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The Caryophyllaceæ of Tibet. By FREDERIC N. WILLIAMS, F.L.S.

BOTANISKA
MUSEET
UPPSALA

The CARYOPHYLLACEÆ of Tibet. By FREDERIC N. WILLIAMS, F.L.S.

[Read 4th June, 1908.]

THE plants collected in the course of the Military Expedition to Lhasa in 1903-4, undertaken by the Indian Government, in relation to the Tibet Frontier Commission, were stored in the Calcutta Herbarium. It was the intention of Col. Prain to issue a Report, which should include an account of the plants collected on the Expedition together with other small parcels of Tibetan plants which had been sent during the previous 20 years to the Calcutta Herbarium and had lain there unexamined. On Col. Prain leaving Calcutta to take up his duties at Kew this idea was abandoned, and those who had undertaken to examine the material of different families were accorded permission to publish the results of their determinations through some other source.

Mr. W. B. Hemsley's 'Flora of Tibet' was published in April 1902, in this Journal (vol. xxxv.), and therefore included none of the material mentioned above. Mr. Hemsley therein enumerates 11 species of Caryophyllaceæ. The reason for offering the present paper for publication is that, after examination of the further material available, the number of species of Caryophyllaceæ is increased to 43. The limits of Tibet as defined by Mr. Hemsley in his 'Flora' are strictly adhered to: otherwise further additions to the Himalayan Flora would have been included, on the confines of Tibet, but politically within the area of Sikkim and Kashmir. Mr. Hemsley has elsewhere pointed out the misapplication of the name of "West Tibet" to a province of Kashmir.

LIST OF SPECIES.

Subfam. *Alsiniaceæ*.

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|---|---|
| 1. <i>Stellaria subumbellata</i> , <i>Edgew.</i> | 16. <i>Arenaria melandryiformis</i> , sp. n. |
| 2. <i>S. gyangtsensis</i> , sp. n. | 17. <i>A. melandryoides</i> , <i>Edgew.</i> |
| 3. <i>S. dianthifolia</i> , sp. n. | 18. <i>A. acicularis</i> , sp. n. |
| 4. <i>S. graminea</i> , <i>Linn.</i> | 19. <i>A. ischnophylla</i> , sp. n. |
| 5. <i>S. lanata</i> , <i>Hook. f.</i> | 20. <i>A. monticola</i> , <i>Edgew.</i> |
| 6. <i>S. Cherleriaë</i> , <i>Williams.</i> | 21. <i>A. kansuensis</i> , <i>Maxim.</i> |
| 7. <i>S. arenaria</i> , <i>Maxim.</i> | 22. <i>A. monantha</i> , sp. n. |
| 8. <i>Krascheninnikowia himalaïca</i> ,
<i>Korshinsky.</i> | 23. <i>A. polytrichoides</i> , <i>Edgew.</i> |
| 9. <i>Cerastium pumilum</i> , <i>Curtis.</i> | 24. <i>A. pulvinata</i> , <i>Edgew.</i> |
| 10. <i>Alsine Roylei</i> , <i>Fenzl.</i> | 25. <i>A. densissima</i> , <i>Edgew.</i> |
| 11. <i>Arenaria orbiculata</i> , <i>Edgew.</i> | 26. <i>A. glanduligera</i> , <i>Edgew.</i> |
| 12. <i>A. monosperma</i> , sp. n. | 27. <i>A. yunnanensis</i> , <i>Franch.</i> |
| 13. <i>A. ciliolata</i> , <i>Edgew.</i> | 28. <i>A. cerastiiformis</i> , sp. n. |
| 14. <i>A. Stracheyi</i> , <i>Edgew.</i> | 29. <i>Gooringia Littledalei</i> , <i>Williams.</i> |
| 15. <i>A. ramellata</i> , sp. n. | 30. <i>Thylacospermum rupifragum</i> ,
<i>Schrenk.</i> |

Subfam. *Silenineae*.

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|---|---|
| 31. <i>Silene cæspitella</i> , sp. n. | 38. <i>Melandryum apetalum</i> , Fenzl. |
| 32. <i>S. adenocalyx</i> , sp. n. | 39. <i>M. indicum</i> , Walp. |
| 33. <i>S. suberetacea</i> , sp. n. | 40. <i>M. jugorum</i> , sp. n. |
| 34. <i>S. Mooreroftiana</i> , Rohrb. | 41. <i>M. lhassanum</i> , sp. n. |
| 35. <i>S. Waltoni</i> , sp. n. | 42. <i>M. viscidulum</i> , comb. n. |
| 36. <i>Hedona ischnopetala</i> , sp. n. | 43. <i>Gypsophila cerastioides</i> , |
| 37. <i>Melandryum nigrescens</i> , comb. n. | <i>D. Don.</i> |

1. *STELLARIA SUBUMBELLATA*, Edgew.

Khamba Fort, 1903 (*Col. Younghusband*, n. 268 ; *Col. Prain*, n. 1150 *).
Gooring Valley, 1895, at 5030 m. (*Littledale*).

