times.

***Torilis webbii* S. L. Jury**

Ref: Jury (1987): p. 297.

***Trianthema portulacastrum* L.**

Note: Danin (1981): p. 27.

***Trifolium glomeratum* L.**

Note: Fragman, in Greuter & Raus (1999): p. 60. This *Trifolium* which was not mentioned by Zohary (1972) was well known to M. Zohary from the Golan. Fragman (1999) reports the first occurrence of this plant from the Upper Galilee. In my database it is recorded from 7 squares of 5x5 km, mainly from volcanic ash at the vicinity of volcanic cones of the eastern Golan.

***Trifolium hirtum* All.**

Note: The first and only specimen in HUJ: Golan, Bab el Hawa, 31.3.1969, Dafni, det. D. Heller.

***Trifolium sylvaticum* Gérard**

Note: Golan, near Quneitra, tuff quarry, 25.4.1969, Shmida, det. D. Heller.

***Trigonella lunata* Boiss.**

Ref.: Boulos & Al-Eisawi (1977b).

***Trigonella sibthorpii* Boiss.**

Ref.: Danin & Small (1989).

Note: The only population of this species found so far in Israel developed at a roadside in the Judean Desert Spring 1974. In the last few years, as a result of expanding the road width, the site of *Trigonella sibthorpii* population disappeared

***Trigonella spruneriana* Boiss.**

Note: The first and only specimen in HUJ: Golan, near Susita, chalk, 8.3.1984, Liston 7-84-176/18.

***Triticum urartu* Tumanian ex Gandilyan**

Ref.: Valkoun & al. (1998).

***Typha angustifolia* L.**

Ref.: Danin, in Greuter & Raus (1989): p. 48.

Note: In addition to the populations found in the newly exposed coastal area of the Kinneret in drought years and depressions with high underground water table near Rishon LeZion, it was found recently near fresh water springs at Ain al Fidan, Edom (SW Jordan), 17.7. 2000, Danin, 2K0301(HUJ).

***Urochloa panicoides* P. Beauv.**

Note: The first specimen in HUJ: Pleshet: 3 km S of Rehovot, Kibbutz Givat Brenner, a ditch draining fields near an asphalt road, 4.x.1998, Danin.

***Urochloa texana* (Buckley) R. Webster**

Note: The first specimen in HUJ: Northern Negev: Ofaqim, a weed in irrigated flowerbed. 21.x.1989, Danin 38781.

Ref.: Danin & Cope, in Greuter & Raus (1995): p. 175; first reported as *Brachiaria texana* (Buckley) S.T. Blake. This plant was collected again and was observed to be a common weed in a cotton field in the Philistean Plain and was re-determined by Prof. H. Scholz.

***Veronica panormitana* Tineo subsp. *baradostensis* (M. A. Fisch.) M. A. Fisch.**

Specimen seen: Jordan, Gilead: Zubia Reserve, north of Ajloun, maquis of *Quercus caliprinos*, alt. 1,000 m. above sea level, 16.3.1996, Danin 960845, det. M.A. Fischer.

Note: Danin (1997): p. 172. After the determination of this diploid taxon with small petals by the expert, Prof. Dr. M.A. Fischer and its distinction from the common polyploid *V. cymbalaria* Bodard, which has larger petals, it was collected also from the following districts: Sharon Plain, Samaria, Shefela, and Judean Mts.

***Veronica polifolia* Benth.**

Specimens seen: Edom, northern section of Dana Reserve, the *Cupressus sempervirens* reserve (4 km S of Bseara), 1500 m, sandy soil, 15.5.1996, Danin 963101.

Ref.: Danin (1997): p. 173.

Note: This semi-shrub, common in depressions of the subalpine Mt. Hermon (dolines) grows in a unique semi-shrub community in the steppe-forest area on sandy soil.

***Vicia benghalensis* M. Bieb.**

Note: The first specimen in HUJ: Hula Valley, Amir, 1.4.1941, F. Weisman.

***Vicia lathyroides* L.**

Note: First specimen in HUJ: Golan, Masa'ada forest, 20.4.1969, Danin.

***Vincetoxicum dionysiense* Mouterde**

Note: First specimen in HUJ: Golan, Nahal Yehudiya 3 km ENE of Katzrin, 4.9.1985, Kaplan, det. A. Liston.

***Vitis vinifera* L. subsp. *sylvestris* (C. C. Gmel.) Hegi**

Note: Rottenberg (1998): p.142 presents the summary of his observations in spontaneous populations of this taxon, and concludes that it occurs as a component in riparian vegetation of the sources of the Jordan River.

***Vulpia membranacea* (L.) Dumort**

Note: The first specimen in HUJ: Sharon, Magdiel, near Tel Aviv, sandy field, 27.4.1928, Eig, det. H. Scholz 2000. The specimen we have in HUJ is a photocopy of the spec-

imen in B. It was sent from our institute many years ago as part of "Flora Palaestinae Exicata", No. 16 *Vulpia uniglumis* Dum.

***Vulpia persica* Boiss.**

Ref.: Danin, in Greuter & Raus (1987): p. 452. Danin & Scholz (1994): pp. 257-259.

***Washingtonia filifera* Wendl.**

Note: Indigenous tree confined to fresh water springs in SW North America (California and Arizona). Introduced as an ornamental plant from California at the beginning of the 20th century. Establishing itself in disturbed ground with low competition and sufficiently wet ground. These conditions may be found in abandoned or almost-abandoned citrus groves of the coastal plain, in gardens at the Mediterranean territories, in roadsides and in trickle-pipe-irrigated date-palm groves. Prevailing spontaneously near desert springs in California and Arizona at a high range of elevations, *W. filifera* is expected to grow at a wide range of elevations in Israel as well.

3-List of species which were mis-identified in Flora Palaestina

There are a few species in Flora Palaestina, which, according to the contemporary opinions expressed in the quoted literature, were mis-identified. The erroneous name is presented in *Italics* and between inverted commas. The correct name is typed in **boldface**.

"*Allium stamineum*": *Allium daninianum* Brullo, Pavone & Salmeri, Ref: Willdenowia 26: 237-244 (1996).

Note: See discussion above under *Allium daninianum*.

"*Arabis nova*": *Arabis auriculata* Lam

Ref: Greuter & al. (1986): p. 53.

"*Aristolochia maurorum*": *Aristolochia bottae* Jaub. & Spach

Ref: Greuter & al., (1984): p. 53.

"*Artemisia herba-alba*": *Artemisia sieberi* Besser

Ref: Leonard (1984): p. 20.

"*Asphodelus aestivus*": *Asphodelus ramosus* L

Ref: Diaz Lifante & Valdes, in Danin (1992): p. 61.

"*Atriplex hastata*": *Atriplex prostrata* Boucher ex DC.

Ref: Greuter & al. (1984): p. 293.

"*Brachypodium pinnatum*": *Brachypodium sylvaticum* (Huds.) P. Beauv.

Note: Thanks are due to Prof. H. Scholz for his comments on the need to re-determine this species.

"*Bromus brachystachys*": ***Bromus pseudobrachystachys*** H. Scholz

Note: In fact most of the specimens of *Bromus* determined as "*Bromus brachystachys*" by Prof. N. Feinbrun (in HUJ) and included in Flora Palaestina IV (Feinbrun-Dothan 1986) were determined by Prof. H. Scholz (summer 2000) as *Bromus tigridis* Boiss. & Noae. Only a few specimens of *Bromus* in HUJ have been named *B. pseudobrachystachys* by an expert. The whole genus in Flora Palaestina area deserves revision.

"*Capparis ovata*": ***Capparis sicula*** Veill.

Ref.: Danin, in Greuter 1981: p. 41; Greuter & al. (1984): p. 155.

"*Chaenorrhinum persicum*": ***Hueblia calycina*** (Banks & Sol.) Speta

"*Cleome arabica*": ***Cleome amblyocarpa*** Barratte & Murb

Ref: Greuter & al. (1984): p. 155.

"*Colchicum bowlesianum*": ***Colchicum feinbruniae*** Persson

"*Commicarpus verticillatus*": ***Commicarpus helenae*** (J. A. Schultes) Meikle

Ref: Greuter & al. (1989): p. 244.

"*Corrigiola litoralis* subsp. *telephiiifolia*": ***Corrigiola palaestina*** Chaudhri

Ref: Greuter & al. (1984): p. 185.

"*Corynephorus divaricatus*": ***Corynephorus articulatus*** (Desf.) P. Beauv.

Ref: According to Prof. H. Scholz (pers. comm.) *C. divaricatus* is a west Mediterranean species.

"*Cymbopogon parkeri*": ***Cymbopogon commutatus*** (Steud.) Stapf

"*Cynosurus elegans*": ***Cynosurus effusus*** Link

"*Cyperus conglomeratus*": ***Cyperus macrorrhizus*** Nees

Ref: Danin & Kukkonen (1995).

Cytinus hypocistis (L.) L.: ***Cytinus ruber*** (Fourr.) Kom

Note: The *Cytinus* root-parasite of the genus *Cistus*, which grows in Israel, has flowers with white corolla and bracts with red colour. It fits the diagnostic characters of *C. ruber* and not of *C. hypocistis*.

"*Erodium subtrilobum*": ***Erodium neuradifolium*** Delile

Ref: Greuter & al. (1986): p. 255.

"*Himantoglossum affine*": ***Himantoglossum caprinum*** (M. Bieb.) Spreng.

Note: Prof. A. Dafni (pers. comm.) communicated the nomenclature changes.

