NOTES ON ANEMONE OBTUSILOBA AND ITS ALLIES

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This account deals with *Anemone obtusiloba* and the many Indian and Chinese species and infra-specific taxa which are closely related to it. Owing to different treatments by previous workers and a certain amount of confusion in the nomenclature, some difficulty has been encountered in naming herbarium specimens. The ample material in the Edinburgh Herbarium and an examination of most of the types has provided sufficient information to merit a review of the *Anemone obtusiloba* complex.

The last monograph of the genus was by Ulbrich in 1906. Other contributions have been made by Hooker and Thomson (1855), Hooker (1872), Brühl (1896), Finet and Gagnepain (1904), Handel-Mazzetti (1931 and 1939) and Comber (1934). Neither Ulbrich nor Finet and Gagnepain appear, however, to have been aware of Brühl's work.

Almost continuous variation throughout the range of specimens led the writer to regard *A. obtusiloba*, in a preliminary investigation, as being one large species with several subspecies and varieties. The sepals, carpels and degree of villosity are so variable as to provide no useful criteria on their own for distingushing the species one from another. But the shape, cutting and toothing of the leaves are found to have sufficient stability to break a complex group into smaller units more favourable than a large unwieldy species.

The form and position of the involucre is not particularly constant. Although, for instance, it is usually compound in typical *A. obtusiloba* and simple in subsp. *ovalifolia*, this situation is occasionally reversed. Herbarium examination of the position of the involucre on the scape shows that it may be on the lower half, the upper half or even overlapping the sepals. Although the involucre apparently lacks any taxonomic significance, a series of observations has been made to determine its behaviour during the growing period of one particular species.

Measurements were taken of the distance from the base of the scape to the involucre and from the involucre to the base of the sepals, on living

Day	Dist. Base-Involucre	Dist. Involucre-Base of sepals	Total	Ratio of Base-Involucre / Involucre-sepals	Remarks
	cm.	cm.	c.m.		
1st	5·5	1·0	6·5	5·5	In bud
3rd	7·1	2·0	9·1	3·5	
5th	9·9	2·5	12·4	3·9*	
7th	10·2	3·3	13·5	3·1	Full flower
9th	11·1	3·8	14·9	2·9	
11th	12·0	4·1	16·1	2·9	
13th	12·0	4·1	16·1	2·9	
15th	12·0	4·1	16·1	2·9	Sepals fallen

* Reversal of the growing rates of columns 2 and 3. This reversal occurred at least once in all the series of measurements taken.

plants of *A. obtusiloba* f. *patula*. In all cases the first distance was always the greater although the ratio between the two distances decreased, except in at least one instance in each case, as the plant grew. It was also found that both portions of the scape continued to increase in length while the plant was in full flower, ceasing a few days before the sepals started to fall. The table on page 179 shows a typical sample of measurements.

ACKNOWLEDGEMENTS

I am indebted to the Directors of Kew and Paris for the loan of herbarium specimens, and to Mr. J. R. Sealy of Kew for information and references concerning *A. potentilloides* Cambess.

My thanks are due also to Mr. P. S. Green for his help and advice throughout the investigation; to Mr. B. L. Burtt for his invaluable advice; and to Miss Rosemary Smith for the leaf drawings.

