SOME CRUCIFERAE OF W. PAKISTAN, AFGHANISTAN AND N.W. HIMALAYA

by S. M. H. JAFRI

FOREWORD

The region dealt with in this paper was largely covered by Boissier's Flora Orientalis (1875–1888) and J. D. Hooker's Flora of British India (1872–1897). Since the publication of Hooker's Flora a great deal of new material (including much from areas like Chitral not covered by Hooker's Flora) has accumulated. Some revisions aside, our general knowledge of the flora is now more than half a century out-of-date.

Within the *Cruciferae*, O. E. Schulz and Dr. K. H. Rechinger have described new taxa, some of which Dr. Jafri has been unable to maintain. Dr. Jafri has revised all the *Cruciferae* of this area for the degree of Ph.D. in the University of Edinburgh, and records more than double the number of species cited by Boissier and Hooker. His thesis (" Taxonomic Study on *Capparidaceae* and *Cruciferae* of W. Pakistan, Afghanistan and N.W. Himalaya," 1954) suggests that this neglected region will well repay extensive taxonomic research. Many systematic mistakes have previously resulted from a failure to realise that the temperate part of the flora shows strong affinities with that of Central Asia. In the present account it has only been possible to extract from the thesis those parts that are of urgent taxonomic importance (descriptions of new taxa, synonymy, etc.), and to leave the more discursive and geographical passages for eventual publication elsewhere. The genera are arranged alphabetically.

A separate paper on *Christolea* has already been published; others on *Farsetia* and *Capparidaceae* will follow.

P. H. DAVIS.

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Alyssum homalocarpum (Fisch. et Mey.) Boiss. Fl. Or. i, 285 (1867). Syn.: *Psilonema homalocarpum* Fisch. et Mey. in Ind. Sem. Hort. Petrop. vi, 63 (1839).

A. horebicum Boiss. in Ann. Sc. Nat. 2 ser., xvii, 156 (1842).

A. nomismocarpum Rech. f. in Phyton, iii, 56 (1951).

Type: Cultivated in Hortus Petropolitanus from seed collected by Schimper in Arabia Petraea (L—not seen).

W. PAKISTAN. Baluchistan: (without locality), *Savage Landor* (BM!).

PERSIA. Baluchistan, Lar, *Rechinger f. et al.* 3272 (W!). Desert on the margin of Zahedan, *Rechinger f. et al.* 196 (W!); Shershah, *Bunge* (K!).

IRAQ. Sabicha, *Gillett & Rawi* 6276 (K!).

ARABIA AND EGYPT (see Burtt & Lewis in Kew Bull., 1949, 283).

The species is recorded for the first time from W. Pakistan and Iraq. Rechinger's *A. nomismocarpum* recently described from Persian Baluchistan is conspecific with *A. homalocarpum*. Rechinger mentions silicules up to 7 mm. broad for his new species, but the type specimen, borrowed from Vienna, does not show a single fruit more than 6·4 mm. wide.

Aphragmus oxycarpus (Hook. f. et Thoms.) Jafri, **comb. nov.**
Syn.: *Braya* ? *oxycarpa* Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 169 (1861); Schulz in Pflanzenr. (86), Crucif. Sisymbr. 236 (1924).

"*B. alpina*" Hook. f. et T. And. in Fl. Brit. India, i, 155 (1872), ex parte—non Sternb. et Hoppe in Denkschr. Bot. Gesellsch. i, 66 (1815).

A. Stewartii Schulz in Fedde, Rep. xxxi, 330 (1933).
Type: W. Tibet: Piti Valley, 3,600–3,900 m., *Thomson* (K!).

N.W. HIMALAYA. Tihri-Garhwal, Damdar Valley, 3,900–4,200 m., *Duthie* 923 (BM!); Dudugadh, 4,500–4,800 m., *Duthie* 897 (K!); Kunawar, *Jacquemont* (K!); Lahul, 4,500 m., *Jaeschke* 27 a(K!); Lahul, Serchu to Keylang, 4.200 m., *N.L. Bor* 15122; Kashmir, Mt. Kolahoi, 4,800 m., *R. Stewart* 9393 (K!); Baltistan, Marpa La, 4,500 m., *Duthie* 11813 (K!); Lidder Valley, Badzulkad nala, 3,900 m., *Duthie* 13427 (K!); Pig-dong-la, 4,500 m., *Osmaston* 199 (K!); Baltistan, Birik above pass, 3,000 m., *Winterbottom* (K!); Ladak, *J. L. Stewart* (K!); Ladak, Khardong La, 4,500 m., *Ludlow & Sherriff* 8430 (BM!) (with *Pegaeophyton scapiflorum* (Hook f. et Thoms.) Marq. et Shaw); Ladak, Skyangpoche, 4,650 m., *Ludlow* 561 (BM!); Khardong La, 4,500 m., *Ludlow* 505 (BM!); Gogra, 4,500 m., *Ludlow* 827 (BM!); Kashmir state, 4,500 m., *R. Stewart* (R!).

GEOG. DIST.: Tibet and Sikkim.

Arabidopsis Stewartiana Jafri, **sp. nov.**

Affinis *A. thalianae* (L.) Heynh. sed floribus minoribus intense flavis ramis filiformibus subarcuatis sparse foliatis divergit.

Herba annua, 15–20 cm. alta, sparse ramosa; caules filiformes, erecti vel ascendentes, sparse foliati, pilis simplicibus vel furcatis inferne ± hispidi. *Folia basalia* rosulata, saepe congesta, oblanceolata, 1·2–3·5 × 0·4–0·8 cm., subintegra, breviter petiolata, ad apicem rotundata. *Folia superiora* lanceolata, sessilia, semiamplexicaulia, integra vel subdentata. *Racemus* 20–30-florus, ebracteatus, corymbosus, in fructu laxus. *Flores* 1·5–2 mm. diam., intense flavi; pedicelli 3–6 mm., in fructu circa 12 mm. longi, filiformes, ascendentes. *Sepala* circa 1·1 × 0·7 mm., aequalia, non saccata, oblonga, obtusa. *Petala* spathulata, circa 1·8 × 0·9 mm., ad apicem subtruncata. *Stamina* circa 1·5 : 2 mm.; antherae circa 0·3 mm. longae, ovatae, obtusae. *Glandulae* nectariferae laterales semiannulares, medianae torosae. *Ovarium* lineare subcylindricum, 34–40-ovulatum; stylus brevis

circa 0·3 mm. longus; stigma depresso-capitatum. *Siliquae* (fere maturae) circa 15×0·9 mm., teretes vel paulo compressae obtusae; valvae glabrae uninervatae; semina circa 0·6×0·3 mm., ellipsoidea, brunnea, humida mucilaginosa; septum haud nervatum.

N.W. HIMALAYA. Punjab Himalaya: Kulu, *E. Nasir* (R!).

Distinguished from *A. thaliana* (L.) Heynh. by its minute, deeply yellow flowers and filiform, subarcuate, sparsely leaved branches. The plants very closely resemble *A. thaliana*, but the flowers are a remarkably deep yellow. I am therefore unable to include it in *A. thaliana* where the flowers are white. Yellow flowers are rare in *Arabidopsis*. *A. pumila* (Steph.) Busch, a species occurring in Baluchistan and extending northwards to C. Asia, has yellow flowers. But this species is very distinct from the present new species in its sagittate-amplexicaule cauline leaves, large flowers and hairy fruits.

Arabidopsis Russelliana Jafri, **sp. nov.**

Affinis *A. campestri* O. E. Schulz sed habitu robusto multiramoso, caulibus inferne sparse hispidis superne glabris, foliis inferioribus runcinati-pinnatifidis superioribus lineari-oblongis elongatis, foliis pilis minutis substellatis vel stellatis praeditis, racemis paucifloris in fructu laxis, pedicellis valde flexuosis differt.

Herba annua vel biennis, circa 65 cm. alta, erecta, multiramosa, inferne sparse hispida, superne glabra. *Folia basalia* laxe rosulata, marcida, lyrato-pinnatifida, longe petiolata. *Folia caulina* inferiora pauca, runcinato-pinnatifida, 5–7-jugata, petiolata, 5–7×1–1·5 cm., ad apicem obtusa sparse pubescentia, pilis minutis substellatis vel stellatis. *Folia superiora* lineari-oblongata, obscure denticulata vel integra, elongata, 1·5–6×0·15–0·5 cm., sessilia, semiamplexicaulia, sparse pubescentia vel glabra. *Racemus* 8–15-florus, laxus, ebracteatus, in fructu circa 20 cm. longus. *Flores* circa 3 mm. diam., albi; pedicelli 5–12(–15) mm., in fructu circa 20 mm. longi, filiformes, tortuosi vel ascendentes. *Sepala* circa 2·5×0·8 mm., aequalia, non saccata, oblonga, obtusa, pube minuta substellata. *Petala* oblanceolata 3·5–4×0·8–1 mm., ad apicem rotundata. *Stamina* 6, circa 3 : 3·5 mm.; antherae circa 0.6 mm., oblongae, obtusae. *Glandulae* nectariferae laterales annulares, mediae torosae conjunctae. *Ovarium* oblongum subcylindricum circa 60-ovulatum; stigma depresso-capitatum subsessile. *Siliquae* (immaturae) lineari-subcylindricae, 6–7×0·08 cm., obtusae, saepe curvatae; valvae subconvexae glabrae uninervatae; semina immatura; septum membranaceum.

N.W. HIMALAYA. Karakoram: Kero Lugma glacier, right bank, c. 3,900 m., 27 July 1939, *R. S. Russell* 1855 (BM!).

Distinguished from *A. campestris* Schulz by its robust habit; much branched stem, sparsely hairy below and glabrous above; lower leaves runcinate-pinnatifid or simply runcinate, minutely pubescent with substellate or stellate hairs; upper leaves linear-oblong, elongated, entire or subdentate; racemes lax; pedicels long, flexuose.

Arabis L.

The genus is represented by only 12 species in the present area; of these two are new to science.