2. *STELLARIA GYANGTSENSIS*, sp. n. (Subg. *Eustellaria*, sect. *Stellaria* propria.)

Squarrosula, divaricata, viridis, glabra. Caules angulati tenues ramosi ; rami teretes foliosi superne scabride puberuli. Folia 9–11 mm., sessilia anguste linearia acuminata uninervia. Flores divaricato-cymosi ; pedicelli flore sesqui-duplo longiores. Bracteæ lanceolatae parvæ purpureo-scariosæ. Sepala lanceolata acuminata uninervia anguste scarioso-marginata. Petala bipartita, calycem æquantia vel eo paullo longiora. Stamina distincte perigyna. Capsula obovato-globosa. Semina brunnea magna arcte seriatim papilloso-granulata subrotundo-reniformia.

Gyangtse, 1904 (*Capt. Walton*, n. 41, n. 1120).

A plant much resembling *S. uda* in the arrangement of the flowers and form of the leaves.

3. *STELLARIA DIANTHIFOLIA*, sp. n. (Subg. *Eustellaria*, sect. *Stellaria* propria.)

Glauco-virens, glabra vel parce puberula. Caules angulati tenues simplices, superne in dichasium soluti. Folia 10–16 mm., elongato-linearia acuminata uninervia, subtus breviter puberula, basin versus margine ciliolata. Flores in dichasium laxum terminale haud foliatum dispositi, longe pedicellati. Pedicelli 12–14 mm., basi etiam ad medium bibracteati ; bracteæ lineares acuminatæ parvæ scariosæ. Dichasium 6–9-florum. Sepala lanceolato-linearia acuminata trinervia anguste scarioso-marginata. Petala profunde bipartita, calyce breviora, lobis angustis. Stamina distincte perigyna. Capsula oblonga. Semina parva ($\frac{1}{4}$ eorum præcedentis), brunnea ruguloso-granulata compresso-subauriformia.

Tibet, without locality, 1884 (*King's collector*, n. 366).

4. *STELLARIA GRAMINEA*, Linn.

Forma nana, foliis brevioribus minus acutis.

* The numbers from 1098 to 1218 are not collector's numbers, but numbers given in the Kew Herbarium.

Lungyung and Tisum, at 4570 m., 1848 (*Strachey & Winterbottom*).
Khamba Fort, 1903 (*Col. Younghusband*, n. 1121).

The Tibetan plant is a high alpine dwarf form distinct in the much shorter and less pointed leaves, and in being more compact in habit.

5. *STELLARIA LANATA*, *Hook. f.*

Redong-Oong, near Chumbi, 1878 (*Dungboo*, n. 1131). Bang Chin, a mountain west of Chumbi, 1882 (*King's collector*, n. 1130).

6. *STELLARIA CHERLERIÆ*, *Williams*, in *Bull. Herb. Boiss. sér. 2, vii.* (1907) 830.

Central Tibet : Gooring Valley, at 5030 m. (*Littledale*, 1895).

Var. UNIFLORA, *Williams*, in *Bull. Herb. Boiss. sér. 2, vii.* (1907) 832.

N. Tibet (*Przewalski*, 1884). Central Tibet : Gooring Valley, at 5030 m. (*Littledale*, 1895) ; between camps 26-27 (*Sven Hedin*, 14 Sept. 1896), E. Tibet : Tangut (*Przewalski*, 1884). S. Tibet : Chumbi (*King's collector*, 1882, n. 1168 ; *C. H. Bell*, 1904, Tibet Frontier Commission, n. 1154) ; Phari (*Dungboo*, 1877, n. 4594).

Var. FASCICULATA, *Williams*, in *Bull. Herb. Boiss. sér. 2, vii.* (1907) 833.

N. Tibet (*Przewalski*, 1884) : Yatung, lat. 27° 51', long. 88° 35' (*H. E. Hobson*, 1897). S. Tibet (*King's collector*, 1882, n. 1167) : Za-ne-gang, between Chumbi Fort and Cho Pass (*King*, 1882, n. 1208) ; Put-lo, in the Chumbi district (*King's collector*, 1884, n. 21).

7. *STELLARIA ARENARIA*, *Maxim. Fl. Tangutica*, p. 91, t. 29, fig. 18 (1889).

Tangut (*Przewalski*, 1884 ; type-specimens in Herb. Petropolit.).

8. *KRASCHENINNIKOWIA HIMALAÏCA*, *Korshinsky*, in *Bull. Acad. Pétersb.* 1898, p. 40.

Syn.—*Stellaria Davidi*, var. *himalaïca*, *Franch.*, *Pl. Delavay.* i. p. 100 ; *Stellaria bulbosa*, *Hook. f.*, *Fl. Brit. Ind.* i. p. 231, non *Wulf.* ; *Krascheninnikowia rupestris*, *auct., non Turcz.*

Tibet : on the Bhutan frontier, at Ga-leng-kya, 1882 (*King's collector*, n. 1136), and on the Pay-Goong Pass in the Chumbi district, 1884 (*King's collector*, n. 447).

