

2003/06/14

2003/09/15

15

51

202

365

12

3

10

10

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225

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# **Classification of Basaltic Flora and Isolation of Rhizobium Strains from Some Wild legumes in Homs region**

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## **ABSTRACT**

Some species of the Syrian Flora were waned, other were extincted. therefore, it was so nessesary to make a releve for restrict and classify the survival species in order to put them under conserving & improvement genetic program. The aim of this research was to study the plant diversity in West Homs; one of important basaltic region in Syria, and to concentrate on the wild legumes and the Rhizobium strains which cohabit with. A plant survey was carried out showed the existence of 365 species belong to 202 genera and 51 families, 15 species are endemic.12 species not observed previously in Syria but are found in Lebanon were recorded,in addition another 3 species not listed at all neither in Syria nor in Lebanon were mentioned. The geobotanical attributes and the economical importance of the gathered species were determined.as so as systematic keys of the most important families were suggested. The root nodules of 10 species belong to 10 genera of wild legumes were studied. Rhizobium strains were isolated and cultured in vitro. The morphologic characters were studied microscopy. The pure strains were reserved by refrigerator.

**Key Words:** Biodiversity, Syrian Flora, West Homs, Root nodule, Rhizobium.

!

(1953- 1936) (1900-1890) (1887-1884) Boissier .(Mouterde, 1966)  
 (1983-1966)

100 3150 (1983, 1970, 1966) Mouterde  
 .(1996 ) 300  
 checklist (1986)

Medchecklist  
 131 865 3459

(1998)

:

(2002)

1998

700 -280

<sup>2</sup> 2000

660

. ° 17.5

(1983, 1970, 1966) Mouterde

27

159

.(1999 , 1995, 1989 )

[1 ] ( <sup>7</sup> )

FAO

: (1993)

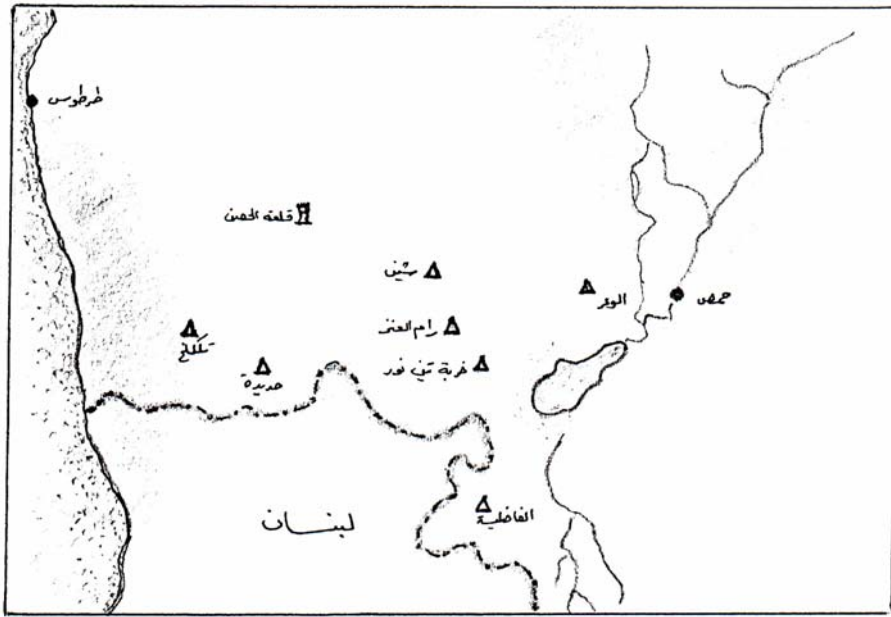
(1930)

$$Q_2 = 2000 P / M^2 - m^2$$

( )  
( )

:Q<sub>2</sub> :  
:P  
:M  
: m

.( )  
.( )



(1)

(2001 - 2002).

