

Floristic Study of Selected Districts in Sabratha region Libya

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ABSTRACT

This work was designed to study the present flora and biodiversity of selected districts of Sabratha region. The study has been carried out in the period between December 2018, and June 2020. A total number of 242 species belonging to 160 genera, and 42 families were collected. Five families are belonging to Monocotyledons and 37 are belonging to Dicotyledons. Analysis of the flora in relation to the number of species and genera belonging to each family showed that the family Asteraceae is the most represented in the study area, followed by Fabaceae then Poaceae. The study has also shown the dominance of the genera Euphorbia and Medicago with 5 species each. Floristic analysis of the collected plant species showed that the Mediterranean plants are the dominant with a number of 94 species, followed by Mediterranean / Iranu – Turanean species with a number of 53 species, while other chorological types were poorly represented. This analysis also showed the dominance of Therophytes with a number of 163 species, followed by Hemicryptophytes with 49 species.

Keyword: *Flora, Lifeform, Chorotype, Sabratha, District.*

INTRODUCTION

The Libyan vascular flora comprises about 2,118 species belonging to 864 genera and 161 families in Libya (Mahklouf, & Etayeb, 2019). The distribution among Libyan seed plants was characterized by a high proportion of herbs (annual to perennial), unlike the low number of woody (tree and shrub) species; these have an important influence on the structure of floral composition, the geographic element of the flora was predominantly tropical and Mediterranean (Mahklouf & Al-Sghair, 2016).

The history of floristic study in Libya has been done by several authors, the most important comprehensive floristic studies in Libya were a checklist of the flora of Libya by Keith (1965) and Flora of Libya by Jafri and El-Ghadi (1976 – 1990), furthermore, there were many regional floristic studies in different areas throughout Libya, such as floristic study of Msallata and Garaboulli province (Mahklouf et al, 2020), flora of Wadi Gerreem (Al-Osta and Erteeb, 2018), biodiversity of Hadaba treatment plant (Mahklouf and Al-Sghair, 2016), and Farwa island (Kikli and Erteeb, 2008). Since the flora of Sabratha has not been studied thoroughly during the work on the flora of Libya (1975-1989), and the only studies conducted were of El-Yafour (2008), Abuhadra and Saed, (2015), and Saed et al, (2019). Therefore, the purpose of this survey is to have an exclusive study to its flora

STUDY AREA:

The boundaries of the study area were limited to 10 districts belong to the Sabratha city which located in the northwest of Libya about 60 km west of Tripoli, these are (Al-jifara, Al-khatatba, Galil, Dahman, Al-Wadi, Al-Ghot, Souq Al-Gomaa, Zwagha, Tellil, Al-Tweela). The study area is bordered to the north by the Mediterranean Sea, Sorman and Al-Ajelat city to the south, Sorman city to the east and Zwara city to the west, the total area of the study area is about (610 km²) divided into 10

different districts as mentioned above (Figure. 1, 2, 3) (Saed et al, 2018)

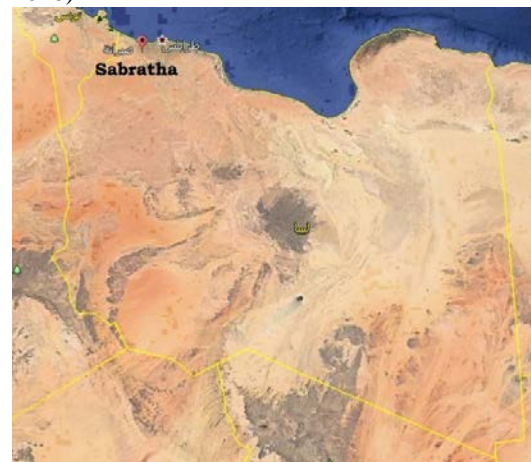


Figure 1: Map of Libya shows Sabratha city



Figure 2: Map of northwest Libya shows Sabratha city.

