Taxonomic review of the genus *Crambe* sect. *Crambe* (Brassicaceae, Brassiceae)

by

Aníbal Oscar Prina

Facultad de Agronomía, Universidad Nacional de La Pampa, C. C. 300, Santa Rosa, La Pampa, República Argentina
prina@agro.unlpam.edu.ar

Abstract


The systematics of the genus *Crambe* L. sect. *Crambe* is reviewed, within which 16 species and 5 infraspecific taxa are considered, which are distributed from E and N Europe to Central Asia. A key for their identification is provided, along with a brief description, synonyms, distribution and habitat of each taxon. The infrageneric systematics of *Crambe* is discussed briefly. The following new combinations are proposed: *Crambe edentula* var. *glabrata* (Frey & Sintenis) Prina comb. nov. and *C. orientalis* subsp. *sulphurea* (Stapf ex O.E. Schulz) Prina stat. nov.

Keywords: *Crambe*, sect. *Crambe*, Brassicaceae, Brassiceae, taxonomy, Central Asia, Europe.

Introduction

The genus *Crambe* L. (Brassicaceae, Brassiceae) has an extensive area of distribution that goes from the Macaronesian archipelagoes to the West of China and North of India and from the Arctic Polar Circle on the Scandinavian Peninsula to 5º Latitude South in the North of Tanzania. It has representation in the Macaronesian, Euro-Siberian, Mediterranean, Sindico-Saharan, Irano-Turkish and Sudan-Zambezian (Ethiopia and Tanzania) regions (Leppik & White, 1975).

Candolle (1821), based mainly on the dimensions and shape of the proximal joint of the fruit, made a first subdivision of the genus in three section: sect. *Dendrocrambe* DC., sect. *Leptocrambe* DC. and sect. *Sarcocrambe* DC. This infrageneric division closely corresponds to the geographical areas of distribution of the taxa it includes. Sect. *Dendrocrambe* is endemic to Macaronesia, Sect. *Leptocrambe* is distributed throughout the Mediterranean basin as far as the East of Africa and sect. *Sarcocrambe* has an area of distribution that goes from the East of Europe to the steppes and mountains of Central Asia. The type species of the genus (*C. maritima* L.) was designated by Green (1925) and belongs to sect. *Sarcocrambe* (Candolle, 1821) which thus becomes the typical section, *Crambe* sect. *Crambe*.

Later authors, such as Prantl (1891) and Schulz (1919) kept to this scheme without change, only adding new taxa described. Here we recognize the three sections: sect. *Leptocrambe* with 5 species and 5 infraspecific taxa (Prina, 1999), sect. *Dendrocrambe* with 14 species (Prina & Martínez-Laborde, 2008), and sect. *Crambe* (≡ sect. *Sarcocrambe* DC.), which is reviewed in this study.
Materials and methods

The classical methodology used in plant taxonomy has been followed, based on the analysis of morphological characters of herbarium material from BM, E, EVIN, K, MA, MPU, VIR and W. In some cases we had living plants obtained from the seeds supplied by the U.S.D.A.-NCRPIS (United States Department of Agriculture-North Central Regional Plant Introduction) and the Bansem-UPM (Banco de Semillas de la Universidad Politécnica de Madrid), and grown in the Campos de Prácticas de la Escuela Técnica Superior de Ingenieros Agrónomos de la Universidad Politécnica de Madrid (ETSIA-UPM). For reasons of space, of the approximately 300 herbarium vouchers studied, only one sample per country is assigned for each taxon.

Taxonomic treatment

The species corresponding to sect. *Crambe s.l.*, appear in the system proposed by Khalilov (1991a), distributed in four different sections: sect. *Crambe s.str.*, sect. *Orientecrambe* I.I. Khalilov, sect. *Astrocrambe* I.I. Khalilov and sect. *Flavocrambe* I.I. Khalilov. The distinctive characters considered for sect. *Orientecrambe* are the fruits with a conspicuous, cylinder-shaped proximal joint, and an ellipsoidal, four-ribbed distal joint; but none of these traits are exclusive to the species included by Khalilov in this section. In a later study based on the characteristics of the pollen grain Khalilov & Archangelsky (1991) recognizes that neither can these characters distinguish this section of sect. *Crambe s.str.* Khalilov (1991b) subdivides sect. *Orientecrambe* into two subsections, subsect. *Orientecrambe* and the subsect. *Juncæae* I.I. Khalilov differentiating between them by the presence of strengthened edges on the distal joint of the fruits (in subsection *Orientecrambe*) or their absence (in subsect. *Juncæae*), in direct contradiction with the main trait with taxonomic value on which the creation of the new section was previously based.

The monotypic section *Astrocrambe* is characterised, according to the author, by its particular fasciculate hair indument, of *C. shugnana* Korsh. The presence of this type of indument also has been found in *C. alutacea* Hand-Mazz., a species which Khalilov (1991a) does not mention in his work, which led to the preliminary solution of including this last species in the new section (Prina, 1998). However, neither do later taxonomic analysis of the entire genus (Prina, 2000) sustain sect. *Astrocrambe*; in fact, *C. alutacea*, apart from the traits of indument, is morphologically closer to *C. orientalis* L., *C. koktebelica* (A. Junge) N. Busch and *C. hedgei* I.I. Khalilov.

Khalilov (1991a) characterises his single species section *Flavocrambe* by the yellow petals of its single species, *C. gordjaginii* Sprygyn & Popov. While this colour of petals is rare in the genus, it is not exclusive to this species, as *C. orientalis var. sulphurea* O.E. Schulz and *C. alutacea* also have yellow petals. Furthermore the disposition of the indument and the leaf morphology of *C. gordjaginii* are closer to those of *C. grossheimii* I.I. Khalilov y C. edentula Korsch., which do not have yellow petals and which Khalilov (1991a, 1993) included in sect. *Orientecrambe*.

Finally, this same author also subdivided sect. *Crambe s.str.* into two subsections, subsect. *Crambe* and the subsect. *Tatariae* I.I. Khalilov, the latter characterised by the distal joint of the fruit reticulate and four-ribbed, but surprisingly without establishing the differences to subsect. *Crambe*. Thus Khalilov (1991b) places the latter in *C. cordifolia* Steven subsp. *cordifolia* and *C. cordifolia* subsp. *kotschyana* (Boiss.) Jafri (= *C. kotschyana* Boiss.), in spite of the fact that in both the distal joint of the fruit has four at least slightly strengthened edges. Once again there is a contradiction in considering the same diagnostic character which was already used to distinguish sect. *Orientecrambe*.