Key to A. obtusiloba and allied species

1. Leaves trisect or tridentate or "pinnate", if trifoliate then terminal leaflet *not* distinctly stalked 2
   2. Leaves divided more than half-way and usually to their base or midrib. Leaves broader than long. Carpels hairy or glabrous . 3
      3. Mature leaves ± ternate with terminal lobe divided but not to the midrib . . . . . *A. obtusiloba* 4
         4. Teeth of lateral lobes many more than those of the middle segment of the terminal lobe. Lateral lobes ± same size as terminal lobe. Leaves usually 3 cm. broad or more, sometimes less (2 cm. or less in var. *potentilloides* and other small forms). Sepals (5–)10–16(–21) mm. long. 5
            5. Lobes of leaf toothed or cut but not to halfway. India, Burma 6
               6. Flowers smaller than leaves. Breadth of leaves more than 2 cm. Sepals 10–21 mm. long. (Figs. A–B) subsp. *obtusiloba* var. *obtusiloba*
               6. Flowers distinctly larger than the leaves. Breadth of leaves 2 cm. or less. Sepals 5–12 mm. long subsp. *obtusiloba* var. *potentilloides*
            5. Lobes of leaf toothed and deeply cut to halfway. China. (Fig. F) . . . . . subsp. *rockii*
         4. Teeth of lateral lobes equal (±1) in number to those of the middle segment of terminal lobe. Lateral lobes smaller than terminal. Leaves usually less than 3 cm. broad, commonly much less. Sepals (3–)6–10(–14) mm. long. (Figs. C–E) subsp. *ovalifolia*
      3. Mature leaves usually ± "pinnate" and imbricate, if not "pinnate" at least terminal lobes divided to the midrib *A. imbricata*
   2. Leaves cut or toothed but never divided to the base or midrib. Leaves longer than broad, though occasionally broader than long when leaf is cordate or truncate. Carpels hairy . . *A. trullifolia* 7

7. Lamina of leaf clearly 3-lobed with lobes toothed. Leaf 1–2 times as long as broad, rarely more 8
   8. Base of leaf cuneate. India and China. (Fig. G) var. *trullifolia*
   8. Base of leaf cordate or truncate. China. (Fig. H–I) *ovalifolia* × *trullifolia*
7. Lamina of leaves toothed or denticulate but not clearly 3-lobed. Leaf often more than three times as long as broad . . 9
   9. Apex of leaf crenate-denticulate. China. (Fig. L) var. *holophylla*
   9. Apex of leaf tridentate, occasionally entire. China and India. (Figs. J–K) . . . . . var. *linearis*

1. Leaves trifoliate with terminal leaflet distinctly stalked. *A. rupestris* 10
   10. Lateral leaflets of mature leaves 10 to about 21 toothed. (Fig. M) subsp. *rupestris*
   10. Lateral leaflets of mature leaves 3–9 toothed . . . 11
      11. Lamina of terminal leaflet 10 mm. or more (rarely less) and of lateral leaflet 5 mm. or more long. Plant 6–15 cm. tall. China. (Fig. N) . . . . . subsp. *gelida* var. *gelida*
      11. Lamina of terminal leaflet up to 8 mm. long and of lateral leaflet up to 5 mm. long. Plant 4–10(–13 cm.) tall. India and Tibet (Fig. O) . . . . . subsp. *gelida* var. *wallichii*

Anemone obtusiloba D. Don, Prodr. Fl. Nep. 194 (1825).

subsp. **obtusiloba** var. **obtusiloba**

Syn.: *A. obtusiloba* D. Don; Pritzel in Linnaea, xv (1), 683 (1841); Hook. f. & Thoms., Fl. Ind. i, 22 (1855); Hook f., Fl. Brit. Ind. i, 8 (1872); Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 78, pl. 106, figs. 1–6, 24–25 (1896) *pro parte max*; Blatter, Beautiful Flowers of Kashmir, i, 6, pl. I, figs. 5–7 (1928).

