

A List of Important Honeybee Nectariferous and Polleniferous Plant Species in the West Bank Governorates, Palestine

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Abstract: The main goal of this study is to provide information about the foraging value of a number of specific plant species for honeybees in Palestine, since one of the limiting factors of Palestine's apiculture industry is the unpredicted seasonality in the blooming phenology of nectariferous and polleniferous plant species. This limiting factor can be overcome by increasing and diversifying the population of bee forage plant species throughout man made plantations. In this survey, a combination of literature and field surveys were used in order to identify and compile a list of plant species, which are of importance for fulfilling the honeybee's needs of nectar and pollen. The study was conducted through bi-weekly visit to a numbers of randomly selected sites located in some nature reserves and agricultural fields, within the West Bank Governorates. A total of 143 nectariferous and polleniferous plant species, belonging to 37 families, were identified through direct observation of foraging bees, and/or through literature survey. The dominant families are Compositae with 27 (18.8%) belonging species, followed by Lamiaceae family with 24 (16.7%) belonging species, then followed by Boraginaceae family with 8 (5.5%) belonging species and then followed by other families. The identified plant species was grouped into pollen, nectar and both pollen and nectar sources plant species. The polleniferous plant species group counted 17 which is equivalent to 11.8%; the nectariferous plant species group counted 29 which is equivalent to 20.2%; and the third groups of plant species that have been visited by bees for collecting both pollen and nectar counted 97, which is equivalent to 68%. The chronologies of the blooming plant species were also recorded. It was concluded that any of the studied locations can be profitably utilized for commercial and or large scale beekeeping, if the important limiting factor can be overcome by increasing and diversifying the population of bee forage plant species throughout man made plantations. The paper provides information on the wild and cultivated nectariferous and polleniferous plants that are important for the bees in the West Bank Governorates, Palestine.

Key words: Diversity, honeybees, nectariferous, polleniferous, Palestine.

1. Introduction

Flowers are the mainstay of bee's life. Honeybee workers make thousands of visits to flowers in order to collect nectar and pollen. Flowering plants of several plant families are blooming at different time intervals of the year [1]. Depending upon the soil type, climatic factors and the habitat of the vegetation, the time of the blossoming may change for even the same nectar plants [2]. Sound information on duration of flowering and blooming time is essential for proper

beekeeping management [3]. The practice of beekeeping is not only depends on the better strain of honeybees but also on abundance and occurrence of pollen and nectar sources within the surrounding area of an apiary [4]. The good knowledge of the diversity, density and blooming chronologies of nectariferous and polleniferous species are prerequisite and essential for guiding beekeepers in the choice of the best suitable sites for locating their apiaries and subsequently enhancing the efficiency of beekeeping industry and successful beekeeping. Such enhancement may enable beekeepers to harvest a good yield of honey and other bee products, and increase their own financial profits.

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Literature survey showed that information on local bee forage plants was compiled by several studies conducted by several scientists, like Refs. [1, 5-13].

In the book, Free [1] mentioned that pollen are more efficiently collected and distributed by mechanical means (by insects or wind current) on crop plants which require cross pollination. The author also arranged crops needing pollination by various pollinator insects in general and those plant families pollinated by honeybees, notably Papilionaceae and Rosaceae. Zohary [5] includes the whole area of the West Bank and the Gaza Strip in his flora palestinae multi volume books, which have updated nomenclature, distribution and habitat data for 2,700 species. Fahn [6] identified nectaries of honey plants in the land of Israel, their structure and the effects of ecological factors on nectar secretion. Gindel [7] studied the acclimation of *Eucalyptus* during 1935-1951 in Israel as a potential source of food rewards for honeybees. Lupo and Eisikowitch [8] concluded that *Eucalyptus erythrocotis* is important source of nectar and pollen for honeybees in Israel. In their evaluation study, Dag et al. [9] studied the economic values of bee forage plants planted in Israel. Dag et al. [10] studied the pollen sources for honeybees colonies in Israel. Reves [11], the author of a guide to *Eucalyptus* species growing in Israel, had shown the importance of different species grown for beekeeping purposes. Tamar and Shmida [12] compiled a list of 266 local wild plant species that have high food potential for honeybees in the neighboring state of Israel. Albaba [13] in previous study showed that a total number of 393 species of plants were identified with the recorded species belonging to 57 families, as potential forage plants for bees in the West Bank, Palestine.

