



Taxonomic Revision and Annotated Catalogue to the Family Brassicaceae of Libya

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Abstract

This paper deals with a comprehensive taxonomic revision of the family Brassicaceae that was published in 1977 for the Flora of Libya. Since then, there have been no updating attempts in the family. Unfortunately, the flora of Libya, including the family Brassicaceae, is out of date. Recently, names of families and species have been updated [phototaxonomy]. The present study concerns mainly concerned with species of the family Brassicaceae, represented by actual authentic voucher specimens preserved in the national herbarium, Faculty of Science, Tripoli University [ULT]. Thus, species that are not represented by voucher specimens deposited in our herbarium are excluded from this study. Therefor, 69 different kinds of taxa representing 43 genera, 69 species, and 13 subspecies included in this study, compared with 96 species, 59 genera, and 15 infarspecific taxa in the flora of Libya No. 23. A total number of 27 species belonging to 21 genera are excluded of which 5 genera with different species are common in both included and excluded genera; these are *Alyssum*, *Brassica*, *Enarthrocarpus*, *Raphanus*, and *Sisymbrium*. The results of this study revealed that the genera *Matthiola* and *Diplotaxis* are the most sizable genera with 8 and 4 species, respectively, whereas the genera *Moricandia*, *Enarthrocarpus*, *Lipedium*, *Lobularia*, and *Sisymbrium* are represented by 3 species each. Other genera are represented by 1-2 species. Four endemic species reported from Libya are confined to the Sahara; these are *Ammosperma variable*, *Matthiola glutnosa*, *Oudneya africana*, and *Savignya parviflora*. Variety *rubella* of the species *Capsella bursa-pastoris* was treated in this study at the specific level. Names of some species are updated according to Plants of the World Online [POWO]. Original keys to the genera and species within each genus are

provided. An annotated list of species follows the generic key. Moreover, 69 species are included with relevant citations, synonyms, distribution of species in Libya, flowering period, and a life forms spectrum are included. In addition to that, an excluded list of 27 different species is also given. Genera and species included in this study are arranged alphabetically.

Keywords: Brassicaceae, Flora of Libya, Taxa, Authentic Specimens, Excluded Species

Introduction

The current paper focuses on taxonomic revision of the family Brassicaceae. Libya is located in North Africa, and occupies an area of about 1.759.59 km² (El-Mokasabi, 2017) between 18° 33' N latitude & 9° 25' E longitude. Bound by the Mediterranean Sea to the north, Egypt to the east, Tunisia and Algeria to the west, Sudan to the southeast, and Chad and Niger to the south (Figure 1). The coastal belt of Libya represents about 5.2% of the total area of Libya (Boulos, 1972), and is considered the most fertile part. Whereas, 95% of the country is desert (Qaiser & El-Gadi, 1984). The climate of Libya varies from arid-semiarid with low rainfall (Boulos, 1972; Keith, 1965). The size of the Brassicaceae family is very small due to the unfavorable climatic conditions; such conditions make the entire flora of Libya very poor with regard to the vast area of the country. The history of plant exploration in Libya dates back to 1819, when collections of Della Cella formed the base of the first checklist of the flora of Libya (Della Cella & Viviani, 1819). Since then, there have been many publications on the Libyan flora published by several workers. (Ascherson, 1881; Bolous, 1972; Cort, 1942; Durand & Barratte, 1910; El-Mokasabi, 2017; Keith, 1965; Maire, 1952-1955; Pampanini, 1931; Qaiser & El-Gdi, 1984; Sherif & Ben-Othoman, 1992; Al-Sghair & Mahklouf, 2022). The family Brassicaceae that was published for the flora of Libya represented by 96 species belonging to 59 genera (Jafri, 1977), of which 27 species have been excluded. Some of the excluded species are known from cultivation, whereas others are reported by different workers (Keith, 1965; Maire, 1952-1955; Pampanini, 1914), but not represented by authentic specimens in our herbarium. The excluded species has never been collected again, and could be extinct; it looks like it no longer exists in Libya, at least for the time being. In fact, excluded Libyan species are held as historical collections in Europe (Della Cella & Viviani, 1819). It has been reported that the flora of Libya is now out of date, and some names have been updated (Gawhar et al., 2018). Four endemic species are reported for the family Brassicaceae; these are *Ammosperma variable*, *Matthiola glutnosa*, *Oudneya africana*, and *Savignya parviflora* (Qaiser & El-Gadi, 1984). The aim of this study is to focus on the actual number of species belonging to the family Brassicaceae that truly exist in Libya, and to determine the excluded species, which are not represented by voucher specimens preserved in our herbarium (ULT).



Figure 1. Map of Libya showing location and bordering countries

Material and Methods

The morphological characters of the species presented in this study were taken from the specimens deposited in the national herbarium (ULT). Original keys for the genera and species were constructed based on qualitative and quantitative morphological characters. An annotated list of the species follows the keys. The nomenclature for all studied species follows the flora of Libya, family Brassicaceae (Jafri, 1977). Names and synonyms of the species are done based on POWO (<http://powo.science.Kew.org>). Genera and species included in this study are arranged alphabetically.

Key to The Genera

1. Fruit siliquae... 2
1. Fruit siliculae... 32
 2. Plants annuals... 3
 2. Plants perennials..... 25
3. Plants dichotomously branched; the fruit beak 10-23 mm. long,
 - 1-seeded; pedicels 20-25 mm. long in fruit11. Coinya
3. Plants not dichotomously branched; fruit beak 2.5-4 mm long,
 - seedless; pedicels 5-10 mm. long 4
 4. Siliquae about 3 times as long as broad with conspicuous beak.....5. Brassica
 4. Siliquae not as above..... 5
 5. Siliquae bi-articulated, upper segment easily separating transversely.....6. Cakile

5. Siliquae not bi-articulated, ant not separating transversely	6
6. Siliquae constructed between the seeds	7
6. Siliquae not constructed between the seeds... ..	8
7. Siliquae winged or keeled, lower segment often with seeds.....	15. Enarthrocarpus
7. Siliquae not winged or keeled, lower segment seedless.....	36. Raphanus
8. Siliquae with 2 apical horns.....	9
8. Siliquae without 2 apical horns	10
9. Stigma 2-lobed, erect; seeds many often narrowly margined or winged; siliquae spreading... ..	24. Matthiola
9. Stigma not 2-lobed; seeds 6-8 not margined or winged; siliquae appressed to the axis.....	33. Notoceras
10. Lower leaves rosulate, petiolate, pinnately lobed, upper leaves Linear $\pm$ sessile; siliquae with scattered simple hairs, beaked.....	20. Hirschfeldia
10. Lower leaves and siliquae not as above... ..	11
11. Leaves pinnate with terminal leaflet slightly longer than lateral leaflets; siliquae glabrous, straight or directed upwards.....	9. Cardamine
11. Leaves and siliquae not as above... ..	12
12. Valves 1- veined	13
12. Valves 3-7 veined... ..	20
13. Siliquae short with straight tapering flat seedles beak; stigma deeply 2 lobed; beak as long or longer than valves.....	17. Eruca
13. Siliquae and septum not as above... ..	14
14. Siliquae oblong, short $\pm$ upcurved; leaves deeply lobed.....	29. Nasturtiopsis
14. Siliquae not upcurved; leaves not deeply lobed	15
15. Plants pubescent with short stellate hairs, much-branched; siliquae linear, directed upwards.....	23. Maresia
15. Plants glabrous, if pubescent then not with stellate hairs; siliquae not as above.....	16
16. Plants glabrous; leaves pinnatisect with 2-4 pairs of fleshly linear lobes	35. Pseuderucaria
16. Plants and leaves not as above.....	17
17. Annual hairy herbs; leaves oblanceolate- oblong, entire-dentate; siliquae linear-subcylindrical; sepals 3-5 mm long; pedicels	

2-4 mm long in fruits; stigma conical.....	42. Strigosella
17. Annual herbs with basal rosette, deeply pinnatisect leaves; sepals 6-8 mm long; siliquae linear-slightly curved; pedicels 5-10 mm long in fruit; stigma capitate.....	18
18. Plants hispid with simple hairs; leaves deeply pinnatisect with linear oblong lobes, pubescent; siliquae linear-slightly curved; stigma capitate on short glabrous style.....	2. Ammosperma
18. Plants and leaves not as above	19
19. Plants annual, spreading-ascending herbs, branched from the base; lower leaves rosette; pedicels short, spreading in fruit; siliquae straight, outcurved, deflexed, or coiled above.....	31. Neotorularia
19. Plants annual-perennial herbs, not branched from the base; lower leaves not rosette; pedicels elongated, ascending-pendulous in fruit; siliquae flat not outcurved, deflexed or coiled above... ..	14. Diplotaxis
20. Annual-biennial herbs with pinnatisect leaves; siliquae biarticulated, upper segment 0-1-seeded without septum, beaked; lower segment 2-8-seeded with distinct septum	18. Erucaria
20. Annual herbs with pinnatifid or bipinnatisec leaves; siliquae not biarticulated; upper and lower segments not as above... ..	21
21. Annual herbs with bipinnatisect leaves; siliquae linear-cylindrical, curved above; pedicels with bunch of axillary hairs; valves $\pm$ transversely partitioned between seeds.....	18. Erucaria
21. Annual herbs; leaves pinnatifid; siliquae not curved above; pedicels without bunch of axillary hairs; valves not transversely between seeds	22
22. Beak tapering, coarsely 3-more-veined	23
22. Beak not tapering or coarsely 3-more-nerved.....	24
23. Beak cylindrical- subcylindrical or conical not compressed; siliquae 8-17-seede, glabrous- sparsely hairy with short retrose hairs	28. Mutarde
23. Beak strongly compressed; siliquae 4-6-seeded	40. Sinapis
24. Petals twice as long as the seples	25
24. Petals not twice as long as sepals... ..	26

25. Plants pubescent, branched from the base; basal leaves rosette, pinnatifid with triangular lobes; flowers usually solitary in each axile; style as thick as the siliquae in fruit; siliquae cylindrical, erect, densely pubescent..... 12. *Dichasanthus*
25. Plants glabrous-subglabrous, not branched from the base; basal leaves not rosette; flowers not solitary in each axile; style thinner than silquae in fruit; siliquae linear, erect-slightly upcurved, glabrous41. *Sisymbrium*
26. Stigma 2-lobed... ..27
26. Stigma not 2-lobed..... 29
27. Plants glabrous; leaves fleshy-sub-fleshy, cordate-amplexicaul, sessile, glabrous; siliquae glabrous.....26. *Moricandia*
27. Plants pubescent; leaves dissected or elliptic-oblong, entire; siliquae pubescent.....28
28. Stigmatic lobes each with a dorsal horn-like appendages; valves inside not partitioned between the seeds24. *Matthiola*
28. Stigmatic lobes without a dorsal horn-like appendages; valves inside partitioned between the seeds 25. *Morettia*
29. Plants $\pm$ aquatic herbs; siliquae $\pm$ slightly upcurved; leaves pinnate with 2-4 pairs of leaflets; seeds with numerous polygonal depressions.....30. *Nasturtium*
29. Plants not aquatic herbs; siliquae straight ; leaves not pinnate; seeds without polygonal depressions on each face 30
30. Plant glabrous shrubs; siliquae erect, glabrous; leaves linear-oblong; seeds broadly winged and emarginated at apex.....34. *Oudneya*
30. Plants often scabrous; siliquae $\pm$ subconvex, pubescent; seeds not winged, if winged then not emarginated at the apex..... 31
31. Shrubs with appressed hairs; sepals 8-12 mm long; petals 15-20 mm long; siliquae broad oblong-suborbicular, 10-25 mm long; seeds winged at margins, but not emarginated 19. *Farsetia*
31. Shrubs pubescent with stellate hairs; sepals 3-4mm long; petals 6-8mm long; siliquae linear-cylindrical 30-40 mm long; seeds not winged 16. *Eremobium*
32. Plants perennials..... 33
32. Plants annuals..... 37