- :  
 ( 1966 , 1970 , 1983 ) Mouterde  
 ( 1966 - 1970 ) Zohary  
 ( 1965 - 1985 ) Davis  
 ( 1966 ) Townsend , Guest , Al Rawia  
 ( 1993 ) Grey - Wilson

Pabot

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:			.1
.			.2
.	10	% 95	.3
.	30	%0.1	.4
.	15		.5
.	0.5		.6
.			.7
) Y.E.M		0.1	.8
	(		
.	°28		.9
.		7 - 4	

( Y.E.M )

. 4°

Abiotic

:

-

(1)

(1)

	Q <sub>2</sub>	m	M	P		
	43.9	2.3	30.7	325.1	510	
	43.3	2.1	36.7	438.6	450	
	89.8	3.7	33	767	500	
	129.6	1.5	28	989.3	695	
	95.8	3.7	32.8	812.7	280	

pH

8 - 6.7

CaCO<sub>3</sub>

2- 0.24

.% 3.5

-

:

365

.(2

)

15

51

202

.1

.2

18

.(2 )

(1966)

.3

:

(Mouterde 1966, 1970 , 1983)

12 (

:  
Alchemilla diademata Rothm.  
Alkanna maleolens Bornm.  
Anacyclus clavatus (Desf.) Pers.  
Anthemis chia L.  
Anthemis hebronica Boiss.et Ky.  
Brassica cretica Lam.

Festuca partensis Huds.  
Isatis tinctoria L.  
Linum nodiflorum L.  
Lobularia maritima L.  
Orobanche lavandulacea Reichenb  
Papaver subpiriforme Fedde

: 3 (

Papaver humile Fedde  
Carthamus lanatus L.  
Santolina chamaecyparissus L.

)

: (

(1 ) : Papaver humile Fedde (1  
Papaveraceae

(2 ) : Carthamus lanatus L (2  
Asteraceae

20 – 30

(3 ) : Santolina chamaecyparissus L. (3  
Asteraceae

70

10-6





Asteraceae  
% 40

Fabaceae (4)  
(Poaceae)

75  
(2)

(5)

100

:

10

10

3

(6 5 4 )

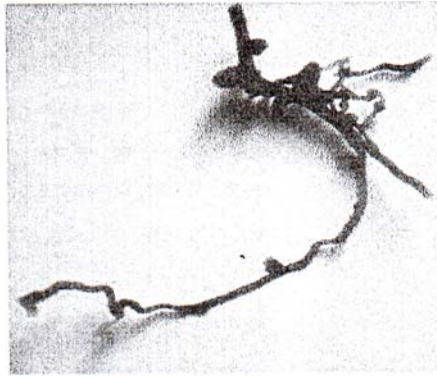
Ononis

Trifolium

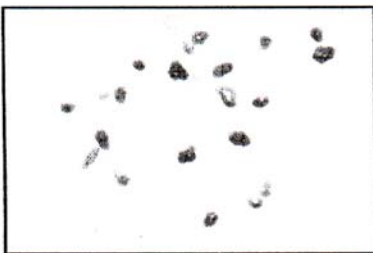
.Astragalus



**Trifolium tomentosum**



**(4)**



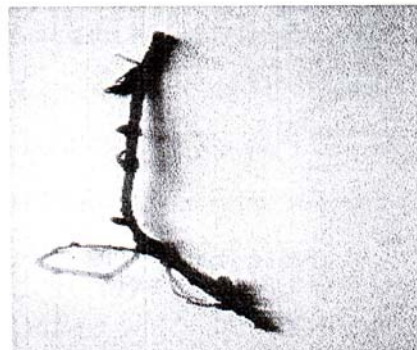
**Lathyrus annuus**



**(5)**



**Astragalus cruciatus**



**(6)**

.1

.2

.3

.4

(\*)

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(2)

Acanthus syriacus Boiss.	Acanthaceae		
Accacia cyanophlla Lind L.	Mimosaceae		O , Af
Achilla wilhelmsii C Kock.	Asteraceae	-	M , Ar
Adonis aestivalis L.	Ranunculaceae		M , W
Aegilopus columnaris Zhuk.	Poaceae		
Aegilopus ovata L.	Poaceae		M
Aegilopus peregrina (Hackel) Maire	Poaceae	-	
Aegilopus triuncialis L.	Poaceae	-	
Agrostis semiverticllata (Forsk.) Christens	Poaceae		F
Ainsworthia trachycarpa Boiss.	Apiaceae		
Alcea acaulis ( Cavan.) Alef.	Malvaceae		