The results of identification of the plant species collected in the investigated sites, their systematic, phenology and other information have followed the Israeli website called the Flora of Israel, which is powered by the Hebrew University in addition to Al Sheikh and Salman [14].

2. Material and Methods

2.1 Study Site

The West Bank is mostly located on the Central highlands of Palestine, just above the Jordan valley. It is composed of four climatically differentiated zones. The semi-coastal zone, which is a narrow strip extending at 100-300 m above sea level, in the North-Northwest corner, comprises of Jenin, Qalqilia and Tulkarem districts; soil is mostly alluvial and loam; the annual rainfall is 600 mm. The second climatic zone is Central highlands, which is mountainous rock and hilly area rising up 1,027 m above sea level, includes area from Jenin Southwards until Hebron district and receives annual rainfall around 400 mm. The third zone is Eastern slope zone, comprises of steep mountains with little rainfall (150-300 mm) and represents the semi-desert climate, as transitional area between Mediterranean and desert. The fourth climatic zone is the Jordan valley and lies 390 m below sea level; the soil is brackish with high content ratio of sodium [15].

2.2 Survey of Nectariferous and Polleniferous Species

A combination of literature and field surveys were used in order to identify and compile a list of 143 plant species, which are of importance for fulfilling the honeybee's needs of nectar and pollen. The study was conducted through bi-weekly visit to the selected sites located in some nature reserves or agricultural fields, which was randomly selected in the West Bank Governorates. In every site visit, four line transects of 1,000 m in length each, were selected and stationed on two separate points in each surveyed site. The start and end of each transect were marked with the national flags to enhance visibility. While moving on the transects each five steps interval, flowering plants found within 2 m radius, were visited and observed for the presence and foraging activities of honeybees within a predetermined period of 10 min. Plants were scored as bee foraging species, when at least three

honeybees had visited and foraged on the flowers within the observation period [16]. Camera shots were used to prove the honeybee's presence and identification of the plant species.

The literature survey revealed a preliminary list of plants diversity as potential forage plants for bees in the West Bank, Palestine. It was compiled based on field survey and literature survey of many existing references, such as Refs. [3-5, 7, 10, 12, 14, 16, 17]. Plant identification, phenology and other information were obtained basically from Ref. [5], flora of Israel web [18] and the preliminary checklist and ecological data—base of plants of the West Bank [14].

3. Results and Discussion

The study area (the West Bank) is mostly located on the Central highlands of Palestine, just above the Jordan valley, whereas natural forest, agricultural fields and irrigated crops are found. Annex 1 lists 143 species from the native flora of Palestine that were identified as bee forage plants out of an initial list of 393 potential plants. The table also reports these species' main food rewards and their blooming period in Palestine. Based on the results of this study, a total of 143 nectariferous and polleniferous plant species, belonging to 37 families (Fig. 1), were identified through direct observation of foraging bees, and/or through literature survey.