The phylogenetic studies based on genetic markers, specifically ITS, published by Francisco-Ortega & al. (1999, 2002) are in agreement with the findings of the author of this article on the basis of morphological characters (Prina 1999, 2000) and do not support the infrageneric classification proposed by Khalilov (1991a, 1991b, 1993); we shall therefore follow here the generic systematics as proposed by Candolle (1821).

**Keys of sections**

1. Microphanerophytes, nanophanerophytes or chamaephytes; distal joint of the fruit acuminate ................................................ sect. *Dendrocrambe*
2. Annual or perennial plants, in this case escapose habit the latter with poorly-leaved vegetative stems and leafless stalks; distal joint of fruit 2.5-3 mm in diameter, proximal joint developed longitudinally, generally longer than broad ........................................ sect. *Leptocrambe*
3. Perennial plant in general not escapose habit generally with no leafless stalks, but foliated vegetative stems; distal joint of fruit (2.5)3-10 mm in diameter, proximal joint as broad as it is long ........................................................................ sect. *Crambe*

**Sect. Crambe**


Hemicriptophytes or chamaephytes, from glabrous to densely pubescent, with either simple or fasciculate hairs. Fruit with proximal joint from obconical to cylin-
der-shaped, poorly developed and sterile, except for C. shugnana and C. koktebelica, and the distal joint well developed, spheric or ellipsoidal, from four strengthened edges to ± rugose, bearing a single seed. Spherical or bifacial seed, smooth testa or slightly reticulate, with highly developed surrounding funiculus.

KEY FOR THE SPECIES OF THE SECT. CRAMBE

1. Fruit with distal joint 4-10 mm diameter .................................. 2
2. Basal leaves 30-50 cm, bearing long petioles, with either coriaceous or herbaceous blades, dark-green and cordate base; caudex of up to 20 cm diameter .......... 3
3. Basal leaves 25-40(50) cm, short and with wide petioles, with either crass or coriaceous blade, frequently glaucous with cuneate base; caudex absent or no greater than 4-5 cm in diameter .......... 4
4. Glabrous stems; rough blade, covered with stiff hairs, ovate-orbicular, irregularly pinnatisect, with asymmetrical lateral segments and terminal with profoundly cordate base; fruit with distal joint 4-5 mm in diameter .......................................................... 1a. C. cordifolia subsp. cordifolia
5. Stems sparsely hairy; smooth blade, with very sparse and thin hairs, ovate-elliptic, from pinnatifid to irregularly pinnatisect, distal joint kidney-shaped with slightly cordate base; fruit with distal joint 5-5.5 mm diameter .......................................................... 1b. C. cordifolia subsp. kotschyania
6. Fruit with spherical distal joint, smooth or dentate, but without strengthened edges ........... 5
7. Fruit with four-sided distal joint, or spherical with 4 very prominent strengthened edges ........ 6
8. Crass leaves, blade from pinnatifid to pinnatisect, ruffe margins, irregularly toothed; fruit with distal joint 6-10 mm diameter, with thick and cork-textured pericarp .......................................................... 2. C. maritima
9. Thin leaves, with pinnatifid blade, non-ruffe edge, entire margin; fruit with distal joint 5-7 mm in diameter, with thin and very stiff pericarp .................................. 3. C. pinnatifida
10. Fruit with distal joint 4.5-4(7)mm .................................. 7
11. Fruit with distal joint 6-8 mm ........................................ 8
12. Almost hairless plants; glaucous leaves, smooth .......................................................... 4a. C. tataria var. tataria
13. Hirsute plants, even when mature; green leaves, rough to touch ........................................... 4b. C. tataria var. aspera
14. Cyril leaves with thin blade, 2-times pinnatifid, narrow and acute lobes, glabrous; fruit with distal joint attenuate towards apex ........................................ 5. C. steveniana
15. Cyril leaves coriaceous blade, pinnatifid, with wide and blunt lobes, glabrous with very sparse stiff hairs along veins and margin; fruit with pinnate distal joint, not acuminate ........................................ 6. C. grandiflora
16. Leaves with non-divided blade, or lyrate-pinnatifid, cor- date-ovate to elliptic-ovate; stamen filaments without teeth, except in C. hedgei .................................................. 10
17. Leaves with pinnati-lobed or lyrate blade, sometimes not divided due to reduction of blade at terminal segment; stamen filaments with one or two teeth (C. gordjaginii) near the apex .......... 12
18. Basal leaves lyrate-pinnatifid, with apical segment from oblong to suborbicular and (1) pairs of lateral segments . 11
19. Basal leaves not divided, widely elliptic ........................................ 7c. C. edentula var. balchanica
20. Basal leaves coriaceous, sparsely haired, with blade margen not ruffe ........................................ 7a. C. edentula var. edentula
21. Basal leaves crass, glabrous, with ruffe blade margin ............
22. Plants somewhat hairy, never glaucous ............................... 13
23. Plants glabrous, frequently glaucous ......................... 8. C. armena
24. Basal zone of stems and leaves covered in fasciculate hairs, grouped over tubercles, giving the appearance of stellate hairs ................................................. 9. C. alutacea
25. Plants with rough surface; basal and lower cauline leaves lyrate blade, with terminal segment noticeably larger and separated from the sides; hairy sepals; fruit with proximal joint sometimes single-seeded ........... 10. C. shugnana
26. Yellow petals ................................................................. 16
27. White petals .................................................................... 17
28. Linear-spathulate petals, slightly narrowing towards the base, light-yellow colour ................... 11. C. gordjaginii
29. Oblong petals, sharply narrowing towards the base, dark yellow colour .......................... 12c. C. orientalis subsp. sulphurea
30. Petals 2.5-3.5(4) mm .................................................... 18
31. Petals 4.5-6 mm ................................................................ 20
32. Basal leaves with ovate-elliptic blade, pinnatifid, with termi- nal segment similar in size and shape to sides ............. 19
33. Basal leaves with blade obovate, lyrate-pinnatifid, with termi- nal segment noticeably larger than the sides, sometimes the latter are absent ........................................... 13. C. grossheinii
34. Branching axes of the inflorescence glabrous or rarely with sparse hair; fruit glabrous .......................................................... 12a. C. orientalis var. orientalis
35. Branching axes of the inflorescence densely pubescent; fruit with sparse antrorse hairs .......................................................... 12b. C. orientalis var. dasycarpa
36. Basal leaves with ovate-lanceolate blade, frequently pinna- tolobed, covered with smooth whitish pubescence even in adults .................................................. 14. C. hedgei
37. Basal leaves with ovate-elliptic blade, pinnatifid, pubescent when young, glabrous when adult .. 21
38. Leaves and base of stem glabrous or with very short, sparse hairs, even when young; upright pedicels, never adpressed; fruit with distal joint slightly rugose .......... 15. C. koktebelica
39. Leaves and base of stem densely hairy, especially in young plants; adpressed pedicels, fruit with smooth distal joint ........................................ 16. C. juncea

subsp. cordifolia (Fig. 1)

Type: RUSSIA. Stavropol. Georgievsk, 1835, D. Fischer 196 (isotypus LE!).