Korshinsky has re-established and defined this genus on a satisfactory basis, and clearly distinguishes the 9 species which are now included in it.

9. *CERASTIUM PUMILUM*, *Curtis.*

Tibet, without locality, 1884 (*King's collector*, "Fl. of Thibet, n. 344") ; valley around Chumbi, 1904 (*E. H. Walsh*, n. 18).

Var. ALPESTRE, *Williams*, *comb. nov.*

Phari, 1877 (*King*, "Fl. of Thibet Himalaya," n. 4583)

Syn.—*Cerastium glutinosum*, var. *alpestre*, Willk. & Lange, Prodr. Fl. Hisp. iii. p. 633.

The Tibetan specimens of the type agree exactly with specimens of *C. pumilum* in Herb. Kew. from both N. Persia and Yunnan.

The Phari plant agrees exactly with Willkomm's *Pl. Hisp. exs.* 1850, n. 298,—“*pumilum, densissime pubescens valdeque viscosum, cymis condensatis, floribus breviter pedicellatis.*” This is Willkomm's Latin translation of the original description in Loscos & Pardo's “*Serie imperfecta de las Plantas Aragonesas espontaneas, particularmente de las que habitan en la parte meridional,*” p. 19 (1862).

10. ALSINE ROYLEI, *Fenzl* ex Hook. f., Fl. Brit. Ind. i. p. 236.
Phari, 1879 (*Dungboo*, n. 1144).

11. ARENARIA ORBICULATA, *Edgew.*
Do-ree-Chu, in the Chumbi district, 1884 (*King's collector*, n. 555).

12. ARENARIA MONOSPERMA, sp. n. (Subg. *Euarenaria*, sect. *Euthaliæ*.)
Perennis, foliosa, caespitosa, humilis, 10–13 cm. Caules teretes tenelli geniculati ramosi, inferne purpurascens, ramis et geniculis interdum scabridis, ceterum glabri. Folia plerumque 9–10 mm., linearia acuminata uninervia patentia subsquarrosa, juniora nitescens. Flores axillares solitarii, et terminales cymosi, ramulis cymuliferis laxè dichasiiformibus; pedicelli flore longiores. Calyx 4 mm., basi haud truncatus; sepala lanceolata acuminata uninervia papilloso-punctata, margine lævia paullo incrassata haud scariosa. Petala alba obovato-linearia, calyce breviora. Ovula pauca. Capsula valvis 6 dehiscens, monosperma. Semen solitarium magnum auriformi-globosum fulvo-brunneum undique granulato-tuberculatum.

Closely allied to *A. tenella*, Duthie. Each fully matured fruit contains a single large seed almost completely filling the capsule.

Tibet, without locality, 1882 (*King's collector*, n. 1119).

13. ARENARIA CILIOLATA, *Edgew.*
Chumbi district, 1884 (*King's collector*); at Pun-ka-bee-see-mo (*King's collector*, “Fl. of Chumbi,” n. 25), at Ka-poop (*King's collector*, “Fl. of Chumbi,” n. 142); Tibet frontier, 1904 (*C. H. Bell*).

14. ARENARIA STRACHEYI, *Edgew.*
Chumbi district: Pan-Thung-lo, 1879 (*Dungboo*, n. 1137), Tab Trong, 1879 (*Dungboo*, n. 1148), Sy-am-poo, 1884 (*King's collector*, n. 130), and without locality, 1884 (*King's collector*, “Fl. of Thibet,” n. 315). Rakas Tal, 1848, at 4730 m. (*Strachey & Winterbottom*). W. Tibet: on broken granite, 1896, at 5125 m. (*Deasy & Pike*, n. 876).

What is intended by the “*Arenaria Stracheyi*” of the Fl. of British India

is somewhat obscure. The material (fragmentary scraps on a single sheet) is so scrappy that the vague description given by no means identifies the "type-specimens." The description seems to indicate a plant quite glabrous, with short stems and solitary flowers, and leaves thickened though not exactly fleshy, and narrower in proportion than those of other species in the section *Sikkimenses*; and more resembling the Persian *A. bulica* rather than any Himalayan species. It is certainly doubtful whether the specimens here referred to *A. Stracheyi* really belong to this species, but they resemble the plant more than they do any of the other specimens of *Arenaria* in the Kew Herbarium; and *A. Stracheyi* is recorded for Tibet.

15. *ARENARIA RAMELLATA*, sp. n. (Subg. *Euarenaria*, sect. *Sikkimenses*.)

Nana, glabra. Caules 4-6 cm., divaricato-adscendentes ramosi, ramis divergentibus, foliosi. Folia 8-9 mm., usque ad flores numerosa, lanceolata acuta sessilia firma plana, nervis obscuris, basin versus attenuata, et ibidem interdum margine ciliata, ceterum glabra; folia pedicellaria haud bractei-formia sed aliis consimilia. Flores ad ramos laxè cymosos solitarii, pedicellis longiores. Calyx campanulatus, basi attenuatus; sepala lanceolata acuminata, apice recurva, anguste membranaceo-marginata. Petala alba obovata, calyce sesquilongiora, apice rotundata, basi vix unguiculata.