The Index Kewensis cites *A. taraxacifolia* T. Anders. as a synonym of *Arabis arvensis* Edgew. I have examined Edgeworth's type specimen of *Arabis arvensis* at Kew, and find it to be nothing but *Malcolmia africana* (L.) R. Br. and his description (Trans. Linn. Soc. xx, 32 : 1851) confirms this. *Arabis taraxacifolia* T. Anders. is a distinct species.

No mention of *Arabis saxicola* Edgew. is made in the Flora of British India, although this species was published in 1851. I have seen the type sheet of this species at Kew on which T. Anderson (?) has made the remark " indeterminable." But seeing Edgeworth's good description of this species and the specimen there can be no doubt of its being distinct. Schulz, apparently not realising its existence, re-described it as a " new " species, *A. scaposa.*

During the present studies at Kew a good specimen of *Arabis fruticulosa* C. A. Mey. from Chitral (*Toppin* 373) was found lying among the unidentified Cruciferae. This species was formerly known from Central and North Asia only.

There can be no doubt that *A. pterosperma* Edgew. is a species distinct from *A. alpina* L., which is purely European and N. Asian (Schulz, in Notizbl. Bot. Gart. Berlin, ix, 1063 : 1927). In addition to other distinguishing characters they have different leaf shapes; *A. alpina* L.—coarsely toothed with short, triangular, obtuse or acute apex; *A. pterosperma* Edgew.—not very coarsely toothed with the apical part elongated, entire with a rounded apex.

Key to species

1. Cauline leaves absent (rarely 1 or 2):
   2. Plants 10–15 cm. tall in fruit; radical leaves sparsely hairy with simple or furcate hairs; siliquae straight, ± erect, on the same radius as 5–8 mm. pedicels . . . . 11. *A. saxicola* Edgew.
   2. Plants about 5 cm. tall in fruit; radical leaves tomentose with soft white, branched hairs; siliquae recurved, ± erect on spreading 10–15 mm. pedicels . . . 12. *A. Griffithiana* Jafri
1. Cauline leaves present, usually many:
   3. Siliquae pubescent . . . 10. *A. fruticulosa* C. A. Mey.
   3. Siliquae glabrous:
      4. Plants minute, 1·5–3 cm. tall in fruit . 1. *A. brevicaulis* Jafri
      4. Plants 10–70 cm. tall in fruit:
         5. Cauline leaves cuneate at the base, subsessile:
            6. Perennial, often short, much branched from the base, subspreading; fruits ± erect 2. *A. tibetica* Hook. f. et Thoms.
            6. Biennial, or annual, often tall, not much branched from the base, erect; fruits ± recurved:

7. Flowers minute, about 2 mm. across; fruits 0·8–1 mm. broad; racemes 20–50 flowered
3. *A. taraxacifolia* T. Anders.

7. Flowers mediocre, 3–3·5 mm. across; fruits 1·2–1·6 mm. broad; racemes 8–20-flowered 4. *A. tenuirostris* Schulz

5. Cauline leaves sessile, bases ± broad, semiamplexicaul or amplexicaul:

8. Annual; pedicels 2–4 mm. long in fruit, thickened
5. *A. auriculata* Lam.

8. Perennial; pedicels 10–25 mm. long in fruit, not thickened:

9. Plants subglabrous, glaucous; petals in pairs, ± diverging
6. *A. bijuga* Watt

9. Plants ± hairy, often hispid; petals neither in pairs nor diverging:

10. Cauline leaves very few, narrowly oblong, not auricled at the base, semiamplexicaul; hairs stellately branched
7. *A. pangiensis* Watt

10. Cauline leaves many, ± broad at the base, amplexicaul; hairs simple or forked:

11. Siliquae ± spreading; rosette leaves large, 5–15 × 1–3 cm. . . . 8. *A. amplexicaulis* Edgew.

11. Siliquae suberect or erect: rosette leaves small, 2–4 × 0·5–1·5 cm. . . 9. *A. pterosperma* Edgew.

Arabis brevicaulis Jafri, **sp. nov.** (Sect. *Alomatium* DC.).

Affinis *A. saxicolae* Edgew. sed habitu tenuissimo, caulibus foliatis, indumento densiore e pilis ramosis composito, foliis radicalibus multo brevioribus differt.

Herba perennis, caespitosa, tenuissima, 1·5–2·5 cm. alta; caulis simplex, erectus, foliatus; caudex 1–2 mm. crassus. *Folia radicalia* rosulata, 4·9 × 1·5–3 mm., elliptica vel oblanceolata, cuneata, sessilia, integra, subobtusa, pilis ramosis brevibus dense pubescentia. *Folia* caulina 2–4, alterna, oblongo-ovata, 1·5–4·5 × 1–2 mm., sessilia, semiamplexicaulia, acuta vel obtusa, dense pubescentia. *Racemus* 5–10-florus, ebracteatus, corymbosus, in fructu circa 1 cm. longus. *Flores* 3–3·5 cm. diam., albi; pedicelli 1 mm. longi, in fructu circa 4 mm. longi, ascendentes, pubescentes. *Sepala* oblonga, 1·2–1·5 × 0·8–1 mm., obtusa, subaequalia, pubescentia. *Petala* circa 3 × 1 mm., obovato-unguiculata, ad apicem subrotundata. *Stamina* 1 : 1·5 mm.; antherae circa 0·3 mm., ovoideae, obtusae. *Siliquae* immaturae 17 × 0·9 mm., lineares, acutae, compressae, glabrae; valvae uninervosae, submembranaceae; stylus 0·5–0·6 mm. longus; stigma minutum depresso-capitatum, integrum. *Semina* 20–30, uniseriata.

N.W. HIMALAYA. Karakoram: Zangia Harar, Hunza Valley, 3,600 m., 5 July 1939, *R. S. Russell* 1066 (BM!).

Distinguished from *A. saxicola* Edgew. by the very short size of the plants, presence of cauline leaves, very small and densely pubescent radical leaves, and indumentum of short branched, white, soft hairs.

Arabis tibetica Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 143 (1861) et Fl. Brit. Ind. i, 136 (1872); Wendelbo in Nytt Mag. Bot. i, 32 (1952). Syn.: *A. Thomsonii* Hook. f. l. c.

A. quinqueloba Schulz in Notizbl. Bot. Gart. Berlin, ix, 1065 (1927).

Arabidopsis multicaulis Pamp., Agg. Fl. Caracorum in Sped. Ital. Filip. ser. II, xi, 160 (1933).

Type: W. Tibet, Zanskar, 3,600–4,200 m., *Thomson* (K!).

Arabis tenuirostris Schulz in Notizbl. Bot. Gart. Berlin, ix, 1066 (1927).

Syn.: *A. Clarkei* Schulz l. c. 1063.

Type: Kashmir, Kunzlwan, 2,250 m., *Clarke* 29400A(K!).

This species is very closely allied to *A. tibetica* but is distinguished by its larger hairs, biennial habit and longer styles. Schulz distinguished *A. Clarkei* by its robust habit and other minor characters which do not hold good when a large number of specimens is examined.

Arabis amplexicaulis Edgeworth in Trans. Linn. Soc. xx, 31 (1851); Hook. f. & Thoms. in Journ. Linn. Soc. Bot. v, 142 (1861) et Fl. Brit. Ind. i, 136 (1872).

Syn.: *A. alticola* Schulz in Notizbl. Bot. Gart. Berlin, ix, 1062 (1927).

Type: N.W. Himalayas, Garhwal, Chur, Shioli, *Edgeworth* (K!).

A very polymorphic species, especially in size of leaves and flowers. *A. alticola* Schulz, said to be distinguished from its small narrow leaves, is nothing but a state of *A. amplexicaulis*.

Arabis saxicola Edgeworth in Trans. Linn. Soc. xx, 32 (1851).
Syn.: *A. scaposa* Schulz in Notizbl. Bot. Gart. Berlin, ix, 1065 (1927); Wendelbo in Nytt Mag. Bot. i, 32 (1952).
Var. **saxicola.**

Type: N.W. Himalaya, Garhwal, Dhawli, 2,700–3,300 m., *Edgeworth* (K!).

Var. **elatior** (Schulz) Jafri, **comb. nov.**

Syn.: *A. scaposa* Schulz var. *elatior* Schulz in Notizbl. Bot. Gart. Berlin, ix, 1066 (1927); Wendelbo in Nytt Mag. Bot. i, 32 (1952).

Type: Kashmir, Gilgit, 3,000–3,300 m., *Duthie* 12430 (B, K!).

Arabis Griffithiana Jafri, **sp. nov.** (Sect. *Drabopsis* Griseb.).

Affinis *A. saxicolae* Edgew. sed statura brevi, foliis radicalibus tomentosis, inferioribus emarcidis basibus persistentibus fibrosis, caudicibus dense obsitis, indumento densiore e pilis ramosis composito, pedicellis longioribus divaricatis, siliquis erectis ad apicem recurvatis differt.

Herba perennis, caespitosa, in fructu circa 5 cm. alta. *Folia radicalia* congesta, rosulata, lanceolata, 1–3×0·2–0·4 cm., tomentosa, integra vel 1–3-subdentata, acuta, petiolata, inferiora emarcida basi persistentia

fibrosa, caudicibus dense vestitis. *Caules* aphylli. *Pedunculi* ± erecti, 5–10-fructiferi, circa 5 cm. longi, glabri. *Pedicelli* 10–15 mm. longi, filiformes, glabri, flexuosi, patentes. *Flores* ignoti. *Siliquae* 20–24× 1 mm., lineares, compressae, glabrae, erectae, ad apicem recurvatae, acutae; valvae membranaceae, uninervatae; stylus circa 1 mm. longus; stigma minutum, depresso-capitatum, integrum. *Semina* 2–30 uniseriata, circa 1×0·4 mm., oblonga-ellipsoidea, brunea, humida haud mucilaginosa; septum membranaceum enervatum.

AFGHANISTAN. Siah sung, limestone rocks, *Griffith* (K!).

Atelanthera Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 138 (1861) et Fl. Brit. Ind. i, 133 (1872); Schulz in Engl. & Prantl, Pflanzenfam, 2 Aufl. 17B, 572 (1936).