A. govaniana Wall. Cat. 4688 (1831) *nom. nud.* non Lindl.

A. mollis Wall. Cat. 4689 (1831) *pro parte nom. nud.*

A. discolor Royle, Ill. Himal. 52, t. 11, f. 1 (1839); Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 77 (1896).

A. obtusiloba D. Don var. *glabra* Hook. f. & Thoms., Fl. Ind. i, 22 (1855); Hook. f., Fl. Brit. Ind. i, 9 (1875).

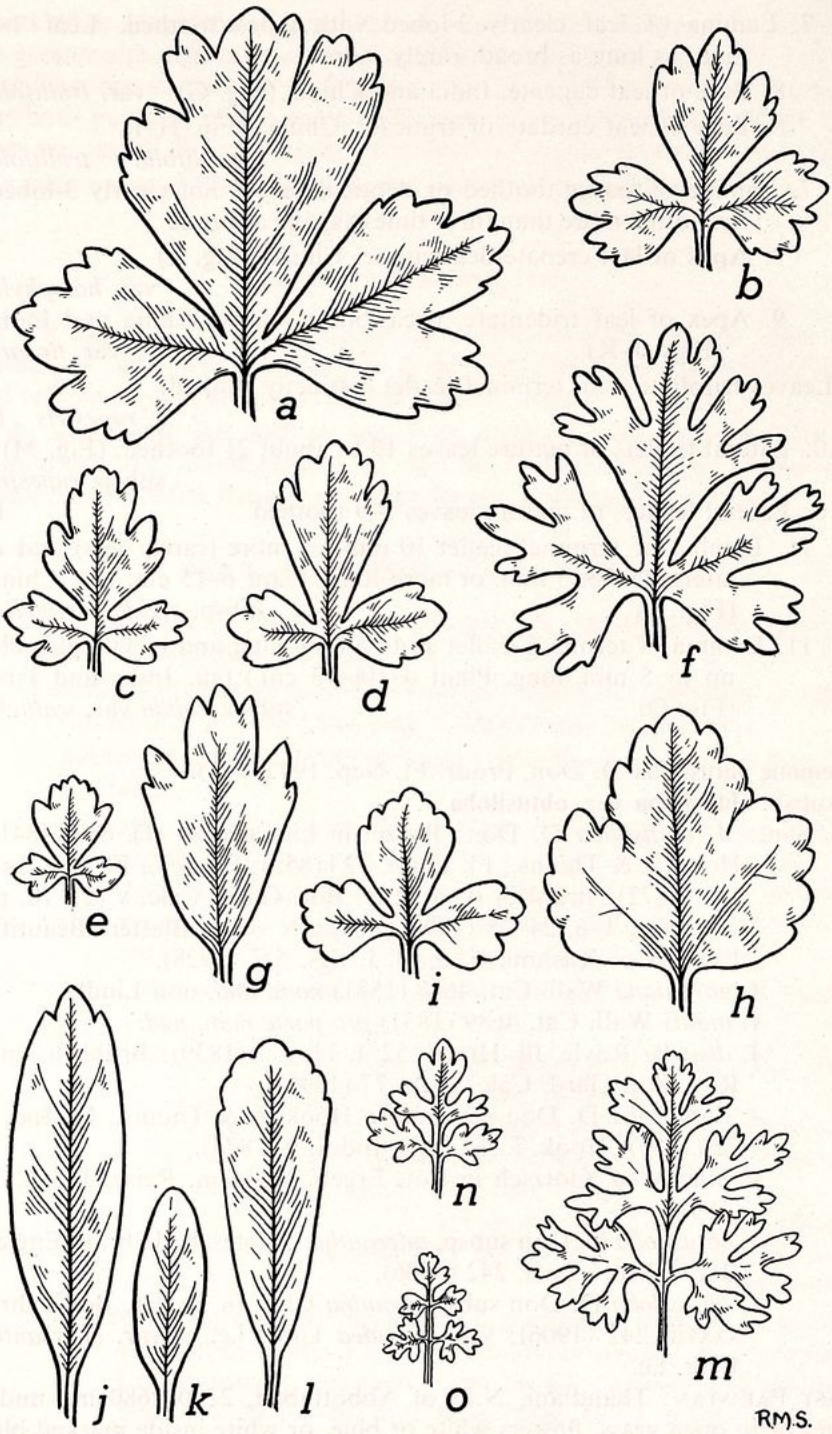
A. micrantha Klotzsch in Bot. Ergeb. Waldem. Reise, 133, t. 38 (1862).