The results have shown that the most important nectariferous and polleniferous plants species are the representatives of family Compositae (*Achillea falcata*, *Achillea fragrantissima*, *Achillea santolina*, *Carthamus glaucus*, *Carthamus nitidus*, *Carthamus tenuis*, *Centaurea hyalolepis*, *Centaurea iberica*, *Centaurea lanulata*, *Centaurea pallescens*, *Centaurea verutum*, *Chiliadenus iphionoides*, *Crupina crupinastrum*, *Onopordum alexandrinum*, *Onopordum blancheanum*, *Onopordum carduiforme*, *Onopordum cynarocephalum*, *Senecio joppensis*, *Senecio vernalis*, *Silybum marianum*, *Cynara syriaca*, *Dittrichia graveolens*, *Dittrichia viscosa*, *Echinops gaillardotii*, *Echinops philistaeus*, *Eupatorium cannabinum*, *Notobasis syriaca*), followed by the representatives of family Lamiaceae (*Ballota undulata*, *Coridothymus capitatu*, *Lamium moschatum*, *Lavandula stoechas*, *Mentha* sp., *Micromeria fruticosa*, *Prasium majus*, *Rosmarinus officinali*, *Salvia fruticosa*, *Salvia hierosolymitana*, *Salvia indica*, *Salvia judaica*, *Satureja thymbra*, *Sideritis perfoliata*, *Sideritis pullulan*, *Stachys distans*, *Teucrium creticum*, *Teucrium divaricatum*, *Teucrium scordium*, *Trifolium fragiferum*, *Trifolium palaestinum*, *Trifolium purpureum*, *Trifolium repens*, *Trifolium resupinatum*), then followed by the representatives of family Boraginaceae (*Alkanna strigosa*, *Cynoglossum creticum*, *Echiochilon fruticosum*, *Echium angustifolium*,

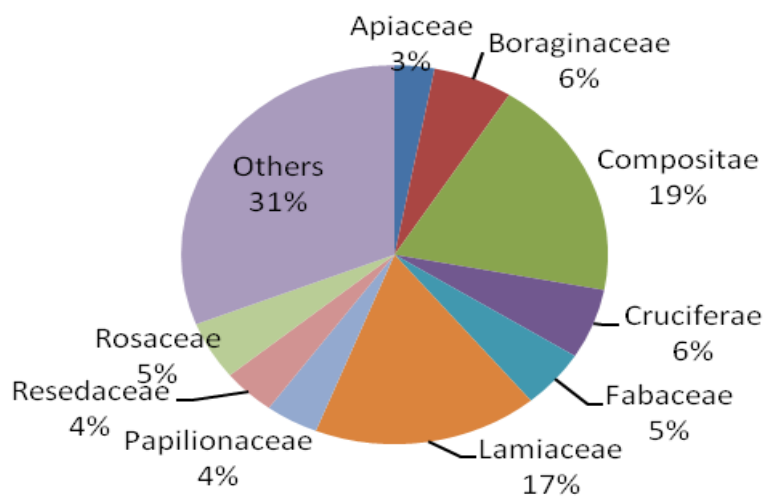


Fig. 1 Family wise distribution in percentage of nectariferous and polleniferous plant species.

Echium glomeratum, *Echium judaeum*, *Echium plantagineum*, *Moltkiopsis ciliata*), and followed by other families representatives as listed in Annex 1.

The identified plant species was grouped into three groups based on their food rewards: a group of pollen source plants species, a group of nectar source plants species and the third group of both pollen and nectar sources plant species. The results have shown the dominance of the plant species which have been visited for collecting both pollen and nectar, counted 97 (68%). The pollen source plant species counted 17 (12%) and the nectar source species were 29 (17%). Flower morphology and the low pollen productivity of nectariferous plants may affect the quantitative participation of pollen as a food rewards sources to attract bees. Some species of Fabaceae family (*Medicago sativa*, *Melilotus albus*) have a secondary period of flowering in late autumn or in summer, which is very important for supplying the honeybees with nectar and pollen during the dry season here in Palestine (Fig. 2).

Column five of Annex 1 provides a classification of the survey species according to their main food elements to honeybees (nectar (N), pollen (P) or both (N+P)). This classification is based on qualitative

observations of honeybees behavior and does not express the quantity of nectar or pollen produced per plant or collected by bees. The chronology of main period of blooming plant species were defined as in Fig. 3. The peak blooming period was recorded in April, followed by May, then by March and then by June, etc..