Karoo-la, 15 miles from Lhasa, 1878 (*Dungboo*, n. 1158).

Very near *A. Stracheyi*, but differing both from the type-specimens and also from Edgeworth's description. Readily distinguished from the next species, to which it is closely allied.

16. *ARENARIA MELANDRYIFORMIS*, sp. n. (Ejusdem sect.)

A specie sequente diversa: caules altiores, 10-15 cm., magis foliati. Folia basalia spatulato-linearè sæpe fasciculata, caulina lanceolata acuta. Sepala anguste lanceolata, vix obtusa, obscure trinervia. Petala obovata, calyce duplo longiora.

a. Forma glanduloso-pubescens.

Beong-chin, a mountain west of Chumbi in Tibet Himalaya, 1882 (*King's collector*, n. 1127).

b. Forma magis hirsuta.

Syam-poo, in Chumbi district, Tibet Himalaya, 1884 (*King's collector*, n. 123).

17. *ARENARIA MELANDRYOIDES*, *Edgew.*

Syam-poo, in Chumbi district, 1884 (*King's collector*, n. 129); Rungkia, in Chumbi district, 1879 (*Dungboo*, n. 1122); Naku Pass, 1903 (*Col. Young-husband*, n. 169).

These agree with specimens in Herb. Kew. from Yatung in Tibet (*H. E. Hobson*, 1897), overlooked in Mr. Hemsley's 'Flora' (p. 170).

18. *ARENARIA ACICULARIS*, sp. n. (Subg. *Eremogoneastrum*, sect. i.)

Radix prælonga crassa lignosa. Caudex lignosus polycephalus. Caules 65 mm., simplices, scabre pubescentes. Folia lineari-acicularia, trinervia, lateralibus marginantibus; floralia lanceolato-linearia pungentia, margine scariosa, basi late scarioso-vaginantia. Flores in dichasium fasciculato-glomeratum 6-9-florum dispositi, pedicellis glanduloso-pilosis suffulti. Calyx basi rotundatus, haud incrassatus; sepala lanceolata acuminata tenuiter trinervia, nervis approximatis, late scarioso-marginata, apice recta, parte scariosa sæpius purpureo-incarnata. Petala obovata, calyce sesqui-duplo longiora. Capsula obovato-oblonga.

Flowers much smaller than in *A. festucoides*, and more crowded at the top of the flowering stem; leaves longer and narrower, never falcate. Somewhat like *A. Przewalskii*, but the leaves in the latter are rough-edged, those of the shoots are obtuse, the cyme is three-flowered, and the disk-glands 5 (not 10).

Kannali River, 1848, at 4730 m. (*Strachey & Winterbottom*, "*A. festucoides*," non *Benth.*). Tibet, without locality ("Fl. of Thibet," n. 66, 1882, and n. 286, 1884, *King's collector*); Khamba Fort, 1903 (*Col. Prain*, n. 1209); Gyantse, 1904 (*Capt. Walton*, n. 95, n. 1116); Phembu Pass, 10-15 miles north of Lhasa, and Yam Doh Cho, 1904 (*Capt. Walton*, n. 1117, n. 1118); Lhasa, at 3600 metres, 1904 (*Col. Waddell*).

19. *ARENARIA ISCHNOPHYLLA*, sp. n. (Ejusdem sect.)

Dense arcteqe cæspitosa. Caudex lignosus polycephalus; rami dense foliati. Folia 7-9 mm. vel paullo longiora, subtriquetra rigida pungentia uninervia, basi scarioso-vaginantia, margine incrassata. Flores pauci, breviter pedicellati, pedicellis pilosis. Calyx basi truncatus; sepala 4 mm. long., lanceolata acuminata, apice recta, trinervia, nervis lateralibus tenuioribus, ultra nervos late scariosa. Petala 5 mm. longa, alba ovato-elliptica, calycem paullum excedentia, basi obsolete unguiculata, apice rotundata. Ovarium globosum.

Near *A. kansuensis*, in which the mass of flowers almost conceals the dense short leaves, whereas in *A. ischnophylla* the dense longer leaves conceal the few flowers.

Khamba Fort, 1903 (*Col. Younghusband*, n. 107).

20. *ARENARIA MONTICOLA*, *Edgew.*

Phari (*Dungboo*, 1877, n. 4559, 1879, n. 1146); Syam-poo, in Chumbi district (*King's collector*, 1884, n. 112, n. 1164).

21. *ARENARIA KANSUENSIS*, *Maxim.*

Karoo Pass, 15 miles from Lhasa, at 5000 m. (*Dungboo*, 1878, n. 1152;

Capt. Walton, 1904, n. 1149); Tibet, without locality (*King's collector*, 1882, n. 1164 bis), and Pem Pass, near Chum-la-ri (*King's collector*, 1882, n. 1145).

22. *ARENARIA MONANTHA*, sp. n. (Subg. *Eremogoneastrum*, sect. ii.)