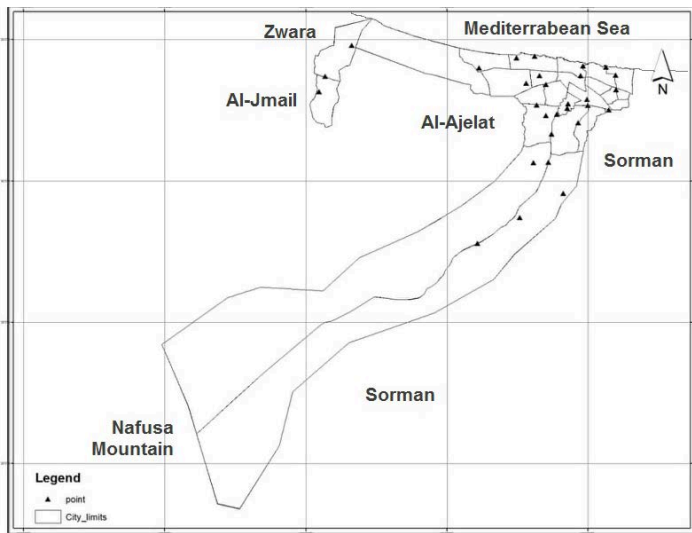


Figure 3: Map of Sabratha city shows the boundaries of the city

Ten different districts were selected for collection of plant species, which are (Al-jifara, Al-khatatba, Galil, Dahman, Al-Wadi, Al-Ghot, Souq Al-Gomaa, Zwagha, Tellil, Al-Tweela). The survey was conducted in two consecutive growing seasons 2018-2019 upon various field trips among which the trips were more frequently done during the rainy seasons and springtime, where the most of the plants are in flowering and fruiting conditions. The plant specimens were collected in flowering or and in fruiting conditions for easy identification. The collected plant specimens were brought to the herbarium and then subjected to the usual herbarium procedures including pressing, poisoning, mounting, labeling, and identifying. Identification of plant species was done by using the following literature reviews (Keith, 1956; Jafri and El-Gadi 1967 – 1990). Eventually, the identified plant specimens were deposited at the herbarium of the Botany Department, Faculty of Sciences, University of Sabratha.

RESULTS AND DESCUSSION

At the end of the survey, a total of 242 plant species belonging to 160 genera and 42 families were collected and identified, of which 5 families and 42 species belong to monocotyledons whereas 37 families and 200 species belong to dicotyledons (Appendix).

After calculation the percentage of each family in relation to the total number recorded. The result showed a predominance of the family Asteraceae with the number of represented by 48 species, followed by the family Fabaceae with the number of 33 species, then the family Poaceae with the number of 31 species, followed by Brassicaceae with the number of 16 species. The rest of the results shown in the (Appendix).

The dominance of the families Asteraceae, Fabaceae, Poceae and Brassicaceae, is expectable because most members of these families are herbs and dominating the Mediterranean region which characterizes the study area, besides, most members of these families are Mediterranean in origin, moreover, these are one of the largest families among the vascular plants, so we expect that it will occupy the highest ratio.

Floristic list also presented in this study which provided the chorotypes and life forms of collected species. The status of each plant species according to the survey also indicated in the floristic list (Appendix).

The study has also shown the dominance of the genera Euphorbia and Medicago with 5 species each, followed by the genera

Asteragalus, Bromus, Plantago, Rumex, Salsola and Silene with 4 species each, then the genera Amaranthus, Lotus, Ononis, Asphodellus, Centaurea, Conyza, Sonchus, Galium, Plygonum, Erodium with 3 species each.

Analysis of the biological spectrum of collected plant species according to Raunkiaer system of life forms of plants (1934), as modified by Govaerts et al. (2000) showed a predominance of therophytes which comprise (67.4 %) with the number of (163) species, followed by hemicryptophytes, which comprise (20.2 %) with the number of (49) species, then the geophytes which comprise (6.2 %) with the number of (15) species, the rest of the result shown in the (Table 1) and (Fig 4).

Table 1: Shows the Number and percentage of Species According to Their Life Forms.

Lifeform	No	%
Therophytes	163	67.4
Hemicryptophytes	49	20.2
Geophytes	15	6.2
Nanophanerophytes	9	3.7
Chaemephytes	5	2.0
phanerophytes	1	0.4

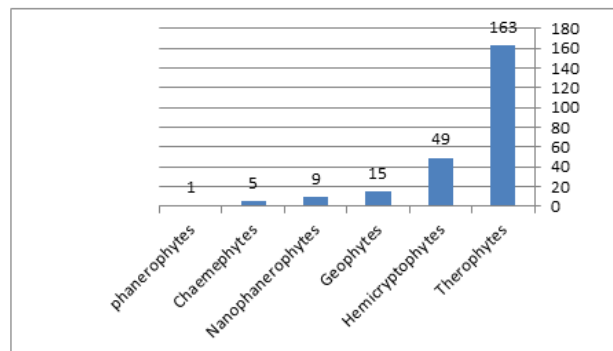


Figure 4: Shows the Number of Species According to Their Life Forms.