A. obtusiloba D. Don subsp. *micrantha* (Klotzsch) Ulbr. in Engler, Bot. Jahrb. xxxvii, 242 (1906).

A. obtusiloba D. Don subsp. *genuina* Ulbr. in Engler, Bot. Jahrb. xxxvii, 242 (1906); var. *coerulea* Ulbr. l.c. et var. *chrysantha* Ulbr. l.c.

WEST PAKISTAN: Thandiani, N.E. of Abbottabad, 2290–2680 m., under pines or in open grass, flowers white or blue, or white inside marked blue on outside of sepals, 5 June 1958, *B. L. Burtt* B 719*; Chitral, Lowari Pass, 3050–3660 m., 21 June 1895, *S. A. Harriss* 15844.

* In the citation of exsiccatae the herbarium location of specimens is given only for type specimens and for those borrowed from Kew and Paris. All other specimens may be assumed to be in the Edinburgh Herbarium.



FIGS a-o. Leaves of *A. obtusiloba* var. *obtusiloba*, (a) Lace 754, (b) Parkinson 3947; subsp. *ovalifolia*, (c) Forrest 5968, (d) Cunningham 468, (e) Cunningham 40; subsp. *rockii*, (f) Forrest 30818. *A. obtusiloba* subsp. *ovalifolia* × *A. trullifolia*, (h) Forrest 28434, (i) Forrest 2152. *A. trullifolia* var. *trullifolia*, (g) Ludlow and Sherriff 29; var. *linearis*, (j-k) Forrest 19590; var. *holophylla*, (l) Forrest 2226. *A. rupestris* subsp. *rupestris*, (m) Hooker s.n.—lectotype; var. *gelida*, (n) Handel-Mazzetti 1658; var. *wallichii*, (o) Rohmoo Lepcha 1095. All × 1.

N. W. INDIA: sine loc., *Dr. J. L. Stewart.*

KASHMIR: Kishtwar, 2440–3050 m., *T. Thomson* s.n.; 3050–3660 m., *T. Thomson* s.n.; Baltistan, Kainpatri Nala, 3350–3650 m., flowers yellow, 20 August 1893, *J. F. Duthie* 13672; Pass to Gurais, 3650 m., 20 June 1847, *J. E. Winterbottom* 501 (K); Kootihar Valley, lat. 33° N., mountain forest, native, an erect herb, calyx white above, pale purple beneath, anthers yellow, 27 Nov. 1896, *H. H. Johnston* 39; Ladakh, 3650 m., July 1879, *G. Watt* 3160; Tragbal Pass, 3510 m., grassy slopes just free of snow, flowers sulphur yellow, sometimes white, 11 July 1935, *Ludlow & Sherriff* 1404; Gosai, near Tragbal Pass, 3200 m., grassy valleys, flowers white, tinged purple on under surface, 12 July 1935, *Ludlow & Sherriff* 1417; Barnaj Nullah, Sapphire Mines, 3050 m., flowers polychromatous, sometimes white, sometimes purple, but white flowers have always a purple shade on under surface of corolla, 7 July 1943, *Ludlow & Sherriff* 9150; Liddar Valley, near Phalgam, growing amongst rocks on river bank in shade, 9 May 1940, *P. M. Pinfold* 79. Nichinai, 3650 m., on grassy alpine meadows, flowers pale yellow or white, reverse flushed purple, 2 Sept. 1956, *O. Polunin* 56/638.

NEPAL: Pola, 3960 m., flowers white, 1928, *Lall Dhwoj* 235; Tangba, 3960–4570 m., flowers white, 1930, *Lall Dhwoj* 140; Chochyo, 1927, *Sir Clive Wigram* 196, 197; Chan-Ke, 6 June 1936, *F. M. Bailey* s.n.; Tukucha, Kali Gandaki, 3350 m., on open grazing alp, petals bluish white, filaments green, 15 July 1954, *Stainton, Sykes & Williams* 1124; Taglung, south of Tukucha, Kali Gandaki, 3650 m., open grass slopes, petals and filaments blue, 11 July 1954, *Stainton, Sykes & Williams* 1743; Rambrong ridge, north of Pokhara, 3200 m., open grassy slopes, flowers rich blue or white, 27 April 1954, *Stainton, Sykes & Williams* 5098.