33. Plant spinose or thorny above, glabrous; siliculae beaked with smooth, wrinkled, or shield-like outgrowth appendages on the surface.....43. Zilla
33. Plant not spinose or thorny above; siliculae not as above..... 34
34. Siliculae ovate- orbicular or obliquely ovate- cordate, laterally flattened, conspicuously notched at the apex, with sessile short stigma topping the fruit; valves strongly keeled or winged at the apex21. Lepidium
34. Siliculae, and stigma not as above... 35
35. Shrubs with woody base; seeds with membranous wings19. Farsetia
35. Shrubs not woody at the base; seeds $\pm$ narrowly winged- none36
36. Plants and fruits pubescent with appressed stellate hairs; siliculae tumid (unequally inflated), flattened-compressed, slightly emarginated at the apex1. Alyssum
36. Plants and fruits pubescent with bipartite hairs; siliculae not tumid or emarginated at the apex22. Lobularia
37. Siliculae bi-articulated38
37. Siliculae not bi-articulated.....41
38. Siliculae rugose, smooth, constricted and articulated in the middle, glabrous; pedicels erect-deflexed... 13. Didesmus
38. Siliculae not rugose, constricted and articulated in the middle...39
39. Siliculae densely pubescent, echinulate, 2-articulated; lower segment Stalk-like, rudimentary; upper segment with 8- more conical projections, deeply pubescent 27. Muricaria
39. Siliculae not echinulate; upper segment without conical projections.....40
40. Siliculae pendulous or deflexed with upper segment sterile, flat lingulate (spoon-shaped); lower segment fertile, hispid hispid on veins with 1-2 seeds10. Carrichtera
40. Siliculae $\pm$ appressed to axis; upper segment elongated not lingulate (spoon-shaped), beaked; lower segment glabrous on veins, seedless 37. Rapistrum
41. Cauline leaves auricled-sagittate at the base; lower leaves loosely rosette, pinnatifid; siliculae ovoid-globose, shortly beaked,

- reticulately rugose, 1- seeded7.Calepin
41. Cauline and lower leaves not as above; siliculae not
reticulately rugose42
42. Siliculae with membranous septum as broad as the fruit, beaked;
seeds conspicuously white-winged at the margins 38. Savignya
42. Siliculae not as above; seeds not white-winged at the margins43
43. Leaves cordate-amplexical, upper leaves smaller
than lower ones; siliculae conspicuously long-beaked
5-12mm long, laterally flattened.....39.Schouwia
43. Leaves and siliculae not as above...44
44. Siliculae glabrous, narrowly winged, conspicuously
notched at the apex; style and stigma included within
the notch...21. Lepidium
44. Siliculae not narrowly winged or notched at apex45
45. Siliculae laterally compressed with 2-orbicular lobes, often
didymous (in pairs); lobes glabrous or hairy with simple
or club-shaped hairs..... 4. Biscutella
45. Siliculae not didymous or laterally compressed.....46
46. Siliculae obcordate-triangular, laterally compressed, slightly
notched; style as long as the notch of the fruit 8. Capsella
46. Siliculae not obcordate-triangular; style not as above47
47. Siliculae broader than long, reniform- sub-reniform,
strongly reticulated or verrucous, shortly pedicelate;
style less than 1 mm long 21. Lepidium
47. Siliculae not as above48
48. Siliculae ovate with 2-cup-shaped appendages
at apex; style beak as long as the fruit3. Anastatica
48. Siliculae without 2-cup-shaped appendages at apex.....49
49. Siliculae sub-globose – lenticular, reticulately wrinkled, glabrous;
lower leaves simple, narrowed below; cauline leaves sagittate or
amplexicaul, sessile... 32. Neslia
49. Siliculae not as above; leaves oblong-obovate or linear-oblongeolate 50

50. Plants and fruits pubescent with stellate hairs;
siliculae tumid (unequally inflated), flattened or
compressed, slightly emarginated at the apex 1. *Alyssum*

50. Plants and fruits pubescent with bipartite hairs;
siliculae not tumid or emarginated at the apex 22. *Lobularia*

1.1. *Alyssum alyssoides* (L.) L., Syst. Nat. ed 10.2:1130.1759.

Clypeola alyssoides L., in Fl. Monsp. Northorst. Dissrt. 70: 21. 1753; *A. campestre* L., Sp. Pl. ed.2: 909. 1763; *A. parviflorum* Fisch. ex M. Bieb., Fl.Taur.-Cauc, 3: 434. 1819; *A. micropetalum* Fisch. in DC.,

Syst. 2: 313. 1821; *Adyseton alyssoides* (L.) Nieuwl. in Amer. Midl. Naturalist 4: 33. 1915; *Alyssum minus*

(L.) Rothm. in Feddes, Rep. 50. 77. 1941.

Distribution: Sahahat, Gebel Akhder, El SusaGoba, Takness, and Susa. Flowers: February-March.

Life form: Therophytes.

1.1..... *Alyssum montanum* L., Sp.Pl. 650. 1753 .

A. atlanticum Desf., Fl. Atlant. 2: 71.1798; *A. montanum* var. *atlanticum* (Desf.) Boiss., Voyage Espagne 44. 1839-45 .

Distribution: Gharian. Flowers: February-March. Life form: Therophytes .

1..... *Ammosperma* Hook. F., Bent. & Hook. F., Gen. Pl. 1: 82 1862.

Annual herbs, hispid with simple hairs; siliquae cylindrical, slightly curved, pubescent; stigma capitate on short glabrous style. It is represented by 2 species, confined mainly to N. Africa .

1. Plants and siliquae densely pubescent; stigma on broad style; valves of the siliquae conspicuously thick..... 2. *A. variabile*

1. Plants and siliquae sparsely pubescent; stigma on thin style; valves of the siliquae thin... 1. *A. cinereum*

1.1..... *Ammosperma cinereum* (Desf.) Hook. F., in Benth. & Hook.f. Gen. Pl. 1: 82. 1862.

Sisymbrium cinereum Desf. Fl. Atlant. 2.83.1798; *Moricandia cinerea* (Desf.) Coss., Compound. 2:154. 1887; *Diploaxis cinerea* (Desf.) Pomel, Nouv. Mat. 359. 1875.

Distribution: Tiji, Tawurgha, Sirte, and Bugrain. Flowers: December- June.

Life form: Therophytes.

1.1.....*Ammosperma*
variabile Nigre & Le Houerou, in Bull. Soc. Bot. France. 106: 149.1959. Distribution: Gebel
 Nafousa, Giado, Ghadames, Hun, and Wadan.

Flowers: January- March.. Life form: Therophytes.

This species is confined to the desert area between Ghadames and Hun .

2.....*Anastatica* L. ,
 Sp.Pl. 641. 1753; Gen. Pl. ed. 5: 290. 1754.

Annual herbs, densely pubescent with stellate hairs; siliculae short, ovate with 2 lateral cup-
 shaped appendages (wings) at the apex, becoming hard and woody which rolled inwards
 during dry conditions .

A monotypic genus

2.1.....*Anastatica*
hierochuntica L., Sp. Pl. 641. 1753.

Distribution: Gebel Uweinat, Gadames, Ghat, and Kufra. Flowers: March-April.

Life form: Therophytes.

This taxon is a sand species confined mainly to the Southern part of Libya .

3.....*Biscutella* L.,
 Sp. Pl. 653. 1753; Gen. Pl. ed. 5: 294. 1754.

Annual herbs; leaves entire-pinnatifid, basal leaves in rosette; siliculae laterally compressed,
 with 2 orbicular lobes (didymous), glabrous-pubescent. It is represented by 1 species .

1.1.....*Biscutella*
didyma L., Sp. Pl. 653. 1753.

B. apula L., Mant. 2: 254. 1771; *B. ciliate* DC. , Monogri Bisc. in Ann. Mus. Nat.18.297.
 1811 ;

B. didyma var. *ciliate* (DC.) Halacs. Consp. Fl. Gr. 1: 105. 1900. Distribution: Khoums,
 Tocrá, Slanta, Derna, El-Merjj, Shahat, and Baida . Flower: February- March.

Life form: Therophytes .

2.....*Brassica* L., Sp.
 Pl. 666.

Annual herbs, hispid; upper leaves usually smaller than basal one, amplexicaul, sessile-
 subsessile ; siliquae $\pm$ 2-3 times as long as broad with conspicuous beak, many seeded, 1-

venied on each valve, glabrous. It is represented by 2 species.

1. Upper leaves amplexicaul; siliquae 5-15 mm. long ; sepals 2-3mm long;
petals 3-6 mm long.....1. B. Cyrenaica

1. Upper leaves absent or 1-2 sub-sessile but not amplexicaul ;siliquae 20-25 mm long;
sepals 5-9 mm.long; petals 9-12 mm. long2. B. gravinae

5.1. *Brassica cyrenaica* Spreng., Syst. 2: 911. 1825.

Camelia souliei Batt. In Bull. Soc. Bot. Fr. 36: 213.1889; *Sisymbrium amplexicaule* Desf., Fl. Atlant. 2: 81. 1800; *Sinapis amplexicaulis* (Desf.) DC., Syst. 2: 610. 1821; B. amplexicaulis (Desf.) Pomel, Mat. Fl. Atlant. 15. 1860; B. souliei (Batt.) Batt. in Bull. Soc. Bot. Fr. 40. 262 . 1893.

Distribution: Gebal Akhdar area. Life form: Therophyte.

5.1.....*Brassica gravinae* Ten., Prodr. Fl. Nap. 39. 181. 1811.

B. brachyloma Boiss. et Reut. Boiss., Ser. 2.1: 30. 1853; B. boissieri Munby in Bull. Soc. Bot. Fr. 2: 283. 1855; B. rupicola Pomel, Nouv. Mat. 362.1875.

Distribution: Tobruk, and Batdia. Life form. Therophytes.

1.....*Cakile* Miller, Gard. Dict. 1: 118. 1754.

Annual, glabrous herbs; leaves spatulate-ovate, entire; siliquae bi-articulated, separating transversally into two parts, upper part large and longer than lower part, beaked, 1-seeded, lower part short and narrower than the upper one. It is represented by 1 species.

1.1.....*Cakile maritima* ssp. maritima Scop. in Fl. Carniol., ed. 2. 2: 35. 1771.

Isatis aegyptica L., Sp.Pl. 671. 1753; C. cyrenaica Spreng, Sys. 2: 825. 1825; C. maritima var. aegyptia (L.) Delile in Descr. Egypte, Hist. Nat. 2(Me'm.): 67. 1813.

Distribution: Khomus, Tripoli, Benghazi, Derna, Shahat, and Susa .

Flowers: March-April. Life form: Therophytes.

2.....*Calepine* Adanson, Fam. 2: 423. 1763.

Annual glabrous herbs; cauline leaves sessile auricled-sagittate, at the base, lower leaves loosely rosulate, Pinnatifid; siliculae ovoid-globose, shortly beaked, reticulatly rugose, 1-seeded.

A monotypic genus

2.1.....Calepine

irregularis (Asso.) Thell. in Shinz & Keller, Fl. Schweiz ed. 2,1: 218. 1905.

Myagrurn irregulate Asso. Syn. Strip. Arag. 82. 1779; C. corvine Desv. in J. Bot. 3: 158. 1814.