Fig. 3 showed that the months January and December are characterized by a low number of flowering polleniferous and nectariferous plants. This study emphasizes the importance of polleniferous and nectariferous plants for honeybees in the West Bank

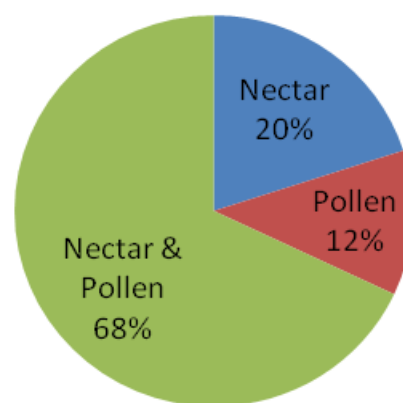


Fig. 2 Food rewards wise distribution in percentage of nectariferous and polleniferous species visited by honeybees workers.

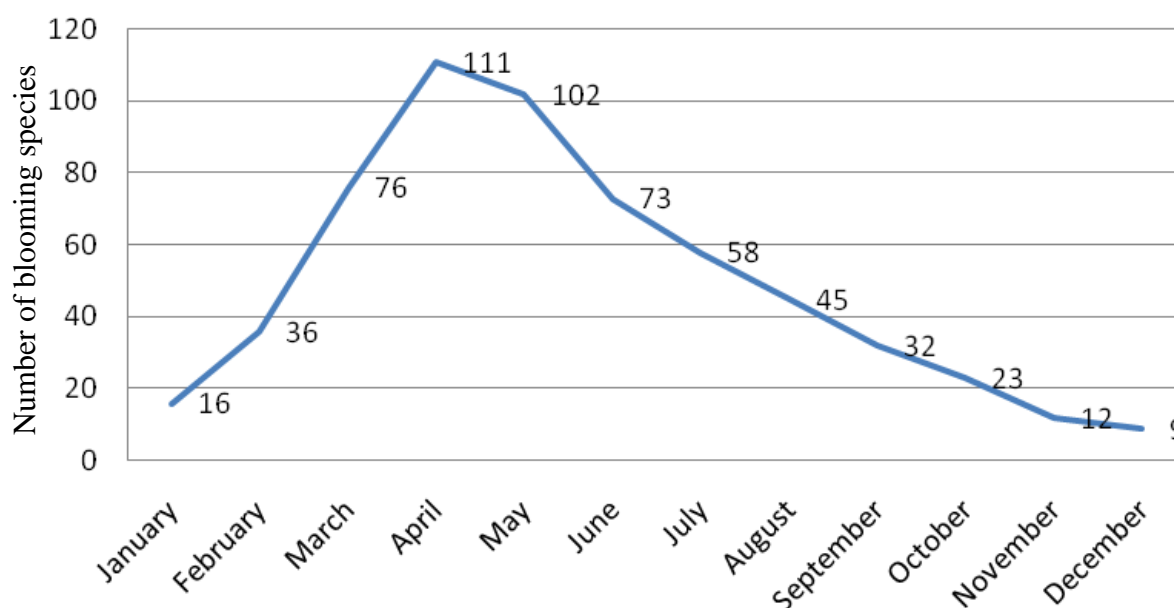


Fig. 3 Number of blooming species throughout months.

Governorates, Palestine. Their findings demonstrate the fluctuations in pollen and nectar availability for bees throughout the months of the year, which will subsequently affect negatively the honey yields and pollination services. These findings are in agreement with many regional and international studies. The listed plant species are of importance for securing food of honeybees and also contribute to the beautiful landscape. Considering its environmental importance, these plant species are recommended to be protected by competent agencies of the Palestinian authority as well as by the surrounding countries.

4. Conclusions

The author's findings have led to some conclusions about the local flora visited by honeybees for nectar and pollen grains. A hundred and forty three taxa have been established in the study of importance for the honeybees in Palestine.

It could be concluded that any of the studied locations can be profitably utilized for commercial or large scale beekeeping, if the important limiting factor can be overcome by increasing and diversifying the population of bee forage plant species throughout man made plantations. The results and subsequent conclusion are in agreement with many regional studies.