“*Hypecoum imberbe*”: *Hypecoum dimidiatum* Delile

Ref: Greuter & al. (1989): p. 281.

“*Lathyrus digitatus*”: *Lathyrus spathulatus* Éelak.

Ref: Greuter & al. (1989): p. 117.

“*Limonium meyeri*”: *Limonium narbonense* Mill

Ref: Greuter & al. (1989): p. 344.

“*Limonium oleifolium*”: *Limonium virgatum* (Willd.) Fourr

Ref: Greuter & al. (1989): p. 343.

“*Ononis reclinata*”: *Ononis mollis* Savi

Ref: Valdes in Danin (1992): p. 152.

Note: Following Valdes' comment the material of the two taxa was studied in HUJ. I found there only *O. mollis*.

“*Orchis laxiflora*”: *Orchis dinsmorei* (Schlechter) H. Baumann & Dafni

Note: Prof. A. Dafni (pers. comm.) communicated the nomenclature changes.

“*Orchis papilionacea*” *Orchis caspia* Trautv.

Note: Prof. A. Dafni (pers. comm.) communicated the nomenclature changes.

“*Pentatropis spiralis*”: *Pentatropis nivalis* (J. F. Gmel.) Field & Wood

Ref: Greuter & al. (1984): p. 57.

“*Petrorhagia cretica*”: *Petrorhagia zoharyana* A. Liston

“*Polygala sinaica*”: *Polygala negevensis* Danin

Ref: Danin (1987).

“*Polygonum patulum*”: *Polygonum bellardii* All.

Ref: Greuter & al. (1989): p. 358.

“*Raphanus aucheri*”: *Quidproquo confusum* Greuter & Burdet

Ref: Greuter & Burdet, in Greuter & Raus (1983): p. 94; Greuter & al. (1986): p. 149.

“*Reboudia pinnata*”: *Erucaria microcarpa* Boiss

Ref: Greuter & al. (1986): p. 104.

“*Salsola longifolia*”: *Salsola oppositifolia* Desf

“*Salsola tetragona*”: *Salsola cyclophylla* Baker

Ref: Danin (1973): p. 22.

"*Sedum pallidum*": ***Sedum rubens*** L.

Ref: H.T. Hart, in Danin (1992): p.187.

"*Serapias vomeracea*": ***Serapias levantina*** H. Baumann & Künkele

Ref: Prof. A. Dafni (pers. comm.) communicated the nomenclature changes.

"*Setaria glauca*": ***Setaria pumila*** (Poir.) Schult.

Note: "*Setaria glauca*". *Setaria glauca* (L.) P.Beauv. is not a taxonomic synonym of *S. pumila*. It was erroneously applied by many authors to *S. pumila*, however, the Linnaean basionym *Panicum glaucum* L. is known at present as the cultivated millet *Pennisetum glaucum* (L.) R. Br.

"*Setaria verticillata*": ***Setaria adhaerens*** (Forssk.) Chiov

Ref: Danin & Scholz (1997).

"*Spergularia media*": ***Spergularia maritima*** (All.) Chiov

Ref: Greuter & al., (1984): p. 283.

"*Stipa barbata*": ***Stipa arabica*** Trin. & Rupr.

Ref: Freitag (1985): p. 461.

"*Stipa lagascae*": ***Stipa pellita*** (Trin. & Rupr.) Tzvelev

Ref: H. Scholz (pers. comm.).

Note: A few specimens labeled *Stipa lagascae* in HUJ were determined *Stipa pellita* and others as *Stipa holosericea* by Prof. Freitag and by Prof. Scholz.

4 - List of species the names of which in Flora Palaestina are regarded at present as synonyms

In the following section the correct updated names are presented in boldface; the synonyms used in Flora Palaestina are written in Italics following the abbreviation Fl.Pal. Most changes follow the conclusions of taxonomic investigations presented in the 3 volumes of MedChecklist (Greuter & al. 1984, 1986, and 1989).

Acacia pachyceras O. Schwartz var. ***najdensis*** (Chaudhary) Boulos

Fl. Pal.: *Acacia gerrardii* Benth. subsp. *negevensis* Zohary

Notes: In his account of the *Acacia* species of the Arabian Peninsula, Boulos (1995: 335-336) disconnects the geographical distribution-relations of the species of *Acacia*, known as TALKH in several Arab speaking countries (e.g. Sinai, Jordan, and Arabia) from the African *Acacia gerrardii* Benth. Contrary to Zohary (1972), he ties it to the species described from Yemen by Schwartz (1939): "In Arabien im innerjemenitischejn hochland". Being acquainted from the field with the "Talkh" in Israel, Sinai and Jordan, and studying both this species and *Acacia gerrardii* in the herbarium (at Kew) I agree with Boulos (1995). I think as Boulos did that the Near Eastern Talkh of Flora Palaestina should be named *Acacia pachyceras*

O.Schwartz var *najdensis* (Chadhry) Boulos. The comment of Chaudhary (1998) disregards the fact that Schwartz (1939) described *Acacia pachyceras* from Yemen. Boulos (1995) thus selected a neotype for this species (Yemen: J.R.I. Wood 2401 [K!]). One of the best field characters that helps recognizing *Acacia pachyceras* is it easily pilling bark into white-cream longitudinal strips. Schwartz gives it in his diagnosis of *A. pachyceras* "tecti primo pilis albis brevibus intermitis longioribus". Several collectors of *Acacia gerrardii* Benth. in the Sudan and in Ethiopia (in K !) write that tree's bark is black and deeply longitudinally fissured. This property is never found in *A. pachyceras* of Israel, Jordan, and Sinai.

Acer obtusifolium Sm; Fl. Pal.: *Acer syriacum* Boiss. & Gaill. [syn.]

Achillea arabica Kotschy; Fl. Pal.: *Achillea biebersteinii* Afan.

Ref: Valant-Vetschera (1999): p.144.

Adonis microcarpa DC.; Fl. Pal.: *Adonis cupaniana* Guss. [syn.]

Adonis palaestina Boiss.; Fl. Pal.: *Adonis aestivalis* L. var. *palaestina* (Boiss.) Zohary [syn.]

Aegilops vavilovii (Zhuk.) Chennav.; Fl. Pal.: *Aegilops crassa* Boiss. subsp. *vavilovii* Zhuk. [syn.]

Aerva javanica (Burm. f.) Juss. ex Schult; Fl. Pal.: *Aerva persica* (Burm. f.) Merr. [syn.]

Aetheorhiza bulbosa (L.) Cass.; Fl. Pal.: *Crepis bulbosa* (L.) Tausch. [syn.]

Agathophora alopecuroides (Delile) Fenzl ex Bunge; Fl. Pal.: *Halogeton alopecuroides* (Del.) Moq. [syn.]

Ajuga chamaepitys (L.) Schreb. subsp. *chia* (Schreb.) Arcang.; Fl. Pal.: *Ajuga chia* Schreb. [syn.]

Alhagi graecorum Boiss.; Fl. Pal.: *Alhagi maurorum* Medik. [syn.]

Allium neapolitanum Cirillo; Fl. Pal.: *Allium neapolitanum* Cyr.

Allium trifoliatum Cirillo; Fl. Pal.: *Allium trifoliatum* Cyr.

Alyssum aureum (Fenzl) Boiss.; Fl. Pal.: *Alyssum meniocoides* Boiss.

Alyssum simplex Rudolphi; Fl. Pal.: *Alyssum minus* (L.) Rothm. var. *minus* [syn.]

Alyssum strigosum Banks & Sol.; Fl. Pal.: *Alyssum minus* (L.) Rothm. var. *strigosum* (Banks & Sol.) Stoj. [syn.]

- Amaranthus cruentus* L.; Fl. Pal.: *Amaranthus hybridus* L. [syn.]
- Amaranthus muricatus* Gillies ex Hicke; Fl. Pal.: *Amaranthus muricatus* Moq. [syn.]
- Amaranthus viridis* L.; Fl. Pal.: *Amaranthus gracilis* Desf. [syn.]
- Ammannia baccifera* L.; Fl. Pal.: *Ammannia aegyptiaca* Willd. [syn.]
- Anchusa azurea* Mill.; Fl. Pal.: *Anchusa italica* Retz. [syn.]
- Arabis alpina* L. subsp. *caucasica* (Willd.) Briq.; Fl. Pal.: *Arabis caucasica* Schltld. [syn.]
- Aristida adscensionis* L.; Fl. Pal.: Including *Aristida coerulescens* Desf.
- Arthrocnemum macrostachyum* (Moric.) K. Koc; Fl. Pal.: *Arthrocnemum macrostachyum* (Moric.) Moris & Delpono [syn.]
- Arundo pliniana* Turr; Fl. Pal.: *Arundo plinii* Turra
- Asparagus horridus* L.; Fl. Pal.: *Asparagus stipularis* Forssk. [syn.]
- Asplenium ceterach* L.; Fl. Pal.: *Ceterach officinarum* DC. [syn.]
- Asplenium sagittatum* (DC.) A. J. Bange; Fl. Pal.: *Phyllitis sagitata* (DC.) Guinea & Heywood [syn.]
- Asplenium onopteris* L.; Fl. Pal.: *Asplenium adiantum-nigrum* L. subsp. *onopteris* (L.) Heufl. [syn.]
- Asteriscus hierochunticus* (Michon) Wiklund; Fl. Pal.: *Asteriscus pygmaeus* (DC.) Coss. & Dur. [syn.]
- Astragalus aleppicus* Boiss.; Fl. Pal.: *Astragalus giladensis* Eig [syn.]; *A. postii* Eig [syn.]; *A. galilaeus* Freyn & Bornm. [syn.]; *A. feinbruniae* Eig ex Rech.f. [syn.]
- Astragalus arnilobus* Kar. & Kir.; Fl. Pal.: *Astragalus gyzensis* Delile ex Bge. [syn.]; *A. hauarensis* Boiss. [syn.]
- Astragalus asterias* Steve; Fl. Pal.: *Astragalus cruciatus* Link [syn.]
- Astragalus campylorrhynchus* Fisch. & C. A. Mey.; Fl. Pal.: *Astragalus negevensis* Zohary & Fertig [syn.]
- Astragalus caprinus* L. subsp. *lanigerus* (Desf.) Maire; Fl. Pal.: *Astragalus platyrhaphis* Fisch. ex Bge. [syn.]; *A. beershabensis* Eig & Sam. [syn.], *A. alexandrinus* Boiss. [syn.]

