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Revised list of *Brassicaceae* for flora aegyptiaca

Abstract

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A total of 97 species belonging to 52 genera of the family *Brassicaceae* are reported for the flora of Egypt. Taxonomic, nomenclatural, synonymy and distribution problems are discussed. Useful notes after each genus are provided.

Introduction

Due to the fact that the Brassicaceae embraces such a large number of species with unusually homogeneous characters as well as the high economic value of several taxa, several studies exist which treat this family from different points of view. Since the publication of the account "Taxonomic studies on Cruciferae in Egypt.1- Check list and key to the genera" by El Hadidi et al. (1988), valuable knowledge has been gained on the taxonomic and nomenclatural changes in this family which were not available at the time of preparation of that account. El Hadidi & Fayed (1994/95) reported *Dipterygium glaucum* Decne. among the *Brassicaceae* and were followed in that respect by Täckholm (1974), while this taxon has been recently transferred to the *Capparaceae*. El Naggar & El Hadidi (1998) revised the tribe *Alysseae* in Egypt. and expressed doubts on the occurrence of *Ricotia lunaria* (L.) DC., *Fibigia clypeata* (L.) Medic., *Alyssum desertorum* Stapf. and *Alyssum szowitianum* Fisch. & A. C. Mey. On the other hand, El Naggar (1978) considered that *Lepidium aucheri* Boiss, *Sinapis aucheri* (Boiss.) O. E. Schulz and *Diplotaxis viminea* (L.) DC. should be excluded from the flora of Egypt.

Among other valuable contributions to our knowledge of the *Brassicaceae* in Egypt are those of Danin et al. (1985), El Naggar (1987), El Hadidi et al. (1988), El Hadidi & Fayed (1994/95), Boulos (1995 & 1999), El Naggar & El Hadidi (1998), El Naggar & Soliman (1999), El Naggar (2000) and Danin (2000).

The aim of the present account is to present an updated synopsis of the *Brassicaceae* in Egypt.

The revised list

Brassica L.

B. rapa L. = *B. campestris* L.

B. tournefortii Gouan

B. deserti Danin & Hedge

B. nigra (L.) Koch = *Sinapis nigra* L.; *Brassica bracteolata* Fisch. & C. A. Mey.

B. juncea (L.) Czern. = *Sinapis juncea* L.

Note: ***Brassica rapa*** is cultivated as a crop for its succulent roots, while its leaves are eaten by animal as fodder and its seeds are used as a source of oil.

Brassica deserti is a hispid perennial herb endemic in Sinai, collected once and only known from the type specimen (E).

Brassica nigra, B. tournefortii **and** ***B. juncea*** are winter weeds in cultivated plots

Erucastrum Presl

E. arabicum Fisch. & C. A. Mey. = *Brassica arabica* (Fisch. & C. A. Mey.) Fiori

Sinapis L.

S. alba L.

S. arvensis L.

a. var. ***arvensis***

b. var. ***orientalis*** (L.) Koch & Ziz = *S. orientalis* L

S. allionii Jacq. = *S. turgida* (Pers.) Delile; *Raphanus turgida* Pers.; *S. arvensis* L. var. *allionii* (Jacq.) Schweinf.

Note: Boulos (1995) considered ***S. allionii*** as a subspecies of ***S. arvensis*** but in 1999 he returned and considered it as a distinct species.

Täckholm (1974) distinguished between ***S. allionii*** and ***S. turgida*** on the basis of leaf characters. In the present work both taxa are treated as conspecific.

Diplotaxis DC.

D. harra (Forssk.) Boiss. = *Sinapis harra* Forssk.

D. acris (Forssk.) Boiss. = *Hesperis acris* Forssk.

D. erucoides (L.) DC. = *Sinapis erucoides* L.

D. muralis (L.) DC.

a. var. ***muralis***

b. var. ***simplex*** (Viv.) El Naggar = *Sisymbrium simplex* Viv.; *Diplotaxis simplex* (viv.) Spreng.

Note: Täckholm (1974); El Hadidi & Fayed (1994/95) and Boulos (1995) mention *D. viminea* which had been excluded from the flora of Egypt by El Naggar (1987) and El Hadidi et al. (1988).

Eruca Mill.