(2)

<i>Alchemilla diademata</i> Rothm.	Rosaceae	* ( )	
<i>Alkanna maleolens</i> Bornm.	Boraginaceae	* ( )	
<i>Alkanna strigosa</i> Boiss. et Hohen	Boraginaceae		
<i>Allium schuberti</i> Zucc.	Liliaceae		M
<i>Alopecurus utriculatus</i> Banks & Sol.	Poaceae		F
<i>Alyssum damascenum</i> Boiss. et Gaill	Brassicaceae		N
<i>Alyssum marginatum</i> Steud.	Brassicaceae		N
<i>Alyssum iranicum</i> Hausskn	Brassicaceae		
<i>Amaranthus hybridus</i> L.	Amaranthaceae		
<i>Ammi majus</i> L.	Apiaceae		M
<i>Anacyclus clavatus</i> (Desf.) Pers.	Asteraceae		
<i>Anagallis arvensis</i> L.	Primulaceae		M, W
<i>Anchusa hybrida</i> Ten.	Boraginaceae		
<i>Anchusa strigosa</i> Labill.	Boraginaceae	-	
<i>Androsace maxima</i> L.	Primulaceae	-	
<i>Anemone coronaria</i> L.	Ranunculaceae		M
<i>Anthemis chia</i> L.	Asteraceae		N
<i>Anthemis cornucopia</i> Boiss.	Asteraceae		N
<i>Anthemis hebronica</i> Boiss. et Ky.	Asteraceae		N
<i>Anthemis palestina</i> Reut. in Boiss.	Asteraceae		N
<i>Anthemis tinctoria</i> L.	Asteraceae		N
<i>Arabis caucasica</i> Schlecht in Willd	Brassicaceae	-	
<i>Artemisia squamata</i> L.	Apiaceae		
<i>Arum palaestinum</i> Boiss.	Araceae		M
<i>Astragalus cruciatus</i> Link	Fabaceae		F
<i>Astragalus hamosus</i> L.	Fabaceae		M, F
<i>Astragalus transjordanicus</i> Sam.	Fabaceae	* ( )	F
<i>Avena alba</i> Vahl.	Poaceae	-	W, F
<i>Avena sterilis</i> L.	Poaceae	-	W, F
<i>Bellardia trixago</i> (L.) All .	Scrophulariaceae		
<i>Bellevalia densiflora</i> Boiss .	Liliaceae	*	
<i>Bellis perennis</i> L.	Asteraceae	-	M
<i>Biscutella ciliate</i> D.C.	Brassicaceae		
<i>Brassica assyriaca</i> sp. nova L.	Brassicaceae		F
<i>Brassica cretica</i> Lam.	Brassicaceae		M
<i>Brassica tournefortii</i> Gou.	Brassicaceae		F
<i>Briza maxima</i> L.	Poaceae		O
<i>Bromus flabellatus</i> (Hack.) Boiss.	Poaceae		F

(2)

Bromus madritensis L.	Poaceae	-	F
Bromus rubens L.	Poaceae	-	F
Bromus scorparius L.	Poaceae	-	F
Bromus squarrosus L.	Poaceae	-	F
Bromus sterillis L.	Poaceae	-	W , F
Bromus tectorum L.	Poaceae	-	W , M , F
Bunium ferulaceum Sibth .et Smith	Apiaceae		
Bupleurum nodiflorum Sibth .et Smith	Apiaceae		F
Calendula arvensis L.	Asteraceae		M
Calendula sinuata Boiss. et Gail .	Asteraceae		
Campanula propinque Fisch. Et Mey	Campanulaceae	-	N
Campanula strigosa Banks et Sol.	Campanulaceae		N
Capsella bursa-pastoris (L.)Medic	Brassicaceae		M , W
Cardaria darba (L.) Desv	Brassicaceae		M
Carduus argentatus L.	Asteraceae		W
Carduus pycnocephalus L.	Asteraceae	-	W
Carthamus glaucus M. Bieb.	Asteraceae		W
Carthamus lanatus L.	Asteraceae		W
Centaurea hyalolepis Boiss.	Asteraceae	-	
Centaurea iberica Trev. et Spreugel	Asteraceae		
Centaurea pallescens Delile	Asteraceae		
Centaureum pulchellum (Sw.) Druce	Gentianaceae		M
Cephalaria joppensis (Reichenb.) Goult.	Dipsacaceae		
Cephalaria syriaca (L.) Schrader var. sessile Boiss .	Dipsacaceae		
Cerastium dubium (Bast.) Schw.	Caryophyllaceae		
Certocephalus flacatus (L.) Pers.	Ranunculaceae		
Chenopodium murale L.	Chenopodiaceae		
Chenopodium vulvaria L.	Chenopodiaceae		
Chrysanthemum coronarium L.	Asteraceae		M
Chrysanthemum segetum L.	Asteraceae		W
Cichorium intybus L.	Asteraceae		M
Clypeola jonthlaspi L.	Brassicaceae		
Consolida ambigua (L.) Ball & Heywood	Ranunculaceae		
Convolvulus althaeoides L.	Convolvulaceae		M