Astragalus crenatus Schultes; Fl. Pal.: *Astragalus corrugatus* Bertol. [syn.]

Astragalus dactylocarpus Boiss. subsp. *acinaciferus* (Boiss.) E. Ot; Fl. Pal.: *Astragalus acinaciferus* Boiss. [syn.]

Astragalus kotschyanus Boiss.; Fl. Pal.: *Astragalus zemeraniensis* Eig [syn.]

Astragalus pelecinus (L.) Barneb; Fl. Pal.: *Biserrula pelecinus* L. [syn.]

Atriplex glauca L.; Fl. Pal.: *Atriplex stylosa* Viv. [syn.]

Atriplex portulacoides L.; Fl. Pal.: *Halimione portulacoides* (L.) Aellen [syn.]

Atriplex prostrata Boucher ex DC; Fl. Pal.: "*Atriplex hastata*".

Atriplex sagittata Borkh.; Fl. Pal.: *Atriplex nitens* Schkuhr [syn.]

Bassia arabica (Boiss.) Maire & Weille; Fl. Pal.: *Chenolea arabica* Boiss. [syn.]

Bassia indica (Wight) A. J. Scott; Fl. Pal.: *Kochia indica* Wight [syn.]

Bellis sylvestris Cirillo; Fl. Pal.: *Bellis silvestris* Cyrill.

Beckmannia eruciformis (L.) Host; Fl. Pal.: *Beckmannia erucaeformis* (L.) Host

Note: According to the contemporary nomenclatural rules, an epithet composed of two words can not be joined by a diphthong (T. Cope, 8/2000, pers. comm.).

Bilacunaria boissieri (Reut. & Huasskn.) Pimenov & Tichomiro; Fl. Pal.: *Hippomarathrum boissieri* Reut. & Hausskn. [syn.]

Bituminaria bituminosa (L.) C. H. Stirt.; Fl. Pal.: *Psoralea bituminosa* L. [syn.]

Bituminaria flaccida (Nábelek) Greuter; Fl. Pal.: *Psoralea flaccida* Nábelek [syn.]

Blepharis Juss. in Israel

Note: According to K. Vollesen (pers. comm., 8/2000), who compiled a monograph of the genus *Blepharis*, the common species of Israel, Jordan and Sinai, is not *B. ciliaris* (L.) B. L. Burt (sensu Feinbrun-Dothan 1978: p. 218). Vollesen indicated that *B. ciliaris* is actually an endemic species of Iran-Afghanistan. The populations of *Blepharis attenuata* Napper, as it is known in the phytosociological research in Israel, are confined to semisteppe batha (Danin & Solomeshch 1999). It is a diagnostic species of the Balloto-Sarcopoterion spinosi Danin & Solomeshch, an alliance in the class Ballotetia undulatae Danin & Solomeshch. When Napper (1972) described this species it was considered as a mesophytic plant and was later declared as a diagnostic of a marginal Mediterranean plant

community. It was considered as an independent species differing from the other, more drought and heat resistant taxon of the warm desert areas of the Dead Sea, Arava Valley, and the coastal area of eastern Sinai (*B. ciliaris* sensu Feinbrun 1978). However, according to the present revision of Vollesen (2000, in press), *B. attenuata* is the right name for both taxa, as so far there is no constant diagnostic character which may be used to distinguish between the two ecological and geographical different races.

Brachypodium distachyum (L.) P. Beauv.; Fl. Pal.: "*Brachypodium distachyon*"

Note: The spelling "distachyon" by Beauvois was inaccurate (T. Cope 8/2000, pers. comm.).

Bunium paucifolium DC; Fl. Pal.: *Bunium elegans* (Fenzl) Freyn [syn.]

Bupleurum orientale Snogerup; Fl. Pal.: *Bupleurum tenuissimum* L. [syn.]

Callipeltis factorovskii (Eig) Ehrend.; Fl. Pal.: *Waburgina factorovskii* Eig [syn.]

Callitriche brutia Petagna; Fl. Pal.: *Callitriche pedunculata* DC. [syn.]

Callitriche lenisulca Clavaud; Fl. Pal.: *Callitriche palustris* L. [syn.].

Callitriche truncata Guss.; Fl. Pal.: *Callitriche hermaphroditica* L. [syn.]

Capparis aegyptia Lam; Fl. Pal.: *Capparis spinosa* L. var. *aravensis* Zohary [syn.]

Capparis sinaica Veill.; Fl. Pal.: *Capparis cartilaginea* Decne. [syn.]

Carduus acicularis Bertol.; Fl. Pal.: *Carduus argentatus* L. var. *esdraelonicus* (Boiss.) Boiss. [syn.]

Carex guestphalica (Boenn. ex Rchb.) Boenn. ex O. Lang; Fl. Pal.: *Carex divulsa* Stocks subsp. *leersii* (Kneuck.) W. Koch [syn.]

Carlina libanotica Boiss. subsp. *microcephala* (Post) Meusel & Dittrich; Fl. Pal.: *Carlina hispanica* Lam. subsp. *galilaea* Meusel & Kästner [syn.]

Centaurea pumilio L.; Fl. Pal.: *Aegialophila pumilio* (L.) Boiss. [syn.]

Note: T. Raus (pers. comm.) suggests returning it to *Centaurea* because there are many sections in *Centaurea* and in Flora Europaea 4: 269 the authors returned all back to *Centaurea*. Feinbrun-Dothan (1978) took one small group and retained *Aegialophila*.

Centropodia forskalii (Vahl) Cope; Fl. Pal.: *Asthenatherum forskalii* (Vahl) Nevski [syn.]

Cerastium glomeratum Thuill.; Fl. Pal.: *Cerastium viscosum* L. [syn.]

Cerasus microcarpa (C. A. Mey.) Boiss.; Fl. Pal.: *Cerasus microcarpa* (C. A. Mey.) C.Koch [syn.]

Ceratocapnos turbinata (DC.) Lide; Fl. Pal.: *Ceratocapnos palaestinus* Boiss. [syn.]

Cheilanthes acrostica (Balb.) Tod.; Fl. Pal.: *Cheilanthes fragrans* (L.) Webb & Berth. [syn.]

Chiliadenus iphionoides (Boiss. & Blanche) Brullo; Fl. Pal.: *Varthemia iphionoides* Boiss & Blanche [syn.]

Chiliadenus montanus (Vahl) Brullo; Fl. Pal.: *Varthemia montana* (Vahl) Boiss. [syn.]

Chrozophora tinctoria (L.) Raf.; Fl. Pal.: *Chrozophora tinctoria* (L.) Ad. Juss. [syn.]

Cicer judaicum Boiss.; Fl. Pal.: *Cicer pinnatifidum* Jaub. & Spach [syn.]

Cichorium endivia L. subsp. *divaricatum* (Schousb.) P. D. Sell; Fl. Pal.: *Cichorium pumilum* Jacq. [syn.]

Cleome arabica L.; Fl. Pal.: *Cleome trinervia* Fresen. [syn.]

Colchicum troodi Kotsch.; Fl. Pal.: *Colchicum decaisnei* Boiss. [syn.]

Commicarpus plumbagineus (Cav.) Standl; Fl. Pal.: *Commicarpus africanus* (Lour.) Dandy [syn.]

Consolida incana (E.D.Clarke) Munz; Fl. Pal.: *Consolida rigida* (DC.) Bornm. [syn.]

Convolvulus auricomus (A.Rich.) Bhandari; Fl. Pal.: *Convolvulus glomeratus* Choisy [syn.]

Conyza stricta Willd.; Fl. Pal.: *Conyza triloba* Decne. [syn.]

Cosentinia vellea (Aiton) Tod.; Fl. Pal.: *Cheilanthes catanensis* (Cosent.) H.P. Fuchs [syn.]

Crucianella aegyptiaca L.; Fl. Pal.: *Crucianella herbacea* Forssk. [syn.].

Ref.: *C. aegyptiaca* is mentioned in Hepper & Friis (1994) as the legitimate name, *C. herbacea* is therefore a synonym.

Cucumis acidus Jacq. f.; Fl. Pal.: *Cucumis callosus* (Rottler) Cogn. [syn.]

Cyperus michelianus (L.) Delile subsp. *pygmaeus* (Rottb.) Asch. & Graebn.; Fl. Pal.: *Cyperus pygmaeus* Rottb. [syn.]

Daucus broteri Ten.; Fl. Pal.: *Daucus bicolor* Sm. [syn.]