SIKKIM: Sandakphu, 3650 m., flower blue and white, 25 July 1919, *Cave* s.n., flower white, 1 July 1922, *Cave* s.n., flower blue, 1 July 1922, *Cave* s.n.; Sandakphu, 3650 m., 21 July 1913, *Rohmoo Lepcha* 758; Gnathong, flower white and blue, 26 June 1919, *Cave* s.n.; Changu, 3960 m., common in meadow, white flowers, blue on underside of petals, 28 June 1913, *R. E. Cooper* 71; Sicarcoon, 3050–3650 m., on grassy hills along with evidently white form of same species and covering 8–10 miles, 25 May 1881, *G. Watt* 5204; sine loc. *Don.* s.n.

BHUTAN: Ha area, 2740–3660 m., flowers blue, 15 May 1938, *B. J. Gould* 22; Dungshing Nag (Black Mountain), N. side 3960 m., open grassy hillsides, foliage green, margined dull reddish, all covered with silvery hairs, corolla most commonly rich deep blue violet, 22 May 1937, *Ludlow & Sherriff* 3094; corolla white with violet tinges on back of petals, 22 May 1937, *Ludlow & Sherriff* 3094A.

KANGRA–LAHUL. Rotang, 2750–3350 m., flowers pale yellow, 1 July 1938, *N. L. Bor* 12101; Manali, 3050 m., a very common herb in alpine meadows, 16 May 1941, *N. L. Bor* 14459, sulphur yellow flowers, 17 May 1941, *N. L. Bor* 14473; Khote, 3810 m., flowers sulphur yellow, 31 May 1941, *N. L. Bor* 14502; Koksar, 3960–4270 m., very common, flowers white or pale yellow, 20 July 1938, *N. L. Bor* 16866.

INDIAN PUNJAB STATES: Dalhousie, Ravee Valley, 2440 m., 14 June 1878, *G. Watt* 1234; Tihri-Garhwal, Harke Dun, 3960 m., 1893, *J. S. Gamble* s.n.; Chamba State, Kalatop Forest, 2440 m., 19 June 1895, *J. H. Lace*

754; Saeh Pass, Pangi side, 3960–4270 m., 14 Aug. 1887, *J. H. Lace* 1616; Chumba and Choaree Pass across the outer Dalhousie range, 2590 m., scape 1–1½ feet, perianth lilac outside, white inside, 23 May 1878, *G. Watt* 527; on the descent from the Sauch Pass into Panji, 3050–4570 m., growing on recently exposed banks, procumbent herb, sepals yellow with purplish marks underneath, 1 June 1878, *G. Watt* 762; Pangi, 3050–3960 m., flower often pale yellow or white, *G. Watt* 2125; Bashahr, above Daranda, 2750 m., June 1891, *J. H. Lace* 1144; Chumba, *G. Watt* 2529; Simla, 1831, *Dr. Govan* s.n., *A. Barclay* s.n., Simla Hill States, Kamru Baspa valley, 3960 m., flowers bright yellow, 26 June 1939, *G. Sherriff* 7345; Kulu, Parbatti valley, Swajni Maidan, 2890 m., low herb with violet blue flowers, 25 May 1934, *C. E. Parkinson* 3946, low herb with yellow flowers, sepals tinged blue at back, *C. E. Parkinson* 3947, low herb with white flowers, sepals tinged blue at back, *C. E. Parkinson* 3948; Pan dache [?], 3960 m., yellow herb on alpine pasture, 10 July 1916, *R. E. Cooper* 5117, flowers yellow, compact herb in swampy peat and gravel, 11 July 1916, *R. E. Cooper* 5130.