C. cordifolia var. microcarpa N. Busch in Kusn. & al., Fl. Cauc. Crit. 3(4): 301. 1908


C. cordata Willd., Enum Pl. Suppl.: 43. 1813, nom. inval.
Hemicriptophyte, profusely branched from the base, 1-1.5 m, lignified caudex up to 15-20 cm in diameter. Stem glabrous. Basal leaves bearing long petioles, with cordate, indviduated and irregularly serrated blade, of 10-15 × 10-12 cm, leaves on stem ovate or obovate, interrupted, the terminal segment with cordate base and 1-2 lateral segments. Glabrous sepals, of 2.5 × 1.5 mm, the middle ones oblong and the lateral oblong-ovate. White petals, of 4.5-5.5 × 2.5-3 mm, with oblong blade and ruffled margin, narrowed in a nail of 0.8-1 mm. Stamen filaments of 2.8-3 mm with the concave ventral face applied to the ovary with one subapical tooth, the sides shorter and without tooth. Fruit with very reduced and sterile proximal joint; distal joint globose, 4.5-5 mm in diameter, slightly strengthened at the edges.

Habitat and distribution. Native to the steppes and plains to the north of the Caucasus. Can be found spontaneous in the S of Great Britain (Jalas & al., 1996).

Representative specimens


1.b. Crambe cordifolia subsp. kotschyana (Boiss.) Jafri, Fl. West Pakistan 55: 30. 1973 (Fig. 2)

C. cordifolia Steven var. kotschyana (Boiss.) O.E. Schulz in Engler, Pflanzenreich 70: 236. 1919

Ind. loc.: “Hab. ad latera in occidentalia montis Sabst-Buschom prope Schiraz (Kotschy N° 380)”. Type: IRAN. Fars, Mt. Sabst-Buschom, prope Schiraz (Kotschy 380 (isotypes, BM!, E!, MPU!, LE!).

C. cordifolia Steven var. kotschyana (Boiss.) O.E. Schulz subvar. sewerzowii (Regel) O.E. Schulz in Engler, Pflanzenreich 70: 236. 1919

Ind. loc.: “In Turkestaniae promontorio Kharli-Tau (Karatau) leg. Sewerzow, in deserto inter fluv. Syr-Darja et Taschkent, in fluvii Sarawschan satis frequens, inter Karakasuk et Schagimardan (O. Fedtschenko, Korallov)”.

C. cordifolia Steven var. kotschyana (Boiss.) O.E. Schulz subvar. palmatifida (Regel & Schmalh. ex Regel) O.E. Schulz in Engler, Pflanzenreich 70: 236. 1919

Ind. loc.: “In Turkestan, ad fluvium Ters in montibus Abraschan leg. Krause”.


Hemicriptophyte 1.5-2 m, with a monopodial stem, branched in its terminal part with single stem and with intensely lignified basal region, with scattered hairs. Basal leaves 30-50 × 50-55 cm, bearing long petioles, cordate to sub-kidney shaped blade and lobed or serrate margin, cauline leaves subsessile, glabrous or with sparse hair. Sepals 4-4.5 mm, all very similar, with stiff antorse hairs on the back. Petals 6-7 × 4.45 mm, white, with oblong blade, narrowed to

Fig. 1. Crambe cordifolia subsp. cordifolia. Grown at ETSIA-UPM: a, plant in bloom; b, flower from above; c, flower without perianth.
a nail of 0.3-0.4 mm. Stamen filaments with concave ventral face and one apical tooth of c. 0.5 mm. Fruit with proximal joint stipitate and the distal joint globose, of 4-6.5 mm in diameter, four strengthened edges, reticulate surface, single-seeded.

Habitat and distribution. Rocky hills and steppes between 500 and 2000 m in Central Asia and NW India.

Representative specimens


The subordination of this entity to *C. cordifolia* is based solely on the difference of greater thickness and less hairiness of the leaves and that its fruit is somewhat smaller. Jafri (1973) states that some specimens from the region of Baluchistan show intermediary characters, which has been confirmed in the study of the specimen *J. H. Lace 3751*. Boissier himself, in the protologue of *C. kotschyana*, points to its affinity with *C. cordifolia* and only points to differences of little significance and great variance such as the size of the flowers and the degree of pubescence. Hedge (1968), while assigning it a specific rank, recognizes this affinity and the little relevance of the characters that differentiate them. Furthermore, both taxa have a different geographic distribution. The specimens with less hair, with flowers and fruit of greater size and leaves less profoundly divided, which are here designated to the subsp. *kotschyana*, are distributed around the eastern region of Iran and S of Afghanistan to Pakistan and to India, whereas those of smaller size, in general with more profoundly divided leaves and more densely-haired, corresponding to the subsp. *cordifolia*, are limited to the region N of the Caucasus.

2. *Crambe maritima* L., Sp. Pl. 1: 671. 1753 (Fig. 3)
*Cocblearia maritima* (L.) Crantz, Class. Cruciform. emend.: 96. 1769
*Caulis maritimus* (L.) E.H.L. Krause, Bot. Centralbl. 81(6): 207. 1900
*Crucifera maritima* (L.) E.H.L. Krause in Sturm, Fl. Deutschl. 2(4): 126. 1902
Ind. loc.: “Hàbitat ad littora Oceani Septentrio nalis”.
Type: Herb. Clifford: 340, Crambe No. 1 (photo lectotypus BM !) (designated by Hedge, 1993).
*Crambe pontica* Steven ex Rupr., Fl. Cauc.: 293. 1869, nom. nud.
*C. maritima* L. prole pontica (Steven ex Rupr.) O.E. Schulz in Engler, Pflanzenreich 70: 231. 1919
Ind. loc.: “Mediterrangebiet.- Mittlere Mediterran provinz in der euxinischen Zone”.
Ind. loc.: “Habitat in Dalmatia. Floret Junio. Quinto a stazione anno. Flores mel redolent”.