- Daucus durieua* Lang; Fl. Pal.: *Daucus subsessilis* Boiss. [syn.]
- Daucus glaber* (Forssk.) Thell.; Fl. Pal.: *Daucus litoralis* Sm. [syn.]
- Desmazeria philistaea* (Boiss.) H. Scholz; Fl. Pal.: *Cutandia philistaea* (Boiss.) Jackson [syn.]
- Deverra tortuosa* (Desf.) DC.; Fl. Pal.: *Pituranthos tortuosus* (Desf.) Asch. & Schweinf. [syn.]
- Deverra triradiata* Hochst. ex Boiss.; Fl. Pal.: *Pituranthos triradiatus* (Hochst. ex Boiss.) Asch. & Schweinf. [syn.]
- Dianthus monadelphus* Vent. subsp. *judaicus* (Boiss.) Greuter & Burdet; Fl. Pal.: *Dianthus judaicus* Boiss. [syn.]
- Dichanthium foveolatum* (Delile) Robert; Fl. Pal.: *Eremopogon foveolatus* (Delile) Stapf [syn.]
- Dittrichia graveolens* (L.) Greuter; Fl. Pal.: *Inula graveolens* (L.) Desf. [syn.]
- Dittrichia viscosa* (L.) Greuter; Fl. Pal.: *Inula viscosa* (L.) Aiton [syn.]
- Doellia bovei* (DC.) Anderb.; Fl. Pal.: *Blumea bovei* (DC.) Vatke [syn.]
Ref: Anderberg (1995).
- Dorycnium hirsutum* (L.) Ser.; Fl. Pal.: *Bonjeana hirsuta* (L.) Rchb. [syn.]
- Dorycnium rectum* (L.) Ser.; Fl. Pal.: *Bonjeana recta* (L.) Rchb. [syn.]
- Dryopteris pallida* (Borrey) C. Chr. ex Maire & Petitm. subsp. *libanotica* (Rosenst.) Nardi;
Fl. Pal.: *Dryopteris villarii* (Bellardi) H. Woytnar ex Schniz & Thell. [syn. p.p.]
- Eclipta prostrata* (L.) L.; Fl. Pal.: *Eclipta alba* (L.) Hassk.
- Eigia longistyla* (Eig) Soják; Fl. Pal.: *Stigmatella longistyla* Eig [syn.]
- Elytrigia elongata* (Host) Nevski; Fl. Pal.: *Elymus elongatus* (Host) Runemark [syn.]
- Elytrigia intermedia* (Host) Nevski; Fl. Pal.: *Elymus hispidus* (Opiz) Meld. [syn.]
- Elytrigia juncea* (L.) Nevski; Fl. Pal.: *Elymus farctus* (Viv.) Runemark ex Melderis [syn.]
- Enneapogon desvauxii* P. Beauv.; Fl. Pal.: *Enneapogon brachystachyus* (Jaub. & Spach) Stapf [syn.]

Ephedra aphylla Forssk.; Fl. Pal.: *Ephedra alte* C.A.Mey. [syn]
Ref.: Danin & Hedge (1973): pp. 264-265.

Ephedra ciliata Fisch. & C. A. Mey.; Fl. Pal.: *Ephedra peduncularis* Boiss. [syn.]
Ref.: Freitag & Maier-Stolte (1994).

Ephedra foeminea Forssk.; Fl. Pal.: *Ephedra campylopoda* C. A. Mey. [syn.]
Ref.: Freitag & Maier-Stolte (1994).

Epilobium tetragonum L. subsp. *tournefortii* (Michalet) Lévêille; Fl. Pal.: *Epilobium tournefortii* Michalet [syn.]

Eragrostis cilianensis (All.) Janch; Fl. Pal.: *Eragrostis cilianensis* (All.) F. T. Hubb. [syn.]
Note: This is not a real synonym, but a late combination (T. Cope 8/2000, pers. comm.).

Eremobium lineare (Delile) Asch. & Schweinf. ex Boiss.; Fl. Pal.: *Eremobium aegyptiacum* (Spreng.) Boiss. var. *lineare* (Delile) Zohary [syn.]

Eremurus spectabilis M. Bieb. var. *libanoticus* (Boiss. & Blanche) O. Fedtsch.; Fl. Pal.: *Eremurus libanoticus* Boiss. & Blanche [syn.]

Erodium crassifolium L'Hér; Fl. Pal.: *Erodium hirtum* Willd. [syn.]

Erodium oxyrhynchum M. Bieb. subsp. *bryoniifolium* (Boiss.) Schoenb.-Tem.; Fl. Pal.: *Erodium bryoniifolium* Boiss. [syn.]

Erodium touchyanum Delile; Fl. Pal.: *Erodium deserti* (Eig) Eig [syn.]

Erophila praecox (Steven) DC.; Fl. Pal.: *Erophila verna* (L.) Besser [syn.]

Erucaria pinnata (Viv.) Täckh. & Boulos; Fl. Pal.: *Erucaria uncata* (Boiss.) Asch. & Schweinf. [syn.]

Erucaria rostrata (Boiss.) Greuter & Burdet; Fl. Pal.: *Erucaria boveana* Coss. [syn.]

Eryngium falcatum F. Delaroche; Fl. Pal.: *Eryngium falcatum* Laroche [syn.]

Euphorbia grossheimii Prokh.; Fl. Pal.: *Euphorbia isthmia* Täckh. [syn.]

Euphorbia heterophylla L.; Fl. Pal.: *Euphorbia geniculata* Ortega [syn.]

Euphorbia hirsuta L.; Fl. Pal.: *Euphorbia verrucosa* L. [syn.]

Euphorbia maculata L.; Fl. Pal.: *Euphorbia nutans* Lag. [syn.]

Euphorbia ramanensis B. R. Baum; Fl. Pal.: *Euphorbia hierosolymitana* Boiss. var. *ramanensis* (B.R. Baum) Zohary [syn.]

Euphorbia valerianifolia Lam; Fl. Pal.: *Euphorbia cybirensis* Boiss. [syn.]

Fagonia scabra Forssk.; Fl. Pal.: *Fagonia sinaica* Boiss. [syn.]

Fagonia tenuifolia Steud. & Hochst. ex Boiss.; Fl. Pal.: *Fagonia bischarorum* Schweinf. [syn.]

Faidherbia albida (Delile) A. Chev.; Fl. Pal.: *Acacia albida* Delile [syn.]

Ferula orientalis L.; Fl. Pal.: *Ferula samariae* Zohary & P.H.Davis [syn.]

Fumaria bracteosa Pomel; Fl. Pal.: *Fumaria densiflora* DC. var. *parlatoriana* (Kral. ex Boiss.) Zohary [syn.]

Fumaria petteri Rechb.; Fl. Pal.: *Fumaria thuretii* Boiss. [syn.]

Garidella unguicularis Poir. Fl. Pal.: *Nigella unguicularis* (Poir.) Spenner Strid (in Opera Bot. 28: 11-12. 1970) proved the independence of *Garidella* (with *G. nigellastrum* L. and *G. unguicularis* Poir. in Lam.) by crossing experiments. He writes: "All attempts to produce hybrids between *Garidella* and various species of *Nigella* have been unsuccessful. In Strid's opinion *Garidella* is best retained as a separate genus.

Glastaria glastifolia (DC.) Kuntze; Fl. Pal.: *Texiera glastifolia* (DC.) Jaub. & Spach [syn.]

Gymnocarpos decander Forssk.; Fl. Pal.: *Gymnocarpos decandrum* Forssk. [syn.]

Gypsophila capillaris (Forssk.) C. Chr. subsp. *confusa* Zmarzty; Fl. Pal.: *Gypsophila arabica* Barkoudah [syn.]

Halothamnus hierochunticus (Bornm.) Botsch; Fl. Pal.: *Aellenia autrani* (Post) Zohary [syn.]

Halothamnus lancifolius (Boiss.) Kothe-Heinrich; Fl. Pal.: *Aellenia lancifolia* (Boiss.) Ulbrich [syn.]

Halotis pilifera (Moq.) Botsch.; Fl. Pal.: *Halotis pilosa* (Moq.) Iljin. [syn.]

Haloxylon eigii (Iljin) Danin & Heller **comb. nov.**; Fl. Pal.: *Hammada eigii* Iljin [syn.]

Haloxylon negevensis (Iljin & Zohary) Boulos; Fl. Pal.: *Hammada negevensis* Iljin & Zohary [syn.]

Haloxylon salicornicum (Moq.) Bunge ex Boiss.; Fl. Pal.: *Hammada salicornica* (Moq.) Iljin and *Hammada schmittiana* (Pomel) Botsch. in Fl. Pal. area. [syn.]

Haloxylon scoparium Pomel; Fl. Pal.: *Hammada scoparia* (Pomel) Iljin [syn.]

Heptaptera anisoptera (DC.) Tuti; Fl. Pal.: *Heptaptera crenata* (Fenzl) Tutin [syn.]

Heteranthelium piliferum (Sol.) Hochst.; Fl. Pal.: *Heteranthelium piliferum* (Banks & Sol.) Hochst. ex Jaub. & Spach [syn.]

Hippocrepis areolata Desv.; Fl. Pal.: *Hippocrepis bicontorta* Loisel. [syn.]

Hippocrepis constricta G. Kunze; Fl. Pal.: *Hippocrepis multisiliquosa* L. subsp. *eilatensis* Zohary [syn.]