Atelanthera, one of the most interesting genera of the family Cruciferae, was described in the year 1861 by Hooker and Thomson. Since then it has been represented by only one species, *A. perpusilla*.*

W. B. Hemsley suggested that it was conspecific with *Erysimum sisymbrioides* C. A. Mey., which is evident from an interesting correspondence (in Herb. Kew) between T. A. Sprague and Mrs. Arber during the year 1931. Sprague in his reply to a letter from Mrs. Arber says, " our only material of *A. perpusilla* is Thomson's original specimen from Zanskar (W. Tibet). . . . I find, however, that *A. perpusilla* has been recorded by Korshinsky from Turkestan. . . . Korshinsky gives a redescription of the species, mentioning that the anthers of the long stamens are unilocular. . . . (1898)."

In the same letter Sprague gives the distinguishing characters of *A. perpusilla* and *Erysimum sisymbrioides* in the following words:

" *Atelanthera perpusilla*: Anthers apiculate, those of the long stamens monothecous. Siliquae with definite slender style about 0·8 mm. long.

" *Erysimum sisymbrioides*: Anthers not apiculate, all dithecous. Siliquae without a distinct style."

The above-mentioned characters leave out a most important vegetative diagnostic which no one appears to have noticed. The leaves of *Atelanthera* are few (3–5 only) and the first two are *opposite*; in *Erysimum sisymbrioides* there are no opposite but several *alternate* leaves.

Specimens collected by *Duthie* [no. 8571 (K!)] from Khojak pass, Baluchistan, and published in Burkill's list of flowering plants of Baluchistan (1909), were wrongly identified as *Atelanthera perpusilla*. They are *Erysimum sisymbrioides*. Thus, the only record which I have seen of the type species of the genus is still Thomson's original gathering from Zanskar (W. Tibet). From Korshinsky's description, however, there can be no doubt that his specimens from Turkestan are also *A. perpusilla*.

The present new species, *A. pentandra* Jafri, is from Kashmir. It can be distinguished from *A. perpusilla* by having only five stamens, even the outer ones being apiculate. Furthermore, the inner stamens are only three; of these, two have monothecous and one dithecous anthers.

* *A. contorta* Gilli (in Fedde, Repert. lvii, 225: 1955) has just been described from Afghanistan. It has 6 stamens.

This curious genus of *Cruciferae* is the only one in which we find some monothecous anthers. Although the suppression of the two outer stamens (as in *Cardamine hirsuta* L. or *Lepidium apetalum* Willd.) or the four inner stamens (as in *Coronopus didymus* (L.) Sm.) is well known in Cruciferae, the type of variation and dimorphism of anthers found in *Atelanthera* is confined to this genus. The discovery of the present new species, *A. pentandra*, raises an interesting question: has this genus 6 or 4 as the basic number of stamens, or is it 6 in one species and only 5 in the other? According to the various Floras concerned, the number of stamens mentioned for *Atelanthera* is 6—the usual number present in Cruciferae. But the present new species has only 5 stamens: the 2 outer ones are normal as in other members of this family, but the 3 inner are dimorphic—one dithecous and two monothecous. In *A. perpusilla* the inner stamens are 4, like most of the other Crucifers, but they are all monothecous. It appears, therefore, as though the two monothecous stamens represent a split condition of one dithecous stamen; in that case the basic number of the stamens in the genus would be 4 only. The present species, *A. pentandra*, would then hold an intermediate position in which only one of the two inner stamens has split. If the basic number is 6, as in *A. perpusilla*, then the present new species has got two of the inner stamens fused together giving a dithecous condition, while the other inner two have still remained monothecous (as in the type species). However, the exact nature of the androecium can be clarified only by further anatomical and developmental studies. I have examined several flowers from different plants of the new species, and find this stamen character constant. In the absence of additional information, I have preferred to describe one species as having 6 stamens and the other 5 stamens, irrespective of the original basic number.

In the absence of fruit, only technical staminal characters have been found to separate the new species from *A. perpusilla*. It is possible that further material may show that this remarkable floral difference is not a constant character sufficient to justify distinct specific rank. In the meantime, however, by describing it as a new species attention is drawn to a unique floral condition in the Cruciferae.

Atelanthera pentandra Jafri, **sp. nov.**

Affinis *A. perpusillae* Hook. f. et Thoms. sed staminibus 5, omnibus apiculatis, interioribus solum 3, dimorphicis 2 antheris monothecis et 1 anthera ditheca divergit.

Herba annua, minima, 1–2 cm. alta; caules erecti, filiformes, inferne violacei, pilis bipartitis appressis. *Cotyledones* persistentes, minutissimi, circa 2×1 mm., oblongi, sessiles, carnosuli, glabri, violacei. *Folia* caulina saepe dua, simplicia, opposita, 3–5×0·6–1·2 mm., oblongo-elliptica, sessilia, pubescentia, apice rotundata, ad marginem integra. *Racemus* 1–3-florus, laxissimus. *Flores* 2·5 mm. diam., albi; pedicelli 1–1·5 mm. longi, filiformes. *Sepala* 2×0·8 mm., oblonga, suberecta, obtusa, aequalia, pubescentia. *Petala* 3·5×1 mm., oblongo-obovata, emarginata. *Stamina* 5; 2 exteriora 2 mm. longa, antheris 0·6 mm. longis, dithecis; 3 interiora 3 mm. longa, dimorphica, antheris 0·6 mm. longis, 2 monothecis et 1

dithecis; antherae omnes apiculatae. *Ovarium* oblongum, subcylindricum, circa 14-ovulatum; stylus circa 0·6 mm. longus, stigma capitatum subbilobatum. *Siliquae* ignotae.

N.W. HIMALAYAS. Kashmir: Suru, 3,090 m., a tiny plant on sand, flowers white, *B.B. Osmaston* 224 (K).

Brassica deflexa Boiss. in Ann. Sc. Nat. Bot. 2 Ser. xvii, 87 (1842); Hook. f. et Thoms. in Jour. Linn. Soc. Bot. v, 170 (1861); Schulz in Pflanzenr. (70), Crucif. Brassic. (1), 63 (1919).
Syn.: *B. tigridis* Boiss., l. c.

B. deflexa var. *tigridis* (Boiss.) Boiss., Fl. Or. i, 393 (1867).

Erucastrum ? *lasiocalycinum* Boiss. et Hausskn. in Boiss. Fl. Or. i, 389 (1867).

B. lasiocalycina (Boiss. et Hausskn.) Boiss., Suppl. Fl. Or. 66 (1888).

B. deflexa var. *lasiocalycina* (Boiss. et Hausskn.) O. E. Schulz in Pflanzenr. (70), Crucif. Brassic. (1), 64 (1919).

B. deflexa var. *mollis* O. E. Schulz and var. *glabrescens* O. E. Schulz l. c. 64–65.

B. iranica Rech. f., Aellen et Esfendiari in Phyton, iii, 44 (1951).
Type: Syria, Aleppo, *Aucher Eloy* 229 (G, K!).

W. PAKISTAN. Baluchistan: without locality, *Stocks* 745 (K!), 834 (K!).

AFGHANISTAN. Kandahar, *Griffith* (K!).

GEOG. DIST.: Syria, Iraq, Iran and Arabia.

This species was described by Boissier (in Ann. Sc. Nat. 2 Ser. xvii, 87 : 1842) when he quoted only one specimen (the type: *Aucher Eloy* 229 from Syria) under it. At the same time he described another new species, *B. tigridis* from Mesopotamia, based also on a single specimen (*Aucher Eloy* 227), but later in Flora Orientalis he reduced it to varietal rank in *B. deflexa* Boiss. Boissier and Haussknecht in Boissier's Flora Orientalis (p. 389) doubtfully described a species as *Erucastrum* ? *lasiocalycinum* based on one gathering collected by Haussknecht from Aleppo (Syria) and primarily distinguished by its long siliquae, thickened pedicels and short beak. Later on Boissier (1888) definitely included it as a species of *Brassica*, calling it *B. lasiocalycina*. Schulz reduced it to a variety of *Brassica deflexa* Boiss. At the same time he also regarded *B. tigridis* Boiss. as conspecific with *B. deflexa* Boiss. Recently Rechinger described a new species, *B. iranica*, distinguishing it from *B. deflexa* Boiss. by its short, thickened pedicels and shorter fruits.

Herbarium specimens of fourteen different gatherings present at Kew (including all the above-mentioned so-called allied taxa) were examined carefully, and proved to be nothing but forms of *B. deflexa* Boiss. The Table shows the variation range of all the characters recognised by other authors to distinguish their so-called taxa from *B. deflexa* Boiss. In several specimens the fruits and pedicels are immature, and it is therefore

difficult to say whether they are going to have thickened pedicels, long or short fruits, but from the table it is quite evident that there is almost continuous variation in all these characters, and that none of the characters is correlated with geographical distribution. Therefore, separation of even infra-specific divisions can serve no useful purpose.

Specimen (Herb. Kew!).	Length of Siliquae in cm.	Length of Pedicels in mm.	Pedicels thickened	Pedicels not thickened	Pedicels slightly or doubtfully thickened
A. *Syria:*					
1. *Aucher Eloy* 229	4·5–5·2	12–20		+	
2. *Gaillardot* 1989		6–8			?
3. *Montbret*— (i)	5·2	12–20			+
(ii)	6·5	18			+
(iii)	7·2	20			+
4. *Haussknecht*	4·8–6·4	7–12	+		
B. *Arabia:*					
5. *Dickson* 407		8?			?
6. *Dickson* 179		8?			?
C. *Iraq* (Mesopotamia):					
7. *Aucher Eloy* 227 (i)	3·5–5	10			+
(ii)	3·5–5	15	+		
D. *Iran* (Persia):					
8. *J. Bornmuller* 2236 (i)	5?	5?			?
(ii)	5?	10?	+		
9. *Stapf*	3·5	5–10			?
10. *A. C. Trott* 1147	3·5?	6–10			?
E. *Afghanistan:*					
11. *Griffith*	3–3·5?	10–14			+
F. *Baluchistan:*					
12. *Stocks* 745	4–6·5	4–12			+
13. *Stocks* 834	4?	4–14	+		
G. *Persian Baluchistan:*					
14. *K. H. Rechinger* 4065	3·8–5	6–12	+		

Cardamine pratensis L., Sp. Pl. 656 (1753).