Distribution: Benghazi. Flowers: April-May.

Life form. Therophytes .

3.....Capsella Medik.

, Pflanzengatt. 1: 85. 1792.

Annual; basal leaves pinnatifid, $\pm$ rosulate, cauline leaves sagittate-amplexicaul; siliculae obcordate- triangular, laterally compressed; valves reticulately veined.

Jafri (1977) in Fl. of Libya recognized the presence of 1 species and 2 varieties in the genus Capsella .

In this work, the named variety rubella has been treated at the specific rank. Accordingly, the genus is represented by 2 species instead of only one.

1. Plants green; sepals green; siliculae margins straight1. C. bursa-pastoris

1. Plants usually reddish- brown; sepals reddish-tinged; siliculae margins sub-curved 2. C. rubella

3.1.....Capsella bursa-

pastoris (L.) Medik., Pflanzengatt. 1: 85. 1792.

Thlaspi bursa L., Sp. Pl. 647. 1753.

Distribution: Tripoli University Campus, Sharshara, Tarhuna, Al Gubba . Flowers: March.

Life form: Therophytes.

This species is a common weed in the lawns .

3.2.....Capsella rubella

Reut. , B. Soc. Haller. 18. 1854.

C. bursapastoris ssp. rubella (Reut.) Rouy et Fouc. , Fl. Fr. 2: 95 . Distribution: Tripoli University Campus .

Flowers: March.

Life form: Therophytes.

4.....Cardamine L. ,

Sp. Pl. 653. 1753; Gen. Pl. ed. 5: 295. 1754.

Annual herbs, glabrous-hairy; leaves pinnate with terminal leaflet longer than lateral ones;

siliquae linear, straight, compressed, glabrous and directed upwards. It is represented by 1 species.

4.1.....Cardamine

hirsute L., Sp. Pl. 655. 1753 .

Distribution: Gebel Akhdar, Shahat, Faidia, and Beida . Flowers: March-April.

Life form: Therophytes.

1.....Carrichtera

DC., Mem. Mus. Hist. Nat. Paris. 7: 244. 1821.

Annual prostrate herbs, hispid with 2-4-pinnatisect leaves; siliculae pendulous or deflexed, biarticulated with sterile spoon-shaped upper segment, and fertile lower segment with hispid on the nerves; 3- veined valves.

A monotypic genus .

1.1.....Carrichtera

annua (L.) DC., Mem. Mus. Hist. Nat. Paris. 7: 250. 1812.

Valla annua L., Sp.Pl. 641. 1753.

Distribution: Gebel Nafousa, El-Klaba, Gharian, Nalut, Gadames, Sharshara, Tokra, Mirawa , Messa, and Baida.

Flowers: February-March. Life form: Therophytes .

2.....Coincya Rouy

in Naturaliste, Ser. 2, 13:248. 1891.

Annual herb, dichotomously branched; basal leaves rosulate, shortly petiolate; siliquae 10 - 23 mm long, 1-seeded beak; pedicels 20-25 mm long in fruit. It is represented by 1 species.

2.1.....Coincya

tournefortii (Gouan) Alcaraz, T. E. Di'az, Rivas Mart. & S'anchez-Go'mez 2: 108. 1989.

Brassica barrelieri ssp. tournefortii (Gouan) Malag in Terme'zetrazi Fuz. 6: 179. 1882; B. tournefortii Gouan in Ill. Observ. Bot, 44. 1773; B. tournefortii var. leiocarpa Maire & Weiller in Fl. Afrika N. 12: 184. 1965 (Not validly publ).

Distribution: Shakshuk, Kleaba, Gharian, Cabaw, Tripoli, Khoms, and Tarhuna. Flowes: January- March.

Life form: Therophytes.

3.....Dichasianthus

Ovcz. & Tunusov in Fl. Tadzhiksk, S.S.R. 5: 625. 1978 .

Annual pubescent herb, branched from the base; basal leaves rosulate; flowers solitary in

each axil; siliquae hirsute, slightly curved above; style $\pm$ as thick as the siliquae in fruit. It is represented by 1 species.

3.1.....Dichasianthus
runcinatus (Leg. ex DC.) V. I. Dorof. in Konspekt Fl. Kavkaza 3(3): 450. 2012 .

Chamaepodium runcinatum (Leg. ex DC.) in Reepert. Spec. Nov. Regni Veg. Beih. 30 :(1)
378, 1925; Erysimum runcinatum (Leg. DC.) Link in Handbuch 2: 313: 1831; Sisymbrium
runcinatum Leg. ex DC. In Syst. Nat. 2: 478. 1821 .

Distribution: Gharian. Flowers: March-April . Life form: Therophytes.

4.....Didesmus Desv.
, J. Bot. Appl. 3: 160.1814.

Annual herb; leaves simple- bipinnate; siliquae bi-articulated, glabrous, segments tetragonal,
1- seeded each, upper segment deciduous with or without septum. It is represented by 2
species.

1. Leaves simple, oblong- pinnatisect, serrate-dentate1. D. aegyptius

1. Leaves conspicuously bipinnatisect2. D. bipinnatus

1.1.....Didesmus
aegyptius (L.) Desv. , J. Bot. Appl. 3: 160. 1814.

Myagrum aegyptium L , Sp. Pl. 641. 1753.

Distribution: El Marj, Taknes, Benghazi, Gebel Akhdar, Susa, Shahat, Tokra. Flowers:
February-May .

Life form: Therophytes.

This species is common in the Gebel Ahkdar area, and it is grazed by livestock while it is
green, and by camels when dry .

1.1.....Didesmus
bipinnatus (Desf.) DC. , Syst. 2: 659. 1821.

Sinapis bipinnata Desf. , Fl. Atlant. 2: 97. 1799; Rapistrum bipinnatum (Desf.) Coss.et Kral,
in

B. Soc. Bot. France 4: 395. 1857.

Distribution: Gharian, Nalut, Kaleba, Cabaw, Gebel Nafusa, Jefren, Giado, and Sharshara.
Flowers: March-June.

Life form: Therophytes.

2.....Diplotaxis DC. ,
Syst. Nat. 2: 628. 1821.

Perennial or annual herbs, not branched from the base; leaves pinnatifid-pinnatisect; pedicels pendulous in fruit; siliquae compressed conspicuously stipitate, linear, shortly beaked, many seeded; stigma capitate $\pm$ 2-lobed. It is represented by 4 species and 22 named subsp.

- 1.....Plants perennial herbs2
- 1.....Plants annual herbs3
- 2.....Leaves glabrous; siliquae straight-curved, on ascending pedicels, with stalk-like beak3. *D. muralis*
- 2.....Leaves hispid; siliquae usually pendulous with inconspicuous beak.....2. *D. harra*
- 3.....Plants densely hispid; siliquae hispid; stigma bifid, conical with sub-decurrent lobes... 1. *D. acris*
- 3.....Plants glabrous-sparsely hispid; siliquae glabrous; stigma capitate not bifid....4
- 4.....Leaves loosely-densely rosulate; siliquae straight-curved, beaked; beak stalk-like-conical, seedless3. *D. muralis*
4. Leaves not as above; siliquae not as above; beak linear 1-2 seeded.....4. *D. virgate*
- 1.1.....*Diplotaxis acris* (Forsk.) Boiss. , Fl. Or. 1: 389. 1867.

Hesperis acris Forsk. , Fl. Agypt.-Arab. 118. 1775; *D. duveyrierana* Coss. in Bull. Bot. Soc. France 11: 164. 1864; *D. acris* var. *duveyrierana* (Coss.) Coss, Compend. Fl. Atlant. 2: 171.1885;

Moricandia hispidiflora DC. , Syst. Nat. 2: 627. 1821.

Distribution: Derj, Sinawan, and Ghadames . Flowers: February-March.

Life form: Therophytes .

- 1.2.....*Diplotaxis harra* (Forsk.) Boiss. , Fl. Or. 1: 388. 1867 .

Sinapis harra Forsk. , Fl. Agypt.-Arab. 118. 1775; *Sisymbrium hispidum* Vahl, Symb. 2: 77.

1794;

S. pendulum Desf. , Fl. Atlant. 2: 82. 1800; *D. hispida* (Vahl) DC. , Syst. Nat. 2: 630.1821.

Distribution: Nalut, Wazen, Cabaw, Ain Rumia, Abugilan, Gebel Nafusa, Gharian, and Waska . Flowers: October-June.

L 1.1.Diplotaxis

muralis (L.) DC. , Syst. Nat. 2: 634. 1821.ife form: Therophytes.

Sisymbrium murale L. , Sp.Pl. 658. 1753; *S. simplex* Viv. , Fl. Lib. Spec. 36. 1824; *D. simplex*

(Viv.) Spreng. Syst. 2: 914. 1825 .

One named subsp., has been recognized in Libya which differs from the type subsp. by its narrow leaves, siliquae with 1-2 mm long linear beak, and much branched from the base.

1.....Siliquae with short obconical beak.....A. ssp. *muralis*

1.....Siliquae with 1-2 mm. long linear – conical beakB. ssp. *simplex*

A.....subsp. *muralis*

Distribution: Gebal Nafusa, Kaleba, Gharian, Cabaw, Nalut, Zintan, Tripoli Univ. Campus, and Tarhuna .

Flowers: February-March. Life form: Therophytes .

B.....subsp. *simplex* (Viv.) Jafri

Sisymbrium simplex Viv. , Fl. Lib. Spec. 36. 1824; *D. simplex* (Viv.) Spreng. , Syst. 2: 914. 1825.

Distribution: Wadi Al-Aital,Gharian, Kaleba, Al-Awenia, Rumia, Zinten, Tarhuna, Wadi El - Magenin, Khoms, Derna, and Al-Qubbah .

Flowers: January-March . Life form: Therophytes .

1.1.....Diplotaxis

vitgata (Cav.) DC. , Syst. Nat. 2: 631. 1821 .

Sinapis virgate Cav., Descr. pl. 428. 1802; *D. eruroides* var. *cyrenaica* Durand & Barratte, Fl. Lib., Prodr. 16. 1910; *D. brachycarpa* Godr. Fl. Juven. ed. 2:55. 1854.

Distribution: Quaminis, Benghazi, Takness, and Gebel Akhdar. Flowers: February-March. Life form: Therophytes.

2.....*Enarthrocarpus*

Labill. , Icon. Fl. Syr. 5: 4. 1812 .

Annual herbs, hispid with whitish hairs, often branched from the base; basal leaves petiolate , sessile-subsessile, pinnatisect with 2-9 pairs of lateral segments, terminal segment ovate-sub- orbicular; siliquae cylindrical, constricted between the seeds. It is represented by 2 species.

1. Siliquae linear-lanceolate, curved-outcurved above, conspicuously winged-keeled below2. E, pterocarpus

1. Siliquae cylindrical, not winged or keeled below1. E. clavatus

2.1.....Enarthrocarpus clavatus Del. ex Godr. , Fl. Juven.adv. 4. 1853 .

E. trabalis Pomel. Nuov. Mat. 358. 1875 .

Distribution: Cabao, Gharian, Nalut, Wadi Al-Aital, Kelaba, Gebael Nafousa, Yafren , Giado, Sabrata, Tarhuna, Khoms, and Tripoli.

Flowers: February-April. Life form: Therophytes .

2.2.....Enarthrocarpus pterocarpus (Pers.) DC. , Syst. Nat. 2: 661. 1821.

Raphanus pterocarpus Pers., Syn. 2: 209. 1807.

Jafri 1977 cited 1 named variety of this species (var. hispida). In this work, such variety has been omitted due to the lack of authentic specimens to verify its existence in our area.