Nana, uniflora, stricta, 5-6 cm. Caulis inferne bifariam pubescens, superne breviter et retrorsum pilosus, simplex. Folia 8 mm., elliptico-lineariter acuta subnervia, supra glabra, subtus puberula, margine parce ciliolata. Flos longe pedunculatus; pedunculus basi sæpe foliis 4 approximatis instructus. Calyx basi truncatus, aperte campanulatus; sepala ima basi connata, pilosa elliptica vix acuta, alternatim anguste lateque scarioso-marginata, obscure nervata. Petala integra ovata alba, basi breviter unguiculata, longitudinaliter evidenter striata, calyce sesqui-duplo longiora. Glandulæ luteo-virentes prominentes, staminibus alternantes.

Not unlike a dwarf and depauperate form of *A. Griffithii*, but leaves not rigid. There is already an "*Arenaria uniflora*" from the island of Kurre-Saar in the Gulf of Riga, though, indeed, it is a doubtful species. Otherwise this name would have been adopted for the present species, in accordance with the Latin form of the generic name.

Hills above Lhasa, Aug. 1204 (*Capt. Walton*, n. 1138).

23. *ARENARIA POLYTRICHOIDES*, *Edgew.*

Za-na-gang, 1879, Tibet, 1882, n. 112, Mee-rook Pass, in Chumbi district, 1884, n. 338 (all *King's collector*).

Var. PERLEVIS, *Williams.*

Rungkia, in Chumbi district, 1879 (*Dungboo*, n. 1151); Tibet, without locality, 1884 (*King's collector*, n. 237); Khamba Fort, n. 53, between Kangra Lama Pass and Khamba Fort, at 4650 to 5100 m., n. 1163, Giagong, at 4500 m., n. 1161 (all of *Col. Younghusband*, 1903); Phari plain and the Upper Chumbi Valley on the way to Phari, 1904 (*E. H. Walsh*, n. 152), Balch Pass, 1848 (*Strachey & Winterbottom*); Gooring Valley, 1895 (*Littledale*). N. Tibet (*Wellby & Malcolm*; *Sven Hedin*). South shore of Lake Mangtza Cho (*Deasy & Pike*, n. 813).

24. *ARENARIA PULVINATA*, *Edgew.*

Tibet, 1882 (*King's collector*, n. 112, n. 131).

25. *ARENARIA DENSISSIMA*, *Edgew.*

Tibet, 1882 (*King's collector*, n. 1165).

26. *ARENARIA GLANDULIGERA*, *Edgew.*

Chumbi district, 1878 (*Dungboo*, n. 1201); Ze-lep-la, n. 1202, Kang-boo, one day north of Phari, n. 1203, Gup-ten-de-la, a little above Chumbi, n. 1155, without locality, n. 1166, n. 1204, n. 1205 (all of *King's collector*, 1882);

Pun-ka-bee-see-mo, 1884 (*King's collector*, "Fl. of Chumbi," n. 24); Khamba Fort, 1903 (*Col. Prain*, n. 1162, n. 1169, n. 1206); Naku Pass, n. 235 (*Col. Younghusband*, 1903).

Var. MICRANTHA, *Williams*.

Folia elliptico-oblonga. Flores minores quam in typo. Sepala obtusa, margine distincte scariosa, vix glandulosa.

With somewhat the facies of *A. ciliolata*.

Mee-rik Pass, 1884 (*King's collector*, n. 628).

Var. CERNUA, *Williams*.

Folia elliptica acuta, in caule pauciora. Flores majores quam in typo, in pedicellis tenuioribus suffulti. Sepala paullum latiora, angustius scarioso-marginata, minus glandulosa.

Bears the same relation to the type as does *A. ciliolata* var. *pendula*, Duthie, to the type of this species.

Tibet, without locality, 1884 (*King's collector*, n. 333); Naku Pass, 1903 (*Col. Younghusband*, n. 172).

27. *ARENARIA YUNNANENSIS*, *Franch.*, in *Bull. Soc. Bot. France*, xxxiii. (1886) p. 431.

Bue-tang, 18 miles north-west of Chumbi, n. 1133 (*Dungboo*, 1878); Shand-hu near Phari, n. 1129, and Chumbi district, n. 1134 (*King's collector*, 1882).

These specimens exactly agree with Franchet's authentic specimens in Herb. Kew.

Forma *angustifolia*.—Folia inferiora breviter petiolata anguste lanceolata, superiora sessilia oblonga.

Do-tho in Chumbi district, n. 1128 (*Dungboo*, 1879).

28. *ARENARIA CERASTIIFORMIS*, sp. n. (Subg. *Macrogyne*.)

Nana, perennis, 7–8 cm. Radix longa. Caules basi ramosi, ramis foliosis unifloris teretibus, bifariam scabro-puberulis. Folia 8–10 mm., crassiuscula elliptica uninervia, nervo modice prominente, basi laxè connata, margine scabro-puberula. Sepala basi saccata, lanceolato-linearè hispidula vix acuta, haud scarioso-marginata, margine glanduloso-ciliolata. Petala 1 cm., alba (vel pallide rosea in specim. nonnullis), calyce duplo longiora, e basi cuneatâ distincte unguiculatâ oblongâ. Filamenta subulata ciliolata. Styli 2.