Syn.: *C. loxostemonoides* Schulz in Notizbl. Bot. Gart. Berlin, ix, 1069 (1927).

" *C. hirsuta* " Biswas in Trans. Bot. Soc. Edinburgh, xxxiii, 424 (1943), partim—non L.

forma **luxurians** (Schulz) Jafri, **comb. et stat. nov.**

Syn.: *C. loxostemonoides* Schulz var. *luxurians* Schulz in Notizbl. Bot. Gart. Berlin, ix, 1070 (1927).

Type: Tihrigarhwal, Nila valley, under rocks, 4,200–4,500 m., *Duthie* 912 (B, K!).

Plant very lax, flexuose, spreading; petioles of the leaves up to 55 cm. long; leaflets up to 30×25 mm., ± trilobulate as in the type race.

Draba Olgae Regel et Schmalh. in Regel, Descrip. Pl. Nov. in Fedtsch., Reise nach Turkest. (18), 8 (1892); Pohle in Fedde, Rep. Sp. Nov., Beih. xxxii, 138 (1925); Schulz in Pflanzenr. (89), Crucif. Draba, 119 (1927).
subsp. **Olgae**

Type: C. Asia: Turkestan, *Olga Fedtschenko* (L!).

N.W. HIMALAYA. Kashmir: Baltistan, Satpura pass above Skardhu, 4,500–4,800 m., *R. Stewart* 20216 (R!).

GEOG. DIST. C. Asia: Turkestan.

Subsp. **chitralensis** (Schulz) Jafri, **stat. nov.**

Syn.: *D. Olgae* var. *chitralensis* Schulz in Pflanzenr. (89), Crucif. Draba, 120 (1927).

Type: Chitral (W. Pakistan), 3,650 m., *S.A. Harriss* 15909 (B, K!).

Known from the type locality only. Distinguished from the type race by its subhairy habit, light yellow flowers, much narrower petals with emarginate apex, and only 8-ovuled ovary.

Draba Ludlowiana Jafri, **sp. nov.** (Sect. *Leucodraba* DC.).

Affinis *D. glomeratae* Royle sed racemis laxis flexuosis remotifloris, floribus minutis, silicula brevi ovato-orbiculata compressa haud contorta, calyce persistente, septo obscure uninervoso recedit.

Herba perennis, caespitosa, 10–18 cm. alta, tomentosa, pilis ramosis albis vestita; caudex 1–1·5 mm. crassus. *Folia radicalia* numerosa, dense rosulata, lineari-lanceolata, 8–16 × 1–2(–3) mm., integra, acuta, tomentosa. *Folia caulina* 2–4, elliptica vel oblongo-obovata, 2–8 × 1–3 mm., amplexicaulia, acuta, integra. *Racemus* 15–20-florus, laxus, remotiflorus, superne subcorymbosus, in fructu circa 9 cm. longus. *Flores* minuti, 2 mm. diam., albi, omnibus partibus persistentibus. *Pedicelli* in fructu 2·5–7 mm. longi. *Sepala* 1–1·5 × 0·6–0·8 mm., oblongo-elliptica, obtusa, ± diversa, pubescentia, persistentia, aequalia. *Petala* 2·5–3 × 1–1·7 mm., obovato-cuneata, ad apicem emarginata. *Stamina* circa 1 : 1·5 mm., longa; antherae circa 0·2 mm. longae, ovoideae, obtusae. *Siliculae* 3–4 × 2·5–3 mm., ovato-orbiculatae, compressae, glabrae, haud contortae; valvae membranaceae, obsolete nervosae; stigma minutum, subsessile vel sessile. *Semina* 8–10 biseriata, circa 0·8 × 0·7 mm., suborbiculata, compressa, brunnea. *Septum* album, membranaceum, obsolete uninervosum.

N.W. HIMALAYA. Kashmir: Ladak, 4,800 m., stony hill slopes, flowers white, 12 Aug. 1941, *Ludlow & Sherriff* 8555 (BM!).

This species appears to be somewhat intermediate between *D. glomerata* Royle and *D. altaica* (C.A.M.) Bunge. The habit, leaf and indumentum closely resemble the former, while the flower and fruit characters resemble the latter.

Draba tibetica Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 152 (1861) excl. var. β & γ, et Fl. Brit. Ind. i, 144 (1872), excl. var. 2; Schulz in Pflanzenr. (89), Crucif. Draba, 300 (1927); Wendelbo in Nytt Mag. Bot. i, 33 (1952).

Syn.: *D. turkestanica* Regel et Schmalh. in Regel, Descrip. Pl. Nov. O. Fedtsch. 7 (1882).

D. Transchelii Litw. in Trav. Mus. Bot. Ac. Petersb. i, 14 (1902).

D. Thomsonii Pohle, Drab. Asiat. 141 (1925).

Type: W. Tibet: Zanskar, 3,600–4,200 m., *Thomson* (K!).

Var. **tibetica.**

W. PAKISTAN. Chitral: Shajanali, 3,000–3,300 m., *Toppin* 255 (K!); below Zapotili, c. 3,600 m., *Wendelbo* (Herb. Oslo—not seen).

N.W. HIMALAYA. Above Kandong, *Drummond* 20258 (K!); Kandong Int., *Drummond* 2026 (K!). Kashmir: Ladak, Khardong pass, *R. Meinertzhagen* 47 (BM!).

GEOG. DIST.: C. Asia.

Var. **chitralensis** (Schulz) Jafri, **comb. nov.**

Syn.: *D. sikkimensis* var. *chitralensis* Schulz in Pflanzenr. (89), Crucif. Draba, 265 (1927).

" *D. armena* " Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 152 (1861)—non Boiss.

Type: Chitral (W. Pakistan), 4,150 m., *S. A. Harriss* (Herb. Dehra-Dun—not seen).

AFGHANISTAN. Kohi Baba, 4,200–4,500 m., *Griffith* (K!).

Perennial, caespitose. Pedicels 4–5 mm. long in fruit. Valves densely pubescent to pubescent. Distinguished from var. *tibetica* by its short pedicels.

D. sikkimensis (Hook. f. et Thoms.) Pohle is confined to the East Himalaya (Sikkim), while *D. tibetica* is common in the N.W. Himalayas. Hooker & Thomson (1861) regarded the two as different varieties of one species. The characters given by Schulz (1927) for his var. *chitralensis* are intermediate between the two species. Griffith's plants from Afghanistan (regarded as " *D. armena* " by Hooker & Thomson) are identical with this variety. A careful study shows that they closely resemble specimens of *D. tibetica* except that the pedicels are short. As *D. tibetica* is common in the present area and *D. sikkimensis* is endemic to E. Himalaya and does not occur in the present area, I have preferred to assign var. *chitralensis* to the former.

Draba aubrietioides Jafri, **sp. nov.** (Sect. *Drabella* DC.).

Affinis *D. cholaensi* W.W.Sm. sed pilis ramosis ± vestita, pedunculis multifloris, siliqua glabra lineari-lanceolata, stylo brevi, stigmate minuto depresso-capitato, seminibus majusculis angustissime alatis differt.

Radix perennis; rami annui numerosi, filiformes, circa 1 mm. crassi, prostrati, foliosi, flexuosi; planta habitu *Aubrietiae* valde similis; pilis ramosis minutis ± vestita. *Folia* numerosa, elliptico-obovata, 1–2·3 × 0·3–0·7 cm., cuneata, subsessilia, acuta vel obtusa, integra vel rarius 1–3-subdentata, membranacea. *Racemus* 8–16-florus, ebracteatus, laxus, in fructu fere 15 cm. longus. *Flores* ignoti. *Pedicelli* 1–2·7 cm. longi,

filiformes, suberecti. *Siliquae* lineari-lanceolati, 1·2–2·5×0·23–0·27 cm., compressae, saepe diverse curvatae, non contortae, glabrae; valvae membranaceae, obscure reticulatae, nervo medio tenui; stylus vix 1 mm. longus, tenuis; stigma minutum, depresso-capitatum; semina 10–20 subbiseriata, circa 1·8×1 mm., oblonga, compressa, angustissime alata, brunnea; septum membranaceum album, nervo medio obscuro.

N.W. HIMALAYA. Kashmir: Kishenganga valley, Sharda, 1,800 m., damp cliffs, 20 July 1939, *R. Stewart* 17760 (holo., K!, iso. R!). Badwan, 2,400 m., shady cliffs, in mats, 12 July 1946, *R. Stewart* 22594 (K!).

This species is closely allied to *D. cholaensis* W.W.Sm. and *D. sachalinensis* F. Schmidt. It is distinguished from *D. cholaensis* by its somewhat dense, minute branched hairs (not sparse, simple or forked), many-flowered peduncle (not 3–5-flowered), glabrous siliquae (not sparsely hairy), very short style (not 1·5–2 mm. long), minute depressed-capitate stigma (not broader than the style and bilobed), large and winged seeds (not 1–1·5×0·75 mm. and wingless). It is distinguished from *D. sachalinensis* by its long, prostrate, filiform branches, mostly entire leaves that are not densely pubescent, few-flowered racemes (not 20–30-flowered), long pedicels, glabrous and not contorted siliquae. *D. cholaensis* is confined to E. Himalaya and *D. sachalinensis* to N. Asia.

Eremobium aegyptiacum (Spreng.) Aschers.

Syn.: *Cithareloma gadrosiacum* Rech. f. et Esfendiari in Phyton, iii, 63 (1951).

The valves of the fruit are convex in *Eremobium*, while in *Cithareloma* they are plano-compressed. The type specimen of *Cithareloma gadrosiacum* was borrowed from Vienna. There can be no doubt that this is a case of misidentification, perhaps due to the fragmentary nature of the specimens.

Erysimum Griffithii (Hook. f. et Thoms.) Jafri, **comb. nov.**

Syn.: *Cheiranthus Griffithii* Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 137 (1861).

" *E. pulvinatum* " Hook. f. et Thoms., l. c. 165—non J. Gay, Erys. 5 (1842).