BURMA. Mt. Victoria, 3020 m., in open sunny glade, 3 in., blue, later found right up on summit at 3050 m., with 3063 this plant carpets the ground, 17 April 1926, *R. Unwin* 3062; ibidem 3020–3050 m., 3 in., white, looks exactly same as 3062, but is white and although mixed up together white and blue flowers are always on separate plants; at first I thought the white ones merely faded blue ones, 17 April 1926, *R. Unwin* 3063; 1924, *R. E. Cooper* 6003; above Kanpelet, flowers white, bluish beneath, 29 June 1924, *R. E. Cooper* 6120.

Anemone obtusiloba was first described by David Don in 1825 from material collected by Wallich at Gossain Than in Nepal. From Don's description and that of Hooker and Thomson there is no doubt as to the identity of *A. obtusiloba*.

Although Don made no mention of flower colour, Hooker and Thomson in Flora Indica, describe it as bluish-white or golden with a bluish-lead coloured spot at the base of the sepals. In the Flora of British India, Hooker stated it to be white, purplish or golden. Material in Edinburgh verifies his note as to the variability in size, hairiness and colour of the flower. The leaves are always trisect or nearly so and orbicular in outline (Figs. A–B). In the material studied the leaves vary from 2–7 cm. across. Flower colour is one of the main problems in this species as field notes show the flowers to be "white or pale yellow", "sulphur yellow", "yellow tinged blue", "white and blue".

Confirmatory evidence on the unreliability of flower colour as a taxonomic character is given by Blatter in Beautiful Flowers of Kashmir i, 6 (1928) where he says, "all varieties common, the yellow variety is smaller; the blue-white varieties are always succeeded by the yellow ones at 12,000 feet". There is an illustration in his Pl. I, Figs. 5–7.

On Mt. Victoria in Burma, Unwin noticed that the ground was carpeted with both blue and white-flowered *A. obtusiloba*, although these two colours are always on separate plants. More recently, in Pakistan in 1958, Mr. B. L. Burtt saw blue and white flowers but no yellow. Since the flower colours are so mixed varietal separation on colour alone is not justified.

It is proposed to drop Ulbrich's varieties *coerulea* and *chrysantha*. P'ei (in Bot. Bull. Acad. Sin. i, 124: 1947) lists some specimens from Sikang under *A. obtusiloba* var. *coerulea* but I have not seen them.

Brühl (1896) treated *A. obtusiloba* in a very broad sense, and included 6 subspecies. Within subsp. *obtusiloba* he made no division and was moved to write of it that "however greatly the various forms of this subspecies differ from each other . . . the variability is so great and the transitions so gradual that it appears to be a thankless task to split up this subspecies into varieties if the definition of such varieties is to be more than a description of individual specimens".

Typical *A. obtusiloba* has a distribution extending from the North West Frontier Province eastwards through the Himalaya to Bhutan, possibly S.E. Tibet and on Mt. Victoria in Burma. Subsp. *ovalifolia* on the other hand is found mainly in Western China. Both taxa have commonly hairy carpels and are separated mainly on leaf character and to a lesser degree on sepal size. The average length of a sepal in subsp. *obtusiloba* is 14 mm., whilst in subsp. *ovalifolia* it is 8 mm. There are, however, several collections from Tibet which do not fall either geographically or morphologically into either of these two subspecies. These anomalies, including *A. wardii*, will be discussed under subsp. *ovalifolia*.

P'ei states (Bot. Bull. Acad. Sin. i, 124: 1947) that *A. obtusiloba* is distributed widely in Northern China and Japan. I have not seen the collections he cites, neither have I seen a representative of the typical species from Japan.

The plant figured as *A. obtusiloba* in Edwards' Botanical Register (xxx, tab. 65: 1844) is a plant with umbellate flowers and is referable most likely to either *A. polyanthes* D. Don or *A. elongata* D. Don. *A. govaniana* Lindl. (Bot. Reg. xxx. Misc. No. 59: 1844) is the same plant, but *A. govaniana* Wall. Cat. 4688 is identical with *A. obtusiloba*.