Hordeum geniculatum All.; Fl. Pal.: *Hordeum hystrix* Roth [syn.] (1797)
Ref.: According to Scholz (pers. comm.) *Hordeum geniculatum* All. (1785) was lectotypified by Bowden (1962) and therefore, since this year it is not in the status of "nomen ambiguum".

Hypocoum littorale Wulfe; Fl. Pal.: *Hypocoum deuteroparviflorum* Fedde [syn.]; *H. geslinii* Coss. & Durieu [syn.]

Hypericum quadrangulum L.; Fl. Pal.: *Hypericum acutum* Moench [syn.]

Hypericum thymifolium Banks & Sol.; Fl. Pal.: *Hypericum serpyllifolium* Lam. [syn.]

Hypochaeris achyrophorus L.; Fl. Pal.: *Hypochoeris achyrophorus* L.

Hypochaeris glabra L.; Fl. Pal.: *Hypochoeris glabra* L.

Ipomoea imperati (Vahl) Griseb.; Fl. Pal.: *Ipomoea stolonifera* (Cyr.) J. F. Gmel. [syn.]

Juncus rigidus Desf.; Fl. Pal.: *Juncus arabicus* (Asch. & Buchenau) Adamson [syn.]
Ref.: In his account of *Juncus*, Snogerup (1971): p. 4 replaced *J. arabicus* by *J. rigidus* Desf. He also determined the material in HUJ in this way and summarized his work in Snogerup (1993).

Kickxia elatine (L.) Dumort. subsp. *crinita* (Mabille) Greuter; Fl. Pal.: *Kickxia sieberi* (Rchb.) Allan [syn.]

Knautia integrifolia (L.) Bertol. subsp. *urvillei* (Coult.) Greuter; Fl. Pal.: *Knautia bidens* (Sm.) Lindley

Lathyrus blepharicarpos Boiss.; Fl. Pal.: *Lathyrus blepharicarpus* Boiss. [syn.]

Leontodon tuberosus L.; Fl. Pal.: *Thrincia tuberosa* (L.) DC. [syn.]

Ref: This is how most authors do in the last 50 years.

Leptochloa fusca (L.) Kunth; Fl. Pal.: *Diplachne fusca* (L.) Roem. & Schult. [syn.]

Leysera leyseroides (Desf.) Maire; Fl. Pal.: *Asteropterus leyseroides* (Desf.) Rothm. [syn.]

Limbarda crithmoides (L.) Dumort.; Fl. Pal.: *Inula crithmoides* L. [syn.]

Limonium graecum (Poir.) Rech.f.; Fl. Pal.: *Statice graeca* Poir. [syn.]

Limonium lobatum (L.f.) Chaz.; Fl. Pal.: *Limonium thouinii* (Viv.) Kuntze [syn.]

Limonium pruinsum (L.) Chaz.; Fl. Pal.: *Statice pruinosa* L. [syn.]

Logfia davisii Holub ex Grierson; Fl. Pal.: *Filago davisii* (Holub ex Grierson) Feinbrun [syn.]; "*Filago arvensis*".

Logfia gallica (L.) Coss. & Germ.; Fl. Pal.: *Filago gallica* L. [syn.]

Lomelosia argentea (L.) Greuter & Burdet; Fl. Pal.: *Scabiosa argentea* L. [syn.]

Ref.: Greuter & Burdet, in Greuter & Raus (1985); p. 73.

Lomelosia palaestina (L.) Raf.; Fl. Pal.: *Scabiosa palaestina* L. [syn.]

Lomelosia porphyroneura (Blakelock) Greuter & Burdet; Fl. Pal.: *Scabiosa porphyroneura* Blakelock [syn.]

Ref.: Greuter & Burdet, in Greuter & Raus (1985); p. 75.

Lomelosia prolifera (L.) Greuter & Burdet; Fl. Pal.: *Scabiosa prolifera* L. [syn.]

Ref.: Greuter & Burdet, in Greuter & Raus (1985); p. 75.

Lupinus pilosus Murray; Fl. Pal.: *Lupinus varius* L. [syn.]

Ref.: *L. pilosus* Murray = was described in 1774 by Murray who edited Syst. Vegetab., and therefore he is the author of *L. pilosus*.

Medicago astroites (Fisch. & C. A. Mey.) Trautv. Fl. Pal.: *Trigonella astroites* Fisch. & C.A.Mey. [syn.]

Medicago ciliaris (L.) All.; Fl. Pal.: *Medicago intertexta* (L.) Mill. var. *ciliaris* (L.) Heyn [syn.]

Medicago doliata Carmign.; Fl. Pal.: *Medicago aculeata* Gaertn. [syn.]

Medicago littoralis Rhode ex Loisel.; Fl. Pal.: *Medicago littoralis* Rhode ex Loisel.

Medicago monantha (C. A. Mey.) Trautv. Fl. Pal.: *Trigonella monantha* C. A. Mey. [syn.]
and *Trigonella noaeana* Boiss. [syn.]

Medicago monspeliaca (L.) Trautv. Fl. Pal.: *Trigonella monspeliaca* L.

Medicago tuberculata (Retz.) Willd; Fl. Pal.: *Medicago turbinata* (L.) All. [syn.]

Melica persica Kunth; Fl. Pal.: *Melica cupanii* Guss. [syn.]

Ref.: *M. cupanii* Guss. is a W Mediterranean species and can't be included in Flora Palaestina without revision.

Melilotus albus Medik.; Fl. Pal.: *Melilotus albus* Medik. ex Desr. [syn.]

Mericalpaea ciliata (Banks & Sol.) Eig; Fl. Pal.: *Mericalpaea vaillantoides* Boiss. [syn.]

Note: The basionym *Valantia ciliata* was published in 1794 and *M. vaillantoides* is from 1843.

Minuartia hybrida (Vill.) Schischk.; Fl. Pal.: *Minuartia tenuifolia* (L.) Hiern. [syn.]

Muscari neglectum Ten.; Fl. Pal.: *Muscari pulchellum* Boiss.

Nasturtiopsis coronopifolia (Desf.) Boiss. subsp. *arabica* (Boiss.) Greuter & Burdet; Fl. Pal.: *Nasturtiopsis arabica* Boiss. [syn.]

Neotorularia torulosa (Desf.) Hedge & J.Léonard; Fl. Pal.: *Torularia torulosa* (Desf.) O. E. Schulz [syn.]

Nepeta cilicia Boiss. ex Benth.; Fl. Pal.: *Nepeta pycnantha* Benth. [syn.]

Nepeta congesta Fisch. & C. A. Mey.; Fl. Pal.: *Nepeta involucrata* (Bunge) Bornm. [syn.]

Nepeta stricta (Banks & Sol.) Hedge & Lamond; Fl. Pal.: *Nepeta calycina* Fenzl [syn.]

Nonea echioides (L.) Roem. & Schult.; Fl. Pal.: *Nonea ventricosa* (Sm.) Griseb. [syn.]

Nymphaea nouchali Burm. f. var. *caerulea* (Savigny) Verdc.; Fl. Pal.: *Nymphaea caerulea* Savigny [syn.]

Ogastemma pusillum (Coss. & Durand ex Bonnet & Barratte) Brummit; Fl. Pal.: *Megastoma pusillum* Coss. & Durand ex Bonnet & Barratte [syn.]

Oligomeris linifolia (Vahl ex Hornem.) J. F. Macbr.; Fl. Pal.: *Oligomeris subulata* (Delile) Boiss. [syn.]

Onobrychis montana DC. subsp. *cadmea* (Boiss.) P. W. Ball; Fl. Pal.: *Onobrychis cadmea* Boiss. [syn.]

- Ononis spinosa* L. subsp. ***antiquorum*** (L.) Arc.; Fl. Pal.: *Ononis antiquorum* L. [syn.]
- Onosma echinata* Desf.; Fl. Pal.: *Onosma aleppica* Boiss. [syn.]
- Ophrys holosericea* (Burm. f.) Greuter; Fl. Pal.: *Ophrys fuciflora* (F. W. Schmidt) Moench [syn.]
- Ophrys israelitica* H. Baumann & Künkel; Fl. Pal.: *Ophrys fleischmannii* Hayek
- Ophrys sphegodes* Mill.; Fl. Pal.: *Ophrys transhyrcana* Czerniak. [syn.]
- Ophrys umbilicata* Desf. subsp. ***carmeli*** (Fleischm. & Bornm.) J. J. Wood; Fl. Pal.: *Ophrys carmeli* Fleischm. & Bornm. subsp. *carmeli* [syn.]
- Opophytum forsskalii* (Hochst. ex Boiss.) N. E. Br.; Fl. Pal.: *Mesembryanthemum forsskalii* Hochst. ex Boiss. [syn.]
- Orchis collina* Banks & Sol.; Fl. Pal.: *Orchis saccata* Ten. [syn.]
- Ornithogalum cuspidatum* Bertol.; Fl. Pal.: *Ornithogalum platyphyllum* Boiss. [syn.]
- Ornithogalum montanum* Cirillio; Fl. Pal.: *Ornithogalum montanum* Cyr. [syn.]
- Ornithogalum umbellatum* L.; Fl. Pal.: *Ornithogalum divergens* Boreau [syn.]
- Papaver macrostemum* Boiss. & A. Heut.; Fl. Pal.: *Papaver divergens* Fedde & Bornm. [syn.]
- Parentucellia latifolia* (L.) Caruel subsp. ***flaviflora*** (Boiss.) Hand.-Mazz.; Fl. Pal.: *Parentucellia flaviflora* (Boiss.) Nevski [syn.]
- Parietaria judaica* L.; Fl. Pal.: *Parietaria diffusa* Mert. & W. D. J. Koch [syn.]
- Paspalum distichum* L.; Fl. Pal.: *Paspalum paspalodes* (Michx.) Scribner [syn.]
- Pennisetum orientale* L. Rich.; Fl. Pal.: *Pennisetum asperifolium* (Desf.) Kunth is nomen superfl.
- Persicaria acuminata* (Kunth) Gomez de la Maza; Fl. Pal.: *Polygonum acuminatum* Kunth [syn.]
- Persicaria lanigera* (R. Br.) Soják.; Fl. Pal.: *Polygonum lanigerum* R.Br. [syn.]
- Persicaria lapathifolia* (L.) Gray; Fl. Pal.: *Polygonum lapathifolium* L. [syn.]
- Persicaria salicifolia* Brouss. ex Willd.; Fl. Pal.: *Polygonum salicifolium* Brouss. ex Willd. [syn.]