As we expect therophytes have a greater capacity for growth than other life forms, apparently because of their wider ecological amplitude, greater plasticity in size, and their small growth requirements. In addition, according to the result in (Appendix), there is a clear positive correlation between therophytes and Mediterranean chorotype, this explains why therophytes dominating the study area which falls within the Mediterranean region. Analysis of chorological spectrum of collected plant species showed a predominance of Mediterranean chorotypes, which comprise (38.8%) with the number of (94) species, followed by Mediterranean / Irano-Turanian chorotypes, which comprise (21.9 %) with the number of (53) species. (Table 2) and (Fig 5).

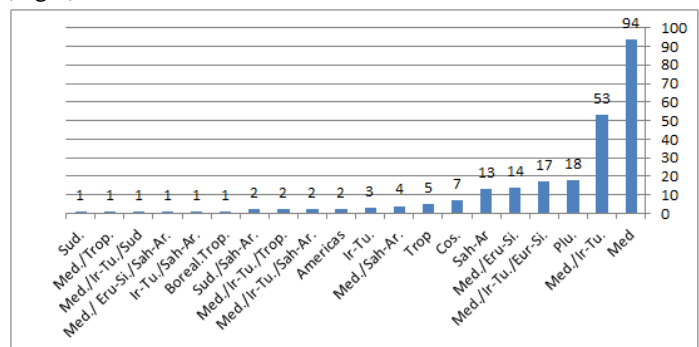


Figure 5: Shows the Number of Species According to Their chorotypes.

Table 2: Shows the Number and percentage of Species According to Their chorotypes.

Chorotype	No	%
Med	94	38.8
Med./Ir-Tu.	53	21.9
Plu.	18	7.4
Med./Ir-Tu./Eur-Si.	17	7.00
Med./Eru-Si.	14	5.3
Sah-Ar	13	5.3
Cos.	7	2.9
Trop	5	2.0
Med./Sah-Ar.	4	1.7
Ir-Tu.	3	1.2
Americas	2	0.8
Med./Ir-Tu./Sah-Ar.	2	0.8
Med./Ir-Tu./Trop.	2	0.8
Sud./Sah-Ar.	2	0.8
Boreal.Trop.	1	0.4
Ir-Tu./Sah-Ar.	1	0.4
Med./ Eru-Si./Sah-Ar.	1	0.4
Med./Ir-Tu./Sud	1	0.4
Med./Trop.	1	0.4
Sud.	1	0.4

This result is expected and not surprising because the study area is located mainly in the Mediterranean region which characterized by sub humid bioclimate, where the sun is not very strong, and the moisture remained longer. The presence of Mediterranean / Irano-Turanean with respected ratio because there are overlapping between the two regions, and both regions are located in the same latitude and have more or less similar climatic conditions. Instead, other chorological types such as Sudanean, Tropical, Saharo-Arabian, or plants that belong to more than one chorological type such as Saharo-Arabian / Irano-Turanean were poorly represented, this may have been due to having been transported or introduced.