(2)

<i>Convolvulus arvensis</i> L.	Convolvulaceae		M , W
<i>Convolvulus pentapetaloides</i> L.	Convolvulaceae		
<i>Cornucopiae cucullayum</i> L.	Poaceae		
<i>Crambe orientalis</i> L.	Brassicaceae		
<i>Crassula alata</i> (Viv.) Berger.	Crassulaceae		
<i>Crassula vaillantii</i> (Willd.) Roth.	Crassulaceae		
<i>Crepis aspera</i> L.	Asteraceae		
<i>Crepis hierosolymitana</i> Boiss.	Asteraceae		
<i>Crepis sancta</i> (L.) Babcock.	Asteraceae		
<i>Crithopsis delileana</i> (Schreb.) Nevski	Poaceae	-	
<i>Cutandia maritima</i> (L.) Benth.	Poaceae		
<i>Cynodon dactylis</i> (L.) Pers.	Poaceae		M , W , F
<i>Cynosurus coloratus</i> Lehm.	Poaceae		F
<i>Cyperus rotundus</i> L .	Cyperaceae		W
<i>Dactylis glomerata</i> L.	Poaceae	-	W , M , F
<i>Datura stramonium</i> L .	Solanaceae		M , W
<i>Daucus carota</i> L . ssp . <i>maximus</i> ( Desf ) Thell	Apiaceae		W , F
<i>Descurainia Sophia</i> (L.) Webb .	Brassicaceae	-	
<i>Dinathus strictus</i> Banks ssp. <i>multipunctatus</i>	Caryophyllaceae		
<i>Ecballium elaterium</i> (L.) A . Rich.	Cucurbitaceae		M
<i>Echinops viscosus</i> DC.	Asteraceae		W , N
<i>Echium angustifolium</i> Mill.	Boraginaceae		
<i>Echium glomeratum</i> Poir.	Boraginaceae		
<i>Echium pabotii</i> Mout.	Boraginaceae	* ( )	
<i>Echium plantaginum</i> L.	Boraginaceae		M
<i>Epilobium tetragonum</i> L.	Onagraceae	-	O
<i>Erigeron bonariensis</i> L.	Asteraceae		
<i>Erigeron canadensis</i> L.	Asteraceae		M
<i>Erodium ciconium</i> (L.) L Her	Geraniaceae		
<i>Erodium cicutarium</i> (L.) L Her	Geraniaceae		M , F
<i>Erodium moschatum</i> (Burm.fil.)L Her	Geraniaceae		F
<i>Erodium moschatum</i> (Burm.fil.)L Her ssp. <i>deserti</i> Eig.	Geraniaceae		F
<i>Erodium subtrilobum</i> Jord.	Geraniaceae		F
<i>Erophila verna</i> (L.) Boiss.	Brassicaceae		
<i>Eryngium creticum</i> Lam.	Apiaceae		

(2)