An *Arenaria* with the facies of *Cerastium*, closely allied to *A. longistyla*, Franch., and, like it, found at high altitudes.

Phari, 1877 (*King*, n. 4588, *Dungboo*, n. 4588 bis), 1879 (*Dungboo*, n. 1147); Mee-rik Pass, Chumbi district, 1884 (*King's collector*, n. 1207); Giagong, 1903, at 4500 m. (*Col. Younghusband*, n. 1160).

29. *GOORINGIA LITLEDALEI*, Williams, in *Bull. Herb. Boiss.* sér. 2, vii. (1897) 530.

Goorling Valley, 1895, at 5030 m. (*Littledale* ;= A. Littledalei, *Hemsley*).

30. *THYLACOSPERMUM RUIFRAGUM*, Schrenk.

Goching, n. 2, and Khamba Fort, at 5700 m. (*Col. Younghusband*, 1903) ; Guge, 1848, from 4570 to 5120 m. (*Strachey & Winterbottom*). W. Tibet, 1896, at 5218 m. (*Wellby & Malcolm*).

31. *SILENE CÆSPITELLA*, sp. n. (Subg. *Eusilene*, sect. *Cincinnosilene*.)

Perennis, cæspitosa, basi fruticulosa. Radix lignosa. Caules florigeri ex rosula foliorum media editi, erecti, pubescentes, 13–25 cm. Folia 4–7 cm., elongato-lineariter rosulata acuminata trinervia, basi membranaceo-vaginantia, margine pubescentia. Bracteæ et prophylla minora uninervia, ceterum autem foliis conformia. Flores in cincinnos simplices dispositi. Calyx evenius clavatus, fructifer paulum ampliatus basi rotundatus, crispato-pubescent, striis furcatis superne bifurcatim conjunctis, dentibus ovatis obtusis late scarioso-marginatis. Petala alba, unguibus inclusis superne utrinque auriculato-dilatatis, lamina anguste oblonga, lobis oblongis, appendicibus binis ovatis obtusis. Genitalia inclusa. Capsula oblonga, fere sessilis. Semina auriformia, dorso canaliculata obtuse tuberculata, faciebus concava striata.

Somewhat resembles in facies *S. tenuis*, but differs in many important characters, the cincinnate sequence of the flowers being quite evident.

Phee-mong, a mile from Chumbi, 1878 (*Dungboo*, n. 1110), Chumbi, 1879 (*Dungboo*, n. 1111), Chumbi, 1882 (*King's collector*, n. 1210) ; Tibet, without locality, 1882 (*King's collector*, n. 164, n. 1115) ; Lomok, 1903 (*Col. Younghusband*, n. 213) ; Gyantse, 1904 (*Capt. Walton*, n. 118, n. 1114, n. 1108,—left-hand specimen on sheet). Note n. 1108 under 33.

32. *SILENE ADENOCALYX*, sp. n. (Subg. *Eusilene*, sect. *Dichasiosilene*.)

Caulis adscendens, breviter scabreque pubescens, ramosus, ramis foliosis. Folia caulina late lanceolata, ramealia angustius lanceolata, omnia acuminata uninervia breviter scabreque sparsim pubescentia, nervo subtus longius piloso, margine glanduloso-ciliata. Flores laxi, breviter pedicellati in dichasiis paucis axillaribus et terminalibus, dichasio 3- vel sæpe 5–7-floro. Calyx tubulosus scaber, basi truncatus, pilis glandulosis brevibus dense vestitus, evenius, striis tenuibus viridibus a glandulis fere occultatis ; dentes longe lanceolati acuminati vix acuti, margine obscure scariosi. Petala alba, lamina parva biloba, ungue exauriculato valde exserto, lobis oblongis, appendicibus binis, lamina $\frac{1}{4}$ – $\frac{1}{5}$ unguis æquante. Capsula oblonga, carpophorum glabrum æquans.

Khamba Pass, at 1440 m., 1904 (*Capt. Walton*, n. 1104).

So named from the structure of the calyx. Both this and the next species belong to that group of the *Macranthe* series which includes *S. cretacea*. This plant is, however, a difficult species to study and compare. Rohrbach's description (Monogr. n. 107, p. 135) is brief and somewhat vague: and there are only two sheets of *S. cretacea* in Herb. Kew., including 5 specimens,—(1) and (2) from the Astrakhan Desert, (3) and (4) from chalky hills above the river Don, and (5) from S. Russia.

33. *SILENE SUBCRETACEA*, sp. n. (Ejusdem sect.)

Caulis fruticulosus erectus, breviter canescenti-pilosus, 1-3-florus, 4 dcm. Folia 7 mm., brevia linearia acuta uninervia, breviter canescenti-pilosa. Flores solitarii vel remoti, breviter pedicellati. Calyx 18 mm., tubuloso-clavatus pilosulus, basi truncatus, evenius, striis tenuibus, fructifer superne ampliatus; dentes oblongo-lanceolati acuti albo-marginati. Petala alba ecoronata, ungue exauriculato exserto. Capsula oblonga, carpophoro glabro sesquolongior. Semina papillosa, dorso sulcato-excavata, faciebus concava.