Glabrous chamaephytes or hemi criptophytes, with gemmiferous roots and with lignified caudex of 3-6(8) cm in diameter, from which issue numerous aerial stems. Basal and lower stem leaves with petiole of 2-3 cm, short crass, canaliculate, and glaucous petioles, blade 14-40 × 7-30 cm, oblong-elliptic, from irregular-
ly pinnatifid to pinnatisect, with ruffled margin, irregularly serrated and overlapping lateral lobes, smaller upper stem leaves, oblong-elliptic and generally sessile. Sepals subequal, glabrous. Petals 7-9 mm, white, blade widely oblong, sometimes slightly cleft at apex. Staminal filaments two times serrated, with concave side applied to ovary and forming an apparent staminoid tube. Fruit with proximal joint cylindrical, 0.5-0.8 mm; distal 6-10 mm, globose, single-seeded, cork-textured when mature and irregularly rugose surface.

Habitat and distribution. Disjunct distribution, on the coasts of the Northern Sea and the Baltic Sea, from France to Finland, spreading towards Eastern Europe, probably through cultivation, and on the coasts of the Black Sea, in the region of Crimea. Grown as a vegetable in the Caucasus region (Czerniakowskaya, 1939). The fruit is adapted to hydrocory (Scott & Randall, 1958).

Representative specimens

The materials from the Black Sea have been considered by Schulz (1919), among others, as a different taxon, be this as a species under the denomination Crambe pinnatifida Stev. ex Rupr. or with this species name in a rank subordinate to C. maritima. No differentiating morphological traits have been found between samples from one region or the other, for which reason we consider it convenient to keep all this material under the same species without acknowledging intraspecific taxa.

There has been one citation for the coast of the Dead Sea; however, according to Dinsmore (1932) this must be an erroneous citation, possibly confusing it with Cakile maritima L. Schulz (1919) points to the same mistake in older citations of the species on the coast of the Mediterranean. The possible occurrence of this species on the coast of Galicia (Spain), cited by Planellas (1852), although without mentioning the herbarium voucher, is more that questionable.

C. tataria Sebeók var. pinnatifida (R. Br.) O.E. Schulz in Engler, Pflanzenreich 70: 235. 1919
C. orientalis Jacq., Ic. Pl. Rar. 1, ed. 2: tab. 128. 1781, non L. (1753)
C. orientalis sensu M. Bieb. Fl. Taur.-Cauc. 2: 89. 1808, non L. (1753)

Ind. loc.: “Nat. of Siberia”, “Cult. before 1759, by Mr. PH. Miller. Mill. dict. ed. 7. Crambe 2”.

Hemicryptophyte, 50-90 cm, entirely glabrous. Petioled basal leaves, with blade 17-30 × 23-26 cm, ovate-elliptical, pinnatifid, pinnatisect or pinnatipartite, sinuate-serrate margin, oblong lateral segments and terminal ob lanceolate, with stem leaves similar although of smaller size. Oblong sepals, glabrous. Petals 4.4-5 mm, white with obovate blade, sharply narrowing to a nail of 0.2-0.3 mm. Staminal filaments
with one subapical tooth of 0.2-0.3 mm. Fruit with proximal joint obconic and sterile, and distal joint spherical, of 5.5-6 mm in diameter, smooth or slightly rugose, single-seeded.

Habitat and distribution. steppes and hills rich in clay in Eastern Europe as far as Armenia.

Representative specimens


4. Crambe tataria Sebeók, Diss. med.-bot. de Tataria hung.: t. 1779
Ind. loc.: “Circa Agriam Hungaria, Eger”. Type: W (not seen).

4a. C. tataria var. tataria
C. laciniata Lam., Encycl. 2: 163. 1786
Ind. loc.: “3. Crambe laciniát, Crambe foliis subbipinnatis, pinnis laciníatis dentátis subtus scabris, caule laevi ramosissimo. N.”.

C. pannonica Hort. ap. Lam., Encycl. 2: 163. 1786
Ind. loc.: “H. R. Crambe (Tataria), foliis decomposito multifidis”.

Ind. loc.: “Russ. Katran… In der Rumanischen und Kalmukischen Steppen…”.

C. tatarica Pall. in Güldenstädt, Reis. Russ. 1: 194. 1787, nom. nud.

C. caspica Raeuschel, Nom. 3 ed.: 183. 1797, non L. (1753)


C. tataria var. taurica DC. Syst. Nat. 2: 653. 1821. “Foliorum lobis oblongis sinuatis lobatis”.

C. biebersteinii Janka, Termeszetud. Füz. 8: 36. 1884

C. tataria var. biebersteinii (Janka) O.E. Schulz in Engler, Pflanzenreich 70: 234. 1919
Type: UKRAINE. Ex Tauria, Steven 1815 (LE!).

C. macro-vell chlorocarpa vel laevis Kitaibel ex Kanitz, Linnaea 22: 502. 1863
Ind. loc.: “Habitat in aggeribus Syrmii et pratis Cottus Csanadensis”.

C. putaria Radde, Kauk. Mus. 2: 58. 1901 (cf. Schulz, 1919)

Hemicriptophyte, with a single upright stem of 30-70 (120) cm, profusely branched in the upper part. Subcress basal leaves, grey-green in colour, with highly canaliculate petiole broadening at base, blade of proximal leaves indivated, margin serrate in diverse ways, the next leaves highly pinnatifid, more distal leaves 1-2(3) times pinnatifid to pinnatipartite, with blade of 30-35 × 25-30 cm, with abundant stiff hairs on the margin and the veins, especially in young plants. Sepals 2-2.5 mm, oblong, white margin, rarely with occasional hairs in the abaxial face. Petals 4.5-5 mm, white, with blade broadly oblong-ovate, subtruncate in the apex, sharply narrowing to a nail. Stamina filaments with one subapical tooth, anthers frequently violaceous. Fruit with proximal joint obconic, 0.3-0.4 mm and sterile, the distal joint sub-globose 4.5(7) mm in diameter, noticeably tetragonous and with conspicuous veins, single-seeded.

Habitat and distribution. It grows on steppes and hills rich in clay and limestone from Eastern Europe to the Caucasus. The adult plant usually breaks up at the base and thus becomes an organ of dispersal (tumbleweed).

Representative specimens


4b. C. tataria var. aspera (M. Bieb.) Boiss., Fl. Or. 1: 406. 1867

C. aspera M. Bieb., Fl. Taur.-Cauc. 2: 90. 1808 [basionym]

Ind. loc.: “Habitat in deserto Caucasicocaspicino et ad Wolgam inferioriorem”.
Type: RUSSIA. Dagestan, 1781, Jacquin (BM!).