Distribution: Bengazi, Wadi Derna, El-Goba, Susa, Baida, Shahat, and Tokra. Flowers: January-June.

Life form: Therophytes.

1.....Eremobium

Boiss. , Fl. Or. 1: 156. 1867.

Shrub-subshrub, ascending-prostrate, branched, stellately pubescent, lower part of the plant sticky that sticks to the sand granules; leaves small, oblong-linear, sessile; siliquae linear-cylindrical, stellately pubescent; pedicels ascending; valves subconvex; seeds obscurely winged at margins. It is represented by 1 species.

1.1.....Eremobium

aegyptiacum (Spreng.) Asch. ex Boiss in Fl. Orient. ,Suppl.: 30. 1888. ssp. longisiliquum (Coss.) Maire in Fl. Afrique N. 14. 66. 1977.

Malcolmia aegyptiaca Spreng. in Syst. Veg. , ed. 16. 2. 898. 1825; Eremobium aegyptiacum

var. longisiliquum (Coss.) Hochr. in Annuarie Conserv. Jard. Bot. Genève. 7-8: 131. 1904; E. longisiliquum (Coss.) Boiss in Fl. Orient. , Suppl. 30. 1888; *Malcolmia aegyptiaca* ssp . longisiliqua (Coss.) Maire in E. Jahandiez & al. , Cat. Pl. Moroc 2: 308. 1932; *M. aegyptiaca* var. longisiliqua Coss. in Fl. Atlant. : 23. 1882.

Distribution: Al Assa, Benghashir, Tarhuna, and Ghat . Flowes: October-February.

Life form: Therophytes.

2.....*Eruca* Miller,
Gard. Dict.ed. 4. 1754.

Annual herb, branched from the base, hispid; leaves lyrate-pinnatifid, lower petiolate, uppere subsessile-sessile; siliquae oblong-ellipsoid, tetragonal with flat, compressed, seedless beak ; stigma bilobed, conical. It is represented by 2 species .

1. Siliquae 4-6 mm broad; valves $\pm$ longer than the beak2. *E. satives*

1. Siliquae up to 3 mm broad; valves usually equal to or shorter than the beak....., 1.
E. longirostris

2.1.....*Eruca*

longirostris Uechtr. in Oesterr. Bot. Zeitschr. 24: 136. 1875.

E. sativa subsp. *longirostris* (Uechtr.) Maire in J. & M. , Cat. Motoc. 279. 1932; *E. vesicaria* subsp. *longirostris* (Uechtr.) Maire, Fl. Afr. Nord, 12: 398. 1965; *E. hispida* Groves in N. G. Bot. Ital. 19. 124. 1887 .

Distribution: Gebel Nafusa, Yefren, Janduba, Gharian, Khoms, and Misurata. Flowers: March-May.

Life form: Therophytes .

2.2.....*Eruca satives*
Mill. , Gard. ed. 8, 1: 1768 .

Brassica eruca L., Sp. Pl. 667. 1753; *E. eruca* (L.) Asch. & Graebn, Fl. Nordosted. 362. 1898;

E. vesicaria (L.) Cav. ssp. *sativa* (Mill.) Thell. Fl. Adv. Montpell. 260. 1912; *E. vesicaria* (L.) Cav. var. *stiva* (Mill.) Thell. in Hegi, Ill. Fl. Mittleur. 4 (1): 201. 1918 .

Distribution: Kabau, Nalut, Yferen, Wadi Al Aital, Gharian, Tagma, Tripoli, and Tarhuna. Flowers: February-April. Life form: Therophytes .

3.....*Erucaria*
Gaertn. , De Fruct. Sem. Pl. 2: 298. 1791.

Annual herbs with pinnatisect-bipinnatisect leaves, glabrous; siliquae with valves 3-5-nerved

, Linear-cylindrical usually glabrous, variable in articulation. It is represented by 2 species.

1. Leaves bipinnatisect; Siliquae curved above, not 2-articulated; pedicels, flower or fruits with bunch of white long hairs in the axils... 2. *E. pinnata*

1. Leaves pinnatisect; siliquae not curved above, 2-articulated; pedicels, flower or fruits without bunch of white long hairs in the axils1. *E.*

microcarpa

1.1.....*Erucaria*

microcarpa Boiss. , Diagn. Ser 1. 8: 47. 1848.

Reboudia microcarpa (Boiss.) Coss. , Compend. 2: 213. 1887; *R. pinnata* O. E. Schulz in Engler ,

Bot. Jährh. 54 (119): 56. 1916; *Erucaria pinnata* Tackh. ed Boulos in Pub. Cairo Univ. Herb. 5: 37.1972.

Distribution: Koubba, Tobruk, and S. of Bardia. Flowers: March.

Life form: Therophytes .

1.2.....*Erucaria pinnata*

(Viv.) Tackh. & Boulos in Publ. Cairo Univ. Herb. 5: 37. 1972.

Brassica capinnita (Viv.) Spreng. in Syst. Veg. ed 16. 2: 911. 1825; *Hussonia pinnata* (Viv.)

Jafri in Fl. Libya 23: 67. 1977; *Raphanus pinnatus* Viv. in Fl. Libyc. Spec.: 37. 1824;

Reboudia pinnata (Viv.) O. E. Schulz in Beibl. Bot. Jahrb. Syst. 119: 56. 1916; *Erucaria*

uncata (Boiss.) Asch. & Schweinf. , Ml. Egypt 40. 1889; *E. aegiceras* Coss. in J. Gay. ex

Coss. in Ill. Fl. Atlant. 1: 47. 1884; *E. aegiceras* J. Gay ex Boiss. in Fl. Orient. 1: 367. 1867 .

Distribution: Wadi Elmeiat, Cabaw, Tripoli, Tarhuna, Nalut, Bugrain, Misurata, Sirt, and Hun.

Flowers: February-May. Life form: Therophytes .

2.....*Farsetia Turra*,

Dissert. *Farsetia* 1. 1765 .

Herbs-shrub, woody at the base, much branched, hoary with appressed bipartite hairs; leaves linear- oblong, sessile; siliquae more or less siliculae-like, oblong, flat, broad with 1-veined septum, dehiscent; pedicels ascending; seeds orbicular, membranous winged at margins. It is represented by 1 species.

2.1.....*Farsetia incana*

(L.) Lag.-Foss., Fl. Tarn et Garrone 19.1847 Distribution:

Shakshuk, Qasre Alhaj, Gharian, Derj, Ghadames, Bugrain, Hun, Weskha, Sokna, and

Sebha.

Flowers: February-November. Life form: Chamaephytes.

This taxon is a desert species associated with *Moricandia suffruticosa* and *Zella spinosa*.

3.....Hirschfeldia

Moench. , Method. 264. 1794 .

Annual-perennial; stem much branched; basal leaves rosulate, pinnately-lobed, hairy-glabrous, petiolate, with ovate, obtuse, dentate terminal lobe; siliquae erect, appressed to the stem. It is represented by 1 species .

3.1.....Hirschfeldia

incana (L.) Lag.-Foss. , Fl. Tarn et Garrone 19. 1847 .

Sinapis incana L. , Cent. Pl. 19. 1755; *S. geniculate* Desf. In Fl. Atl. 2: 98. 1798;

Hirschfeldia adpressa Moench. , 264. 11794; *H. adpressa* var. *geniculate* (Desf.) Batt. in J.

A. Battandier & L. C . Trabut, Fl. Alge'ric, Dicot.: 61. 1888; *Brassica adpressa* (Moench.)

Boiss. , Voy. Espagne 2:38.1839;

B. geniculate (Desf.) Ball in J. Linn. Soc., Bot. 16: 327. 1877. Distribution: All over the country.

Flowers: September- January. Life form: Therophytes.

This species easily recognized by its rosette lobed leaves, which lie flat on the ground.

1.....Lepidium L.,

Sp. Pl. 643. 1753 .

Annular- perennial herbs ± woody at the base, glabrous-hairy; leaves linear-elliptic, lower often petiolate, upper subsessile-sessile; siliculae ovate- obovate or obliquely ovate-cordate, glabrous laterally compressed, emarginated at apex, sometimes broader than long; valves strongly verrucose or reticulately veined, narrowly winged and notched at the apex with style and stigma included within the notch. It is represented by 3 species.

1.....Plants perennial

herbs; siliculae obliquely ovate-orbicular ± cordate2. *L. draba*

1.....Plants annual

herbs; siliculae not as above.....2

2.....Siliculae

winged and conspicuously notched at apex,

not reticulated or verrucose3. *L. sativum*

2. Siliculae not winged or notched at apex, strongly reticulated

or verrucose1. *L. coronopus*

1.1.....*Lepidium*

coronopus (L.) Al-Shehbaz in Novon 14: 152. 2004.

Carana coronopus (L.) Medik. in Pfl: Gatt.:35.1792; *Coronopus coronopus* (L.) H. Karst. in

Ill.Repet. Pharm.-Med. Bot.: 673. 1886; *Cochlearia coronopus* L. in Sp. Pl.: 648. 1753;

Senebiera coronopus (L.) Cav. in Elench. Pl. Horti Matr.: 34. 1803.

Distribution: Confined to the Eastern part of Libya.

Flowers: February-March. Life form: Therophytes.

1.2.....*Lepidium draba*

L. in Sp. Pl.: 645. 1753.

Cardaria draba (L.) Desv. in J. Bot. Agric. 3: 163. 1815; *Cochlearia draba* (L.) L. in Syst.

Nat. ed. 10. 2: 1129 . 1759; *Crucifera cardaria* E.H.L. Krause in J. W. Sturm, Deutschl. Fl.

Abbild. , ed. 2.6: 156. 1902; *Lepidium draba* ssp. *eudraba* Thell.in Neue Denkschr. Schweiz.

Naturf. Ges. 41 (Abh. 1): 87. 1906; *Nasturtium draba* (L.) Grantz in Cl. Crucif. Emend.: 81.

1769.

Distribution: Rumia, Yefern, Gharian, and Abugilan. Flowers: March-April.

Life form: Therophytes.

1.3.....*Lepidium*

sativum L., Sp. Pl. 644.1753.

L. spinescens DC., Syst. Nat. 2: 534. 1821; *L. sativum* ssp. *spinescens* (DC.) Thell. in Mith.

Bot. Mus. Univ. Zurich, 28: 161. 1906.

Distribution: Benghazi, Derna, and Jaghub.

Flowers: February-March. Life form. Therophytes.

1.....*Lobularia* Desv.

in J. Bot. 3: 162. 1814.

Annual-perennial herbs; plant and siliculae pubescent with appressed bipartite hairs; leaves

linear , ovate-oblongate, entire; siliculae oblong-ovate or obovate; valves 1-veined, not

emarginated at apex. It is represented by 2 species.

1. Plants perennial; siliculae with 1-seed per locule2. *L. maritima*

1. Plants annual; siliculae with 4-6 seeds per locule1. *L. libyca*

1.1.....*Lobularia libyca*

(Viv.) Meisner, Pl. Vasc. Gen. 2: 11.1836.

Lunaria libyca Viv. , Fl. Lib. Spce. 34. 1824; *Alyssum libycum* (Viv.) Coss. , Bull. Soc. Bot.

France

.1857 .467 :4

Distribution: Shakshuk, Qaser Alhaj, Cabaw, and Tripoli Univ. campus . Flowers: January-June.

Life form: Therophytes.

1.1.....Lobularia
maritima (L.) Desv. in J. Bot. 3: 169. 1814.