In his monograph Ulbrich reduced *A. micrantha* Klotzsch to a subspecies of *A. obtusiloba*, distinguishing it from typical *A. obtusiloba* by having flowers 15–20 mm. in diameter as against 25 mm. in diameter. He enumerated several collections from an area covering Kashmir to Kansu, Yunnan and Szechuan; some of these are included under Brühl's *A. obtusiloba* subsp. *ovalifolia* var. *geochares* and undoubtedly belong to that subspecies. Nevertheless the specimen which must determine the position of *A. micrantha* Klotzsch is the type, collected by Dr. Werner Hoffmeister in the Himalaya.

Hoffmeister accompanied Prince Waldemar von Preussen on an expedition in 1845 and 1846. He made numerous collections 108 of which were described as new species and illustrated in Dr. Klotzsch's account of the expedition. Hoffmeister was killed at the early age of 26 in a battle against the Sikhs at Ferozeshah near Ferozepore in the Punjab. The specimen of *A. micrantha* is not available and the only locality given for all Hoffmeister's collections is "Himalaya". However, there is a table giving the vegetational zones of the expedition, and this shows that the collections must have been made in an area approximately bounded by Naini Tal in the south, Bhagirathi River to the west, the Alacananda River on the east and northwards to Kedarnath, Gangotri and Sutlej. This area covers part of Northern Punjab and the Western Himalaya around 79° long. and 30° lat. It can therefore be said with certainty that *A. micrantha*

was collected in the Western Himalaya. (See also F. W. Pennell in Acad. Nat. Sci. Philad. Monograph No. 5 (Scrophulariaceae) 145: 1943.)

Klotzsch's illustration shows this species to have an obvious affinity with *A. obtusiloba* although it does bear some resemblance to subsp. *ovalifolia* in stature. From a distributional point of view and from the toothing of the leaves it is therefore retained as a synonym of subsp. *obtusiloba.*

In 1855 Hooker and Thomson described *A. obtusiloba* var. *glabra* as glabrous or glabrescent on the scape and leaves. In the Flora of British India Hooker describes it as "the most abnormal form . . . quite glabrous with very many golden sepals". The type was collected by Winterbottom in W. Tibet. There are several Winterbottom specimens in Kew Herbarium, none of them specially annotated, and none of them completely glabrous. In the Watt Herbarium in Edinburgh there is a specimen *G. Watt* 3160, which possesses more sepals than usual. Normally there are about 5–7 more or less ovate sepals in *A. obtusiloba*, but in the above specimen there are as many as 10 to each flower. Watt himself put a tentative name on the sheet, but a description was never published. Several other specimens in the Edinburgh Herbarium, all from Kashmir, match this one in number of sepals, but none of them is completely glabrous, although *Duthie* 13672 is almost so. However, the degree of villosity in the specimens with numerous sepals is almost as great as in typical *A. obtusiloba*, and the large number of sepals is the only character which differentiates them from *A. obtusiloba.* These specimens are considered to be forms within the variation range of subsp. *obtusiloba* which seem to occur only in Kashmir.

Cultivation. As far as the writer is aware *A. obtusiloba* subsp. *obtusiloba* var. *obtusiloba* has only just recently come into cultivation through the agency of Dr. M. Lewis of Wrexham, who collected seed at Sandakphu, Phalut, near Darjeeling, in 1957. He collected the seed from two blue and two white forms at 11,900 feet and the blue forms have flowered at the Edinburgh Botanic Garden.