E. Hookeri Boiss., Fl. Or. i, 203 (1867).

Type: Afghanistan, Kohi Baba, 4,200–4,500 m., *Griffith* 1441 (K!). Known from the type locality only.

Boissier (1867) correctly placed the above gathering under *Erysimum*, but instead of making a new combination he gave it an entirely new name, *E. Hookeri*, and quoted *Cheiranthus Griffithii* Hook. f. et Thoms. as a synonym of it. This was presumably done because of the pre-existence of a different species, *E. Griffithianum* Boiss. (1842). However, there is nothing in the rules of nomenclature to prevent the combination, *E. Griffithii*, from being made. *E. Hookeri* Boiss. is an illegitimate name and must be replaced by *E. Griffithii*.

Hooker and Thomson (1861) regarded part of the gathering *Griffith* 1441 to belong to *E. pulvinatum* J. Gay and the rest to *Cheiranthus Griffithii*. But a careful study of all the material bearing this number at Kew shows that it belongs to one taxon, *E. Griffithii*.

Erysimum pachycarpum Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 167 (1861); et Fl. Brit. Ind. i, 153 (1872).

Subsp. **pachycarpum.**

Type: East Himalaya, Sikkim, 3,000 m., *J. D. Hooker* (K!). Known from the type locality only.

Subsp. **cachemiricum** (Schulz) Jafri, **comb. et stat. nov.**

Syn.: *Erysimum cachemiricum* Schulz in Notizbl. Bot. Gart. Berlin, ix, 1080 (1927).

Type: Kashmir: Kishenganga valley, Tilel, 3,300–3,600 m., *Keshavanand*, 1473 (B, photo. K!).

Perennial, 50 cm. tall in fruit. Basal leaves up to 12 cm. long; cauline leaves few, about 8. *Racemes about* 40-*flowered*, ebracteate, increasing up to 25 cm. in fruit. Flowers similar to those of the typical subspecies. Siliquae 3–5 × 0·25 cm.

N.W. HIMALAYA. Kashmir: Burzil pass, chowki, 3,600 m., *R. Stewart* 22122 (R!).

The type subspecies is very little known, the only record of it being Hooker's original collection from Sikkim. The subsp. *cachemiricum* appears to be confined to Kashmir and is distinguished by its many-flowered raceme and somewhat short fruits.

Erysimum Melicentae Dunn in Kew Bull. 336 (1920). Schulz in Fedde, Rep. xxxi, 333 (1933).

Syn.: "*E. odoratum*" Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 166 (1861) et Fl. Brit. Ind. i, 154 (1872)—non Ehrh.

E. Parkeri Schulz in Notizbl. Bot. Gart. Berlin, ix, 1083 (1927).

Type: Kashmir, 2,100–2,400 m., *Thomson* (K!).

Key to the varieties

1. Racemes ebracteate:
   2. Biennial; basal leaves 5–10 cm. long . . . var. *Melicentae*
   2. Perennial; basal leaves mostly 10–15 cm. long, narrow, elongated, sinuate-toothed . . . . . var. *Falconerianum*
1. Racemes bracteate . . . . . var. *multibracteatum*

Var. **Melicentae**

GEOG. DIST.: Himalaya (primarily Kashmir).

Var. **Falconerianum** Jafri, **var. nov.**

A typo habitu perenne, foliis valde elongatis, angustis, sinuato-dentatis divergit.

Perennis. Folia radicalia dense rosulata, elongata, linearia, sinuato-dentata, circa 15 cm. longa, acuta, dentibus triangularibus. Caulis simplex. Folia caulina elongata. Flores typo similes. Siliquae maturae ignotae.

N.W. HIMALAYA. Kashmir: without locality, *Falconer's collector* 2147 (Herb. East India Co. 175—holo. K!); 1,500–3,000 m., *Thomson* (K!).

Var. **multibracteatum** Schulz in Notizbl. Bot. Gart. Berlin, ix, 1084 (1927).

Type: Kashmir: Baltistan, *Duthie* 13834 (B—not seen).

Fibigia pendula (Boiss.) Boiss., Fl. Or. i, 260 (1867).

Syn.: *Farsetia pendula* Boiss. in Ann. Sc. Nat. 2 ser. xvii, 90 (1842).

Fibigia membranacea Rech. f. in Phyton, iii, 53 (1951).

Type: Persia (without locality), *Aucher Eloy* 4086 (G, K!).

AFGHANISTAN. Minjan pass, 3,600 m., *Koelz* 12690 (W, US!).

This species is very little known. Boissier (1867) quotes only one specimen—*Aucher Eloy* 4086 from Persia: it is the only specimen present at Kew and is in fruit. The small leaves of this species are very distinct from those of other species of *Fibigia*. Rechinger (1951) regards Koelz's specimen from Afghanistan as a new species, *F. membranacea* Rech. f. The fruits on it are immature, but the habit, small leaves and 1–2-ovuled ovary leave no doubt that it is *F. pendula* Boiss.

Hymenolobus Nuttall in Torr. & Gray, Fl. North America, i, 117 (1838).

Syn.: *Hinterhubera* Reichb. ex Nym., Consp. Fl. Eur. i, 66, (1878).

Hutchinsiella O. E. Schulz in Engler, Bot. Jahrb. lxvi, 92 (1933).

O. E. Schulz (1933) described a new genus, *Hutchinsiella*, with one species, *H. perpusilla* (Hemsl.) Schulz [Syn.: *Hutchinsia perpusilla* Hemsl.]. This closely resembles *Hymenolobus procumbens* (L.) Nutt., even in the number of seeds—in both 6 in each loculus. Schulz regarded it as closely related to *Hutchinsia* R. Br. But a careful study leaves no doubt that Schulz's new genus is congeneric with *Hymenolobus* Nutt. The species is very closely related to *Hymenolobus procumbens* except that it can be distinguished by its short, erect, simply or very sparsely branched habit, few flowered raceme and minute flowers. I have therefore transferred Hemsley's species *Hutchinsia perpusilla* to *Hymenolobus*.

Hymenolobus perpusillus (Hemsley) Jafri, **comb. nov.**

Syn.: *Hutchinsia perpusilla* Hemsley in Hooker, Icon. Pl. xvi, t. 1599 (1887).

Hutchinsiella perpusilla (Hemsl.) O. E. Schulz in Engl. Bot. Jahrb. lxvi, 92 (1933), et in Engl. & Prantl, Pflanzenfam. 2 Aufl. 17B, 446 (1936).

Type: Kashmir, Gilgit, Killa Panja, 2,700 m. *Giles* 115 (K!).

AFGHANISTAN. Wakhan, 2,700 m., *Giles* 102 (K!).

Isatis Stocksii Boiss. Fl. Or. i, 376 (1867).

Syn.: *Pachypterygium macranthum* Rech. f. in Phyton, iii, 48 (1951).

Type: Baluchistan, Doobund (Quetta), *Stocks* 964 (K!).

W. PAKISTAN. Baluchistan: Zarghum, 2,160 m., *Lace* 3792 (photo. K!); Surkab Valley, 1,650 m., *Lace* 3831 (E!); Uam, 2,100 m., *Lace* (E!).

AFGHANISTAN. In bushes near Chokey, *Griffith* 506 (K!); Kabul-Chazni road, 2,250 m., edge of cultivated land, *W. R. Hay* 193 (K!); Pulalam, 2,100 m., flowers yellow, pods flattened and curved, *Koelz* 11866 (W, US!).

Isatis emarginata Kar. et Kir., Enum Pl. Songor. No. 126 in Bull. Soc. Nat. Mosc. xv (1842); Komarov, Fl. U.R.S.S. viii, 207 (1939).

Syn.: *I. violascens* Bunge, Rel. Lehm. 214 (1854) No. 140; Boiss. Fl. Or. i, 376 (1867).

Type: Turkestan, *Karelin et Kirilov* (L, K!).

AFGHANISTAN. Badghis, in the sandy downs of Gulran, *Aitchison* 1013 (K!).

GEOG. DIST.: C. Asia and Persia.

Isatis tinctoria L., Sp. Pl. 670 (1753); Hook. f. & T. And. Fl. Brit. Ind. i, 163 (1872); Komarov, Fl. U.R.S.S. viii, 212 (1939).

Syn.: *I. Koelzii* Rech. f. in Phyton, iii, 46 (1951).

Type: Europe (not precisely designated).

W. PAKISTAN. Chitral: 1,350–1,500 m., *Toppin* 80 (K!); N.W.F.P.: Peshawar, *H. Deane* (K!).

AFGHANISTAN. Cotipore, *Griffith* (K!); Kurrum Valley, very profuse from Kurrum to Seratgah, c. 3,300 m., *Aitchison* 78 (K!), 251 (K!); Daulatshah 2,100 m., *Koelz* 11642 (W!).

GEOG. DIST.: C. and S. Europe; introduced elsewhere.

I. Koelzii Rech. f. is nothing but a form of this variable species with narrow (immature) silicules.

Isatis Harsukhii O. E. Schulz in Notizbl. Bot. Gart. Berlin, ix, 1085 (1927).

Syn.: *Pachypterygium leptoloma* Rech. f. in Phyton, iii, 47 (1951).

Type: Baluchistan (W. Pakistan), Sinkach, *Harsukh* 20464 (B, photo. K!).

AFGHANISTAN. Jalalabad, *Koelz* 11380 (W!).

GEOG. DIST.: Endemic.

Malcolmia Behboudiana Rech. f. et Esfandiari in Phyton, iii, 64 (1951).

Syn.: *M. circinata* Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 155 (1861) nom. illegit.—non *M. circinata* (Bunge) Boiss (1867).

M. Bungei Boiss. var. *glabrescens* Boiss. Fl. Or. i, 226 (1867).

" *M. turkestanica* " Schulz in Notizbl. Bot. Gart. Berlin, ix, 1089 (1927)—non (Regel) Litwin.

M. grandiflora (Bunge) O. Kuntze var. *glabrescens* (Boiss.) Burtt et Lewis in Kew Bull., 1949, 243.

Type: Persia, Luristan, *Behboudi* 109 (W—not seen).

For discussion on the nomenclature see under *M. Boissieriana*.