- Persicaria senegalensis* (Meisn.) Soják.; Fl. Pal.: *Polygonum senegalense* Meisn. [syn.]
- Petroedmondia syriaca* (Boiss.) Tamamsch.; Fl. Pal.: *Smyrniopsis cachroides* Boiss. [syn.]
- Petrorhagia dubia* (Raf.) G. López & Romo; Fl. Pal.: *Petrorhagia velutina* (Guss.) P. W. Ball & Heywood [syn.]
- Peucedanum junceum* (Boiss.) Mouterde; Fl. Pal.: *Peucedanum spreitzenhofferi* Dingl. [syn.]
- Phalaris aquatica* L.; Fl. Pal.: *Phalaris tuberosa* L. [syn.]
- Phleum exaratum* Hochst. ex Griseb. subsp. *exaratum* and subsp. *breviglume* (Bomm.) H. Scholz; Fl. Pal.: *Phleum graecum* Boiss. & Heldr. subsp. *aegeum* (Vierh.) Greuter [syn.]
- Picris altissima* Delile; Fl. Pal.: *Picris sprengeriana* (L.) Chaix [syn.]
- Picris asplenioides* L.; Fl. Pal.: *Picris radicata* (Forssk.) Less. [syn.]
- Picris longirostris* Sch. Bip.; Fl. Pal.: *Picris damascena* Boiss. & Gaill. [syn.]
- Piptatherum thomasi* (Duby) Kunth; Fl. Pal.: *Piptatherum miliaceum* (L.) Coss. var. *thomasi* (Duby) Boiss. [syn.]
- Pisum sativum* L. subsp. *humile* (Holmboe) Greuter & al.; Fl. Pal.: *Pisum syriacum* (Berg.) Lehm. [syn.]
- Plicosepalus acaciae* (Zucc.) Wiens & Polhill; Fl. Pal.: *Loranthus acaciae* Zucc. [syn.]
- Polycarpaea robbairea* (Kuntze) Greuter & Burdet; Fl. Pal.: *Robbairea delileana* Milne-Redhead [syn.]
Ref.: Greuter & Burdet, in Greuter & Raus (1982b): p. 189.
- Polypodium cambricum* L. subsp. *australe* (Fee) Greuter & Burdet; Fl. Pal.: *Polypodium vulgare* L. var. *serratum* Willd. [syn.]
- Prangos ferulacea* (L.) Lindl.; Fl. Pal.: *Prangos goniocarpa* (Boiss.) Zohary [syn.]
- Pseudognaphalium luteo-album* (L.) Hilliard & B. L. Burt; Fl. Pal.: *Gnaphalium luteo-album* L. [syn.]
- Pulicaria incisa* (Lam.) DC.; Fl. Pal.: *Pulicaria desertorum* DC. [syn.]
- Pulicaria undulata* (L.) C. A. Mey.; Fl. Pal.: *Pulicaria crispa* (Forssk.) Benth. ex Oliv. [syn.]

Note: A result of the decision made by the committee for Spermatophyta (Brummitt 1983:

pp. 282-283) is that the plant which was used to be called *P. crispa* "must now be called *P. undulata* L."

Ranunculus scandicus (Boiss.) P. H. Davis; Fl. Pal.: *Ranunculus marginatus* D'Urv. var. *scandicus* (Boiss.) Zohary [syn.]

Reseda urnigera Webb; Fl. Pal.: *Reseda maris-mortui* Eig [syn.]

Rhamnus lycioides L. subsp. *graeca* (Boiss. & Reut.) Tutin; Fl. Pal.: *Rhamnus palaestinus* Boiss. [syn.]

Rhamnus punctata Boiss.; Fl. Pal.: *Rhamnus punctatus* Boiss. [syn.]

Rostraria cristata (L.) Tzvelev; Fl. Pal.: *Lophochloa cristata* (L.) Hyl. [syn.]

Rostraria obtusiflora (Boiss.) Holub; Fl. Pal.: *Lophochloa obtusiflora* (Boiss.) Gontsch. [syn.]

Rostraria pumila (Desf.) Tzvelev; Fl. Pal.: *Lophochloa pumila* (Desf.) Bor [syn.]

Rostraria smyrnacea (Trin.) H. Scholz; Fl. Pal.: *Lophochloa berythea* (Boiss. & Blanche) Bor [syn.]

Rosularia libanotica (Labill.) Muirh.; Fl. Pal.: *Rosularia libanotica* (L.) Sam. ex Rech. f. [syn.]

Rubus canescens DC.; Fl. Pal.: *Rubus tomentosus* Borkh. [syn.]

Rumex roseus L.; Fl. Pal.: *Rumex tingitanus* L. [syn.]

Salsola imbricata Forssk.; Fl. Pal.: *Salsola baryosma* (Schultes) Dandy [syn.]

Salsola incanescens C. A. Mey.; Fl. Pal.: *Salsola volkensis* Schweinf. & Asch. [syn.]
Ref.: in Eichov. Pl. Cawsp.-Cauc. 35 t. 26.

Salvia viridis L.; Fl. Pal.: *Salvia horminum* L. [syn.]

Sanguisorba minor Scop. subsp. *magnolii* (Spach) Briq.; Fl. Pal.: *Sanguisorba minor* Scop. subsp. *verrucosa* (Link ex G. Don f.) Holmboe [syn.]

Sarcocornia fruticosa (L.) A. J. Scott; Fl. Pal.: *Arthrocnemum fruticosum* (L.) Moq. [syn.]

Sarcocornia perennis (Mill.) A. J. Scott; Fl. Pal.: *Arthrocnemum perenne* (Mill.) Moss [syn.]

Scandix grandiflora L.; Fl. Pal. *Scandix falcata* Lond. [syn.]

Scutellaria brevibracteata Stapf subsp. ***subvelutina*** (Rech. f.) Greuter & Burdet; Fl. Pal.: *Scutellaria subvelutina* Rech. f. [syn.]

Note: Another synonym found in literature is *Scutellaria rubicunda* Hornem. subsp. *subvelutina* (Rech. f.) J. R. Edmondson

Secale strictum (C. Presl) C. Presl; Fl. Pal.: *Secale montanum* Guss. [syn.]

Securigera cretica (L.) Lassen; Fl. Pal.: *Coronilla cretica* L. [syn.]

Securigera parviflora (Desv.) Lassen; Fl. Pal.: *Coronilla rostrata* Boiss. & Spruner [syn.]

Sedum sediforme (Jacq.) Pau; Fl. Pal.: *Sedum nicaeense* All. [syn.]

Seetzenia lanata (Willd.) Bulloc; Fl. Pal.: *Seetzenia orientalis* Decne. [syn.]

Senna alexandrina Mill.; Fl. Pal.: *Cassia senna* L. [syn.]

Senna italica Mill.; Fl. Pal.: *Cassia italica* (Mill.) Steud. [syn.]

Serratula pusilla (Labill.) Dittrich; Fl. Pal.: *Rhaponticum pusillum* (Labill.) Boiss. [syn.]

Silene alexandrina (Asch.) Danin; Fl. Pal.: *Silene apetala* Willd. var. *alexandrina* Asch. [syn.]

Silene decipiens Barc.; Fl. Pal.: *Silene apetala* Willd. [syn.]

Silene dichotoma Ehrh. subsp. ***racemosa*** (Otth) Graebn. & Graebn. f.; Fl. Pal.: *Silene trinervis* Banks & Sol. [syn.]

Sisylx arenaria (Forssk.) Greuter & Burdet; Fl. Pal.: *Scabiosa rhizantha* Viv. [syn.]
Ref.: Greuter & Burdet, in Greuter & Raus (1985): p. 76. Following Hepper & Friis (1994) it is evident that the short description of *Scabiosa arenaria* by Forsskal makes this epithet valid.

Sisylx eremophila (Boiss.) Greuter & Burdet; Fl. Pal.: *Scabiosa eremophila* Boiss. [syn.]
Ref.: Greuter & Burdet, in Greuter & Raus (1985): p. 76.

Solanum villosum (L.) Mill.; Fl. Pal.: *Solanum luteum* Mill. [syn.]

Solenostemma arghel (Delile) Hayne; Fl. Pal.: *Solenostemma oleifolium* (Nectoux) Bullock & E. A. Bruce [syn.]

Sonchus asper (L.) Hill. subsp. ***glaucescens*** (Jord.) Ball; Fl. Pal.: *Sonchus nymanii* Tinneo & Guss. [syn.]