Six species of the surveyed plants (*Hedera helix*, *Moltkiopsis ciliate*, *Senecio vernalis*, *Maresia pulchella*, *Sinapis alba* and *Leucophyllum frutescens*) produce pollen and nectar, and have long blooming period. Therefore, the author recommends their conservation and planting if possible as pollen and nectar sources, in combination with other plants that can serve as sources of food elements for honeybees in Palestine

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Annex 1 A list of important honeybee nectariferous and polleniferous plant species of the West Bank Governorates, Palestine.

No.	Spp. scientific name	Family name	Spp. English name	Food elements	Blooming months
1	<i>Asphodeline lutea</i>	Liliaceae	Yellow Asphodel	P & N	March-May
2	<i>Asphodelus aestivus</i>	Liliaceae	Asphodel	P & N	February-May
3	<i>Acer obtusifolium</i>	Aceraceae	Syrian Maple	P & N	March-May
4	<i>Ammi visnaga</i>	Apiaceae	Toothpick	P	April-August
5	<i>Cuminum cyminum</i>	Apiaceae	Cumin	P & N	March-April
6	<i>Eryngium creticum</i>	Apiaceae	Field Eryngo	P & N	May-August
7	<i>Eryngium glomeratum</i>	Apiaceae	Sea Holly	P & N	May-September
8	<i>Eryngium maritimum</i>	Apiaceae	Sea Holly	P & N	April-August
9	<i>Hedera helix</i>	Araliaceae	Ivy	P & N	January-December
10	<i>Scilla hyacinthoides</i>	Asparagaceae	Hyacinth Squill	P & N	February-April
11	<i>Alkanna strigosa</i>	Boraginaceae	Strigose Alkanet	N	March-June
12	<i>Cynoglossum creticum</i>	Boraginaceae	Blue Hound's Tongue	N	April-May
13	<i>Echiochilon fruticosum</i>	Boraginaceae	Bushy Bugloss	N	March-June
14	<i>Echium angustifolium</i>	Boraginaceae	Hispid Viper's-bugloss	P & N	March-August
15	<i>Echium glomeratum</i>	Boraginaceae	Tall Viper's-bugloss	P & N	March-June
16	<i>Echium judaeum</i>	Boraginaceae	Judean Viper's-bugloss	P & N	March-April
17	<i>Echium plantagineum</i>	Boraginaceae	Purple Viper's Bugloss	P & N	January-April
18	<i>Moltkiopsis ciliata</i>	Boraginaceae	Callous-leaved Gromwell	N	December-August
19	<i>Ceratonia siliqua</i>	Caesalpiniaceae	Carob tree	P & N	July
20	<i>Cercis siliquastrum</i>	Caesalpiniaceae	Cercis	N	February-May