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APPENDIX

Family	Scientific name	Lifeform	Chorotype
Aizoaceae	<i>Carpobrotus edulis</i> (L.) N.E. Brown in Philips.	Geo	Plu.
Aizoaceae	<i>Mesembryanthemum crystallinum</i> L.	Th	Med./Eru-Si.
Aizoaceae	<i>Mesembryanthemum nodiflorum</i> L.	Th	Med./ Eru-Si./Sah-Ar.
Alliaceae	<i>Allium ampeloprasum</i> L.	Geo	Med.
Alliaceae	<i>Allium roseum</i> L.	Geo	Med.
Amaranthaceae	<i>Amaranthus graecizans</i> L.	Th	Plu.
Amaranthaceae	<i>Amaranthus retroflexus</i> L.	Th	Trop.
Amaranthaceae	<i>Amaranthus viridis</i> L.	Th	Trop.
Amaryllidaceae	<i>Pancratium maritimum</i> L.	Geo	Med.
Apiaceae	<i>Bupleurum semicompositum</i> L.	Th	Med./Ir-Tu.
Apiaceae	<i>Daucus capillifolius</i> Gilli.	Th	Med.
Apiaceae	<i>Foeniculum vulgare</i> Mill.	Geo	Med./Ir-Tu.
Apiaceae	<i>Pituranthos tortuosus</i> (Desf.) Benth & Hok.	H	Med.
Asteraceae	<i>Amberboa libyca</i> (Viv.) Alavi.	Th	Med.
Asteraceae	<i>Anacyclus monanthos</i> (L.) Thell.	Th	Med.
Asteraceae	<i>Anthemis secundiramea</i> Biv.	Th	Med.
Asteraceae	<i>Artemisia campestris</i> L.	H	Med./Eur-Si.
Asteraceae	<i>Artemisia herba-alba</i> Asso.	H	Ir-Tu.
Asteraceae	<i>Atractylis carduus</i> (Forsk.) Christen.	H	Sah-Ar.
Asteraceae	<i>Atractylis serratuloides</i> Sieb.ex cass.	H	Sah-Ar.
Asteraceae	<i>Calendula arvensis</i> L.	Th	Med./Ir-Tu.
Asteraceae	<i>Carduncellus eriocephalus</i> Boiss.	H	Med.
Asteraceae	<i>Carduus argentatus</i> Durieu in Duchartre.	Th	Med.
Asteraceae	<i>Carduus getulus</i> Pomel.	Th	Sah-Ar
Asteraceae	<i>Carthamus lanatus</i> L.	Th	Med./Ir-Tu./Eur-Si.
Asteraceae	<i>Centaurea alexandrina</i> Delile	Th	Med.
Asteraceae	<i>Centaurea dimorpha</i> Viv	H	Med/Ir-Tu.
Asteraceae	<i>Centaurea glomerata</i> Vahl.	Th	Med.
Asteraceae	<i>Chamamilla aurea</i> Loefl.	Th	Med./Ir-Tu.
Asteraceae	<i>Chrysanthemum carinatum</i> Schousb	Th	Med/Eur-Sib
Asteraceae	<i>Chrysanthemum coronarium</i> L.	Th	Med.
Asteraceae	<i>Conyza bonarensis</i> (L.) Cornq.	Th	Med.
Asteraceae	<i>Conyza canadensis</i> L.	Th	Cos.
Asteraceae	<i>Conyzaa egyptiaca</i>	Th	Med.
Asteraceae	<i>Crepis senecioides</i> Delile	Th	Med.
Asteraceae	<i>Cynara cardunculus</i> L.	H	Med.
Asteraceae	<i>Echinops spinosissimus</i> Turra.	H	Med.
Asteraceae	<i>Filago desertorum</i> Pomel	H	Med.
Asteraceae	<i>Filago pyramidata</i> L.	Th	Med./Ir-Tu.
Asteraceae	<i>Filago fuscescens</i> Pomel	Th	Med.
Asteraceae	<i>Hedypnois cretica</i> (L.) Dum.-Courset	Th	Med.
Asteraceae	<i>Helichrysum stoechas</i> (L.) Moench	Th	Med.
Asteraceae	<i>Hyoseris scabra</i> L.	H	Med.
Asteraceae	<i>Hypochoeris achyrophorus</i> L.	Th	Med.
Asteraceae	<i>Hypochoeris glabra</i> L.	H	Med.
Asteraceae	<i>Ifloga spicata</i> (Forsk.) Schullz. in Webb & Berth.	Th	Med./Ir-Tu.
Asteraceae	<i>Launaea nudicaulis</i> (L.) Hooker, fil	H	Sah-Ar.
Asteraceae	<i>Launaea resedifolia</i> (L.) O.Kuntze	H	Med.
Asteraceae	<i>Leontodon simplex</i> (Viv) Widder.	Th	Med.
Asteraceae	<i>Leucanthemopsis trifurcata</i> (Desf.) Alavi.	H	Med.
Asteraceae	<i>Onoprdum arenarium</i> (Desf.) Pomel.	H	Med.
Asteraceae	<i>Picris asplenoides</i> L.	Th	Sah-Ar.
Asteraceae	<i>Reichardia tingitana</i> (L) Roth.	Th	Ir-Tu./Sah-Ar.
Asteraceae	<i>Scolymus hispanicus</i> L.	Th	Med./Eur-Si.
Asteraceae	<i>Senecio gallicus</i> Chiaux.	Th	Med.