Clypeola maritima L. , Sp. Pl.652. 1753; Alyssum maritimum (L.) Lam. , Encycl. 1: 98. 1783;

Koniga maritima (L.) R. Br. , Obs. Pl. Oudney. 9. 1826 .

Distribution: Gebel Nafusa, Gharian, Abu Gilan, and Tripoli Univ. Campus. Flowers: December- April.

Life form: Therophytes .

2.....Maresia Pomel,
Nouv, Mat. Fl. Atl. 228. 1874 .

Annual herbaceous, erect, much branched, covered with stellate hairs; leaves linear-oblong, entire; siliquae linear-cylindrical, pedicelate, pubescent with stellate hairs, directed upwards, many seeded ; pedicels covered with stellate hairs, 2-3mm long increasing to 5-8 mm long in fruits. It is represented by 1 species.

2.1.....Maresia nana
(D C.) Batt. in Batt.& Trabut., Fl. Alger. (Dicot.) 68. 1. 1888.

Sisymbrium nanum DC. , Syst. 2. 486. 1821; Malcolmia nana (DC.) Boiss. , Fl. Or. 1: 222. 1867;

M. binervis (C. A. Mey.) Boiss. in Ann. Sc. Nat. Ser. 2. 17: 71. 1842 . Distribution: Tripoli (Univ. campus), Benghazi, and Tobrok.

Flowers: March-June. Life form: Therophytes.

3.....Matthiola R. Br.
In Aiton. , Hort. Kew. ed. 2. 4: 119. 1812.

Annual, biennial, and perennial herbs, and shrubs, branched, ± covered with branched stellate hairs; leaves oblanceolate, entire-dissected; siliquae not constructed or partitioned between the seeds with 2-apical horns, pubescent; valves without basal appendages; stigma 2-lobed, each lobe with a dorsal horn-like appendages, seeds many often narrowly winged. It is represented by 8 speciesm and 4 subsp.

Species of the genus *Matthiola* cosmopolitan and aromatic, some of its species are cultivated for colorful and scented flowers.

- 1.....Perennial
herbaceous or shrubby plants, woody at the base... ..2
- 1.....Annual or
biennial plants, not woody at the base... ..3
- 1.....Shrubby plants,
covered with stellate whitish hairs, and sparsely with yellowish- glaucous glandular; basal
leaves none, cauline leaves linear-oblong; sepals densely glandulosa; petals conspicuously
undulated at margins; siliquae rigid, pubescent with prominent
reflexed horns.....2. *M. glutinosa*
2. Herbaceous Plants not glandulose; basal leaves in roseate, cauline leaves few-none; sepals
not glandular; petals not undulated at margin; siliquae usually with upcurved
horns.....1. *M.*
fruticulosa
3. Biennial herbaceous plant; basal leaves in roseate; stigma 2-lobed without
apical horns7. *M. sinuate*
3. Annual herbaceous plant; basal leaves not as above; stigma conspicuously with apical
horns.....4
4. Siliquae with basal appendages (horn-like); sepals saccate at the
base.....3. *M. kralikii*
4. Siliquae without basal appendages; sepals not saccate
at the base.....5
5. Small annual herbs, not branched from the base; cauline leaves oblong, pilose with
branched hairs... ..6. *M. parviflora*
5. Annual plants branched from the base, covered with stellate hairs6
6. Petals usually undulated at margins4. *M.*
longipetales
6. Petals not undulated at margins.....7
7. Petals with conspicuous emarginated limbs.....8. *M.*
tricuspidate
7. Petals without emarginated limbs;5. *M. lunates*
- 1.1.....*Matthiola*

fruticulosa (L.) Maire in Jah. & Maire, Cat. Pl. Maroc. 2: 311. 1932.

Cheiranthus fruticosus L., Sp. Pl. ed. Pl. ed. 2: 925. 1759; Matthiola tristis (L.) R. Br. In Ait., Hort. Kew. Ed. 2.4: 120. 1812; M. perennes P. Conti in Mem. Herb. Boiss. 18. 58. 1900.

Distribution: Gebal Nafusa, kabou, Nalut, Wadi El Hera, Gharian, Yafren, Ain Rumia, Qasre Al Haj, and Tarhuna. Flowers: February- May.

Life form: Chamaephytes.

1.2.....Matthiola glutinosa Jafri, in Ali & Jafri, Fl. Libya 23: 155. 1977.

This species easily recognized from other species of the genus Matthiola by absence of basal rosette leaves; shrubby plant, pubescent with stellate hairs and sparsely glaucous glandular; sepals densely glandular; petals linear with undulate margins; siliquae pubescent – glandular with apical reflexed stigmatic horns. It is reported as an endemic to the southern paret of Libya (13).

Distribution: Sebha-Hun highway. Flowers: March-April.

Life form: Chamaephytes.

1.3.....Matthiola kralikii Pomel in Nouv. Mat. Fl. Atl. 2: 374. 1875.

Lonchophora kralikii (Pomel) Jafri in Fl. Libya 23: 163. 1977; Matthiola kralikii Pomel, Nouv. Mat. Fl. Atl.

374. 1874; M. longipetala ssp. kralikii (Pomel) Maire in Fl. Afrique N. 14. 24.1977; M. oxyceras var.

basiceras Coss. , & Kralik in Bull. Soc. Bot. France, 4: 56. 1857.

It differs from M. longipetala by absence of basal rossate leaves. Distribution: Nalut, Gharian, Kabau, Zintan, Tripoli, and Tarhuna. Flowers: February-May.

Life form: Therophytes.

1.4.....Matthiola longipetala (Vent.) DC. Sys. 2: 174. 1821.

Cheiranthus longipetalus Vent. , Hort. Cals. 93. 1802; C. lividus Del., Fl. Aeg. Illust. 591. 1813.

A polymorphic species much branched from the base, with different pubescence. Therefore, it is split into 2 subspecies.

1. Plant pubescent with short stellate hairs, sometimes with glandular hairs;

lateral horns up to 10mm

long.....

A. ssp. longipetala

1. Plants pubescent with dimorphic short-long branched hairs; lateral horns up

4mm long... ..B. ssp. pumilio

A.....subsp.

longipetala

Distribution: Zintan, Tripoli, Khoms, Tarhuna, Nalut, and Sinawan. Flowers: February-April.

Life form: Therophytes.

B.....subsp. pumilio

(Sibth. & Sm.) P. W. Ball in Fedde, 68: 194. 1964.

Cheiranthus pumilio Sibth. & Sm. Prodr. Fl. Graec. 2. 26. 1806; Matthiola pumilio (Sibth. & Sm.) DC.,

Syst. 2. 177. 1821; M. bicornis var. pumilio (Sibth. & Sm.) Boiss. Fl. Or. 1: 156. 1867.

Distribution: Nalut, Sebrata, Kaleba, Zinten, Misrata, and Khoms. Flowers: January-May.

Life form: Therophytes.

1.1.....Matthiola

lunates DC., Syst. Nat. 2: 176. 1821.

M. anoplia Pomel, Nouv. Mat. 231. 1874. Distribution: Gebel Akhdar, Susa, and Shahat.

Flowers: March-June.

Life form: Therophytes

This species somewhat confined to Gebel Akhdar area.

1.2.....Matthiola

parviflora (Schousboe) R. Br. in Ait. , Hort. Kew. Ed. 2. 4: 121. 1812.

Cheiranthus parviflorus Schousboe, Jagttag. Over Vextrig. Morokko 195. 1800.

This species easily recognized by its stem leaves dentate, oblong, pilose with short-branched hairs,

and absence of basal rosette leaves; siliquae pubescent, straight –upcurved, with 2-diverging lateral horns.

Distribution: Yefren, Wadi El Hira, and Rumia. Flowers: March-June.

Life form: Therophytes.

1.3.....Matthiola

sinuate (L.) R.Br. in Ait. Hort. Kew. ed. 2. 4: 120. 1812.

Cheiranthus sinuatus L., Sp. Pl. ed. 2: 926. 1763.

Distribution: Gebel Akhdar, Wadi Lathrun, Derna, Susa, and Wadi Mahbool. Flowers: March-April.

Life form: Therophytes.

1.4.....*Matthiola*

tricuspidata (L.) R. Br. In Ait. Hort, Kew. ed. 2. 4: 120. 1812.

Cheiranthus tricuspidatus L. Sp. Pl. 663. 1753.

Annual prostrate, branched herbs; petals with emarginated limbs; siliquae cylindrical, straight on short Pedicel, usually with 3 apical horns.

Very variable species in pubescence of leaves, and stigmatic lateral horns. 2 subsp. are recognized.

1. Terminal horn almost equal to lateral horns or slightly shorterA. ssp.
tricuspidata

1. Terminal horn shorter than lateral hornsB. ssp.
pseudoxylaras

A. subsp. *tricuspidata*

Distribution: Tockra, Qaminis, Bengazi, Susa, and Gebal Akhdar. Flowers: February-July.

Life form: Therophytes.

This subsp. is confined to the coastal area in Gebal Akhdar.

B. subsp. *pseudoxylaras* (Conti) Jafri, stat. nova.

M.pseudo-oxyceras Conti in Mem. Herb. Boiss. 18. 71. 1900.

Distribution: Martuba, Merawa, Wadi Derna, Gebel Akhdarusa, Ras Al Hilal, Derna, and Tockra. Flowers: January- June.

Life form: Therophytes.

This taxon easily recognized by broad emarginated petals, and apical horn shorter than lateral ones.

2.....*Morettia* DC.,
Syst . Nat. 2: 426. 1821.

Perennial much branched herbs, covered with stellate white hairs; leaves small ovate- oblong, shortly petiolate-sessile, tomentose; siliquae short, cylindrical, tomentose except stigma and style, pedicelate, appressed to the stem $\pm$ curved; valves partitioned between the seeds inside; stigma 2-lobed on short glabrous style, lobes diverging in fruit.

A monotypic genus .

1.1.....Morettia

philaeana (Delile) DC., Sys. Nat. 2: 427. 1821.

Sinapis philaeana Delile in Fl. Egypte, Hist. Nat. 2. 243. 1813; *Morettia canescens* Boiss., Diagn. Ser 1.8:17.1849; *M. canescens* var. *erecta* Maire in Bull. Soc. Mist. Nat. Afrique N. 32: 203. 1941. Distribution:

Distribution: Sebha, Hun, Weshka, and Gebel Soda. Flowers: January-March.

Life form: Therophytes.

2.....Moricandia

DC., Syst. Nat. 2: 626. 1821.

Shrub-undershrub or herbaceous plant, glabrous, branched; leaves fleshy-subfleshy, sessile, glabrous, lower leaves obovate, upper ones ovate-cordate; siliquae linear, compressed with subangular valves, glabrous; stigma 2-lobed on short style; seeds many not margined or winged at apex. It is represented 2 species.

1. Leaves broad, mostly cordate-amplexicual at the base1. *M. arvensis*

1. Leaves narrow, oblong-obovate not cordate or amplexicual at the base... .2. *M. nitens*

2.1.....Moricandia

arvensis (L.)DC.,Syst. Nat. 2: 626. 1821.

Brassica arvensis L. , Mant. 1: 95. 1767; *B. suffruticosa* Desf. Fl. Atl. 2: 94. 1798;

Moricandia longirostris Pomel, Nouv. Mat.367. 1875; *M. spinosa* Pomel, Nouv. Mat. 365. 1875; *M. arvensis* ssp. *spinosa* (Pomel) Batt. in B. & T. Fl. Alg. 65. 1888; *M. suffruticosa* (Desf.) Coss. et Dur. in Ann. Sc. Nat. Bot. ser. 44:282.1855;

M. arvensis var. *suffruticosa* (Desf.) DC. Syst. 2: 627. 1821. Distribution: Gharian, Boghilan, Nalut, and Cabaw.

Flowers: March-June.