Khamba Fort, 1903 (*Col. Younghusband*, n. 73,—flower-specimens); Gyantse, 1904 (*Capt. Walton*, n. 105, n. 1108,—fruit-specimens).

34. *SILENE MOORCROFTIANA*, *Rohrb. Monogr. Gatt. Silene*, p. 129, n. 93 (1868), forma *NANA*, *Hook. f. Fl. Brit. Ind.* i. 219 (1874).

Near Rakas Tal, 1848, from 4570 to 5180 m. (*Strachey & Winterbottom*).

35. *SILENE WALTONI*, sp. n. (Subg. *Eusilene*, sect. *Botryosilene*).

Caulis erectus robustus rotundatus rubens basi fruticulosus, alternatim ramosus, ramis divergentibus laxe racemosis, breviter parceque pilosus. Rami floriferi primum racemosi, ramulis secundariis dichasia subcomposita gerentibus. Folia 9 mm., læte virentia late linearia vix acuta uninervia crassiuscula, subtus præsertim ad nervum pilosula, margine hispidulo-ciliata. Dichasia secundaria longe pedunculata, floribus erectis; flos centralis breviter pedicellatus, pedicello longior; bracteæ foliis consimiles. Calyx clavatus evenius umbilicatus tenuiter pilosulus, dentibus triangularibus obtusis late albo-marginatis dense ciliatis. Petala alba, ad faucem biappendiculata, unguibus glabris auriculatis distincte exsertis, lamina biloba, lobis latis. Filamenta glabra. Styli filiformes.

Gyantse, 1904 (*Capt. Walton*, n. 1105).

Named after Capt. Walton, of whose assiduity in collecting Col. Younghusband speaks in such glowing terms.

36. *HEDONA ISCHNOPETALA*, sp. n.

Radix longa tenuis. Caulis erectus sat ramosus, cum foliis pilis brevibus reversis vestitus. Folia firma uninervia lanceolata, inferiora latiora sed basin versus attenuata, floralia lanceolato-linearum. Flores longe pedicellati, in dichasium laxum (triflorum) dispositi; pedicelli alares centrali breviores, basi prophyllis sæpe 4 approximatis instructi. Calyx pilis crustaceis brevibus crispatis dense vestitus, dentibus triangularibus vix acutis margine membranaceo-ciliatis, nervis infra dentium sinus arcuatim conjunctis. Petala anguste cuneato-ovata irregulariter erosa, ungue solum basi ciliato. Capsula sessilis. Semina atro-cyanea rotundato-reniformia, dorso faciebusque tuberculata.

Near *Hedona Davidi*, Williams, a Sze-chuen plant.

Tibet: Gum-lo-teen, in the Chumbi district, at 600 m., 1878 (*Dungboo*, n. 1106). Sikkim: Lachen, near the Tibetan frontier, at 2700 m., 1885 (*King's collector*, n. 1211).

37. *MELANDRYUM NIGRESCENS*, Williams. (Sect. *Gastrolychnis*.)

Syn.—*Lychnis nigrescens*, Edgew., in Hook. f., Fl. Brit. Ind. i. p. 223 (1874); *Melandryum macrorhizum*, Rohrb., in Linnæa, xxxvi. (1869) p. 228, non Walp., Rep. Bot. i. p. 280 (1842), nec *Lychnis macrorhiza*, Royle, Illustr. Bot. Himal. p. 80 (1833).

Phari, 1877 (*Dungboo*, n. 4565), Do-tho in Chumbi district, 1879 (*Dungboo*, n. 1215), and Khamba Fort, 1903 (*Col. Younghusband*, n. 275). Lanjar, 1848 (*Strachey & Winterbottom*).

38. *MELANDRYUM APETALUM*, Fenzl. (Sect. *Gastrolychnis*.)

Syn.—*Lychnis apetala*, Linn.

Guge, 1848 (*Strachey & Winterbottom*). W. Tibet, 1896 (*Deasy & Pike*, n. 894). Karoo Pass, 15 miles from Lhasa, at 4950 m. (*Dungboo*, 1878, n. 1101; *Capt. Walton*, 1904, n. 1100); To-koo Pass in Chumbi district (*Dungboo*, 1879, n. 1103); Tem Pass, one day north-east of Phari (*King's collector*, 1882, n. 1216); Ka-po-po (*King's collector*, 1884, n. 1217); Lomok on the Naku Pass (*Col. Younghusband*, 1903, n. 163); Naku Pass (*Col. Younghusband*, 1903, n. 165); Khamba Fort (*Col. Prain*, 1903, n. 1102), Goring Valley, at 5030 m. (*Littledale*).

39. *MELANDRYUM INDICUM*, Walp. (Sect. *Gastrolychnis*.)