Malcolmia Boissieriana Jafri, **nom. nov.**

Syn.: *Dontostemon circinatus* Bunge in Arb. Naturf. Verz. Riga, i, no. 99 (1848).

Malcomia circinata (Bunge) Boiss., Fl. Or. i, 227 (1867)—non Hook. fil. et Thoms. in Journ. Linn. Soc. Bot. v, 155 : 1861.

Type: Turkestan, Kisil Kum, *Lehmann* 94 (G—not seen).

AFGHANISTAN. Harirud valley, *Aitchison* 1006 (K!); without locality, *Aitchison* 302 (K!).

GEOG. DIST.: C. Asia.

The name, *Malcolmia circinata* (Bunge) Boiss. hitherto accepted by other authors, is an invalid name due to an earlier homonym, *M. circinata* Hooker f. et Thoms.; it is therefore given a new name here: *Malcolmia Boissieriana.*

Hooker and Thomson quoted *Dontostemon grandiflorus* Bunge as a synonym of their *Malcolmia circinata*, thus invalidating the latter name. Similarly, Boissier cited *D. grandiflorus* Bunge as a synonym of *M. Bungei* Boiss., thus making the name of his own species illegitimate. O. Kuntze made the first valid combination, *M. grandiflora* (Bunge) O. Kuntze. Boissier, however, cited *M. circinata* Hook. f. et Thoms. as a synonym of *M. Bungei* Boiss. var. *glabrescens* Boiss. Burtt & Lewis (Kew Bull. 1949) have discussed this matter thoroughly, and transferred var. *glabrescens* to *Malcolmia grandiflora.*

Recently Rechinger published a new species, *Malcolmia Behboudiana*, from Iran, which is the same as the so-called *M. grandiflora* var. *glabrescens* (Boiss.) Burtt & Lewis. During the present studies it was found that the Central Asian specimens of true *M. grandiflora* are quite distinct from its so-called var. *glabrescens* of W. Pakistan, Afghanistan, Iran, Iraq and Arabia, especially in fruit-shape and leaf characters; there can be no doubt that the taxa represent two distinct species. As *M. circinata* Hook. f. et Thoms. (regarded as a synonym of *M. grandiflora* var. *glabrescens*) is an illegitimate name, I have therefore recognised *M. Behboudiana* Rech. fil. as the valid specific epithet.

Malcolmia cabulica (Boiss.) Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 156 (1861); Boiss., Fl. Or. i, 224 (1867).

Syn.: *Strigosella cabulica* Boiss., Diagn. 2 Ser. i, 22 (1853).

" *M. strigosa* " Hook. f. et T. Anders. in Fl. Brit. Ind. i, 146 (1872)—non Boiss.

M. strigosa var. *macrantha* Schulz in Notizbl. Bot. Gart. Berlin, ix, 1087 (1927).

M. Toppinii Schulz l. c. 1088.

M. Koelzii Rechinger f. in Phyton, iii, 64 (1951).

Type: Afghanistan, Kabul, Pushut, *Griffith* 1542 (G, K!).

W. PAKISTAN. Chitral: Drosh, 1,350 m., *Toppin* 106 (K!). N.W.F.P.: Peshawar, *Vicary* (K!); *H. Deane* (K!); Landikotal, Khyber pass, *Lester-Garland* (K!); Khyber pass, *G. Taylor* (BM!); Dargai, Doa, *Lester-Garland*

(K!); Parachinar, *Barbour* (BM!). Punjab: Hazara to Jhelum, *J. L. Stewart* (K!); Rawalpindi, Topi park, *Pinfold* 24 (BM!); Kohat to Kalabagh, *Schlagintweit* 10734 (BM!); Rawalpindi, Hurroe, *Aitchison* 1010 (K!) and 316 (K!); *H. Rich* 460 (K!); Salt range, *J. L. Stewart* (K!); *Fleming* (K!); Karak, *Drummond* 24105 (K!), 20391 (K!) and 13841 (K!); Shahpur, *Drummond* 20397 (K!), 20393 (K!) and 20395 (K!); Hazara, *Drummond* 20392 (K!); near Hasan Abdal, *R. Stewart* 6949 (R!). Baluchistan: Harnai, 900 m., *Lace* 3670 (K! E!).

AFGHANISTAN. Kabul, Rushut, *Griffith* 1542 (K!); Harirud valley, *Aitchison* 1005 (K!); Tangi Charu, 1,650 m., *W. R. Hay* 49 (K!); Khyber pass, stony nullah, 1,080 m., *H. Johnston* 36 (E! K!). Jagdalek, 2,100 m., dry slope, *W. Koelz* 11484 (W!).

GEOG. DIST. Endemic.

A very polymorphic species.

Microsisymbrium axillare (Hook. f. et Thoms.) Schulz in Pflanzenr. (86), Crucif. Sisymbr. 160 (1924).

Syn.: *Sisymbrium axillare* Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 162 (1861), et Fl. Brit. Ind. i, 149 (1872).

Subsp. **axillare.**

Type: Sikkim (E. Himalaya) *J. D. Hooker* (K!).

Subsp. **brevipedicellatum** Jafri, **subsp. nov.**

A typo racemis in parte superiore ebracteatis, pedicellis multo brevioribus divergit.

Rami inferne prostrati vel suberecti, 2–10 cm. longi, dense hispidi. Racemus fere 10-florus, inferne bracteatus. Flores minuti vix 2 mm. diam., pedicelli circa 1 mm. longi, in fructu circa 3 mm. longi.

N.W. HIMALAYA. Lahul, Keylang, 3,600 m., 8 June 1889, *G. Watt*, 2433 (E!).

Microsisymbrium bracteosum Jafri, **sp. nov.**

Species haec affinis *M. axillari* (Hook. f. et Thoms.) Schulz et *M. flaccido* Schulz: ab hoc foliis majoribus grossius dentatis, racemis circa 15-floris, pedicellis longioribus, floribus majoribus differt; ab illo racemis bracteatis, indumento dense hispido, foliis basalibus spathulatis recedit.

Herba annua, pilis simplicibus et furcatis dense hispida. *Rami* inferne prostrati deinde adscendentes, 10–20 cm. longi, filiformes, teretes, flexuosi, remote foliata. *Folia* basalia et inferiora petiolata, spathulata, haud congesta, 2–4 × 0·8–1·5 cm., obtusa, ad marginem remote 3–5-denticulata; folia superiora sessilia vel subsessilia, obovata vel late elliptica, 1–3 × 0·5–1·5 cm., obtusa, cuneata, remote denticulata; omnia membranacea dense hispida. *Racemus* bracteatus, circa 15-florus. *Flores* circa 5 mm. diam., albi, bracteati, pedicellati; pedicelli 5–10 mm. longi, filiformes, flexuosi. *Sepala* 3·5–4 × 1 mm., erecto-patentia, anguste oblonga, obtusa, hirsuta, subaequalia, lateralia subsaccata. *Petala* 5–6 × 1·7–2 mm., spathulata, alba. *Stamina* 3·5 : 4 mm.; antherae 0·6 mm. longae, ovoideae. *Ovarium* cylindricum, ovulis fere 30; stylus et stigma brevia. *Siliquae* immaturae pedicellis aequilongae, lineares, glabrae.

Distinguished from *M. axillare* (Hook. f. et Thoms.) Schulz by its larger leaves with coarse teeth, racemes with about 15-flowers and larger flowers with long pedicels. It is distinguished from *M. flaccidum* Schulz by its bracteate racemes, densely hispid habit and spathulate basal leaves.

N.W. HIMALAYA. Kumaon, Byans, c. 2,400 m., April 1881, *J. R. Reid* (E!).

Microsisymbrium angustifolium Jafri, **sp. nov.**

Affinis *M. flaccido* Schulz sed indumento densiore e pilis brevibus ramosis composito, foliis caulinis anguste oblongis, lyrato-pinnatipartitis, summis integris vel sinuato-dentatis, sepalis et pedicellis pubescentibus longioribus recedit.

Herba probabiliter annua (pars inferior abest) pilis brevibus ramosis ± vestita. *Rami* filiformes ± erecti. *Folia* caulina petiolata, anguste oblonga, membranacea, inferiora lyrato-pinnatipartita, 2·5–4×0·2–0·4 cm., lobo terminali circa 1 cm. longo, obovato-oblongo vel elliptico, obtuso, ad marginem remote 2-denticulato, lobis lateralibus oblongis, integris vel subintegris, 2–5×1–2 mm.; summa 1–2 sinuato-dentata vel integra, obtusa vel acuta, 1–2×0·1–0·2 cm. *Racemus* ebracteatus, circa 10-florus, laxissimus. *Flores* circa 4 mm. diam., roseo-lilacini vel albi, longe pedicellati; pedicelli 6–12 mm. longi, filiformes, flexuosi. *Sepala* 3–3·2×0·8–1 mm., erecto-patentia, anguste oblonga, obtusa, pubescentia subaequalia, lateralia subsaccata. *Petala* 5–6×1·2–1·8 mm., oblongo-obovata, roseo-lilacina vel alba. *Stamina* 3 : 4 mm. longa; antherae 0·8 mm. longae, ovoideae. *Ovarium* cylindricum, ovulis circa 30; stylus et stigma brevia. *Siliquae* (immaturae) circa 22×0·6 mm., lineares, glabrae, pedicellis 17–19 mm. longis suffultae; pedicelli et siliquae saepe curvata.

W. PAKISTAN. N.W.F.P.: Kamshilman, 510 m., 18 Feb. 1889, *G. Watt* 4730 (E!).

Moriera Boiss. in Ann. Sc. Nat. 2 Ser. xvi, 380 (1841) et xvii, 182 (1842) et Fl. Or. i, 338 (1867); Schulz in Engl. & Prantl, Pflanzenfam. 2 Aufl. 17B, 439 (1936).
Syn.: *Aethionema* sect. *Moriera* (Boiss.) N. Busch in Komarov, Fl. U.R.S.S. viii, 577 (1939).