Asteraceae	<i>Senecio vulgaris</i> L.	Th	Cos.
Asteraceae	<i>Sonchus maritimus</i> L.	H	Med./Ir-Tu
Asteraceae	<i>Sonchus oleraceus</i> L.	Th	Cos.
Asteraceae	<i>Sonchusa sper</i> (L.) Hill	Th	Med./Ir-Tu.
Asteraceae	<i>Urospermum delachampii</i> L.	H	Med.
Asteraceae	<i>Verbasina encelioides</i> (Cav.) Benth. & Hook	Th	Americas
Boraginaceae	<i>Alkanna tinctoria</i> (L.) Tausch.	Th	Med.
Boraginaceae	<i>Echium angustifolium</i> Mill.	H	Med.
Boraginaceae	<i>Echium plantagineum</i> L.	Th	Med.
Boraginaceae	<i>Elizaldia calycina</i> Roem.	Th	Med.
Boraginaceae	<i>Heliotropium europaeum</i> L.	Th	Med.
Brassicaceae	<i>Brassica tournefortii</i> Gouan.	Th	Med./Sah-Ar.
Brassicaceae	<i>Cakile aegyptiaca</i> (L.) Willd.	Th	Med./Eur-Si.
Brassicaceae	<i>Capsella bursa-pastoris</i> (L.) Medik.	Th	Plu.
Brassicaceae	<i>Didesmus bipinnatus</i> (Desf.) DC.	Th	Med.
Brassicaceae	<i>Diplotaxis harra</i> (Forsk.)Boiss.	Th	Med./Ir-Tu.
Brassicaceae	<i>Diplotaxis muralis</i> (L.) DC.	Th	Med./Eur-Si.
Brassicaceae	<i>Enarthrocarpus clavatus</i> Del. ex Godr.	Th	Med.
Brassicaceae	<i>Eruca longirostris</i> Uechtr.	Th	Med.
Brassicaceae	<i>Eruca sativa</i> Mill.	Th	Med./Ir-Tu.
Brassicaceae	<i>Lobularia libyca</i> (Viv.) Meisner.	Th	Med./Ir-Tu.
Brassicaceae	<i>Lobularia maritima</i> L & Desv.	H	Med.
Brassicaceae	<i>Matthiola longipetala</i> (Vent.) DC.	Th	Med./Ir-Tu.
Brassicaceae	<i>Matthiola parviflora</i> (Schousbe.) R.Br. In Ait.	Th	Sah-Ar.
Brassicaceae	<i>Sinapis alba</i> L.	Th	Med./Ir-Tu./Eur-Si.
Brassicaceae	<i>Sisymbrium erysimoides</i> Desf.	Th	Med./Ir-Tu.
Brassicaceae	<i>Sisymbrium irio</i> L.	Th	Med./Ir-Tu.
Cactaceae	<i>Opuntia ficus-indica</i> (L.) MilL.	NP	Med./Trop.
Cactaceae	<i>Opuntia tuna</i> Mill.	NP	Trop.
Caryophyllaceae	<i>Cerastium glomeratum</i> Thuill.	Th	Med./Ir-Tu./Eur-Si.
Caryophyllaceae	<i>Minuartia hybrida</i> Vill.	Th	Med./Ir-Tu.
Caryophyllaceae	<i>Polycarpon tetraphyllum</i> L.	Th	Med./Eur-Si.
Caryophyllaceae	<i>Silene apetala</i> Willd.	Th	Med./Ir-Tu.
Caryophyllaceae	<i>Silene colorata</i> Poirer.	Th	Med.
Caryophyllaceae	<i>Silene gallica</i> L	Th	Cos.
Caryophyllaceae	<i>Silene succulenta</i> Forsk	H	Med.
Caryophyllaceae	<i>Spergularia diandra</i> (Guss.) Heldr. & Sart.	Th	Med./Ir-Tu./Eur-Si.
Caryophyllaceae	<i>Stellaria media</i> (L.) Cyrill	Th	Cos.
Chenopodiaceae	<i>Atriplex halimus</i> L.	NP	Sud./Sah-Ar.
Chenopodiaceae	<i>Beta vulgaris</i> L.	Th	Med./Ir-Tu./Eur-Si.
Chenopodiaceae	<i>Chenopodium album</i> L.	Th	Plu.
Chenopodiaceae	<i>Chenopodium murale</i> L.	Th	Plu.
Chenopodiaceae	<i>Salsola kali</i> L.	Th	Plu.
Chenopodiaceae	<i>Salsola longifolia</i> Forsk.	H	Med.
Chenopodiaceae	<i>Salsola tetrandra</i> Forsk.	Ch	Med./Sah-Ar.
Convolvulaceae	<i>Convolvulus altheoides</i> L.	H	Med.
Convolvulaceae	<i>Convolvulus arvensis</i> L.	H	Plu.
Cyperaceae	<i>Cyperus rotundus</i> L.	H	Med./Ir-Tu./Trop.
Cyperaceae	<i>Scirpus holoschoenus</i> L.	Geo	Med./Ir-Tu./Eur-Si.
Euphorbiaceae	<i>Chrozophora obliqua</i> (Vahl.) Juss. Ex Spreng	Th	Med./Ir-Tu.
Euphorbiaceae	<i>Euphorbia exigua</i> L.	Th	Med.
Euphorbiaceae	<i>Euphorbia helioscopia</i> L.	Th	Med./Ir-Tu./Eur-Si.
Euphorbiaceae	<i>Euphorbia paralias</i> L.	Th	Med./Eru-Si.
Euphorbiaceae	<i>Euphorbia peplus</i> L.	Th	Med./Ir-Tu./Eur-Si.
Euphorbiaceae	<i>Euphorbia terracina</i> L.	H	Med./Eru-Si.
Euphorbiaceae	<i>Ricinus communis</i> L.	NP	Sud.
Fabaceae	<i>Anthyllis tetraphylla</i> L.	Th	Med.
Fabaceae	<i>Argyrolobium uniflorum</i> (Decne.) Jaub. & Spach	Ch	Med.
Fabaceae	<i>Astragalus asterias</i> Stev. ex Ledeb.	Th	Med./Ir-Tu.