<i>Eucalyptus maidenii</i> L.	Myrtaceae		M , Ar, Af
<i>Euphorbia aleppica</i> L.	Euphorbiaceae		M
<i>Euphorbia altissima</i> Boiss.	Euphorbiaceae		M
<i>Euphorbia cybirensis</i> Boiss.	Euphorbiaceae		M
<i>Euphorbia macroclada</i> Boiss.	Euphorbiaceae		M
<i>Euphorbia peplis</i> L.	Euphorbiaceae		M , W
<i>Ferula barbeyi</i> Post	Apiaceae		F
<i>Ferula tingitana</i> L.	Apiaceae		F
<i>Festuca partensis</i> Huds.	Poaceae	-	F
<i>Filago arvensis</i> L.	Asteraceae		
<i>Filago contracta</i> (Boiss.) Chrtek et Holub	Asteraceae		
<i>Filago palaestina</i> (Boiss.) Chrtek et Holub	Asteraceae	-	
<i>Filago eriocephala</i> Guss.	Asteraceae		
<i>Foeniculum vulgare</i> Mill	Apiaceae		M , F , Ar
<i>Fumaria capreolata</i> L .	Fumarioideae		
<i>Fumaria densiflora</i> D.C.	Fumarioideae		
<i>Fumaria officinalis</i> L .	Fumarioideae		M
<i>Galium aparine</i> L .	Rubiaceae	-	M , W
<i>Galium hierosolymitanum</i> L .	Rubiaceae		
<i>Galium pisiferum</i> L.	Rubiaceae		
<i>Galium setaceum</i> Lam.	Rubiaceae		
<i>Galium tricornutum</i> Dandy	Rubiaceae		
<i>Garhadiolus hedypnois</i> (Fisch. et C.A.Meyer) Jaub. et Spach	Asteraceae	-	
<i>Gentaurium pulchellum</i> ( SW. ) Druce	Gentianaceae		
<i>Geranium dissectum</i> L.	Geraniaceae	-	W
<i>Geranium molle</i> L.	Geraniaceae		W
<i>Gladiolus aleppicus</i> Boiss .	Iridaceae		O
<i>Goniolimon Collinum</i> ( Griseb .) Boiss .	Plumbaginaceae		
<i>Gynandris sisyrinchium</i> (L.) Parl	Iridaceae		
<i>Gypsophila linearifolia</i> ( Fisch. et Mey ). Boiss.	Caryophyllaceae		
<i>Hedypnois rhagadioloides</i> (L.) F.W.Schmidt	Asteraceae		
<i>Heliotropium bovei</i> Boiss.	Boraginaceae		

(2)

Heliotropium supinum L.	Boraginaceae		
Hibiscus trionum L.	Malvaceae		
Hippocrepis unisiliquosa L.	Fabaceae		
Hirschfeldia incana (L.) Lagreze - Fossat.	Brassicaceae		
Holosteum umbellatum L.	Caryophyllaceae		
Hordeum bulbosum L.	Poaceae	-	F
Hordeum murinum L. ssp. glaucum Steud.	Poaceae	-	W , F
Hordeum spontaneum C.Koch.	Poaceae	-	F
Hymenocarpus circinatus (L.) Savi	Fabaceae		W
Hyocymus reticulatus L.	Solanaceae		M
Hyoscyamus pendulum L.	Papaveraceae		
Inula viscosa (L.) Ait.	Asteraceae		M , Ar
Iris basaltica Dinsmore	Iridaceae	* ( )	O
Iris pseudacorus L.	Iridaceae		M , W
Isatis aleppica Scop.	Brassicaceae		
Isatis tinctoria L.	Brassicaceae		
Juncus articulatus L.	Juncaceae		W
Kickxia sieberi (Reichenb.) Dorfl.	Scrophulariaceae		
Knautia bidens (Sibth. Et Sm) Boiss.	Dipsacaceae		
Koeleria phleoides (Vill ) Pers.	Poaceae		F
Lagoecia cuminoides L.	Apiaceae		
Lamium amplexicaule L.	Lamiaceae		W
Lamium purpureum L.	Lamiaceae	-	M , W
Lathyrus annuus L.	Fabaceae		W , F
Lathyrus aphaca L.	Fabaceae		M , F
Lathyrus basaltica Rech. fit.	Fabaceae	* ( )	F
Lathyrus hierosolymitanus Boiss.	Fabaceae		F
Lathyrus pseudocicera Pampanini	Fabaceae		F
Leontodon tuberosus L.	Asteraceae		
Lepidium spinescens D.C.	Brassicaceae		
Linaria arvensis (L.) Desf .	Scrophulariaceae		
Linum nodiflorum L.	Linaceae		M , O , I
Lobularia maritime L.	Brassicaceae		
Lolium loliaceum (Bor.) Haud	Poaceae		F
Lolium rigidum Gaudin	Poaceae		F
Lotus conimbricensis Brot.	Fabaceae		F