Life form. Therophytes.

2.2.....Moricandia

nitens (Viv.) MDMurand & Barratte, Fl. Lib. Prod. 15. 1910.

Hesperis nitens Viv. , Fl. Lib. Spec. 38. 1824; *Moricandia atvensis* ssp. *nitens* (Viv.) Maire in M. C. 2636.1939;

M. dumosa Boiss. , Diagn. Ser. 1: 8: 25. 1849; *M. suffruticosa* var. *nitens* (Viv.) Schweinf. & Aschers. Illust. Fl. Egypt. 14. 1887.

Distribution: Derna, Tamini, and Tobruk. Flowers: Septamber- October.

Life form: Therophytes.

This taxon differs from the previous one by its weak habit, small shrub, leaves obovate-oblong.

3.....Muricaria Desv.
, J. Bot. 3: 159, 2. 1814.

Annual, prostrate herbs, branched from the base; leaves deeply dissected, retorsely pubescent with simple hairs, basal leaves in rosette, petiolate, upper ones subsessile; siliculae subglobose-echinulate, 2-articulated, with 8-more conical projections, densely pubescent; beak 1-seeded, glabrous; pedicels 2-4 mm long increasing in up to 6 mm long in fruit.

A monotypic genus

3.1.....Muricaria
prostrata (Desf.) Desv. , J. Bot. 3: 159. 1814.

Bunias prostrata Desf. , in Fl. Atlant. 2: 76. 1798; Muricaria battandieri Hochr. , Sud Oranais, 133. 1904; Calepina prostrata (Desf.) Spreng. in Syst. Veg. , ed. 16. 2. 850. 1825; Laelia prostrata (Desf.) Pers. In Syn. Pl. 2: 185. 1806; Myagrum prostratum (Desf.) Poir. In J. B. A. M. de Lamarck, Encycl., Suppl. 2. 48. 1811.

Distribution: Kaleba, Nalut, Gebel Nafusa, and Giado. Flower: March-April.

Life form: Therophytes.

1.....Mutarda Bernh.
in Syst. Verz. Erf. , 184. 1800.

Annual herbs, bristly, hairy-glabrous; leaves dentate-lobed, lower leaves petiolate, upper ones sessile- subsessile; siliquae beaked, many-seeded, rounded, glabrous-sparsely hairy, ascending, spreading, ended with a straight bristly, seedless beak; beak almost 1/2 as long as the fruit; pedicels 3-7 mm long, thickened in fruit; stigma capitate, almost compressed. It is represented by 1 species.

1.1.....Mutarda
arvensis (L.) D. A. German in Turczaninowia, 25 (2). 56.2022.

Agrosinapis arvensis (L.) Fourr. In Ann. Soc. Linn. Lyon, n.s. 16: 329-1868; Crucifera sinapistra E. H. L. Krausa in J. W. Sturas, Deutsch. Fl. Abbild. , ed. 2. 6: 134. 1902;

Raphanus arvensis (L.) Crantz in Cl. Crucif. Emend. :

109. 1769; Sinapis arvensis L. in Sp. Pl.: 668. 1753; Sinapis arvensis (L.) Spach in Hist. Nat. ve'g. 6: 345. 1838. Distribution: Tripoli, and Gebel Nafusa.

Flowers: February-April. Life form: Therophytes.

2.....Nasturtiopsis

Boiss. , Fl. Or. 1: 237. 1867.

Annual herbs, pubescent with short, simple hairs; leaves deeply lobed, dentate-entire, lower leaves short petiolate, upper leaves sessile; siliquae oblong, usually upcurved, many seeded; pedicels 10 mm long

in fruit; valves 1-veined; stigma depressed on short style. A monotypic genus

2.1.....Nasturtiopsis

coronopifololius (Desf.) Boiss. , Fl. Or. 1: 237. 1867.

Sisymbrium coronopifololium Desf. Fl. Atlant. 2. 82. 1798; Nasturtiopsis coronopifololium (Desf.) DC. , Syst. 2: 194. 1821; N. Arabica Boiss. , Fl. Or. 1: 237. 1867.

Distribution: Gebel Nafusa, Giado, and Bugariba. Flowers: March-April.

Life form: Therophytes.

3.....Nasturtium R.

Br. In Aiton, Hort. Kew. ed. 2. 4: 100. 1812.

Perennial, rhizomatous aquatic herbs, prostrate or floating, glabrous; leaves pinnate with 4-9 leaflets; siliquae Cylindrical-sbucylindrical, glabrous, many-seeded; seeds ovoid with many polygonal depressions. It is represented by 1 species.

3.1.....Nasturtium

officinale R. Br. in Aiton, Hort. Kew. ed. 2. 4: 110. 1912.

Sisymbrium nasturtium-aquaticum L., Sp. Pl. 657. 1753; Rorippa nasturtium (L.) Hayek, Sched. Fl. Styr. Exs.

22. 1905.

Distribution: Ain Rumia, Wadi Derna, Derna-Susa costal road, and Gebel Akhdar. Flowers: January-April.

Life form: Therophytes.

4.....Neotorularia

(Desf.) Hedge & J. Le'onard in Botanic Garden Meise, V. 56, No. 3/4. 389-395. 31.12.1986.

Annual with spreading branches, pubescent with short bifid hairs; basal leaves rosette, shortly Petiolate-sessile, pinnatifid-dentate; siliquae straight-reflexed or coiled above, usually hispid-scabrid. It is represented by 1 species.

4.1.....Neotorularia

torulosa (Desf.) Hedge & J. Le'onard in Bull. Jard. Bot. Natl. Belg. 56: 395. 1986.

Dichasanthus torulosus (Desf.) Soja'k in Sborn. Na'r. Mus. v Praze, Rado B, Prir. Ve'dy 1982: 107. 1982;

Malcolmia torulosa (Desf.) Boiss. in Fl. Orient. 1: 225. 1867; *Sisymbrium torulosum* Desf. In Fl. Atlant. 2:

84. 1798; *Torularia torulosa* (Desf.) Schulz in Engler (ed.), Pflanzenr. IV. 105 (86): 222. 1924. Distribution: Kaleba, Mizda, and Benghazi.

Flowers: March-April. Life form: Therophytes.

1.....Nesilia Desv., J. Bot. Appl. 3: 162. 1814.

Annual herbs, branched above, hairy with bipartite hairs; leaves simple, sagittate; siliculae subglobose- subspherical or Lenticular with or without style, indehiscent, 1-seeded, reticulately wrinkled; pedicels ascending-spreading, elongated in fruit. It is represented by 1 species.

1.1.....Nesilia paniculata ssp. thracica (Velen.) Bornm. in Oesterr. Bot. Z. 44: 125. 1894.

Nesilia thracica Velen. in Oesterr. Bot. Z. 41: 122, 375. 1891; *Vogelia thracica* (Velen.) Hand.-Mazz. Hofmus. 27: 56. 1913; *Nesilia apiculate* Mey. in Index Seminum (Petropolitanus) 8. 68. 1842; *Nesilia hispanica* Porta in Atti Imp. Regia Accad., Rovereto 1896.

Distribution: Shahat, Gebel Akhdar, Taknass, and Kaleba. Flowers: February-April.

Life form: Therophytes.

2.....Notoceras R. Br. in Ait., Hort. Kew. ed. 2. 4: 117. 1812.

Annual, branched herbs, hairy with bipartite hairs; leaves oblong-ob lanceolate; siliquae subquadrate, short, appressed to the axis, hairy, with 2 apical horns, dehiscent, 6-8-seeded; style short not exceeding the apical horns. It is represented by 1 species.

2.1.....Notoceras bicornis (Aiton) Amo in Fl. Fan. Penins. Ibe'rica 6: 536. 1873.

Erysimum bicornis Aiton in Hort. Kew. 2: 394. 1789; *Notoceras bicornis* var. *hispanicum* Amo in Fl. Fan. Penins, Ibe'rica 6: 536. 1873.

Distribution: Gharian, Gebel Nafusa, and Shakshuk. Flowers: February- May.

Life form: Therophytes.

3.....Oudneya R. Br.

in Denh & Clapp., Trav. Append. 20. 1826.

Shrubs, woody at the base, branched above, glabrous; leaves small, fleshy, alternate, linear-oblong, sessile; sepals unequal; petals twice as long as the sepals; siliquae erect, compressed, almost with undulated margins, dehiscent, many seeded; seeds with broad winged, and emarginated at apex.

A monotypic genus

3.1.....Oudneya

africana R. Br. Denh. et Clapp., Trav. Append. 20. 1826.

Henonia deserti Coss. et Dur. Bull. Soc. Bot. France 2: 245. 1855; *Henophyton deseti* Coss. et Dur. in Bull. Soc. Bot. France 2: 625. 1855.

This taxon reported to be an endemic to the Libyan Sahara.

Distribution: Hun, Sokna, Bugrain, Waddan, and Sebha. Flowers: February- April.

Life form: Therophytes.

4.....Pseuderucaria

(Boss.) Schulz in Engler, Bot. Jahrb. 54 beibl. 119: 54. 1916.

Annual glabrous herbs; leaves pinnetisect with 2-4 pairs of linear lobes; siliqua linear, dehiscent, many- Seeded; valves rigid-subrigid with prominent mid-vein. It is represented by 1 species.

4.1.....Pseuderucaria

teretifolia (Desf.) Schulz in Engler, Bot. Jahrb. 54 beibl. 119: 54. 1916.

Brassica teretifolia Desf. , Fl. Atlant. 2: 94. 1798; *Moricandia teretifolia* (Desf.) DC. , Syst. 2: 628. 1824;

Ammosperma teretifolium (Desf.) Boiss. , Fl. Or. 1: 387. 1867.

Distribution: Hun, Wadi Lager, and Weshka. Flowers: February-April.

Life form. Therophytes.

5.....Raphanus L. ,

Sp. Pl. 669. 1753.

Annual herbs, branched, britly-hairy all over with simple hairs; lower leaves rosette, rough lobed with

large terminal lobe, upper leaves narrower, entire, toothed-serrate, roughly hairy; siliquae 2-segments, lower segment short, seedless, upper segment-elongated, constructed between the seeds, terminating with tapering seedless beak, fruit breaking into 1-seeded parts at maturity. It is represented by 1 species.

1.1.....Raphanus

raphanistrum L. , Sp. Pl. 669. 1753. Distribution: Throughout the country.

Flowers: January-April. Life form: Therophytes.

This taxon (wild Radis) is common and widespread weed, found growing on roadside, and as a weed in cultivated areas. It is cultivated for fodder purposes in Libya. The roots of cultivated Radis (R. sativus L.) is widely used as an edible vegetable.

2.....Rapistrum

Crantz, Class. Crucif. 105. 1769.

Annual herbs, hispid with simple hairs; leaves lower coarsely toothed, petiolate, upper simple toothed; siliculae 2 articulated, upper segment subglobose, strongly nerved, beaked, 1-seeded, indehiscent, falling entirely at maturity, lower segment slender-oblong, narrow usually 1-3-seeded; valves rigid. It is represented by 1 species.

2.1.....Rapistrum

rugosum (L.) All. , Fl. Pedem. 1: 257. 1785.

Myagrum rugosum L. , Sp. Pl. 640. 1753; Rapistrum orientale (L.) Crantz, Crucif. 106. 1769.

Distribution: Tripoli, Khoms, Shahat, and Baida. Flowers: April-June.

Life form: Therophytes.

3.....Savignya DC. ,

Syst. Nat. 2: 283. 1821.