Fabaceae	<i>Astragalus hamosus</i> L.	Th	Med.
Fabaceae	<i>Astragalus sinaicus</i> Boiss	Th	Med./Ir-Tu.
Fabaceae	<i>Astragalus stella</i> Gouan.	Th	Med.
Fabaceae	<i>Calicotome villosa</i> L.	NP	Med.
Fabaceae	<i>Hippocrepis bicontorta</i> Lois.	Th	Sah-Ar.
Fabaceae	<i>Hippocrepis multisiliquosa</i> L.	H	Med.
Fabaceae	<i>Hymenocarpus circinatus</i> (L.) Savi.	Th	Med./Ir-Tu.
Fabaceae	<i>Lotus cytisoides</i> L.	H	Med.
Fabaceae	<i>Lotus edulis</i> L.	Th	Med.
Fabaceae	<i>Lotus halophilus</i> Boiss.	Th	Med.
Fabaceae	<i>Medicago laciniata</i> L.	Th	Sah-Ar.
Fabaceae	<i>Medicago littoralis</i>	Th	Med.
Fabaceae	<i>Medicago minima</i> (L.) Bart.	Th	Med./Ir-Tu.
Fabaceae	<i>Medicago polymorpha</i> L.	Th	Med./Ir-Tu.
Fabaceae	<i>Medicago sativa</i> L.	Th	Med.
Fabaceae	<i>Melilotus indicus</i> (L.) All.	Th	Med.
Fabaceae	<i>Melilotus sulcatus</i> Desf.	H	Med.
Fabaceae	<i>Ononis angustissima</i> L.	Th	Med.
Fabaceae	<i>Ononis reclinata</i> L.	Th	Med./Ir-Tu.
Fabaceae	<i>Ononis serrata</i> Forsk.	Th	Med./Ir-Tu.
Fabaceae	<i>Retama reatam</i> (Forsk.) Webb	NP	Sah-Ar.
Fabaceae	<i>Scorpiurus muricatus</i> L.	Th	Med.
Fabaceae	<i>Scorpiurus subbvillosus</i> (L.) Lam	Th	Med.
Fabaceae	<i>Trifolium scabrum</i> L.	H	Med.
Fabaceae	<i>Trifolium tomentosum</i> L.	Th	Med./Ir-Tu./Eur-Si.
Fabaceae	<i>Trigonella maritima</i> Delile ex Poiret in Lam.	Th	Med.
Fabaceae	<i>Trigonella stellata</i> Forsk.	Th	Med./Ir-Tu.
Fabaceae	<i>Vicia sativa</i> L.	Th	Med./Ir-Tu./Eur-Si..
Fabaceae	<i>Vicia villosa</i> Roth.	Th	Med./Ir-Tu./Eur-Si.
Fabaceae	<i>Hedysarum spinosissimum</i> L.	Th	Med.
Fumariaceae	<i>Fumaria parviflora</i> Lam.	Th	Med./Eur-Si.
Fumariaceae	<i>Fumaria vaillantii</i> Lois.	Th	Plu.
Gentianaceae	<i>Centaurium pulchellum</i> (Swartz.) Druce.	Th	Med.
Geraniaceae	<i>Erodium arborescens</i> Desf.	H	Sah-Ar.
Geraniaceae	<i>Erodium laciniatum</i> (Cav.) Willd.	Th	Med.
Geraniaceae	<i>Erodium malacoides</i> (L.) L Her.	Th	Med./Ir-Tu./Sah-Ar.
Geraniaceae	<i>Monsonia nivea</i> (Decne.) Decne. ex Webb.	H	Med./Ir-Tu.
Illecebraceae	<i>Herniaria hemistemon</i> J.Gay in Duch..	H	Med./Ir-Tu.
Illecebraceae	<i>Paronychia arabica</i> (L.) DC.	Th	Med./Ir-Tu.
Illecebraceae	<i>Paronychia chlorothyrsa</i> Murb.	H	Sah-Ar.
Lamiaceae	<i>Ajuga iva</i> (L.) Schreber.	H	Med./Ir-Tu.
Lamiaceae	<i>Marrubium alysson</i> L.	Th	Med.
Lamiaceae	<i>Salvia lanigera</i> Poir.	Th	Med./Ir-Tu.
Lamiaceae	<i>Teucrium polium</i> L.	Ch	Med./Ir-Tu.
Liliaceae	<i>Asphodelus aestivus</i> Brot.	Geo	Med.
Liliaceae	<i>Asphodelus fistulosus</i> L.	H	Med.
Liliaceae	<i>Asphodelus microcarpus</i> Salzm. & Viv	Geo	Med.
Liliaceae	<i>Muscari comosum</i> (L.) Mill.	Geo	Med.
Liliaceae	<i>Scilla peruviana</i> L.	Geo	Med.
Liliaceae	<i>Urginea maritima</i> (L.) Baker	Geo	Med.
Malvaceae	<i>Malva parviflora</i> L.	Th	Med./Eur-Si.
Malvaceae	<i>Malva sylvestris</i> L.	H	Med./Ir-Tu.
Mimosaceae	<i>Acacia cyanophylla</i> Lindley.	Ph	Ir-Tu.
Neuradaceae	<i>Neurada procumbens</i> L.	Th	Med./Ir-Tu.
Oxalidaceae	<i>Oxalis pes-caprae</i> L.	Geo	Plu.
Papaveraceae	<i>Glaucium flavum</i>	H	Med./Eur-Si.
Papaveraceae	<i>Papaver rhoeas</i> L.	Th	Med./Ir-Tu.
Plantaginaceae	<i>Plantago albicans</i> L.	H	Med./Ir-Tu.
Plantaginaceae	<i>Plantago coronopus</i> L.	Th	Med./Ir-Tu.
Plantaginaceae	<i>Plantago lagopus</i> L.	th	Med./Ir-Tu./Eur-Si.