Type: RUSSIA. Dagestan, Mt. Beschbarmak, 21-7-1830, without collector, Enum. Cauca. Casp. 1694 (LE!).

C. tataria var. buschii O.E. Schulz in Engler, Pflanzenreich 70: 234. 1919

C. buschii (O.E. Schulz) Grossheim, Fl. Kavkaza 2: 179. 1930
Glaucescent plants up to 40 cm, densely hispid in leaves and stems, even in adult plants. Stem leaves highly pinnatifid with lobes generally narrower than in the typical variety.

Representative specimens

FRANCE. Hérault: Montpellier, Cult. Hort. Mons. ex sem. Sarepta, 23-IV-1834, Herb. Fac. Médecine 396 (MPU). HUNGARY. Somogy: Sarepta, 23-IV-1834, ga, VI-1965, 1876, 14 V-1957, status as a variety, following Boissier. It does not justify species status, nor present a differential extending its area of distribution. It corresponds to those of this variety, thus considerably extending its area of distribution.

It has been considered endemism in the region of the Lower Volga and the desertic area between the Caucasus and the Caspian Sea (Czerniakowskaya, 1939); however samples have been studied that were gathered in Turkey and Hungary whose characters correspond to those of this variety, thus considerably extending its area of distribution.

The differentiating morphological characters do not justify species status, nor present a differential area of distribution, for which reason we confirm its status as a variety, following Boissier.

Ruprecht (1869) describes C. gibberosa claiming an alleged tuberculate surface of its fruit. The type specimen has been studied and these “tubercules” are simply surface wrinkles due to the immature state of these fruits; all other characters coincide with those of the variety aspera.

6. Crambe grandiflora DC., Syst. Nat. 2: 652. 1821

Ind. loc.: “Hab. in insula Taman ad ostia anticetae (Kuban) ad Pontum Euximum (Steven)”

Type: UKRAINE. Crimea, Peninsula de Tamán, M. Bieberstein ex herb. Ledeb. 5772.2 (LE!).

C. lipskii Czerniak. in herb.

Type: UKRAINE. Inter Feodosia et Salia, litus meridion Koktebell, 10-5-1905, N. A. Busch Iter Taucicum I (LE!).

Branched hemicriptophyte of 60-100 cm, stems with strengthened edges, glabrous or with sparse retrorse and patent hairs. Glabrous basal leaves or with very sparse stiff cilia along the veins and margin, blade ovate or ovate-lanceolate, highly pinnatifid, with 4-6 lateral segments oblong to lanceolate, markedly sinuate-serrate to highly pinnatifid, the caulinar leaves oblong, serrate, the distal leaves sublinear, generally whole. Sepals 3.4-4 mm, oblong. Petals (5)-5.5-6 × 3-4 mm, white, with oblong blade sharply narrowing to a nail. Staminal filaments of 3.5-4 mm, with one tooth in the apical area. Fruit with proximal joint obconical 3.5-4 mm, the distal joint
tetragonal spherical or barely ovoid, of 7-8 mm in diameter, clearly veined and rugose.

Habitat and distribution. Known on the Taman peninsula and the estuary of the Kuban river in the Russian region of Krasnodar and in the region of Dagestan, its area now spreads considerably towards the S, including Turkey and Iran.

Representative specimens


In accordance with Schulz (1919), C. grandiflora is close to C. tataria. While the fruit with four strengthened and somewhat rugose edges remind us of the fruits of the latter, the rest of the plant is morphologically more similar to C. koktebelica and C. orientalis, especially in certain glabrous forms of this last species. The greater size of the flowers and in general of the fruit, however, indicate the convenience of keeping this taxon.

We have been able to study the 8 vouchers collected by N.A. Busch and determined by Czerniakowskaya to be C. lipskii Czerniak. On one of these, in the handwriting of that author, the word typus is accompanied by a brief description and a drawing in pencil of a petal, preliminary elements of a diagnosis which however would seem not to have been published. From the study of this material and their comparison with the type specimen of C. grandiflora DC. we deduce that we are dealing with the same taxonomical entity.


Ind. loc.: “In Turcomania boreali a Karelin detecta”.
Type: TURKMENISTAN. Novo Krasnowodsk, ad Mare Caspio, Karelin (isotype, LE!).

Three varieties are distinguished and are differentiated by the following characters.

7a. C. edentula var. edentula (Fig. 4)

Chamaephyte of 45-70 cm, with thin root, lightly lignified, and stems with multiple strengthened edges, with leaves at proximal end. Basal and proximal cauline leaves with stiff hairs, especially along the veins and in the petiole, blade 4-12 × 4-10 cm, lyrate-pinnatifid, with I terminal segment ovate-cordate, distal caulines linear-subulate, subsessile or with short petiole, of 2-3.5 cm. Sepals 2.8-3 mm, oblong, subequal, glabrous. Petals 4.5-6 × 2.5-3 mm, white, with blade oblong-obovate. Staminal filaments 2.3 mm, with no apical tooth and with small wings. Fruit with proximal joint 0.5-0.8 mm, distal joint widely ovate to sub-spherical 3.5-4 mm in diameter, glaucous, with smooth surface, with a viable seed and, sometimes, also vestiges of an accompanying seed.

Habitat and distribution. Rocky slopes, holes and fissures in the N of the Caucasus and gypsum and limestone soils on the coast of the Caspian Sea.

Representative specimens

TURKMENISTAN. Ajalskiy Velayat: Kopet Dag, 60 km Ak-sadag, 8-V-1963, Gubanov 163 (LE).

Although this presents morphological similarities to C. kralikii Coss. and C. hispanica L., both of which belong to sect. Leptocrambe, the scarce development in length of the proximal joint leaves little doubt that it should be included in the section Crambe.
7b. *C. edentula* var. *glabrata* (Freyn & Sintenis) Prina, comb. nov. (Fig 5)

*C. juncea* M. Bieb. b *glabrata* Freyn & Sintenis in Freyn, Bull. herb. Boiss. 3, ser. 2(34): 858. 1903 [basionym]

Ind. loc.: “Krasnowodsk, in deserto arenoso pr. Ufra. 24.IV.1901. In Knospen mit der ersten sich entfaltenden Blüthe”.

Type: TURKMENISTAN. Balkanskiy Velayat, Krasnowodsk, in deserto arenoso prope Ufra, 24-4-1901, *P. Sintenis* 1581 (WU!).