E. vesicaria (L.) Cav. subsp ***sativa*** (Miller) Thell. = *Brassica eruca* L.; = *Brassica vesicaria* L.

Note: ***Eruca vesicaria*** subsp. ***sativa*** is a common weed in wastelands and cultivated in Egypt as salad.

Raphanus L.

R. raphanistrum L.

R. sativus L.

Note: ***Raphanus sativus*** is also known in cultivation as a crop for its succulent fusiform roots; its fleshy leaves used as fodder.

Enarthrocarpus Labill.

E. lyratus (Forssk.) DC. = *Raphanus lyratus* Forssk.

E. strangulatus Boiss.

E. pterocarpus (Pers.) DC.

Note: ***E. pterocarpus*** is rare in Egypt.

Rapistrum L.

R. rugosum (L.) All.

Note: *R. rugusum* is rarely growing in Egypt.

Didesmus Desv.

D. aegyptius (L.) Desv. = *Maygrum aegyptium* L.

D. bipinnatus (Desf.) DC. = *Sinapis bipinnatus* Desf.

Erucaria Gaertner

E. microcarpa Boiss. = *Reboudia pinnata* (Viv.) O. E. Schulz; *E. pinnata* (Viv.) Täckholm. & Boulos.

E. hispanica (L.) Druce = *Sinapis hispanica* L.

E. crassifolia (Forssk.) Delile = *Brassica crassifolia* Forssk.

E. pinnata (Viv.) El Naggar non Täckholm & Boulos = *Raphanus pinnatus* Viv.; *Hussonia uncata* Boiss.; *Hussonia pinnata* (Viv.) Jafri; *Erucaria uncata* (Boiss.) Aschers. & Schweinf. sensu Täckholm (1974).

Note: *Erucaria microcarpa* has been a confused taxon since Cosson (1887) transferred it into the genus *Reboudia* and O. E. Schulz (1916) wrongly used the name *Reboudia pinnata*, basically on *Raphanus pinnatus* Viv. which in fact, is *Erucaria uncata* (Boiss.) Aschers.& Schweinf. *Erucaria microcarpa* is a variable taxon in its leaf and fruit characters. It is a common desert plant particularly in the northern coastland of Egypt.

Erucaria pinnata (Viv.) El Naggar has a confused nomenclature, synonymy and taxonomy. In 1827 Viviani collected an immature Libyan specimen, which he described and illustrated it as *Raphanus pinnatus* Viv. Twenty-two years later Boissier in 1849 described another specimens from Sinai and Palestine as *Erucaria microcarpa* Boiss. Cosson in 1887 transferred Boissier's taxon to *Reboudia* as *R. microcarpa* (Boiss.) Coss. Later in 1916, O. E. Schulz, in my opinion wrongly regarded Viviani's taxon (*Raphanus pinnatus*) and Boissier's taxon (*Erucaria microcarpa*) as conspecific and gave them the name *Reboudia pinnata* (Viv.) O. E. Schulz. In 1974, Täckholm agreed with O. E. Schulz (i.e in

only recognizing one taxon) but returned it to *Erucaria* under the name *Erucaria pinnata* (Viv.) Täckholm & Boulos. Jafri in 1977 also considered this problem; he separated the two taxa as *Erucaria microcarpa* Boiss. and named the second one based on Viviani's *Raphanus pinnatus*, as *Hussonia pinnatus* (Viv.) Jafri. I have not seen Viviani's specimen, since Viviani's herbarium was destroyed at Genova; specimens are also reputedly at the herbaria GE, M, O. PAD and RBG (Holmgren et al., 1981), but I have studied the original description and the illustration of *Raphanus pinnatus* and I have also studied the type specimen of *Erucaria microcarpa* Boiss. my conclusion is:

1- With the available evidence, *Raphanus pinnatus* Viv. is the basionym of the plant which has generally been called *Erucaria uncata* (Boiss.) Ascherson & Schweinf.; the valid name for the species in *Erucaria* should be *Erucaria pinnata* (Viv.) El Naggar

2- Specimens named as *Erucaria pinnata* (Viv.) Täckholm & Boulos should be called *E. microcarpa* Boiss. Recently Boulos in 1999 used the name *Erucaria pinnata* (Viv.) Täckholm & Boulos as a valid name instead of *Erucaria pinnata* (Viv.) El Naggar, which is illegal.