Moriera Boiss. is very closely allied to *Aethionema* R. Br., and is primarily distinguished from the latter by its characteristic bushy and subaphyllous habit and by its white, membranous, indehiscent silicules. Busch reduced *Moriera* to the status of a section of *Aethionema*. In the present area only one species of each of these genera occur, and the two species, *Moriera spinosa* and *Aethionema carneum*, are so distinct from each other that their inclusion under one genus is impossible. *Aethionema* is primarily a genus of the wide Mediterranean region with about 40 species, but only one species of it, *A. carneum* (Soland.) Fedtsch., extends up to the present area. This species has dehiscent fruits with rigid (not white) valves and leafy branches, very distinct from *Moriera spinosa* Boiss. subsp. *cabulica* (Boiss.) Jafri of the present area. I have, therefore, followed Boissier (1867), Bentham and Hooker (1862) and O. E. Schultz (1936) in keeping *Moriera* as generically distinct from *Aethionema*.

Boissier, as well as Schulz, recognises *M. spinosa* Boiss. and *M. cabulica* Boiss. as distinct species. Boissier quotes only two specimens under each taxon, and distinguishes the latter species from the former by its slightly larger fruits. The following specimens seen at Kew and quoted by Boissier under the two species show the following fruit measurements:

M. spinosa Boiss.

1. Persia, Ispahan, *Aucher Eloy* 347 and 4149 (K!): siliculae:—4–4·2× 3·8–4 mm.

M. cabulica Boiss.:

1. Persia, Schahrud, *Bunge* (K!): siliculae:—4·5–5×4·2–5 mm.
2. Afghanistan, Cabul, *Griffith*: siliculae:—(5·5) 6–6·5×6–6·5 (–7) mm.

As a matter of fact, we do not know the exact range of silicule size due to the lack of enough herbarium specimens. They might prove to be one race when we know more about them, but under the present circumstances the Afghanistan plants definitely have slightly larger fruits than the Persian plants. I have, therefore, preferred to transfer Bunge's specimen from Persia, included under *M. cabulica* by Boissier, to *M. spinosa* and to recognise Griffith's plants from Afghanistan as representing a subspecies (*cabulica* (Boiss.) Jafri) of *M. spinosa* Boiss.

Thus, so far as we know, *M. spinosa* subsp. *spinosa* is confined to Persia and Central Asia, while subspecies *cabulica* is endemic to Afghanistan.

Moriera spinosa Boiss. in Ann. Sc. Nat. 2 ser. xvii, 182 (1842); Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 178 (1861), excl. syn; Boiss. Fl. Or. i, 338 (1867).

Syn.: *Aethionema spinosum* (Boiss.) N. Busch in Komarov, Fl. U.R.S.S. viii, 557 (1939).

Subsp. **spinosa.**

Type: Persia, Ispahan, *Aucher Eloy* 347 (G, K!).

Perennial 15–20 tall, erect, very branched with short, forked, zigzag, sharp-tipped, subaphyllous branches, glabrous, glaucous; rootstock 4–8 mm. thick, woody. Leaves caducous, linear, fleshy, obtuse, 1–3×0·1–0·2 cm., ± entire. Racemes 10–15-flowered, lax, ebracteate, increasing up to 4 cm. in fruit. Flowers, 4–5 mm. across, white; pedicels 1–1·5 mm. long, filiform, glabrous not increasing in fruit. Petals 4–5×1–1·2 mm., oblong-cuneate, apex rounded. Stamens about 1·8 : 2 mm.; anthers about 0·5 mm. Siliculae orbicular, 4–5×3·8–5 mm., wings about as broad as the width of the loculus, loculus wall prominently 1-veined; seed usually one, about 1·5×0·7 mm. oblong-ovate, brown.

GEOG. DIST.: Persia and C. Asia.

Subsp. **cabulica** (Boiss.) Jafri, **stat. et comb. nov.**

Syn.: *Moriera cabulica* Boiss., Diagn. 2 ser. i, 41 (1853) et Fl. Or. i, 339 (1867) excl. Persian plant.

Type: Afghanistan, Erak, Kohi Baba, 4,050–4,350 m., *Griffith* (G, K!).

Perennial, 18–30 cm., tall, comparatively more robust than the type race but habit ± similar. Siliculae larger, 5·5–6·5 × 6–7 mm., wing broader than the width of the loculus. Other characters more or less as in the subsp. *spinosa*.

Known from the type locality only.

Parrya stenocarpa Kar. et Kir. in Bull. Soc. Nat. Mosc. xv, 147 (1842); Komarov, Fl. U.R.S.S. viii, 265 (1939).

Subsp. **stenocarpa**.

Type: C. Asia, Baskhan and Sarchan, *Karelin & Kirilov* 1197 (L, K!).

GEOG. DIST.: C. Asia.

Subsp. **gilgitica** Jafri, **subsp. nov.**

A typo lobo terminali foliorum valde elongato anguste lanceolato multo longiore, lobis lateralibus variantibus brevibus divergit.

Folia radicalia elongata; pinnatifida vel pinnatipartita, rarius integra vel pinnatisecta, dense hispida, lobo terminali multo longiore lanceolato saepe 2–3 × 0·2–0·3 cm., lobis lateralibus brevibus 2–6 × 2–4 mm. plus minusve triangulari. *Racemus* 3–6-florus. *Siliquae* (submaturae) circa 9 × 0·2 cm., lineares, subtorulosae, compressae, acutae, saepe curvatae.

N.W. HIMALAYA. Kashmir: Gilgit, Tin pass, 3,600–4,200 m., 12 July 1886, *Giles* 476 (holo. K!); without locality, *Giles* (E!).

Parrya chitralensis Jafri, **sp. nov.**

Affinis *P. stenocarpae* Kar. et Kir. sed habitu glabro, foliis radicalibus non congestis pinnatisectis 5–7-jugatis, lobis omnibus ± aequalibus, anguste oblongis, ellipticis vel lanceolatis, scapo glabro in racemum 3–4-florum brevissimum protracto differt.

Herba perennis, glabra; radix 4–5 mm. crassus, lignaceus. *Folia* radicalia rosulata pauca, non congesta, 3–7 × 1–1·6 cm., pinnatisecta, 5–7-jugata, lamina petiolo duplo longior; lobus terminalis brevis, 5–10 × 1·5–5 mm., acutus, lobis lateralibus 4–10 × 1–2·5 mm., omnibus anguste ellipticis, oblongis vel lanceolatis, integris. *Scapus* 7–18 cm. altus, erectus, glaber, racemo 3–4-floro brevissimo terminatus. *Flores* circa 7 mm. diam., pallide lilacini vel albi. *Pedicelli* 1–3 mm. longi, ± erecti, glabri, in fructu elongati. *Sepala* 7–10 × 2–3 mm. oblonga, erecta, obtusa, glabra, ad marginem alba, interiora basi saccata. *Petala* 15–18 × 3–5 mm., spathulata, longe unguiculata, apice subemarginata. *Stamina* 7–9 : 9–10 mm. longa; antherae circa 3 mm. longae, lineari-oblongae, basi auriculatae, subobtusae vel vix apiculatae. *Stylus* circa 2 mm. longus; stigma bilobatum conicum decurrens. *Siliquae ignotae*.

W. PAKISTAN. Chitral, 3,300 m., 3 June 1895, *S. A. Harriss* 15910 (holo. K!); Shajanali, 3,150–3,300 m., *Toppin* 375 (K!).

Distinguished from *P. stenocarpa* Kar. et Kir. by its glabrous habit; radical leaves few, not congested, pinnatisect, 5–7-jugate, with all the lobes short, almost equal in size and shape, elliptic, oblong or lanceolate; racemes few-flowered with flowers confined to the apex only.

Sisymbrium Loeselii L., Cent. Pl. 18 (1755); Hook. f. et T. And., Fl. Brit. Ind. i, 151 (1872); Schulz in Pflanzenr. (86), Crucif. Sisymbr. 94 (1924).

Syn.: *Sisymbrium decipiens* Bunge, Del. Sem. Hort. Dorpat. in Linnaea xviii, 505 (1844); Schulz in Pflanzenr. (86), Crucif. Sisymbr. 87 (1924).

In my opinion *S. decipiens* Bunge is nothing but a form of *S. Loeselii* L. It was primarily distinguished by its glaucous habit and shorter fruits, but these characters do not hold good. Schulz quotes three specimens under *S. decipiens*, of which two are from Kashmir. I have seen Falconer's specimen (Herb. East Ind. Co. 160—K!) from Kashmir included under this species by Schulz, and I have not the least doubt that it is *S. Loeselii*.

Sisymbrium pakistanicum Jafri, **sp. nov.** [sect. *Pachypodium* (Webb et Berth.) Fourn.].

Affinis *S. rigidulo* Decne. sed habitu sparsim hispido superne ± glabro, foliis profunde pinnatifidis vel pinnatipartitis paucis lobatis, lobis obovatis 3-lobulatis, floribus majoribus pallide lilacinis, pedicellis in fructu saepe longis multo angustioribus valde patentibus, siliquis brevioribus acutioribus saepe recurvatis, stylo et stigmate brevibus, septo tenuiter membranaceo differt.

Herba annua, 5–10 (–30) cm. alta. *Caules* ascendentes vel suberecti, ramosi, saepe tortuosi, sparse hispidi vel interdum superne ± glabri, pilis simplicibus vel furcatis sparse obsiti. *Rami* filiformes 0·7–1·5 mm. crassi, paucifoliati, interdum basi florentes. *Folia* inferiora profunde pinnatifida vel pinnatipartita, 3–5-jugata, 1·5–5×0·5–2 cm., sparse hispida, lamina petiolo 2–4-plo longiore, lobis obovatis vel oblongis 3-lobulatis obtusis vel rotundatis, lateralibus ascendentibus; folia superiora subglabra vel glabra. *Racemus* 10–20-florus ebracteatus, laxissimus, in fructu circa 10 cm. longus. *Flores* majusculi 8–15 mm. diam., pallide lilacini. *Pedicelli* 4–12 mm. longi, filiformes, glabri, saepe flexuosi, in fructu crassiusculi patentes saepe recurvati. *Sepala* 5–8×2–2·4 mm. oblonga, inaequalia, interiora latiuscula subsaccata ad apicem vix cornuta. *Petala* 10–15×3–6 mm. late obovata, apice subtruncata, unguiculata. *Stamina* 8–9 : 9–10 mm. longa; antherae 2·5 mm. longae, lineares subobtusae. *Ovarium* stipitiforme, glabrum, 40–60-ovulatum. *Siliquae* 3–3·5 (–5·5)×0·1–0·12 cm., lineares, angustatae, acutae, saepe curvatae, glabrae; valvae ± 3-nerviae; stylus brevis, circa 1 mm. longus, incrassatus; stigma tenue, retusum et depressum. *Semina* 40–60, circa 1×0·5 mm. oblonga brunnea, haud mucilaginosa; septum membranaceum non septulatum.