21	<i>Capparis aegyptiaca</i>	Capparaceae	Egyptian Caper	P & N	March-August
22	<i>Capparis sicula</i>	Capparaceae	Caper	P & N	April-October
23	<i>Capparis spinosa</i>	Capparaceae	Spiny Caper	P & N	March-August
24	<i>Scabiosa palaestina</i>	Caprifoliaceae	Scabious	P & N	March-May
25	<i>Scabiosa prolifera</i>	Caprifoliaceae	Prolific Scabious	P & N	March-May
26	<i>Cistus incanus</i>	Cistaceae	Hairy Rockrose	P	March-June
27	<i>Helianthemum vesicarium</i>	Cistaceae	Pink Sun-rose	P & N	January-May
28	<i>Achillea falcate</i>	Compositae	Sulphur-colored Milfoil	P & N	April-May
29	<i>Achillea fragrantissima</i>	Compositae	Lavender Cotton	P & N	March-May
30	<i>Achillea santolina</i>	Compositae	Woolly Yarrow	P & N	March-May
31	<i>Carthamus glaucus</i>	Compositae	Glaucous Star Thistle	N & P	May-August
32	<i>Carthamus nitidus</i>	Compositae	Smooth Distaff thistle	N & P	April-August
33	<i>Carthamus tenuis</i>	Compositae	Safflower	N & P	May-September
34	<i>Centaurea hyalolepis</i>	Compositae	Centauray-thistle	N & P	March-June
35	<i>Centaurea iberica</i>	Compositae	Spanish Centauray-thistle	N & P	April-July
36	<i>Centaurea lanulata</i>	Compositae	Centauray-thistle	N & P	January-May
37	<i>Centaurea pallescens</i>	Compositae	Centauray	N & P	April-August
38	<i>Centaurea verutum</i>	Compositae	Centauray-thistle	N & P	May-July
39	<i>Chilidenuus iphionoides</i>	Compositae	Goldy Locks	P	September-November
40	<i>Crupina crupinastrum</i>	Compositae	False Saw-wort	N & P	March-May
41	<i>Onopordum alexandrinum</i>	Compositae	Thistle	N & P	March-May
42	<i>Onopordum blancheanum</i>	Compositae	Cotton Thistle	P & N	March-June
43	<i>Onopordum carduiforme</i>	Compositae	False Plumed Thistle	N & P	March-June
44	<i>Onopordum cynarocephalum</i>	Compositae	Artichoke Cotton-Thistle	N & P	May-July
45	<i>Senecio joppensis</i>	Compositae	Jaffa Groundsel	P & N	January-April
46	<i>Senecio vernalis</i>	Compositae	spring Groundsel	P & N	January-December
47	<i>Silybum marianum</i>	Compositae	Milk Thistle	N & P	March-May
48	<i>Cynara syriaca</i>	Compositae	Syrian Artichoke	N & P	June-August