*C. edentula* Fisch. & Mey. ex Korsh. var. *freynii* Czer- 

Further to the differences noted in the key, it differs from the typical variety in the greater size of its flower. The sample studied did not have fruit.

**Habitat and distribution.** Shares area with typical variety.

**Representative specimens**

Only type specimen was studied.

Czerniakowskaya (1925) describes *C. edentula* var. *cretacea* and later (Czerniakowskaya, 1929) raises it to the rank of species. Among the several samples studied therein, the first to be cited is the sample *Sintenis* 1581, which had been used to describe *C. juncea* b *glabrata* (Freyn, 1903). Later, Czerniakowskaya (1939) omits any allusion of the species name *cretacea* but undertakes a critical analysis of the sample *Sintenis* 1581 and on this basis proposes *C. edentula* var. *freynii* Czerniak., which is an illegitimate name, since in the varietal range, the epithet used by Freyn & Sintenis holds priority. These authors seem to have been unconfident of the systematic position of their variety, noting that the absence of teeth on the stamen distanced it from *C. juncea*, but the indicated no affinity with *C. edentula*.

7c. *C. edentula* var. *balchanica* Czerniak. in V.L. Komarov, Fl. URSS 8: 486. 1939

Type: TURKMENISTAN. Balkanskiy Velayat, Balchan, 900 m, 25-5-1928, *Jarmolenko & Fedtchenko* 153 (lectotype LE, here selected).

Distinct from the typical variety in its crass leaves at the base, with petioles of 5-8 cm, slightly widening at base and blade 10-12 × 9-10 cm, widely ovate and reduced at terminal segment, with sinuate-serrate margin with adpressed and rough hairs.

**Habitat and distribution.** Grows in the region of the Balkhan range (Turkmenistan) and in the surroundings of the eastern coast of the Caspian Sea.

The specimen *Jarmolenko & Fedtchenko* 153 (LE) possesses a label which identifies with the name of this variety, written in Czerniakowskaya’s hand, we therefore propose that it here be considered its lectotype.


Type: AZERBAIJAN. Nachicevan, prope salinas, 12-5-1923, *Grossheim* (LE!).

Hemicriptophyte of 50-60 cm; glabrous plants, frequently glaucous. Basal leaves with petiole of 2-2.5 cm, blade 7-10 × 4-5 cm, from indivdided to lyrate or pin-
natilobed, at times reduced at terminal segment, with ruffled margin, caulines sessile, blade oblong 3-4 × 2-3.5 cm, margin irregularly serrate. Sepals 2 mm, oblong. Petals white, with blade 3.5-4 mm, elliptical, sharply narrowing in one nail 0.2-0.3 mm. Staminal filaments with one apical tooth. Fruit with proximal joint cylindrical 1-1.5 mm, sterile; the distal joint globose, smooth, of 3.5 mm in diameter, with a single seed.

**Habitat and distribution.** Grows in salty soils in the region of the Caucasus and to W of Turkmenistan, from which it was cited for the first time.

**Representative specimens**


**9. Crambe alutacea** Hand.-Mazz., Annal. K. K. Naturhist. Hoffmus. 27(1): 53. 1913 (Fig. 6)


Ind. loc.: “In steinigen Kalksteppen am Nordfuss des Dschebel Abd el Asis zwischen el Abed und Gharra, 21.IV (Nr. 1709) und zwischen Gharra und Spaijan 23.IV.1910 (Nr. 1822), auf Mergel bei Gharra. Dann (nur nach Notizen!) auf der Hochfläche zwischen Urfa und südlichen Kette des Taurus gegen Kjachta auf steinigen Stellen und von Schios nördlich von Mossul gegen Peschawur, 400-800 m”.


Hemikryptophyte with gemmiferous roots, of 80-100 cm., velutinous plant. Basal leaves with canaliculate petiole of 2.5-5 cm, blade elliptical-lanceolate, apparently individed or pinnatifid, with 4-8 lateral segments obovate and terminal segment similar to laterals and converging with these, subcrass, colour green-greyish, densely covered by hairs arranged in tubercules, the caulines sparse, sessile, poorly pubescent. Sepals oblong, white edged, glabrous. Petals yellow, with blade oblong of c. 3 × 1 mm, sharply narrowing in a nail of 0.3-0.4 mm. Staminal filament with a hardly perceptible apical tooth. Fruit with proximal joint obconical, irregularly striated-rugose; the distal joint spherical, of 2.5-3 × 2 mm, slightly strengthened edges, 1-2-seeded.

**Habitat and distribution.** Rocky ground at 2300-2700 m, in the region of Shugnan (Tajikistan) and in the Pamir Alai (Kyrgyzstan).

**Representative specimens**


Fig. 6. *Crambe alutacea*: a, type, Hand.-Mazz. 1709 (isototype, W); b, type, Hand.-Mazz. 1822 (isototype, W); c, basal rosette. Grown at ETSIA-UPM; d, base of a foliar trichome. Scale bar = 71.4 µm.
Type: holotype?, TASH; cotype, LE (cf. Czerniakowskaya, 1939) (not seen).

Hemicriptophyte of 30-60 cm, with base of stem rugose and lignified. Coriaceous basal leaves, with hirsute petiole from 4-6 cm, blade 5.6 × 3.5-5 cm, lyrate-pinnatifid, glabrous or with very sparse hairs, frequently reduced to terminal segment or with 1-2 lateral vestiges of segments close to the base. Sepals 3.4 × 1.5-1.6 mm, glabrous, white-edged. Petals with linear-spathulate blade, gradually narrowing towards the base, yellow, with veins of a more intense yellow colour. Staminal filament of 1.8-2 mm, with lateral teeth at a different height. Fruit with proximal joint 1.5-1.7 mm, cylindrical or slightly swallowed in the middle, the distal joint 2.5 mm in diameter and up to 3 mm, smooth, single-seeded, flattened seed.

Habitat and distribution. Grows in salty or marlstone soils in the region of the Pamir Alai in Kyrgyzstan and on the steppe of Kyzyryk-Dara, in Uzbekistan; it is here documented for the first time for Afghanistan.

Representative specimens

Ind. loc.: “Hábitat in Oriente. Tourn cor. 14”.

12a. C. orientalis subsp. orientalis var. orientalis
(Fig. 8)
Cochlearia orientalis (L.) Cranz, Class. Cruciform. emend.: 97. 1769
Myagrum orientale (L.) Cranz, Class. Cruciform. emend.: 102. 1769
Ind. loc.: “N. 179, Mesopotamia”.