Cakile Mill.

C. maritima Scop.

Zilla Forssk.

Z. spinosa (Turra) Prantl

a. subsp. ***spinosa*** = *Z. myagrioides* Forssk.

b. subsp. ***macroptera*** (Cosson) Maire & weiller = *Z. biparmata* (Cosson) O. E. Schulz

Note: Boulos (1999) used the name *biparmata* for the subs. ***macroptera*** which is illegal because *biparmata* is based on ***Zilla biparmata*** O. E. Schulz (1916), while *macroptera* is based on ***Z. macroptera*** Cosson (1856).

Carrichtera DC.

Carrichtera annua (L.) DC. = *Vella annua* L.

Schouwia DC.

S. purpurea (Forssk.) Webb = *S. arabica* DC.; *S. thebaica* Webb

Note: ***Schouwia*** is a monotypic genus represented by one species ***S. purpurea***, El Naggar and Soliman (1999)

Savignya DC.

S. parviflora (Delile) Webb = *Lunaria parviflora* Delile

Moricandia DC.

M. sinaica (Boiss.) Boiss. = *Brassica sinaica* Boiss

M. nitens (Viv.) Dur. & Barr. = *Hesperis nitens* Viv.

Pseuderucaria (Boiss.) O. E. Schulz

P. teretifolia (Desf.) O. E. Schulz = *Brassica teretifolia* Desf.

P. clavata (Boiss. & Reut.) O. E. Schulz = *Moricandia clavata* Boiss. & Reut.

Conringia Heist. Ex Fabr.

C. orientalis (L.) Andrs. = *Brassica orientalis* L.

Aethionema R. Br.

A. carneum (Banks & Solander) B. Fedtsch.

Note: ***A. carneum*** is recorded recently by Danin et al. (1985) from Sinai, no specimens have been seen by the author.

Lepidium L.

L. virginicum L.

L. sativum L. = *L. spinescens* DC.

L. latifolium L.

Note: *Lepidium virginicum* has not been reported by Boulos (1999). However, this taxon becomes naturalized in Egypt. ***L. aucheri*** was excluded from the flora of Egypt by El Naggar (1987) and El Hadidi et al. (1988).

Coronopus Zinn.

C. squamatus (Forssk.) Aschers. = *Lepidium squamatum* Forssk.

C. niloticus (Delile) Spreng. = *Cochleraria nilotica* Delile

C. didymus (L.) = *Lepidium didymum* L.

Cardaria Medic.

C. draba (L.) Desv.= *Lepidium draba L.*

a. subsp. ***draba***

b. subsp. ***chalepensis*** (L.) O. E. Schulz = *Cardaria chalepensis* (L.) Hand. Mazz.

Note: *Cardaria* is a distinct genus, not a synonym to *Lepidium,* as reported by Boulos (1999).

Isatis L.

I. microcarpa Boiss.

I. lusitanica L. = *I. aleppica* Scop.

Biscutella L.

B. didyma L.

a. var. ***didyma***

b. var. ***depressa*** (Willd.) El Naggar = *B. depressa* Willd.

c. var. ***elbensis*** (Chrtek) El Naggar = *B. elbensis* Chrtek

Capsella Medic.

C. bursa-pastoris (L.) Medic.

Hymenolobus Nutt. Ex Torr. & Gray

H. procumbens (L.) Fourr. = *Lepidium procumbens* L.

Anastatica L.

A. hierochuntica L.

Schimpera Hochst. & Steud.

S. arabica Hochst. & Steud. = *S. persica* Boiss.

Ochtodium DC.

O. aegyptiacum (L.) DC.

Neslia Desv.

N. apiculata Fisch., C. A. Mey. & Ave-Lall.

Farsetia Turra

F. aegyptia Turra = *F. ovalis* Boiss.

F. stylosa R. Br. = *F. ramosissima* Fourn.

F. longisiliqua Decne = *F. stylosa* (Steud.) T. Ander.

Alyssum L.

A. homalocarpum (Fisch. &C. A. Mey.) Boiss. = *Psilonema homalocarpum* Fisch. & C. A. Mey.

A. marginatum Steud.

A. simplex Rudolphi = *A. minus* Rothm. non. L.

Lobularia Desv.