Syn.: "*S. rigidulum*" Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 158 (1861)—non Decaisne.

S. septulatum prol. *rigidulum* O. E. Schulz in Pflanzenr. (86), Crucif. Sisymbr. 121 (1924), partim.

W. PAKISTAN. N.W.F.P.: Peshwar, *H. Deane* (holo. K!); Khyber hills, *Vicary* (K!); without locality, *J. L. Stewart* (K!); Khyber pass, *M. Nath* 15454 (R!); Hazara, *Hassanud Din* 153 (R!).

Smelowskia C. A. Mey. in Ledeb., Fl. Alt. iii, 165 (1831); Schulz in Pflanzenr. (86), Crucif. Sisymbr. 352 (1924).

Syn.: *Chrysanthemopsis* Rech. f. in Phyton, iii, 51 (1951).

Recently Rechinger (1951) described a new genus, *Chrysanthemopsis* from Afghanistan, with one species, *C. Koelzii*. He included his new genus under the subtribe *Capsellineae* of the tribe *Lepidieae* in the system given by O. E. Schulz (in Pflanzenfam. 17b : 1936). Rechinger's new genus, *Chrysanthemopsis*, is congeneric with *Smelowskia* C. A. Mey, and his new species *C. Koelzii* is conspecific with *S. calycina* (Willd.) C. A. Mey.

Rechinger, apparently relying only on Schulz's classification (1936) and not finding anything like his new genus and species under *Lepidieae* (and considering the immature siliculae like those in *Hutchinsia*), described it as a new genus under the group, *Lepidieae-Capsellineae*. Desvaux (1814) made a similar mistake when he transferred Willdenow's *Lepidium calycinum* to *Hutchinsia* (see the synonyms given under the species, *Smelowskia calycina*). This is primarily due to the superficial resemblance of the siliculae of *Smelowskia* to those of *Hutchinsia* and several other genera of the *Lepidieae*. But careful observation reveals that *Smelowskia* is closely allied to genera like *Sophiopsis* of the tribe *Sisymbrieae*, primarily in its yellow flowers and nectariferous glands character; and Schulz (1924) has correctly transferred it to *Sisymbrieae*.

Smelowskia calycina (Willd.) C. A. Mey in Ledeb., Fl. Alt. iii, 170 (1831).

Syn.: *Lepidium calycinum* Steph. ex Willd., Sp. Pl. iii, 433 (1800).

Hutchinsia calycina (Willd.) Desv. in Journ. Bot. iii (4), 168 (1814); DC., Prodr. i, 178 (1824).

Hutchinsia pectinata Bunge in Ledeb., Fl. Ross., i, 210 (1842).

Chrysanthemopsis Koelzii Rech. f. in Phyton, iii, 51 (1951).

Smelowskia Koelzii (Rech. f.) Rech. f. in Öst. Akad. Wissensch. 1954, No. 7, 6 (1954).

Type: C. Asia, Altai, *Willdenow*? (B—not seen).

AFGHANISTAN. Minjan pass, 3,900 m., *W. Koelz* 12767 (US!—isotype of *S. Koelzii*).

N.W. HIMALAYA. Gilgit, Dorah pass, 3,900 m., *Giles* A 201 (K!); North of Chitral, Dorah pass, 4,200–4,500 m., *Davidson* (K!).

GEOG. DIST.: C. Asia.

Spirorrhynchus sabulosus Kar. et Kir. in Bull. Soc. Nat. Mosc. xv, 159 (1842).

Syn.: *Anguillicarpus Bulleri* Burkill in Proc. Asiat. Soc. Bengal, iii (8), 559 (1907).

Spirorrhynchus Bulleri (Burkill) O. E. Schulz in Engl. Bot. Jahrb. lxvi, 98 (1933).

Type: C. Asia: Soongaria, *Karelin et Kirilov* 1262 (L, K!).

W. PAKISTAN. Baluchistan: Kharan, Quetta, *R. Hughes-Buller* 23193 (Herb. Calcutta—not seen).

GEOG. DIST.: Persia and Trans-Caspian region.

This species is very variable in the shape and size of the apical and basal processes of the fruit. But careful study reveals that these variations all belong to a single species, *S. sabulosus* Kar. et Kir.

Burkill (1907) described a new genus, *Anguillicarpus*, from Baluchistan with one species, *A. Bulleri* Burkill. He distinguished it from *Spirorrhynchus* by its bisaccate sepals, presence of nectariferous glands, 6 stamens with free filaments and larger fruits. Schulz (1933) regarded this genus as congeneric with *Spirorrhynchus* and transferred Burkill's species to the latter, making a new combination, *S. Bulleri* (Burkill) Schulz.

Study of the several specimens shows that all the distinguishing characters mentioned for *S. Bulleri* by the above authors disintegrate: we find all these characters even on the same plant of *S. sabulosus* (*P. Sintenis* 166 (K!) from Trans-Caspian region)—free to connate filaments, small to large fruits.

Tetracme pamirica Vass. in Komarov Fl. U.R.S.S. vii, 648 (1939) et viii, 300, t. xix, fig. 5 (1939).

Syn.: *T. appressa* Rech. f. in Phyton, iii, 60 (1951).

Type: W. Pamir, between Kazidich and Schambedah, 2,200 m., *Alexeenko* 3432 (L—not seen).

AFGHANISTAN. Shibar pass, dry slope, 3,000 m., *Koelz* 12156 (W!).

N.W. HIMALAYA. Kashmir: Burzi La, 3,600 m., *Clarke* 29884A (K!), 29884D (BM!).

Distinguished from *T. quadricornis* (Steph.) Bunge by its tall, flexuose flowering axis, erect, straight siliquae covered with short stellate hairs only (not heterotrichous).

Thlaspi septigerum (Bunge) Jafri, **comb. nov.**

Syn.: *Eutrema septigerum* Bunge, Verzeichn. Pfl. Ostl. Altai, 73 (1836); O. E. Schulz in Notizbl. Bot. Gart. Berlin, ix, 1084 (1927).

Type: C. Asia, Altai, Bunge (L, K!).

N.W. HIMALAYA. Kashmir: Burzil pass, *Duthie* 14030 (B—not seen); Thalle La, Baltistan, 4,500–4,600 m., *R. R. Stewart* 20756 (R!) (with *Arabidopsis mollissima*).

Thlaspi cochleariforme DC., Syst. ii, 381 (1821) et Prodr. i, 176 (1824).

Syn.: "*Th. alpestre*" Hook. f. et Thoms. in Journ. Linn. Soc. Bot. v, 177 (1861) et Fl. Brit. Ind. i, 162 (1872), partim—non L.; Wendelbo in Nytt Mag. Bot. 32 (1952).

Subsp. **cochleariforme.**

Type: N. Asia, Siberia, Dahuria, *Potanin* (? G—not seen).

GEOG. DIST.: C. Asia, Himalaya and W. Pakistan.

Subsp. **Griffithianum** (Boiss.) Jafri, **stat. et comb. nov.**

Syn.: *Carpoceras Griffithianum* Boiss., Diagn. 2 Ser. i, 40 (1853).

Thlaspi Griffithianum (Boiss.) Boiss., Fl. Or. i, 329 (1867).

"*Th. alpestre*" Hook. f. et Thoms. in Fl. Brit. Ind. 162 (1872), partim—non L.

Type: Afghanistan, Kabul, Bharowul, *Griffith* (G, K!).

Torularia humilis (C. A. Mey.) O. E. Schulz in Fedde, Rep. Sp. Nov. Beihefte xii, 390 (1922) et Pflanzenr. (86), Crucif. Sisymbr. 223 (1924).

Syn.: *Sisymbrium humile* C. A. Mey. in Ledeb., Ic. Pl. Ross. ii, 16, t. 147 (1830); Hook. f. et T. And., Fl. Brit. Ind. i, 148 (1872).

Var. **humilis.**

Type: Altai, *Ledebour* (L, K!).

AFGHANISTAN. Wakhan, 2,850 m., *Giles* 79 (K!).

N.W. HIMALAYAS. Lahul, 2,700 m., *H. Jaeschke* (K!); Kumaon, Pelang gadh, 3,300–3,600 m., *Duthie* 5349 (K!). Kashmir: Ladak, Saleti, 3,900 m., *Koelz* 2512 (K!); Gilgit, *Giles* (E!); Rupshu, 4,500 m., along stream, *Koelz* 8889 (K!); Ladak, *Thomson* (K!); *J. L. Stewart* (K!).

GEOG. DIST.: C. and N. Asia, N. America and China.

Var. **Piasezkii** (Maxim.) Jafri, **comb. nov.**

Syn.: *Arabis Piasezkii* Maxim., Melang. Biol. x, 567 (1880).

Sisymbrium humile C. A. Mey. var. *Piasezkii* (Maxim.) Maxim. Enum. Pl. Mongol. 62 (1889).

Torularia humilis prol. *Piasezkii* (Maxim.) Schulz in Pflanzenr. (86), Crucif. Sisymb. 226 (1924).

Type: Mongolia, *Piasezk* (L—not seen).

Plants very densely branched from the base. Leaves minute, 3–12 × 1–2·5 mm., linear, entire or dentate. Siliquae short, 8–13 × 1 mm., slightly curved towards the apex.

W. PAKISTAN. N.W.F.P.: Hazara, Kaghan valley, *Inayat* 19198 (B—not seen).

N.W. HIMALAYAS. Kashmir: Baltistan, *Winterbottom* 874 (K!); Rupshu, 4,650 m., *Koelz* 2185 (R!).

GEOG. DIST.: Tibet, China.