Annual-biennial herbs or shrub, glabrous, branched from the base; leaves, lower dentate, shortly petiolate' upper oblong-linear, subsessile-sessile; siliculae oblong-elliptic or suborbicular, flattened; pedicels filiform elongated, lower ones mostly pendulous; valves flattened-compressed or inflated convex, dehiscent, beaked; septum as broad as the fruit; seeds with white membranous wings at the margins. It is represented by 1 species.

3.1.....Savignya

parviflora (Deelile) Webb. Fl. Aethiop.-Aegypt in Parlatore, Giorn. Bot. Ital. 2: 215. 1847.

Lunaria parviflora Delile, Fl. Egypt. Explic. Pl.104. 1847; Savignya aegyptiaca DC. , Syst. 2: 283. 1821;

Farsetia parviflora (Delile) Spreng. , Syst. Veg. 2: 871. 1825.

This taxon very polymorphic. Therefore, it is split into 3 subspecies.

1.....Style up to 2-

3.5 mm longC. ssp.

longistyle

1.....Style up to 2
mm long2

2.....Plants

herbaceous; siliculae oblong-elliptic; valves flattenedA. ssp.

parviflora

2. Plants shrubby; siliculae suborbicular, globose-subglobose; valves convex B. ssp.

globosa

A.subsp.

parviflora

Plants small herbaceous; flower small 1 cm across; siliculae oblong.

Distribution: Nalut, Ghadames, Sinawan, Bugrain, Hun, and Sebha. Flowers: February-June.

Life form. Therophytes.

B.subsp. globose

Jafri, ssp. nov, 23.85. 1977.

Plants shrubby; flowers 1 cm across; siliculae globose-subglobose.

Distribution: Brak, Sebha, and Hun. Flowers: February-March.

Life form: Therophytes.

A.subsp.

longistyle (Boiss. et Reut.) Maire in Bull. Soc. Nat. Afr. N. 22: 172. 1929. Plants usually robust; siliculae with long style 2-3.5 - more mm long.

Savignya longistyla Boiss. et Reut. , Diagn. Ser. 2. 5: 27. 1856.

Distribution: Nalut, and Ghadames. Flowers: Feb-March.

Life form: Therophytes.

1.....Schouwia DC. ,
Syst. Nat. 2: 643. 1821.

Annual, glabrous, robust, branched above; lower leaves obovate, sessile- subsessile; upper leaves ovate- cordate or amplexicaulate; siliculae with valves laterally compressed, dehiscent, many seeded; beak 5-10 mm long; style distinct.

A monotypic species

1.1.....Schouwia

purpurea (Forssk.) Scheef. In Bull. Herb. Boiss. 4 (Append.2): 183. 1896.

Subularia purpurea Forssk. , Fl. Aegypt.-Arab. 117. 1775; Schouwia Arabica (Vahl) DC. ,

Syst. Nat. 2: 644. 1821; Schouwia schimperi Jaub. & Spach. Fl.Or. 3: 145. 1847; Schouwia thebachia Webb. Fl. Aethiop.-Aegypt In Parl. , Giorn Bot. 2: 219. 1847.

Distribution: Ghat. Flowers: February-April. Life form: Therophytes.

This species is confined to arid and semiarid regions.

2.....Sinapis L., Sp. Pl. 668. 1753.

Annual-perennial herbaceous plant, hairy-glabrous; leaves pinnatifid, lower shortly petiolate; upper sessile-subsessile; siliquae linear-cylindrical, many-seeded; pedicels spreading in fruit; beak tapering with or without seeds, coarsely 3-more-veined. It is represented by 3 species.

1.....Plants perennial herbs, densely pubescent with whitish appressed hairs; siliquae

appressed to axis, 10-17- seeded; beak not compressed3. *S. pubescens*

1.....Plants annual herb, hispid-glabrous with spreading-deflexed hairs; siliquae ascending-

spreading, not appressed to axis, 2-8-seeded; beak strongly compressed $\pm$ ensiform (sword-like)2

2.....Siliquae bristly, swollen on the valves around the seeds; petals 8-12 mm long;

pedicels 10- 15 mm long in fruit1. *S. alba*

2. Siliquae not swollen on valves around the seeds; petals less than 8 mm long;

pedicels up to 6 mm long in fruit2. *S. flexuosa*

2.1.....*Sinapis alba* L. Sp. Pl. 668. 1753.

Brassica alba (L.) Rabenh. , Fl. Lusatica, 1: 154. 1893; *Sinapis mairei* Lindb. , Itin. Medierr. 65. 1932; *S. alba*

ssp. *mairei* (Lindb.) Maire in M. C. 1365. 1933.

Distribution: Gebel Akhdar, and Shahat. Flowers: February-April.

Life form: Therophytes.

2.2.....*Sinapis flexuosa* Poiret in Lam. , Encycl. Meth. Bot. 4: 341. 1797.

Sinapis hispida Schouush. , Jag. Vextr. Marokko, 182. 1800; *Sinapis alba* var. *flexuosa* (Poir.) in Syn. Pl 2: 207. 1807; *Sinapis alba* var. *hispida* Alef. In Landw. Fl. 250. 1866.

Distribution: Wadi Derna, and Ras Hilal. Flowers: February-March.

Life form: Therophytes.

1.1.....Sinapis

pubescens L. , Mant. 1: 95. 1767.

Sinapis circinata Desf. , Fl. Atlant. 2: 96. 1800; Sinapis indurata Coss. , Bull. Soc. Bot.

France 9: 168. 1862; Sinapis aristida (Coss. et Dur.) Pomel, Nouv. Mat. 358. 1875; Sinapis

pubescens var. Cyrenaica Coss. et Daveau in Bull. Soc. Bot. France 36: 103. 1889; Brassica

pubescens (L.) Ardoino in Fl. Anal. Alpes-Mar.: 1867; Rhamphospermum pubescens (L.)

Al-Shehbaz in Harvard Pap. Bot 26: 4. 2021.

Distribution: Gebel Akhdar, Shahat, and Baida. Flowers: January-June.

Life form: Therophytes.

2.....Sisymbrium L.,

Sp. Pl. 657. 1753.

Annual herbs, sparsely hairy with simple hairs, glabrous-subglabrous; leaves pinnatifid-

pinnatisect, lower petiolate, upper sessile; Petals twice as long as the sepals; siliquae linear,

erect, glabrous, spreading, dehiscent, with convex valves, many-seeded. It is represented by

3 species.

1.....Siliquae slightly

upcurved; valves swollen; pedicels 10-15 mm long in fruit,

ascending, thinner than siliquae2. S. irio

1.....Siliquae straight

not upcurved; pedicels up to 6 mm long in fruit,

usually as thick as the siliquae2

2.....Siliquae 50-100

mm long; flowers 5-6 mm across; sepals 4-5 mm long;

petals 7-10 mm long; Pedicels 3-6 mm long in fruit.....3. S. orientale

2. Siliquae 20-40 mm. long; flowers 2 mm. across; sepals up to 3 mm long;

petals less than 4 mm long; Pedicels short 1-2 mm long in fruit1. S.

erysimoides

2.1.....Sisymbrium

erysimoides Desf. ,Fl. Atl. 2: 84.1798.

Pachypodium erysimoides (Desf.) Webb & Berth. ,Phyt. Canar. 1: 203. 1340. Distribution:

Gebel Nafousa, Sabrata, Gharian, Ain Rumia, Tripoli, Baida, and Derna. Flowers: February-

April.

Life form: Therophytes.

2.2.....*Sisymbrium irio*
L., Sp. Pl. 659. 1753.

Sisymbrium irioides Boiss. in Ann. Sc. Nat. Ser. 2. 17: 76. 1842.

Distribution: Ain Rumia, Yafren, Gharian, Tripoli, Tarhuna, Derna, and Susa, Flowers:
February-May.

Life form: Chamaephytes.

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2.3.....*Sisymbrium*
orientale L., Cent. Pl. 2: 24. 1756.

Sisymbrium columnae Jacq., Fl. Austr. 12. 1776.

Distribution: Wadi Mahboul, Baida, and Derna. Flowers: February-March.

Life form: Therophytes.

3.....*Strigosella*
Boiss. in Diagn. Pl. Orient., Ser 2. 1: 22. 1854.

Annual herbs, densely pubescent with branched hairs; leaves oblanceolate-elliptic, entire-dentate with broad triangular teeth, pubescent rarely glabrous; sepals 3-5 mm long, hairy; petals longer than sepals, 6-12 mm long; siliquae linear-subcylindrical, pubescent with branched hairs, spreading, many-seeded, without tapering Beak; valves rigid, pilose rarely glabrous; stigma conical. It is represented by 1 species.

1.1.....*Strigosella*
africana (L.) Botsch. In J. Bot. Zhurn. U. R. S. S. 57: 1038. 1972.

Hesperis africana L., Sp. Pl. 663. 1772; *Malcolmia africana* (L.) W. T. Aiton, Hort. Kew 4: 121. 1812; *Wilckia africana* (L.) F. Muell., in Nat. Pl. Victoria, 1: 33. 1879; *Fedtschenkoa africana* (L.) Dvorak in Fedde, Repert. 81 (6-7): 403. 1970.

Distribution: Kelaba, Ain Rumia, Yefren, and Bengashe=ir. Flowers: March-April.

Life form: Therophytes.

2.....*Zilla* Forsk., Fl.
Aegypt-Arab. 121. 1775.

Perennial small shrub, spinose or thorny above, glabrous; lower leaves oblong-spathulate, petiolate; cauline leaves oblong-linear, often semi-amplexical, entire-sparsely dentate, sessile-subauriculate at the base; siliculae ovoid-subglobose, smooth, wrinkled or with

shield-like outgrowth on surface, beaked. It is represented by 1 species and 2 subsp.

2.1.....Zilla spinosa

(L.) Prantl in Engler & Prantl, Pflanzenfam. 3 (2): 174. 1890.

Bunias spinosa L., Mant. 1: 96. 1767.

Due to fruit variation, two subsp. are recognized for this species.

1.....Siliculae

without shield-like appendages on the valves.....A. ssp. spinosa

1.....Siliculae with

conspicuous shield-like appendages on the valves... ..B. ssp.

macroptera

A.....subsp. spinosa

Zilla myagroides ssp. myagroides (Fosk.) Maire & Weiller in M. C. 2641. 1939.

Siliculae of this subsp. globose, beaked, without conspicuous shield-like outgrowth appendages on the valves.

Distribution: Gelel Nafousa, Nalut, Ghadames, Bugrain, Sebha, Hun, Sokna, and Weshka.

Flowers: January-March.

Life form: Chamaephytes.

B.....subsp.

macroptera (Coss.) Maire & Weiller in Maire, Fl. Afr. Nord. 13: 8. 1967.

Zilla macropeta Coss. in Bull. Soc. Bot. France 3: 670.1856; Zilla biparmata O. E. Schulz in Engler's, Bot. Jahrb. 119: 55. 1916.

Siliculae of this subsp. conspicuously with shield-like outgrowth appendages on the valves.

Distribution: Tamini, Beni walid, Mizda, and Ghadamis. Flowers: September- October.

Life form: Chamaephytes.

Excluded List of Species

The following list is consisting of 27 excluded species of the family Brassicaceae, of which some were known from cultivation, and others have been reported by foreigner workers mostly European, and deposited in herbaria outside Libya [Table 1].