(2)

Lupinus digitatus Forssk.	Fabaceae		F
Lycopus europaeus L.	Lamiaceae	-	M
Lythrum hyssopifolia L.	Lythraceae		
Malva neglecta Wall	Malvaceae		F
Malva nicaeensis All.	Malvaceae		F
Malva sylvestris L.	Malvaceae		M , W , F
Marrubium cuneatum Banks et Sol.	Lamiaceae	*	F
Marrubium vulgare L.	Lamiaceae		M , Ar , F
Matricaria aurea (L.) Cass.	Asteraceae		M
Medicago blanchena Boiss.	Fabaceae		F
Medicago hispida Gaertn.	Fabaceae		W , F
Medicago laciniata (L.) Mill.	Fabaceae		F
Medicago minima (L.) Bartal.	Fabaceae		F
Medicago orbicularis All.	Fabaceae		W , M , F
Medicago radiata L.	Fabaceae		F
Medicago sativa L.	Fabaceae		M , F
Medicago truncatula Gaertn.	Fabaceae		F
Melia azedarach L.	Meliaceae	-	Af
Melilotus indicus (L.) All.	Fabaceae		M , F , W
Melilotus segetalis ( Bort. ) Ser.	Fabaceae		F
Melilotus sulcatus Desf .	Fabaceae		F
Mentha microphylla C. Koch .	Lamiaceae	-	Ar , N , F
Mentha pulegium L.	Lamiaceae		M ,Ar ,N
Minuartia Formosa ( Fenzl ) Mattf	Caryophyllaceae		
Minuartia hybrida (Vill.) Schiskine	Caryophyllaceae		
Monerma cylindrica (Willd.) Coss.	Poaceae		
Myosurus minimus L.	Ranunculaceae		
Nerium oleander L.	Apocynaceae		M , O , I
Nonea ventricosa (Sm.) Griseb	Boraginaceae		
Notobasis syriaca (L.) Cass.	Asteraceae		W
Olea europaea L.	Oleaceae		M , F
Onobrychis crista-galli (L.) Lam	Fabaceae		
Ononis mitissima L.	Fabaceae		
Ononis natrix L.	Fabaceae		
Ononis spinosa L.	Fabaceae		M
Ononis viscosa L.	Fabaceae		
Onopordum carduifolium Boiss.	Asteraceae		
Onopordum syriacum Holmboe	Asteraceae	* ( )	

(2)

Orbanche lavandulacea Reichenb	Orobanchaceae		W
Orbanche ramose L.	Orobanchaceae		W
Ornithogalum divergens Boreau.	Liliaceae		
Ornithogalum neurostegium Boiss.	Liliaceae		
Oryzopsis miliacea (L.) Asch.	Poaceae		F, W, M
Oxalix corniculata L.	Oxalidaceae		M
Pallenis spinosa (L.) Cass.	Asteraceae		W
Papavera dubium L.	Papaveraceae		W
Papavera humile Fedde	Papaveraceae		W
Papavera rhoeas L.	Papaveraceae		M, W
Papavera subpiriforme Fedde	Papaveraceae	* ( )	M
Papavera syriacum Boiss.	Papaveraceae		W
Parentucellia latifolia (L.) Caruel	Scrophulariaceae		
Paronychia argentea lam.	Caryophyllaceae		M
Paronychia macrosepala Boiss.	Caryophyllaceae		
Paspalum distichum L.	Poaceae		F
Peganum harmala L.	Zygophyllaceae		M
Phalaris brachystachyus Link	Poaceae		W, F
Phalaris paradoxa L.	Poaceae	-	W, F
Phlomis Kurdica Rech. fil.	Lamiaceae		N
Picnomon acarna (L.)	Asteraceae		W
Picris altissima Del.	Asteraceae		W
Plantago coronopus L.	Plantaginaceae		F
Plantago cretica L.	Plantaginaceae		F
Plantago lagopus L.	Plantaginaceae		F
Plantago lanceolata L.	Plantaginaceae		M, W, F
Plantago major L.	Plantaginaceae		M, W, F
Poa bulbosa L.	Poaceae		F
Poa persica Trin.	Poaceae		F
Poa sinaica Steud.	Poaceae	-	F
Polycarpon tetraphyllum L.	Caryophyllaceae		
Polygonum equisetiforme Sibth et Smith	Polygonaceae		W
Polygonum kitaibelianum Sadler	Polygonaceae		W
Polygonum polycnemoides Jaub. et Spach	Polygonaceae	-	W
Polypogon monspeliensis (L.) Desf.	Poaceae	-	F
Populus nigra L.	Salicaceae		M, Af