Plantaginaceae	<i>Plantago lanceolata</i> L.	H	Med./Ir-Tu./Sah-Ar.
Plumbaginaceae	<i>Limoniastrum monopetalum</i> (L.) Boiss. in DC.	H	Med.
Poaceae	<i>Aegilopes kotschy</i> Boiss. \	Th	Med./Ir-Tu.
Poaceae	<i>Aegilops kotschy</i> Boiss.,	Th	Med./Ir-Tu.
Poaceae	<i>Aegilops ventricosa</i> Tausch.	Th	Med.
Poaceae	<i>Alopecurus myosuroides</i> Huds.,	Th	Med./Ir-Tu./Eur-Si..
Poaceae	<i>Avena fatua</i> L.	Th	Plu.
Poaceae	<i>Avena sterillis</i> L.	Th	Med./Ir-Tu.
Poaceae	<i>Avena barbata</i> Pott. ex Link.	Th	Med./Ir-Tu.
Poaceae	<i>Brachypodium distachyon</i> (L.) Beauv.	Th	Med./Ir-Tu.
Poaceae	<i>Bromus diandrus</i> Roth.	Th	Med.
Poaceae	<i>Bromus madritensis</i> L.	Th	Plu.
Poaceae	<i>Bromus rigidus</i> Roth.	Th	Med./Eur-Si
Poaceae	<i>Bromus rubens</i> L.	Th	Med./Ir-Tu./Eur-Si.
Poaceae	<i>Cenchrus ciliaris</i> L.	Th	Sah-Ar.
Poaceae	<i>Cenchrus incertus</i> (L.) Barbey.	Th	N. America
Poaceae	<i>Cutandia maritima</i> (L.)	Th	Med.
Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	Geo	Boreal. Trop.
Poaceae	<i>Dactylis glomerata</i> L.	Th	Med./Ir-Tu.
Poaceae	<i>Dactyloctenium aegyptium</i> (L.) P. Beauv.,	Th	Trop.
Poaceae	<i>Digitaria bicornis</i> (Lam.) Roem. et Schult..	Th	Trop
Poaceae	<i>Hordeum glaucum</i> L.	Th	Med./Ir-Tu.
Poaceae	<i>Hordeum murinum</i> L.	Th	Plu.
Poaceae	<i>Hyparrhenia hirta</i> (L.) Stapf	H	Plu.
Poaceae	<i>Lagurus ovatus</i> L.	Th	Med./Eur-Si
Poaceae	<i>Lamarckia aurea</i> (L.) Moench	Th	Med./Ir-Tu./Sud
Poaceae	<i>Lygeum spartum</i> Loefl. ex L.	Geo	Med.
Poaceae	<i>Phalaris minor</i> Retz.	Th	Med./Ir-Tu.
Poaceae	<i>Phragmites australis</i> (Cav.) Trin. ex steud.	Geo	Cos.
Poaceae	<i>Piptatherum miliaceum</i> (L.) Coss.	H	Med.
poaceae	<i>Poa annua</i> L.	Th	Plu.
Poaceae	<i>Polypogon monspeliensis</i> (L) Desf.	Th	Plu.
Poaceae	<i>Trachynia distachya</i> (L.) Link.	Th	Med./Ir-Tu.
Polygonaceae	<i>Emex spinosus</i> L	Th	Med./Ir-Tu.