Pad-lo, near Chumbi, 1878 (*Dungboo*, n. 1125); Rinchin-gong, in the Chumbi Valley, 1877 (*Dungboo*, n. 4286, and *Sir G. King*, n. 4287); Chumbi district, Lo-Beang near Chumbi, and between Chumbi and the Tangka Pass, 1882 (*King's collector*, n. 1107, n. 1218, n. 1123).

40. MELANDRYUM JUGORUM, sp. n. (Sect. Elisante.)

Perennis. Caulis e medio foliorum basaliu editus, elatus ramosus, molliter pilosulus, ramis numerosis foliosis magis pilosis. Folia 10 mm., flavo-virentia villosopilosula uninervia elliptico-lanceolata apice falcato-acuminata. Flores in dichasiis, mediani fructiferi retroflexi. Pedunculus centralis flore multum brevior, pedunculi alares eo duplo longiores vel ultra; bracteæ foliaceæ, foliis minores, ceterum subsimiles. Calyx 10-nervius evenius oblongo-clavatus subampliatus pilosulus; fructifer 14 mm., magis distentus, infra capsulam constrictus, apice apertus, dentibus ovatis obtusis rotundatis. Petala purpureo-rubescens, ungue glabro exserto, appendicibus conspicuis ovatis acutis. Filamenta glabra. Capsula primum medianicide dehiscens, dentibus deinde breviter bifidis, oblongo-ovata, carpophoro serius multum incrassato duplo longior. Semina reniformia, dorso faciebusque undique tuberculata, dorso leviter sulcata.

Gum-bo-teen, 800 m. above Chumbi, n. 1143 (*Dungboo*, 1878); Lo-Beang, near Chumbi, n. 1219, and Chumbi district, n. 1098 (*King's collector*, 1882).

41. MELANDRYUM LHASSANUM, sp. n. (Sect. Elisante.)

Perennis. Caulis e medio foliorum basaliu editus, tereti-rotundatus elatus erectus ramosus, pilis brevibus scabris retrorsis dense vestitus, in parte purpureo-rubescens, ramis 10-22 cm. Folia læte virentia lanceolato-ovata acuta, apicem versus haud falcato-acutata, pilis brevibus scabris retrorsis dense vestita, margine undulata ciliolata, basi connata haud attenuata; inferiora 32-36 mm., basi triplinervia, nervo mediano valido, nervis lateralibus incompletis, superiora 25-30 mm., uninervia, nervo prominente. Rami floriferi axillares et terminales. Flores in dichasiis laxè compositis. Pedunculus centralis flori æquilongus; ramuli alares longe pedunculati, pedunculis pedicellisque dense glanduloso-pilosis; bracteæ foliaceæ glanduloso-pilosæ, foliis subsimiles. Calyx 10-nervius evenius, striis purpureis, clavatus, basi truncatus, pilis glandulosis asperulato-scabridus; fructifer 12 mm., obconico-clavatus accretus, basi truncato-umbilicatus, apice apertus, infra capsulam vix constrictus, dentibus triangularibus obtusis late membranaceo-marginatis ibique nervis latius expansis. Petala rubella, calyce sesquilingiora, ungue glabro utrinque laminam versus conspicue auriculato, lamina biloba, lobis oblongis obtusis, appendicibus oblongo-linearibus obtusis vix rotundatis. Filamenta glabra. Capsula primum medianicide dehiscens, dentibus deinde breviter bifidis, oblongo-ovata, carpophorum sat crassum æquans vel eo paulum longior. Semina reniformia (immatura), dorso canaliculata cristato-tuberculata, faciebus excavato-concaviuscula vel depressa.

Quite distinct from any other species of *Melandryum*; resembling one or more of the Yunnan species described by Franchet under *Silene*.

Hills above the city of Lhassa, 1904 (*Capt. Walton*, n. 1112).

42. MELANDRYUM VISCIDULUM, *Williams*. (Sect. *Elisanthe*.)

Syn.—*Silene viscidula*, Franch., Pl. Yunnanenses, in Bull. Soc. Bot. France, xxxiii. (1886) p. 421.

A plant of the habit of *M. Olgae*, as may be seen by comparing this Himalayan plant with specimens from the Chinese province of Manchuria in Herb. Kew. It tallies with the description of *S. viscidula*, Franch., of which there is no specimen in Herb. Kew. *M. Olgae*, Maxim. (= *S. Olgae*, Rohrb.), is not to be confused with *S. Olgae*, Regel & Schmalh., a quite different plant from Russian Turkestan.

Lo-Beang, near Chumbi, 1882 (*King's collector*, n. 1109), in the same locality where *M. jugorum* occurs.

43. GYPSOPHILA CERASTIOIDES, *D. Don*.

Chumbi Valley, 1879 (*Dunghoo*, n. 1132); Gup-ten-de-la, a little above Chumbi, Aug. 1882 (*King's collector*, n. 1220,—a poor and stunted specimen); Ta-che-Kung, Mee-rook Pass, and Ha-toom-py-ong, all in the Chumbi district, 1884 (*King's collector*, n. 10, n. 345, n. 499); Chumbi Valley, 1904 (*E. H. Walsh*, n. 44).