Fig. 7. Crambe shugnana: a, type, Korschinsky 2841 (LE); b, type, Korschinsky 2842 (LE).

C. orientalis L. b aucheri (Boiss.) Boiss., Fl. Or. 1: 407. 1867


Ind. loc.: “N. 4131, Demavend”.


Hemicriptophyte of 90-150 cm, with stems hispid at base. Basal leaves with petiole of 1.5-3 cm, blade ovate-elliptical of 15-10(35) × 12-14 cm, from indivisible to pinnatifid, with 5-10 pairs of lateral segments, obovate, acute, irregularly serrate, the terminal similar in size and shape to the laterals, the distal caulines generally individed and sub-sessile, all with patent to sub-adpressed pubescence, very lax. Branches of the inflorescence glabrous or with sparse hairs. Sepals 2.5-2.6 mm, glabrous, yellow-edged. Petals 3-4 × 1-1.5 mm, with oblong-ovate blade, narrowing sharply in a nail 0.3-0.4 mm, white. Staminal filament with one tooth in the upper part. Fruit with proximal joint ovoid-stipitate 0.5-0.7 mm, sterile, the distal joint spherical, with four strengthened edges, 2.5-3 mm in diameter, single-seeded.

Habitat and distribution. Widely distributed from the Eastern Mediterranean to Central Asia, in steppes and mountains with clay soils, between 300 and 2500 m. Usually behaves as a weed (Zohary, 1966).

Representative specimens


12b. C. orientalis subsp. orientalis var. dasycarpa O.E. Schulz in Engler, Pflanzenreich 70: 238. 1919

Ind. loc.: “Cilicien: bei Maaden unweit Bulghar 1300 m ü. M. (W. Siebe n. 560)”.

Type: TURKEY. Içel (Cilicia), bei Maaden unweit Bulghar 1300 m ü. M., 1895-1896, Siebe 560 (isotypes, BM!, E!, K!, LE!).

Plants with a similar aspect to the typical variety but with branches on the inflorescence densely haired and fruit with sparse antorse hairs.

Habitat and distribution. Shares area with the variety orientalis.

Representative specimens

Only type specimen studied.

12c. C. orientalis subsp. sulphurea (Stapf ex O.E. Schulz) Prina, stat. nov.

C. orientalis var. sulphurea Stapf ex O.E. Schulz in Engler, Pflanzenreich 70: 238. 1919 [basionym]

Ind. loc.: “Kurdistan: an grasigen Stellen in der Nähe von Süwerek bei Kara-Koei”.

Type: TURKEY. Urfa: Süwerek (Siverek), in herba ad Kara Kwei, 24-5-1988, P. Sintenis 743, It. Or. 1888 (E!).

Fig. 8. Crambe orientalis subsp. orientalis. Grown at ETSIA-UPM: a, plant in bloom; b, flower from above; c, flower without perianth.
C. orientalis L. var. glaberrima (Bornm.) O.E. Schulz in Engler, Pflanzenreich 70: 239. 1919
C. glaberrima (Bornm.) Mouterde, Nouv. Fl. Liban & Syrie 2: 121. 1970

Ind. loc.: “Elburs occid, in vallibus subalpinis prope Sheheri-tanek, 2200 m (5.VI, fl. et fr., 7.VII; n 6304). var (nov.) glaberrima Bornm., tota planta glaberrima in consortio praecedentis (n. 6305)”.

Type: IRAN. Scheheristanek: Mte. Elburs, 5-6-1902, Bornmüller 6305 (LE!).

Is differentiated from the subsp. orientalis by the greater size of its petals of 3.8-4.2 mm, the sepals are also tinted yellow, and the general glabrescence of the plant. Given that plants of these characteristics have a defined area of distribution, it was decided to propose the subspecific status.

Bornmüller (1905) describes C. persica var. glaberrima based on the specimen Bornmüller 6305, indicating in the protologue “Tota planta glaberrima”. Later, Schulz (1919) transfers the variety to C. orientalis and Mouterde (1970) gives it the rank of species. The indumentum of the species is extremely variable, from totally glabrous to totally hairy plants. The stems are in general glabrous and smooth, although there are specimens which have striated stems with retrorse hairs. The presence or absence of indumentum on the stems is independent of the hairiness of the leaves, just as it is independent of the variety to which they belong. There are also totally glabrous specimens which may be confused with C. pinnatifida. The following material studied presents hairs on the stems: Wendelbo 1302 (E), Archibald 2346 (E), Davis 42741, 19175 and 43674 (E), Mannissadjian 776 (E), Davis 28232 (BM), De Heldreich s. n. (BM), Haussknecht s.n. (BM, var. orientalis) and Sintenis 743 (E, var. sulphurea).

Habitat and distribution. Desert areas in the region of Kurdistan.

Representative specimens


Ind. loc.: “Caucasus, Transcaucasia australis, RSSA Nakhitschevan, prope salifodinam”. Type: AZERBAIJAN. Nachichevan: prope salifodinam, 22-6-1987, I. Khailov 17 (LE!).

Hemicriptophyte of 30-50 cm, with caudex from which grow several stems with stiff hairs, from patent to retrorse at the base. Basal leaves with petiole of 4-6 cm, hispid and highly canaliculate, with blade of 6.7 × 4.5 cm, obovate, irregularly serrate, lyrate-pinnatifid with the terminal segment noticeably larger than the laterals, these latter at times absent, with hispid hairs on both sides. Sepals 2.2-2.5 mm, glabrous. Petals 3-3.5 mm, with obovate blade and short nail, white. Staminal filament with one incurved apical tooth. Fruit with stipitate proximal joint of 1.8-2 mm, sterile, the distal joint globose, spherical, 2.8-3 mm in diameter, smooth, single-seeded.

Habitat and distribution. Characteristic species of salty soil to S of Caucasus and S of Turkmenistan.

Representative specimens


Ind. loc.: “Afganistan, Malestan, Ghazni, Inter Miradina et jugum Ghoutem Kol, N Sangi-Masha, 33°30’N, 67°5’E, c. 3300 m, 2-7-1962”.

Type: AFGHANISTAN. Malestan, Ghazni, Inter Miradina et jugum Ghouten Kol, N Sangi-Masha, 33°30’N, 67°5’E, c. 3300 m, 2-7-1962, K. H. Rechinger 17604 (W!).