Polygonaceae	<i>Polygonum argyrocoleum</i> Steud. in Kuntze.	Th	Med./Ir-Tu.
Polygonaceae	<i>Polygonum equisetiforme</i> Sibth.	H	Plu.
Polygonaceae	<i>Polygonum maritimum</i> L.	H	Med.
Polygonaceae	<i>Rumex bucephalophorus</i> L.	Th	Med.
Polygonaceae	<i>Rumex simpliciflorus</i> Murb.	Th	Med.
Polygonaceae	<i>Rumex tingitanus</i> L.	Th	Ir-Tu.
Polygonaceae	<i>Rumex vesicarius</i> L.	Th	Sah-Ar.
Portulacaceae	<i>Portulaca oleracea</i> L.	Th	Med./Ir-Tu./Eur-Si.
Primulaceae	<i>Anagallis arvensis</i> L.	Th	Med./Ir-Tu./Eur-Si.
Primulaceae	<i>Anagallis monelli</i> L.	H	Med.
Ranunculaceae	<i>Adonis microcarpa</i> DC.	Th	Med./Ir-Tu.
Ranunculaceae	<i>Delphinium halteratum</i> Sibth. & Smith,	Th	Med.
Ranunculaceae	<i>Nigella arvensis</i> L.	Th	Med./Ir-Tu.
Resedaceae	<i>Reseda alba</i> L.	Th	Med./Ir-Tu./Eur-Si.
Rubiaceae	<i>Galium aparine</i> L.	Th	Med.
Rubiaceae	<i>Galium murale</i> L.	Th	Med.
Rubiaceae	<i>Galium verrucosum</i> Huds.	Th	Med.
Rubiaceae	<i>Sherardia arvensis</i> L.	Th	Med./Ir-Tu.
Rubiaceae	<i>Valantia hispida</i> L.	Th	Med.
Santalaceae	<i>Thesium humile</i> Vahl	Th	Med.
Scophulariaceae	<i>Kicbia aegyptiaca</i> (L.) Nabelek,	H	Med./Sah-Ar.
Scophulariaceae	<i>Linaria tenuis</i> (Viv.) Sperng.	Th	Med./Sah-Ar.
Solanaceae	<i>Datura innoxia</i> Mill.	Th	Med.
Solanaceae	<i>Nicotiana glauca</i> R. C. Graham.	NP	Plu.
Solanaceae	<i>Solanum nigrum</i> L.	Th	Cos.

Tamaricaceae	<i>Reaumuria hirtella</i> Jaub. & Spach.	Ch	Med.
Tamaricaceae	<i>Tamarix aphylla</i> Graham.	NP	Sud./Sah-Ar.
Thymeleaceae	<i>Thymelaea microphylla</i> Coss. et Dr.	Ch	Med.
Urticaceae	<i>Urtica pilulifera</i> L.	Th	Med./Ir-Tu.
Urticaceae	<i>Urtica urens</i> L.	Th	Med./Ir-Tu.
Verbinaceae	<i>Lantana camara</i> L	NP	Med./Ir-Tu./Trop.
Zygophyllaceae	<i>Fagonia cretica</i> L.	H	Med.
Zygophyllaceae	<i>Tribulus terrestris</i> L.	H	Plu.
Zygophyllaceae	<i>Zygophyllum album</i> L.	H	Med.