Stellaria cupaniana (Jord. & Fourr.) Beguinot; Fl. Pal.: *Stellaria media* (L.) Vill. subsp. *postii* Holmboe [syn.]

Stellaria pallida (Dumort.) Crépin; Fl. Pal.: *Stellaria pallida* (Dumort.) Piré [syn.]

Symphytum brachycalyx Boiss.; Fl. Pal.: *Symphytum palaestinum* Boiss. [syn.]

Taeniatherum caput-medusae (L.) Nevski subsp. *crinitum* (Schreb.) Melderis; Fl. Pal.: *Taeniatherum crinitum* (Schreb.) Nevski [syn.]

Tanacetum sinaicum (Fresen.) Decne. ex K. Bremer & Humphries; Fl. Pal.: *Tanacetum santolinoides* (DC.) Feinbrun & Fertig [syn.]

Telmissa microcarpa (Sm.) Boiss.; Fl. Pal.: *Sedum microcarpum* (Sm.) Schol. [syn.]

Tetragonolobus requienii (Mauri ex Sanguinetti) Sanguinetti; Fl. Pal.: *Tetragonolobus requienii* (Mauri ex Sanguinetti) Daveau [syn.]

Teucrium capitatum L.; Fl. Pal.: *Teucrium polium* L. [syn.]

Teucrium lamifolium D'Urv. subsp. *stachyophyllum* (P. H. Davis) Hedge & Ekim; Fl. Pal.: *Teucrium stachyophyllum* P. H. Davis [syn.]

Teucrium scordium L. subsp. *scordioides* (Schreb.) Maire & Petitm.; Fl. Pal.: *Teucrium scordioides* Schreb. [syn.]

Thymelaea gussonei Boreau; Fl. Pal.: *Thymelaea pubescens* (L.) Meissner [syn.]

Tordylium carmeli (Labill.) Al-Eisawi & Jury; Fl. Pal.: *Synelcosciadium carmeli* (Labill.) Boiss. [syn.]

Tordylium cordatum (Jacq.) Poir.; Fl. Pal.: *Ainsworthia cordata* Boiss. [syn.]

Tordylium trachycarpum (Boiss.) Al-Eisawi & Jury; Fl. Pal.: *Ainsworthia trachycarpa* Boiss. [syn.]

Torilis tenella (Delile) Rchb.; Fl. Pal.: *Caucalis tenella* Delile [syn.]

Tribulus mollis Ehrenb. ex Schweinf.; Fl. Pal.: *Tribulus longipetalus* Viv. var. *mollis* (Ehrenb. ex Schweinf.) Zohary [syn.]

Tribulus pentandrus Forssk.; Fl. Pal.: *Tribulus longipetalus* Viv. [syn.]

Trichodesma africanum (L.) Sm.; Fl. Pal.: *Trichodesma africanum* (L.) Lehm. [syn.]

- Trichodesma ehrenbergii* Schweinf.; Fl. Pal.: *Trichodesma ehrenbergii* Boiss. [syn.]
- Trifolium billardieri* Spreng.; Fl. Pal.: *Trifolium billardieri* Spreng. [syn.]
- Trifolium filiforme* L.; Fl. Pal.: *Trifolium micranthum* Viv. [syn.]
- Trifolium grandiflorum* Schreb.; Fl. Pal.: *Trifolium speciosum* Willd. [syn.]
- Trifolium lineare* Greene; Fl. Pal.: *Trifolium philistaeum* Zohary [syn.]
- Trigonella balansae* Boiss. & Reut.; Fl. Pal.: *Trigonella corniculata* (L.) L. [syn.]
- Trigonella glabra* Thunb.; Fl. Pal.: "*Trigonella hamosa*"; *Trigonella moabitica* Zohary [syn.]
Ref.: Lassen, in Greuter & Raus (1987): p. 447.
- Trigonella hierosolymitana* Boiss.; Fl. Pal.: *Trigonella kotschyi* Fenzl ex Boiss. var. *hierosolymitana* (Boiss.) Sirj. [syn.]
- Tripodion tetraphyllum* (L.) Fourr.; Fl. Pal.: *Physanthyllis tetraphilla* (L.) Boiss. [syn.]
- Ulmus minor* Mill. subsp. *canescens* (Melville) Browicz & J. Zielinsk; Fl. Pal.: *Ulmus canescens* Melville [syn.]
- Urochloa mutica* (Forssk.) Nguyen; Fl. Pal.: *Brachiaria mutica* (Forssk.) Stapf [syn.]
- Urtica kioviensis* Rogow.; Fl. Pal.: *Urtica hulensis* Feinbrun
- Urtica membranacea* Poir.; Fl. Pal.: *Urtica dubia* Forssk.
- Vaccaria hispanica* (Mill.) Rauscher; Fl. Pal.: *Vaccaria pyramidata* Medik. [syn.]
- Valeriana dioscoridis* Sm.; Fl. Pal.: *Valeriana italica* Lam. [syn.]
- Vicia parviflora* Cav.; Fl. Pal.: *Vicia tenuissima* (M. Bieb.) Schinz & Thell. [syn.]
- Voluntaria crupinoides* (Desf.) Maire; Fl. Pal.: *Amberboa crupinoides* (Desf.) DC.
- Voluntaria lippii* (L.) Cass. ex Maire; Fl. Pal.: *Amberboa lippii* (L.) DC.
- Vulpia fasciculata* (Forssk.) Fritsch; Fl. Pal.: *Vulpia fasciculata* (Forssk.) Samp. [syn.]
- Xolantha guttata* (L.) Raf.; Fl. Pal.: *Tuberaria guttata* (L.) Fourr. [syn.]
- Zaleya pentandra* (L.) C. Jeffrey; Fl. Pal.: *Trianthema pentandra* L. [syn.]

5. List of species excluded from the "Distribution Atlas"

Agrostis gigantea Roth

Ref.: El-Oqlah & Lahham (1985)

Note: An accurate collection site and a specimen determined by a grass expert are needed before inclusion in the Flora Palaestina list of species.

Allium macrochaetum Boiss. & Hausskn.

Note: The record of this species from Edom could not be verified.

Anthyllis vulneraria L.

Ref.: Baierle & al., (1988): p. 460.

Note: The authors reporting its presence in Ajloun-Zobiah area (Gilead) have postulated doubts concerning the exact taxonomic position of this taxon. Further collection and investigations may solve the questions and enable the inclusion of the appropriate taxon in the list of Flora Palaestina species.

Arnebia macrocalyx (Cosson & Kralik) Boulos

Ref.: Boulos & Al-Eisawi (1977a).

Note: I could not find a way to verify this record.

Arrhenatherum elatius (L.) Beauv. & J. C. Presl

Ref.: El-Oqlah & Lahham (1985)

Note: An accurate collection site and a specimen determined by a grass expert is needed before inclusion of this species in the Flora Palaestina list of species.

Artemisia verlotiorum Lamotte

Ref.: Baierle & al. (1988): p. 457.

Note: Not included in the "Distribution Atlas" because its collection site is east of the 36° E longitude.

Asphodeline damascena (Boiss) Baker

Ref.: El-Oqlah & Lahham (1985)

Note: An accurate collection site and a specimen citation are needed before inclusion in the Flora Palaestina list of species.

Astragalus berytheus Boiss. & Blanche

Ref.: El-Oqlah & Lahham (1985)

Note: This is a plant of coastal sands. An accurate collection site and a specimen determined by an expert of the complicated genus *Astragalus* are needed before inclusion in the Flora Palaestina list of species.

Astragalus intercedens Sam. ex Rech. f.

Ref.: El-Oqlah & Lahham (1985)

Note: This is a plant of extreme desert areas. An accurate collection site and a specimen

determined by an expert to the complicated genus *Astragalus* are needed before inclusion in the Flora Palaestina list of species.

***Avena wiestii* Steud.**

Ref.: El-Oqlah & Lahham (1985)

Note: This is a plant of steppes and desert areas; probably collected in a desert area east of the Gilead.

***Biarum eximium* (Schott & Kotschy) Engler**

Ref.: The long-distant discontinuity noted by Al-Eisawi (1985a): p. 349 between the Turkish endemic *B. eximium* and the Jordanian population deserves further observations before its inclusion in Flora Palaestina.

***Bupleurum semicompositum* L.**

Ref.: El-Oqlah & Lahham (1985)

Note: Probably grows in a steppe or desert area out of the Gilead

***Calendula tripterocarpa* Rupr.**

Ref.: El-Oqlah & Lahham (1985)

Note: This is one of the most drought and heat resistant species of *Calendula* in the Flora Palaestina area. Its record from the area drawn in the Ajloun Mts. seems to deserve further verification.

***Calligonum tetrapterum* Taub. & Spach**

Ref.: Al-Eisawi (1983).

Note: Not included in the "Distribution Atlas" because its collection site is east of the 36° E longitude.

***Campanula sulphurea* Boiss.**

Ref.: El-Oqlah & Lahham (1985)

Note: This is a psammophyte restricted to sandy soils. Most specimens in the Flora Palaestina area are recorded from the coastal sandy soils.

***Carex mediterranea* C. B. Clarke**

Ref.: El-Oqlah & Lahham (1985)

Note: An accurate collection site and a specimen determined by sedge expert is needed before inclusion of this species in the Flora Palaestina list of species.

***Centaurea pallescens* Delile**

Ref.: El-Oqlah & Lahham (1985)

Note: This is a plant of steppes and deserts. El-Oqlah & Lahham do not give clear location of their collection, the Gilead, including Jebel Ajloun, is a typical Mediterranean area and therefore this record could not be included in the Gilead.