A List of Important Honeybee Nectariferous and Polleniferous Plant Species in the West Bank Governorates, Palestine

(Annex 1 continued)

No.	Spp. scientific name	Family name	Spp. English name	Food elements	Blooming months
49	<i>Dittrichia graveolens</i>	Compositae	Stinkwort	P & N	August-December
50	<i>Dittrichia viscosa</i>	Compositae	Inula	P & N	September-November
51	<i>Echinops gaillardotii</i>	Compositae	Globe Thistle	N & P	June-July
52	<i>Echinops philistaeus</i>	Compositae	Pale Globe Thistle	N & P	May-August
53	<i>Eupatorium cannabinum</i>	Compositae	Common Hemp Agrimony	P & N	June October
54	<i>Notobasis syriaca</i>	Compositae	Syrian Thistle	N & P	April-June
55	<i>Convolvulus althaeoides</i>	Convolvulaceae	Mallow Bindweed	N	March-June
56	<i>Convolvulus dorycnium</i>	Convolvulaceae	Splendid Bindweed	N	April-July
57	<i>Diplotaxis eruroides</i>	Cruciferae	White Wall-rocket	N	February-March, November-December
58	<i>Diplotaxis harra</i>	Cruciferae	Wall-rocket	N	January-May
59	<i>Eruca sativa</i>	Cruciferae	Arugula	P & N	February-May
60	<i>Maresia pulchella</i>	Cruciferae	Pretty Maresia	P & N	January-November
61	<i>Sinapis alba</i>	Cruciferae	White Mustard	P & N	January-December
62	<i>Sinapis arvensis</i>	Cruciferae	Charlock	P & N	March-May
63	<i>Zilla spinosa</i>	Cruciferae	Spiny Zilla	N	January-May
64	<i>Raphanus raphanistrum</i>	Cruciferae	Sea-Radish, White Charlock	N	January-May
65	<i>Ecballium elaterium</i>	Cucurbitaceae	Squirting Cucumber	N & P	May-October
66	<i>Cephalaria joppensis</i>	Dipsacaceae	Jaffa Scabious	P & N	May-September
67	<i>Arbutus andrachne</i>	Ericaceae	Eastern Strawberry Tree	N	March-April
68	<i>Lupinus pilosus</i>	Fabaceae	Blue Lupine	P	February-April
69	<i>Prosopis farcta</i>	Fabaceae	Prosopis	P & N	May-August
70	<i>Lotus collinus</i>	Fabaceae	Judean Bird's-foot Trefoil	P & N	March-May
71	<i>Lotus creticus</i>	Fabaceae	Silvery Bird's-foot Trefoil	P & N	March-August
72	<i>Lupinus palaestinus</i>	Fabaceae	Palestine Lupine	P	February-May
73	<i>Medicago sativa</i>	Fabaceae	Buffalo Herb	P & N	April-July
74	<i>Melilotus albus</i>	Fabaceae	Yellow Melilot	N & P	April-October
75	<i>Hypericum triquetrifolium</i>	Gluciaceae	Tumble St. John's-wort	P	May-September
76	<i>Moluccella laevis</i>	Labiatae	Molucca Balm; Shell Flower; Bells of Ireland	N	April-July
77	<i>Origanum syriacum</i>	Labiatae	The Rose of Jericho	N & P	January-September
78	<i>Ballota undulata</i>	Lamiaceae	Common Ballota	N	April-October
79	<i>Coridothymus capitatus</i>	Lamiaceae	Cone Head Thyme	P & N	May-October
80	<i>Lamium moschatum</i>	Lamiaceae	Musky Archange	N	March-April
81	<i>Lavandula stoechas</i>	Lamiaceae	French Lavender; Spanish Lavender	N	February-May
82	<i>Mentha</i> sp.	Lamiaceae	Mint	N	June-July
83	<i>Micromeria fruticosa</i>	Lamiaceae	White Leaved Savory	P & N	February-June
84	<i>Prasium majus</i>	Lamiaceae	Great Hedge-nettle	N	July-October
85	<i>Rosmarinus officinalis</i>	Lamiaceae	Rosemary	N	March-September
86	<i>Salvia fruticosa</i>	Lamiaceae	Greek Sage	N	March-June
87	<i>Salvia hierosolymitana</i>	Lamiaceae	Jerusalem Sage	P & N	March-July
88	<i>Salvia indica</i>	Lamiaceae	Wild Sage	P & N	April-May
89	<i>Salvia judaica</i>	Lamiaceae	Judean Sage	P & N	April-June
90	<i>Satureja thymbra</i>	Lamiaceae	Savory of Crete	N	March-July
91	<i>Sideritis perfoliata</i>	Lamiaceae	Mountain Tea	N	June-October
92	<i>Sideritis pullulans</i>	Lamiaceae	Branching Ironwort	N	May-October
93	<i>Stachys distans</i>	Lamiaceae	Lamb's Ear	N	May-June
94	<i>Teucrium creticum</i>	Lamiaceae	Cretan Germander	N & P	May-September

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(Annex 1 continued)