(2)

<i>Poterium spinosum</i> L.	rosaceae		M , Fe
<i>Pterocephalus brevis</i> Coulter	Dipsacaceae		
<i>Pulicaria dysenterica</i> (L.) Bernh.	Asteraceae		
<i>Ranunculus cornutus</i> D.C.	Ranunculaceae		
<i>Ranunculus paludosus</i> Poiret	Ranunculaceae		
<i>Ranunculus scandicus</i> (Boiss.) Davis	Ranunculaceae		
<i>Raphanus raphanistrum</i> L.	Brassicaceae		M , W
<i>Raphanus sativus</i> L.	Brassicaceae		F
<i>Rapistrum rugosum</i> (L.) All	Brassicaceae		W
<i>Reseda luteola</i> L.	Resedaceae		M , F
<i>Rhagadiolus stellatus</i> (L.) Gaertn	Asteraceae		
<i>Rumex pulcher</i> L.	Polygonaceae		M
<i>Salvia ceratophylla</i> L.	Lamiaceae		N , Ar
<i>Salvia palestina</i> Benth.	Lamiaceae		M , Ar
<i>Santolina chamaecyparissias</i> L.	Asteraceae		M , Ar
<i>Scabiosa argentea</i> L.	Dipsacaceae		
<i>Scabiosa palasestina</i> L.	Dipsacaceae		
<i>Scabiosa prolifera</i> L.	Dipsacaceae		
<i>Scandix iberica</i> M. Bieb	Apiaceae		F
<i>Scandix pecten-veneris</i> L.	Apiaceae		W
<i>Scolymus hispanicus</i> L.	Asteraceae		W
<i>Scolymus maculatus</i> L.	Asteraceae		W
<i>Scorpirus subvillosus</i> L.	Fabaceae		
<i>Scorzonera cana</i> (C.A.Meyer) Hoffm.	Asteraceae		
<i>Scorzonera judaica</i> Eig	Asteraceae	-	
<i>Scorzonera mollis</i> M. Bieb.	Asteraceae	-	
<i>Scrophularia decipiens</i> Boiss .	Scrophulariaceae		
<i>Scrophularia peyronii</i> Post	Scrophulariaceae		
<i>Scrophularia tagetifolia</i> Boiss.	Scrophulariaceae		
<i>Secale montanum</i> Guss.	Poaceae	-	F
<i>Senecio gallicus</i> Chaix in Vill.	Asteraceae		
<i>Senecio mousterdei</i> Arenes	Asteraceae	* ( )	
<i>Senecio vernalis</i> Waldst. et Kit.	Asteraceae		W
<i>Seteria viridis</i> (L.) P.B.	Poaceae		W , F
<i>Sherardia arvensis</i> L.	Rubiaceae		W
<i>Silybum marianum</i> (L.) Gaertner	Asteraceae		M
<i>Silene aegyptiaca</i> L.	Caryophyllaceae		

(2)