***Cephalanthera damasonium* (Mill.) Druce**

Ref.: El-Oqlah & Lahham (1985).

Note: An accurate collection site and a specimen determined by an orchid expert is needed before inclusion of this species in the Flora Palaestina list of species.

***Chiliadenus montanus* (Vahl) Brullo**

Ref.: El-Oqlah & Lahham (1985).

Note: This is a plant of rocks in steppes and desert areas further south of Jebel Ajloun area.

***Chrysopogon gryllus* (L.) Trin.**

Ref.: Al-Eisawi (1985a).

Note: I could not find a way to verify this record.

***Cicer arietinum* L.**

Ref.: El-Oqlah & Lahham (1985).

I could not find a way to verify this record.

***Colchicum crocifolium* Boiss.**

Ref.: Al-Eisawi & al. (1996).

Note: Not included in the "Distribution Atlas" because its collection site is east of the 36° E longitude.

***Crocus cartwrightianus* Herb.**

Ref.: Al-Eisawi (1985a).

Note: I could not find a way to verify this record.

***Crucianella aegyptiaca* Forssk. (= *C. herbacea* Forssk.) and *Crucianella transjordanica* Rech. f.**

Ref.: El-Oqlah & Lahham (1985).

Note: Probably derived from desert areas out of the Gilead

***Daucus guttatus* Sm.**

Ref.: El-Oqlah & Lahham (1985).

Note: I could not find a way to verify this record.

***Ephedra ciliata* Fisch. & C. A. Mey. (= *E. peduncularis* Boiss.)**

Ref.: El-Oqlah & Lahham (1985c).

Note: This is a plant of hot and extreme deserts; if determined correctly probably collected in a desert area out of the Gilead.

***Erucaria rostrata* Boiss. ex Dinsm.**

Ref.: El-Oqlah & Lahham (1985).

Note: This is a plant of steppes and desert areas; probably collected in a desert area out of the Gilead.

***Erysimum scabrum* DC.**

Ref.: Polatschek, in Greuter & Raus (eds.) 1983: p. 92.

Note: An ambiguous record.

***Gisekia pharnacioides* L.**

Ref.: Danin, in Greuter & Raus (1989): p. 36.

***Guizotia abyssinica* (L. f.) Cass.**

Note: One specimen in HUJ with doubtful determination may indicate an un-successful growth of an alien. Until more information is gathered this species is removed from the list of Flora Palaestina species.

***Halothamnus iraqensis* Botsch.**

Ref.: Al-Eisawi & al. (1996).

Note: This species was not accepted by Greuter & al., (1984) and was not mentioned in the list of plants from the E Mediterranean area.

***Hypocoum aegyptiacum* Asch. & Schweinf.**

Ref.: El-Oqlah & Lahham (1985).

Note: This is a plant of steppes and desert areas; probably collected in a desert area out of the Gilead.

***Iris reticulata* M. Bieb.**

Ref.: El-Oqlah & Lahham (1985).

Note: An accurate collection site and a specimen determined by an expert to *Iris* species of the Near East are needed before inclusion of this species in the list of species of Flora Palaestina.

***Linum album* Kotschy**

Ref.: Al-Eisawi (1985b).

Note: Recorded far east of the 36° longitude, the eastern boundary of the Distribution Atlas.

***Lomelosia porphyroneura* Greuter & Burdet**

Ref.: El-Oqlah & Lahham (1985).

Note: This is a plant of steppes and desert areas; probably collected in a desert area out of the Gilead.

***Lotus glinoides* Delile and *Lotus halophilus* Boiss. & Spruner**

Ref.: El-Oqlah & Lahham (1985)

Note: *L. glinoides* is a plant of extreme desert areas; *L. halophilus* is a plant of sandy soils of the coastal plain and of desert areas. It is hard to accept the records of either of the two *Lotus* species for the Gilead.

***Lupinus palaestinus* Boiss.**

Ref.: El-Oqlah & Lahham (1985).

Note: *L. palaestinus* is a plant of sandy soils of the coastal plain of Israel. It is hard to accept the record of this species for the Gilead.

***Medicago arabica* (L.) Hudson**

Ref.: El-Oqlah & Lahham (1985).

Note: An accurate collection site and a specimen determined by a *Medicago* expert is needed before inclusion of this species in the Flora Palaestina list of species.

***Medicago laciniata* (L.) Mill.**

Ref.: El-Oqlah & Lahham (1985).

Note: This species was probably collected in a desert area out of the Gilead and can not be included without accurate location.

***Melilotus siculus* (Turra) D. Jacks.**

Ref.: El-Oqlah & Lahham (1985).

Note: Being a new record for Jordan and for the Gilead an accurate location is needed.

***Micromeria sinaica* Benth.**

Ref.: El-Oqlah & Lahham (1985).

Note: This is a rock plant of steppes and desert areas situated much further south of the Ajloun area.

***Myrrhoides nodosa* (L.) Cannon**

Ref.: El-Oqlah & Lahham (1985).

Note: I could not find a way to verify this record.

***Ononis vaginalis* Vahl**

Ref.: El-Oqlah & Lahham (1985).

Note: This is a plant of sandy soils of Edom and desert areas in Egypt. It is hard to accept the records of this species for the Gilead.

***Ophrys speculum* Lynk and *Ophrys spruneri* Nyman**

Ref.: El-Oqlah & Lahham (1985).

Note: An accurate collection site and specimens determined by an orchid expert are needed before inclusion in the Flora Palaestina list of species.

***Orchis militaris* L. and *Orchis simia* Lam.**

Ref.: El-Oqlah & Lahham (1985).

Note: I could not find a way to verify these records.

***Parapholis gracilis* Bor**

Ref.: El-Oqlah & Lahham (1985).

Note: An accurate collection site and a specimen determined by a grass expert is needed

before inclusion of this species in the Flora Palaestina list of species.

***Paronychia palaestina* Eig**

Ref.: El-Oqlah & Lahham (1985)

Note: This is an endemic plant restricted to Mediterranean beach of Israel. Its record is unreasonable and could not be verified.

***Pennisetum villosum* R. Br.**

Ref.: El-Oqlah & Lahham (1985)

Note: An accurate collection site and a specimen determined by a grass expert is needed before inclusion of this species in the Flora Palaestina list of species.

***Plantago phaeostoma* Boiss. & Heldr.**

Ref.: El-Oqlah & Lahham (1985)

Note: Probably collected in a desert area out of the Gilead.

***Polygonum palaestinum* Zohary**

Ref.: El-Oqlah & Lahham (1985)

Note: This plant is endemic to coastal dunes.

***Rhamnus disperma* Ehrend. Ex Boiss.**

Ref.: El-Oqlah & Lahham (1985)

Note: Probably collected in a desert area out of the Gilead.

***Salix pseudosafsaf* A. Camus & Gamble**

Ref.: El-Oqlah & Lahham (1985)

Note: I could not find a way to verify this record.

***Salvia aegyptiaca* L.**

Ref.: El-Oqlah & Lahham (1985)

Note: This is a plant of steppes and desert areas; probably collected in a desert area out of the Gilead.

***Scrophularia pinardii* Boiss.**

Ref.: El-Oqlah & Lahham (1985)

Note: I could not find a way to verify this record.

***Senecio flavus* (Decne.) Schultz Bip.**

Ref.: El-Oqlah & Lahham (1985)

Note: This is a plant of hot deserts. It is hard to include it in the Gilead from reasons presented above for *Centaurea pallescens*.

***Smyrniopsis cachroides* Boiss.**

Ref. El-Oqlah & Lahham (1985)

Note: I could not find a way to verify this record.

***Teucrium rigidum* Benth.**

Ref. Al-Eisawi (1983).

Note: Not included in the "Distribution Atlas" because its collection site is east of the 36⁰E longitude.

***Trifolium angustifolium* L.**

Ref.: El-Oqlah & Lahham (1985)

Note: This is a rare plant of Mt. Carmel area. An accurate location and determination by a *Trifolium* expert is needed before inclusion in the Flora Palaestina list.

***Trifolium palaestinum* Boiss.**

Ref.: El-Oqlah & Lahham (1985)

Note: This is an endemic plant of sandy soils of the coastal Mediterranean in Israel. Until verified, this record can not be included in the Atlas for the Gilead.

***Trigonella homosa* L. (= *T. hamosa*?)**

Ref.: El-Oqlah & Lahham (1985)

Note: Until the correct name is verified this taxon can not be included in the list of Flora Palaestina.

***Urtica membranacea* Poir.**

Ref.: El-Oqlah & Lahham (1985)

Note: A plant of sandy soils at the coastal area. It is hard to accept its record for the Gilead.

***Valantia muralis* L.**

Ref.: El-Oqlah & Lahham (1985)

Note: The ecological conditions in the area where this species grows in Israel (the spray zone at the Mediterranean beach) are basically different than those reported by El-Oqlah & Lahham (1985). Until verified, this record can not be included.

***Valerianella scleropoa* Fischer & C.A.Mey.**

Ref.: El-Oqlah & Lahham (1985)

The record of this species from the Gilead could not be verified.

***Zingeria pisidica* (Boiss.) Tutin**

The record of this species from Ammon and Edom could not be verified.

***Zingeria trichopoda* (Boiss.) P. Smirnov**

Ref.: Al-Eisawi (1985a)

Note: I could not find a way to verify this record.

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