L. arabica (Boiss.) Muschl. = *Koniga arabica* Boiss.

L. lybica (Viv.) Meissn. = *Lunaria libyca* Viv.

L. maritima (L.) Dev. = *Clypeola maritima* L.

Clypeola L.

C. jonthlaspi L.

Camelina Grantz

C. hispida Boiss.

C. rumelica Velen.

Arabis L.

A. alpina L. s. l. = *A. caucasia* Willd.

A. nova Vill. = *A. auriculata* Lam.

Nasturtium R. Br.

N. officinale R. Br.

Rorippa Scop.

R. indica (L.) Hiern. = *Nasturtium indicum* (L.) DC.; *Clandestinaria indica* (L.) Spach

R. palustris (L.) Besser = *Nasturtium palustre* (L.) DC. ; *Sisymbrium amplibium* L. var. *palustre* L.

R. integrifolia Boulos

Notoceras R. Br.

N. bicorne (Ait.) Caruel. = *N. canriense* R. Br.

Matthiola R. Br.

M. arabica Boiss.

M. fruticulosa (L.) Maire = *Cherianthus fruticulosus* L.

M. parviflora (Schousboe) R. Br. = *Cherianthus parviflorus* Schousboe

M. longipetala (Vent.)DC. = *Cherianthus longipetalus* Vent.

a. subsp. ***longipetala***

b. subsp. ***bicornis*** (Sm.) P. W. Ball = *M. bicornis* (Sm.) DC.

c. subsp. ***hirta*** (P. Conti) Greuter & Burdet = *M. humilis* DC.

d. Subsp. ***livida*** (Delile) Maire = *M. livida* (Delile) DC.

Morettia DC.,

M. canescens Boiss.

a. var. ***canescens***

b. var ***parviflora*** Boiss.

M. philaeana (Delile) DC. = *Sinapis philaeana* Delile

Note: *M. parviflora* sensu Täckholm (1974) and Boulos (1999) is considered here as variety of *M. canescens* Boiss.

Leptaleum DC.

L. filifolium (Willd.) DC. = *Sisymbrium filifolium* Wild.

Malcolmia R. Br.

M. africana (L.) R. Br. = *Hesperis sfricana* L., *Strigosella africana* (L.) Botsch.

Eremobium L.

E. aegyptiacum (Spreng.) Boiss. = *Malcolmia aegyptiaca* Spreng., *Eremobium diffusum* (Decne.) Botsch. Sensu Täckholm (1974).

Erysimum L

E. repandum L.

Maresia Pomel.

M. pygmaea (DC.) O. E Schulz = *Hesperis pygmaea* DC.; *Malcolmia pygmaea* (DC.) Boiss.

M. nana (DC.) Batt. = *Sisymbrium nanum* DC.; *Malcolmia nana* (DC.) Boiss.

Sisymbrium L.

S. irio L.

S. septulatum DC.

S. orientale L.

S. runcinatum L.

S. polyceratium L.

S. erysimoides Desf.

Note: From the natural distribution of *S. officinale* (L.) Scop. this taxon is expected to be in Egypt but has not been recorded so far.

Neotorularia Hedge & J. Leonard

N. torulosa Hedge & J. Leonard = *Torularia torulosa* (Desf.) O. E. Schulz; *Malcolmia torulosa* (Desf.)Boiss.

N. aculeolata (Boiss). Hedge & J. Leonard = *Torularia aculeolata* (Boiss.) O. E. Schulz

Descurainia Webb & Berth

D. sophia (L.) Webb & Berth. = *Sisymbrium sophia* L.

Robeschia Hochst. ex Fourn.

R. schimperi (Boiss.) O. E. Schulz = *Sisymrium schimperi* Boiss.

Nasturtiopsis Boiss.

N. cornopifolia (Desf.) Boiss.

subsp. ***arabica*** (Boiss.) Greuter & Burdet = *N. arabicum* Boiss.

Arabidopsis (DC.) Heynh.

A. pumila (Steph. Ex Willd.) N. Busch. = *Sisymbrium pumilum* Steph. ex Willd.

A. kneuckeri (Bornm.) O. E. Schulz = *Sisymbrium kneuckeri* Bornm.

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