Silene oliveriana Otth.	Caryophyllaceae		
Silene siderophila Boiss . et Gaill.	Caryophyllaceae		
Sinapis alba L.	Brassicaceae		M
Sinapis arvensis L. var. orientalis (L.)	Brassicaceae		W
Sorghum halepense (L.) Pers.	Poaceae	-	W , F
Spergularia bocconii (Sol.ex Scheele) Fou	Caryophyllaceae		
Stachys nivea Labill.	Lamiaceae	*	Ar
Stellaria media (L.) Vill.	Caryophyllaceae		M , W , F
Synelcosciadium carmeli ( lobill ) Boiss.	Apiaceae		
Tanacetum aucheri DC.	Asteraceae		
Teucrium scordioides Schreb.	Lamiaceae		Ar
Thesium humile Vahl	Santalaceae		
Torilis leptophylla (L) Reich.f Var. erythrotricha	Apiaceae		M
Torilis nodosa (L.) Gaertn.	Apiaceae		
Torilis tenella (Del) Reich.	Apiaceae		
Trifolium angustifolium L.	Fabaceae		F
Trifolium arvense L.	Fabaceae		F
Trifolium campster Scherb	Fabaceae		N , F
Trifolium cherleri L.	Fabaceae		F
Trifolium clypeatum L.	Fabaceae		F
Trifolium medusacum Bl.	Fabaceae	* ( )	F
Trifolium nervulosum Boiss. et Helder	Fabaceae		F
Trifolium pauciflorum d'Urv.	Fabaceae		W , F
Trifolium plebeium Boiss .	Fabaceae	* ( )	F
Trifolium purpureum Loisel.	Fabaceae		M , F , N
Trifolium resupinatum L.	Fabaceae		F , N
Trifolium scabrum L.	Fabaceae		F
Trifolium scutatum Boiss.	Fabaceae		F
Trifolium spumosum L.	Fabaceae		F
Trifolium stellatum L .	Fabaceae		W , F
Trifolium subterraneum L .	Fabaceae		F
Trifolium tomentosum L. var. bullatum	Fabaceae		F

(2)

Trifolium tomentosum L. foma curvisepalum (V.Tackh.)	Fabaceae		F
Trifolium xerocephalum Fenzl	Fabaceae		F
Trigonella caelesiyrriaca Boiss.	Fabaceae		F
Trigonella spicata Smith	Fabaceae		F
Tripleurospermum oreades (Boiss.) Rechf.	Asteraceae		
Tripleurospermum parviflorum Willd	Asteraceae	-	
Turgenia latifolia (L.) Hoffm.	Apiaceae	-	
Umbilious intermedius Boiss.	Crassulaceae		
Valerinella muricata (Stev.) Baxt.	Valerinaceae		
Valerinella vesicaria (L.) Moench.	Valerinaceae		
Verbascum blancheanum Boiss.	Scrophulariaceae	* ( )	
Verbascum sinuatum L.	Scrophulariaceae		M
Veronica anagalloides Guss.	Scrophulariaceae		W
Veronica hederifolia L.	Scrophulariaceae		W
Veronica polita Fries	Scrophulariaceae		W
Veronica syriaca Rorem.	Scrophulariaceae		W
Vicia hybrida L.	Fabaceae		W , F
Vicia palaestina Boiss.	Fabaceae		F
Vicia pubescens (D.C.) Link.	Fabaceae		F
Vicia sativa L.	Fabaceae		M , F
Vicia tenuifolia Roth.	Fabaceae		F , N , O
Vicia villosa Roth.	Fabaceae		W , F
Vinca herbacea Waldst. et Kit.	Apocynaceae		
Vulpia ciliata (Pers.) Link.	Poaceae	-	F
Vulpia myros (L.) C.C.Gmel	Poaceae		F
Xanthium spinosum L.	Asteraceae		W

(2)

F	Af	O	M
W	I	Ar	N

(3)

					x		( )			
+					1x1.5		6-4	15-2		<b>Astragalus cruciatus</b>
		-			1.5x1.5	-	7-5	12-5		<b>Hymenocarpus circinnatus</b>
+					2x4		9-5	12-5		<b>Lathyrus annuus</b>
					2x2		15-	10-5		<b>Lotus conimbricensis</b>
+	+	-			3x4		>17	20		<b>Lupinus digitatus</b>
					1x2.5	-	>9	12		<b>Medicago hispida</b>
							0	15		<b>Ononis spinosa</b>
					1x1.5		6-4	12-7		<b>Scorpiurus subvillosus</b>
					1x2 0.5x1		>12	15-7		<b>Trifolium tomentosum</b>
				-	2x2 1x1		>7	10		<b>Vicia hybrida</b>

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