Table 1. List of excluded species of the family Brassicaceae. Reported species marked with an asterisk

No.	Excluded species	No.	Excluded species
1.	* <i>Alyssum granatense</i> Boiss. et Reut.	16.	* <i>Eremophyton chevallieri</i> (Barr.) Beg.
2.	* <i>Arabidopsis thaliana</i> (L.) Heynh.	17.	* <i>Erophila verna</i> (L.) Besser
3.	* <i>Arabis nova</i> Vill.	18.	* <i>Erucastrum varium</i> (Dur. ex Duch.) Dur

4.	<i>Armoracia rusticana</i> (Lam) Caertn.	19.	<i>*Hymenolobus procumbens</i> (L.) Nutt. Ex O. Schulz
5.	<i>*Brassica fruticulosa</i> Cyr.	20.	<i>*Iberis acutiloba</i> Bertol.
6.	<i>Brassica juncea</i> (L.) Czern & Coss.	21.	<i>*Isatis lucitanica</i> L.
7.	<i>Brassica napus</i> L.	22.	<i>*Lonchophora capiomontana</i> Durieu
8.	<i>Brassica nigra</i> (L.) Koch	23.	<i>Raphanus sativus</i> L.
9.	<i>Brassica oleracea</i> L.	24.	<i>*Rorippa islandica</i> (Oeder) Borbas
10.	<i>Brassica rapa</i> L.	25.	<i>*Sisymbrium officinale</i> (L.) Scop.
11.	<i>Camelina sativa</i> (L.) Crantz	26.	<i>*Sisymbrium polyceratum</i> L.
12.	<i>*Clypeola jonthlaspi</i> L.	27.	<i>*Thlaspi perfoliatum</i> L.
13.	<i>*Conringia orientalis</i> (L.) Andr.		
14.	<i>Crambe maritima</i> L.		
15.	<i>*Enarthrocarpus strangulatus</i> Boiss		

Results

The current study is concerned with a comprehensive taxonomical revision of taxa belonging to the family Brassicaceae. The results of this study revealed that the presence of 43 genera, 69 species, and 13 subspecies compared with 59 genera, 96 species, 11 subspecies, and 4 varieties, as published in the family Brassicaceae, flora of Libya No.23 (Jafri, 1977). According to that, 27 species of 96 species are excluded from this study; some of which have been known from cultivation, whereas others have been reported by foreign workers, and deposited in herbaria outside of Libya (Table 1). Therefore, species not represented by authentic herbarium specimens have been excluded from this study. Based on that, only species represented by authentic voucher specimens and preserved in the national herbarium (ULT) are counted in this study. The results of this study showed that the 69 species included in this paper represent 71.88% of the total number of species included in the flora of Libya. Moreover, 28 genera included in this study are represented by 1 species, of which 8 genera are monotypic (Table 2). Whereas 15 genera are represented by 2 or more species, of which *Matthiola* and *Diplotaxis* are the most sizable genera with 8 and 4 species respectively, other genera are represented by 2-3 species (Table 3). Such results revealed that the large number of genera in proportion to that of species indicates that each genus consists of 1-3 species. Therefore, the number of species per genus is very low. In addition to that, the family Brassicaceae represents 4.73% of 2028 species of Angiosperms included in the flora of Libya (Sherif & Ben-Othman, 1992), however, the present study showed that the genera of the family Brassicaceae represent 5.52%

of 779 genera in the flora of Libya, and the species represent 3.40% of 2028 species included in the flora of Libya [Table 4]. This result indicates that the size of the family Brassicaceae is very small compared to that of the flora of Libya, which itself is very poor with regard to the vast area of Libya. Names of some species are updated based on Plants of the World Online (POWO) (Table 5). The life forms analysis according to Raunkiaer (1934) showed that the complete dominance of therophytes with 64 species (92.75%), followed by chamaephytes with 5 species (7.25%) (Table 6). Such a result indicates that the prevalence of annuals and absence of trees is due to scarcity of rainfall during winter, and unfavorable conditions of the extreme hot and dry summer season.

Table 2. List of genera represented by 1 species, including 8 monotypic genera (marked with an asterisk)

Number	Genera	Number	Genera
1.	*Anastitica L.	15	Mutarda Bernh
2.	Biscutal L.	16	*Nasturtiopsis Boiss.
3.	Cakile Miller	17	Nasturtium R. Br.
4.	*Calepine Adanson	18	Neotorularia (Desf.) Hedge & Le'onad
5.	Cardamine L.	19	Neslia Desv.
6.	*Carricthera DC.	20	Notoceras R. Br.
7.	Coincya Rouy	21	*Oudneya R. Br.
8.	Dichasianthus Ovez & Tunusov	22	Pseuderucaria (Boiss.) O. E. Schulz
9.	Ermobium Boiss.	23	Raphanus L.
10.	Farsetia Turra	24	Rapstruim Crantz
11.	Hirschfeldia Moench	25	Savignya DC.
12.	Maresia Pomel	26	*Schouwia DC.
13.	*Morettia DC.	27	Strigosella Boiss.
14.	*Moricanndia Desv.	28	Zilla Forsk.

Table 3. List of genera represented by 2 or more species and percentage of species based on the current study

Genera	Number of species	percentage
Matthiola	8	18.60%
Diplotaxis	4	9.30%
Enarthrocarpus	3	6.98%

Lipidium	3	6.98%
Moricandia	3	6.98%
Sinapis	3	6.98%
Sisymbrium	3	6.98%
Alyssum	2	4.65%
Ammosperma	2	4.65%
Brassica	2	4.65%
Capsella	2	4.65%
Didesmus	2	4.65%
Eruca	2	4.65%
Erucaria	2	4.65%
Lobularia	2	4.65%

Table 4. Percentage of genera and species of the family Brassicaceae with regard to the flora of Libya

Taxon	Flora Of Libya	Family Brassicaceae	Percentage
Genera	779	43	5.52%
Species	2028	69	3.40%

Table 5. List of updated names based on Powo

Old names	Updated names (POWO)
Alyssum minus (L.) Rothm	Alyssum alyssoides (L.) L.
Brassica tournefortii Gouan	Coincya tournefortii (Gouan) Alaraz.
Cakile aegyptica (L.) Willd.	Cakile maritima ssp. maritima Scop
Cardaria draba (L.) Desv.	Lepidium draba L.
Coronopus squamatus (Forsk.) Ascher.	Lepidium coronopus (L.) Al-Shehbaz.
Eremobium longisiliquum (Coss.) Boiss.	Eremobium aegyptiacum (Spreng.) ssp. longisiliquum (Coss.) Maire
Hussonia pinnata (Viv.) Jafri	Erucaria pinnata (Viv.) Tackh. & Boulos
Lonhophora kralikii (Pomel) Jafri	Matthiola kralikii Pomel
Malcolmia Africana (L.) R.Br.	Strigosella africana (L.) Botsch.
Neslia apiculata Fisch.	Neslia paniculata ssp. thracia (Velen.) Bornm.
Notoceras bicornes (Ait.) Caruel	Notoceras bicornes (Aiton) Amo.
Sinapis arvensis L.	Mutarda arvensis (L.) D. A. Gemen
Sisymbrium runcinatum Lag. ex Dc.	Dichasianthus runcinatus (Leg ex DC.) V.I, Dorof.

Torularia torulosa (Desf.) Schulz	Neotorularia torulosa (Desf.) Hedge & J. Le'onard
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Table 6. Percentage of Life forms analysis of species with respect to the current number of taxa

Life Forms	No. of Species	Percentage
Therophytes	64	92.75%
Chamaephytes	5	7.25%

Discussion

The results of the present study revealed that the family Brassicaceae represented by 43 genera, 69 species, and 13 subspecies. 28 genera are represented by 1 species, of which 8 are monotypic, whereas 15 genera are represented by 2 or more species. The family with such a number of species in proportion to the large number of genera is considered very small with regard to the large area of Libya. Only species represented by actual voucher specimens are considered in this study, whereas those not represented by voucher specimens have been excluded. Some of the excluded species were known from cultivation, others were reported by foreign workers and preserved in herbaria outside Libya. It seems that the reported species has never been collected again, i.e., no longer exists in Libya. Original keys for the genera and species were constructed. Four endemic species are reported confined to the Sahara, these are *Ammosperma variable*, *Matthiola glutnosa*, *Oudneya africana*, and *Savignya parviflora*. Endemism is very low due to the lack of natural regions in Libya except for the Gabel Akhdar area; therefore, only 4% of Libyan taxa are endemic (13) (Qaiser & El-Gadi, 1984). The life forms spectrum of taxa included was analyzed according to Raunkiaer (1934), showing that the dominance of therophytes with 64 species followed by chamaephytes with 5 species. Names of some species are updated based on Plants of the World Online (POWO).

References

- Al-Sghair, F., & Mahklouf, M. (2022). Floristic analysis and diversity of the cruciferous species represented by voucher specimens depending on the flora of Libya. *American Journal of Life Science Researches*, 10(1), 8–24. <http://www.diili.org/ojs-2.4.6/index.php/ajlsr/index>
- Ascherson, P. (1881). Die aus dem mittlern Nordafrika, dem Gebiete der Rohlfs'schen Expedition nach Kufra bekannt gewordenen Pflanzen. In G. Rohlfs (Ed.), *Kufra* (Vol. 8, pp. 386–560). Leipzig.
- Boulos, L. (1972). Our present knowledge on the flora and vegetation of Libya: Bibliography. *Webbia*, 26(1), 365–400.
- Corti, R. (1942). Flora e vegetazione del Fezzan e della regione di Gat (pp. 1–492). Reale Società Geografica Italiana.
- Della Cella, P., & Viviani, D. (1819). Viaggio da Tripoli di Barberia alle frontiere dell'Egitto. Ponthenia.
- Durand, E., & Barratte, G. (1910). *Florae Libycae Prodrum ou catalogue raisonné des plantes de Tripolitania* (pp. 1–33). Genève.

- El-Mokasabi, F. M. (2017). Studies on the flora of Libya. *ContROL*, 1, 8.
- Gawhar, A. M. H., Jury, S. L., & Culham, A. (2018). Towards an updated checklist of the Libyan flora. *Phytotaxa*, 338(1), 1–16. Magnolia Press.
- Jafri, S. M. H. (1977). Brassicaceae. In S. Ali & S. M. H. Jafri (Eds.), *Flora of Libya* (Vol. 23, p. 205). Al-Faateh University, Faculty of Science, Department of Botany.
- Keith, H. G. A. (1965). A preliminary checklist of Libyan flora (p. 1047). Ministry of Agriculture.
- Maire, R. (1952–1955). *Flore de l’Afrique du Nord* (Maroc, Algérie, Tunisie, Tripolitaine, Cyrénaïque et Sahara) (Vols. I–III). Paris.
- Pampanini, R. (1914). *Plantae Tripolitaniae ab auctore anno 1913 lectae et Repertorium florum vascularis Tripolitaniae* (pp. 1–334). Firenze.
- Pampanini, R. (1931). *Prodromo della flora cirenaica* (pp. 1–66). Ministero delle Colonie, Pubblicazioni di Forlì.
- Qaiser, M., & El-Gadi, A. (1984). A critical analysis of the flora of Libya. *Libyan Journal of Science*, 13, 31–40.
- Raunkiaer, C. (1934). *The life forms of plants and statistical plant geography*. Oxford: Clarendon Press.
- Sherif, A. S., & Ben-Othman, A. R. (1992). Checklist and analysis of El-Naser Forest flora (Tripolitania). *Bulletin of the National Herbarium, Faculty of Science, Tripoli University*, 3, 9–20.
- Plants of the World Online. (2023). Royal Botanic Gardens, Kew. <https://www.plantsoftheworldonline.org/> (Retrieved August 16, 2023)
- Viviani, D. (1824). *Florae Libycae specimen* (pp. 1–68). Genua.