No.	Spp. scientific name	Family name	Spp. English name	Food elements	Blooming months
95	<i>Teucrium divaricatum</i>	Lamiaceae	Spreading Germander	P & N	April-June
96	<i>Teucrium scordium</i>	Lamiaceae	Water Germander	P & N	June-October
97	<i>Trifolium fragiferum</i>	Lamiaceae	Strawberry Clover	N	April-May
98	<i>Trifolium palaestinum</i>	Lamiaceae	Palestine Clover	P & N	April-May
99	<i>Trifolium purpureum</i>	Lamiaceae	Purple Clover	P & N	April-May
100	<i>Trifolium repens</i>	Lamiaceae	Dutch Clover	N	April-May
101	<i>Trifolium resupinatum</i>	Lamiaceae	Trifolium Pink Clover	N	April-May
102	<i>Urginea maritima</i>	Liliaceae	Sea-squill	P & N	July-October
103	<i>Alcea dissecta</i>	Malvaceae	Bristly Hollyhock	P & N	April-July
104	<i>Alcea setosa</i>	Malvaceae	Hollyhock	P & N	April-June
105	<i>Eucalyptus</i> sp.	Myrtaceae	Eucalyptus	N	February-May, August-December
106	<i>Glaucium flavum</i>	Papaveraceae	Yellow-horned Poppy	P	April-August
107	<i>Glaucium grandiflorum</i>	Papaveraceae	Red-horned Poppy	P	April-May
108	<i>Anagyris foetida</i>	Papilionaceae	Mediterranean Stinkbush	P	January-April
109	<i>Ononis alopecuroides</i>	Papilionaceae	Foxtail Rest Harrow	P	April-May
110	<i>Ononis hirta</i>	Papilionaceae	Hairy Rest Harrow	P	March-May
111	<i>Ononis natrix</i>	Papilionaceae	Sticky Rest Harrow	P	April-September
112	<i>Ononis pubescens</i>	Papilionaceae	Downy Rest Harrow	P	March-July
113	<i>Retama raetam</i>	Papilionaceae	White Broom	N & P	March-April
114	<i>Calligonum comosum</i>	Polygonaceae	Calligonum Fringed	N & P	February-April
115	<i>Anemone coronaria</i>	Ranunculaceae	Crown Anemone	P	February - May
116	<i>Clematis cirrhosa</i>	Ranunculaceae	Virgin's Bower	P & N	November-February
117	<i>Clematis flammula</i>	Ranunculaceae	Sweet Virgin's Bower	P & N	April-June
118	<i>Reseda alba</i>	Resedaceae	White Upright Mignonette	P & N	February-April
119	<i>Reseda boissieri</i>	Resedaceae	Mignonette	P & N	February-May
120	<i>Reseda decursiva</i>	Resedaceae	Mignonette	P & N	February-November
121	<i>Reseda lutea</i>	Resedaceae	Yellow Mignonette	P & N	March-June
122	<i>Reseda muricata</i>	Resedaceae	Mignonette	P & N	March-April
123	<i>Reseda orientalis</i>	Resedaceae	Oriental Mignonette	P & N	December-February
124	<i>Rhamnus lycioides</i>	Rhamnaceae	Palestine Buckthorn	P & N	January-April
125	<i>Ziziphus spina-christi</i>	Rhamnaceae	Christ's Thorn Jujube	P & N	April-October
126	<i>Amygdalus communis</i>	Rosaceae	Common Bitter Almond	P & N	February-March
127	<i>Amygdalus korschinskii</i>	Rosaceae	Wild Almond	P & N	February-March
128	<i>Amygdalus</i> sp.	Rosaceae	Almond	P & N	February -March
129	<i>Prunus avium</i>	Rosaceae	Sweet Cherry	P & N	March-April
130	<i>Prunus domestica</i>	Rosaceae	Plum	P & N	March-April
131	<i>Prunus persica</i>	Rosaceae	Peach	P & N	March-April
132	<i>Prunus ursina</i>	Rosaceae	Bear's Plum	P & N	March-April
133	<i>Citrus</i> spp.	Rutaceae	Lemon	P & N	April-June
134	<i>Salix alba</i>	Salicaceae	Willow	P & N	March-June
135	<i>Verbascum galilaeum</i>	Scrophulariaceae	Common Mullein	P	April-July
136	<i>Verbascum sinaiticum</i>	Scrophulariaceae	Sinai Mullein	P	April-July
137	<i>Verbascum sinuatum</i>	Scrophulariaceae	Scallop-leaved Mullein	P	April-October
138	<i>Styrax officinalis</i>	Styracaceae	Storax Tree	N & P	March-April
139	<i>Tamarix aphylla</i>	Tamaricaceae	Athel Pine	P & N	July-November
140	<i>Tamarix tetragyna</i>	Tamaricaceae	Tamarisk	P & N	March-May
141	<i>Phyla nodiflora</i>	Verbenaceae	Sawtooth Fogfruit	N	April-September
142	<i>Nitraria retusa</i>	Zygophyllaceae	Salt Tree	P & N	April-May
143	<i>Zygophyllum dumosum</i>	Zygophyllaceae	Bushy Bean Caper Plant	P & N	February-April

P = pollen and N = nectar.