C. orientalis sensu Hedge en K.H. Rechinger, Fl. Iranica 57: 48. 1968, pro parte

Hemicriptophyte of 60-90 cm, with leafy stems from the base, finely pubescent. Basal leaves with petiole of 6-10 cm, and blade of 15-35 × 5-8 cm, ovate-lanceolate, highly pinnatifid, with 8-12 pairs of subtriangular lateral segments 0.5-2.5 cm, with velutinous pubescence on both sides; caulines similar to basal leaves, somewhat smaller in size towards the apex. Sepals 3.5-4 mm, glabrous, yellowish-green. White petals, with blade 4.5-6 × 2.5-3 mm, oblong, and obtuse apex, nail 0.3-0.4 mm. Staminal filaments without subapical tooth. Fruit with proximal joint short obconical, 0.8-0.9(1) mm, sterile, with no vestiges of seeds, the distal joint spherical 2.5-3 mm in diameter, smooth surface or at times slightly strengthened edges, single-seeded.
**Habitat and distribution.** Grows on rocky and arid hills of N Afghanistan, between 2000 and 3000 m.

**Representative specimens**

AFGHANISTAN. **Bamiyan:** ca. 10 km E of crossing to north to Dosi on the road of Charikar to Bamiyan, 2-VII-1972, **Pertti A. Junge** (phototype, LE!).


*C. orientalis* var. *koktebelica* (A. Junge) O.E. Schulz in Engler, Pflanzenreich 70: 239. 1919

Ind. loc.: “Tiflis, Elizabethpol vi Teguerana” (Cyrillic in the original)

Type: UKRAINE. Crimea: Tauria, Koktebell, 15-5-1906 fl. 12-6-1906 fr., A. Junge (phototype, LE!).


*C. orientalis* var. *juncea* (M. Bieb.) O.E. Schulz in Engler, Pflanzenreich 70: 238. 1919

Ind. loc.: “Habitat in Iberia”

Type: GEORGIA. Tbilisi, ex Herb. Marschal Bieberstein (LE!).

*C. buxbaumii* Willd. ex Ledeb. Fl. Ross. 1: 222. 1842

Ind. loc.: “Hab. in Iberia! (Adams in Willd. herb., Wilhelms), prov. Talisch alt. 670 hexap. (C.A. Meyer)”.

Type: Willd. herb. n.” 11758.

*C. juncea* var. *aculeolata* N. Busch, Fl. Cauc. crit. 3(4): 299. 1909

*C. aculeolata* (N. Busch) Czerniak. in Komarov, Flora of U.S.S.R., add. 7: 488. 1939

*C. orientalis* var. *juncea f. aculeolata* (N. Busch) O.E. Schulz in Engler, Pflanzenreich 70: 239. 1919

Ind. loc.: “In der Gegend von Nachitschewan (Rade nach Busch)”.

Typus: AZERBAIJAN. Nachichevan, prope Belev, 17-6-1871, Fl. Fr. imm., Rade (LE!).

Hemicriptophyte of 1.5-2.5 m; base with very dense and retrorse pubescence in young plants, glabrous or with very short hairs and sparse in adult plants. Basal leaves petiolate, blade 20-30(60) × 9-8(25) cm, discolour, lighter on the lower side, ovate-elliptical, pinnaisect, with 4-6 pairs of lateral segments, with dense pubescence of hairs from stiff to lying on both surfaces, the caulines of 2-5 cm, sparse, very reduced, from linear to oblanceolate. Upright pedicels, never adpressed. Sepals 2-2.5 mm, glabrous, colour green glabrous. Petals 4.5-5.5 mm, with obovate blade, sharply narrowing in a nail of c. 0.3 mm, white. Staminal filaments with one subapical tooth of c. 0.3 mm. Fruit with proximal joint short obconical, of 1-1.4 mm, with aborted seed primordia, the distal joint globose, with dark and prominent veins which give it a slightly rugose quality, of 3.5-4 mm in diameter, single-seeded.

Habitat and distribution. Grows on the Taman peninsula and the coasts of Ukraine on the Azov Sea and the Black Sea, and in Russia in the region of the Volga delta on limestone-clay soils.

**Representative specimens**

RUSSIA. **Kalmyckaja:** Astrakan, Ergeni prope cabinam “Manykski Ulus”, 17-VI-1926, Kazarkevicz 2913 (LE). UKRAINE.


This is a species related to *C. juncea* and to *C. orientalis*. It was described as a variety of the first taxon and later elevated by Busch (1909) to the rank of species, a criterion followed by Czerniakowskaya (1939); it was also considered as a variety of *C. orientalis* (Schulz, 1919). Its specific status is supported by the larger size of its flowers compared to *C. orientalis*, its rougher and shorter hairiness than that of *C. juncea*; furthermore it grows in coastal areas of marine influence where neither of the other species are to be found.
Habitat and distribution. Arid hills and slopes of Armenia between 300 and 1300 m, north-eastern region of Caucasus and N of Iran.

Representative specimens


Busch (1909) described the var. aculeolata based on aculeate petioles and stems, later it was elevated to the rank of species by Czerniakowskaya (1939) and maintained at that rank by Khalilov (1993). The study of the type specimens of C. juncea and C. aculeolata has demonstrated that the taxonomical value of the latter is also to be found in the type specimen of C. juncea, for which reason they have been considered synonyms.

Dubious taxa and names

C. tataria Sebéék var. parviflora (Hub.-Mor. & Reese) Hedge & Hub.-Mor., Notes Royal Bot. Gard. Edinburgh 26: 181. 1965
Ind. loc.: “Kleinasien; Phrygian zwischen Usak und Salihli, ca. 20 km westlich von Usak, 900 m, 8.VI.35, leg. H. Reese, E. Wall”.

Huber-Morath & Reese (1940) described C. parviflora on the basis of a sample collected in the region of Phrygia, in W Turkey. They pointed to similarities with C. aspera and differentiated it from C. tataria by the smaller size of its organs, especially the flowers. Later, this species was reduced to a variety of C. tataria by Hedge & Huber-Morath (1965). A few specimens of this region have been detected with small flowers, but do not coincide with C. parviflora in its other traits, above all because some of these individuals have mature fruit of the same size as that frequently found in C. tataria. Khalilov (1993) synonymizes it with the typical variety of this species. Given the great morphological variability of the group “tataria”, we think it convenient to consider this taxon as dubious for the moment, until such time as the study of a greater number of specimens may confirm its status.

C. suecica

Miller (1768) describes this taxon with the indication “foliis profunde laciniatis, caule erecto, ramoso.

Sea Cabbage with leaves deeply cut, and an upright bran king stalk”. This is probably a synonym of C. maritima L., but as the description offers so little information and as the author in the same work consigns C. maritima to a different taxon, we have decided to keep this name as dubious.

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