Among all the species mentioned in this paper, the only other anemone in cultivation is *A. obtusiloba* D. Don f. *patula* Craib first described in the Botanical Magazine t. 8636 (1915). Plants were collected by Mrs. Wheeler Cuffe from Mt. Victoria in W. Burma, and brought home to be cultivated at Glasnevin. From the resulting plants the form was figured and described. It was shown by Lisadell Nurseries at the Royal Horticultural Society's Autumn Show at Crystal Palace in 1934. The following year it won the Award of Merit for the Donard Nursery Co. It appears to be an easy plant once in cultivation but difficult to propagate. There is a good illustration of the plant in cultivation in the Edinburgh Royal Botanic Garden in the Journal of the Royal Horticultural Society, lxx, fig. 90 (1945).

A. obtusiloba f. *patula* has a decumbent habit which is found in many other specimens of typical *A. obtusiloba.* Its distinctive feature is purported to be the marked elongation of the flowering branches in proportion to the length of the petioles. In the Edinburgh Herbarium there are two specimens from Mt. Victoria collected by R. E. Cooper and two by R. Unwin. One of the Cooper gatherings does show this marked elongation, the other

does not. It does not seem that this character of the flowering branches is constant even at Mt. Victoria. It may be, as Craib remarked, the consequences of cultivation. As it is in cultivation this name is probably best retained although it is scarcely worth maintaining in a botanical classification; indeed, it would be difficult to apply this name to a herbarium specimen.

At least twice in literature the name *Anemone patula obtusiloba* is mentioned; it is none other than the plant just discussed.

subsp. **obtusiloba** var. **potentilloides** Lauener, **var. nov.**

Syn.: *A. potentilloides* Cambess. MS.; Besant in Gard. Chron. lxxxi, 371, fig. 177 (1927); Gard. Chron., xcix, 337 (1936); Journ. Roy. Hort. Soc. lxi, 290, cxxxvii (1936); Giuseppi in Journ. Roy. Hort. Soc. lxx, 235 (1945); Quart. Bull. Alp. Gard. Soc. v, 19, tab. p. 17 (1936); Giuseppi in Quart. Bull. Alp. Gard. Soc. viii, 300, tab. p. 294 (1940)—*omnia nomina subnuda*.

Planta minor sed floribus foliis maioribus, sepalis 5–12 mm. longis a typo differt.

North West Frontier Province: Hazara, Siran Range, 3200 m., 8 June 1899, *Inayat Khan* s.n. (K); Siran Valley, 30 June 1896, *Inayat Khan* 19062a (K); Sarul, Kagan Valley, 31 May 1896, *Inayat Khan* 19060a (K), and 15 Aug. 1897, *Inayat Khan* s.n. (K); Kagan, Musa Ka Musalla, 4270 m., 9 June 1899, *Inayat Khan* s.n. (K).

Kashmir: Sind Valley, Zaiwan, 3350–3810 m., in open meadows, flowers either white or yellow, yellow predominating, 17 June 1940, *Ludlow & Sherriff* 7651; above Gulmarg, 2750–3650 m., 2 June 1892, *J. F. Duthie* 11335; supra Shupien, in herbosis excelsissimus, *V. Jacquemont* 665 (holo. K).

West Tibet: Sine loc., *Falconer* 28 (K).

The specific epithet *potentilloides* was first given by Cambessedes to herbarium specimens which were later included either in *A. obtusiloba* s.l. or *A. rupestris* Wall. (non Hook. f. & Thoms.) s.l. Dr. Hutchinson apparently regarded it as a distinct species and gave the name "*A. potentilloides* Cambess. MSS." to a plant grown at Glasnevin from seeds collected in Kashmir by a Mrs. Webber. Subsequently, Besant used the name in Gardener's Chronicle, where he remarked that *A. potentilloides* had been suggested as being an extreme form of *A. obtusiloba* but was far enough removed to merit specific rank. In 1936 a plant exhibited by Lady Lawrence as *A. potentilloides* received the Award of Merit from the Royal Horticultural Society, and in the following year a photograph of this plant in cultivation appeared in the Bulletin of the Alpine Garden Society.

The writer does not know whether this form of *A. obtusiloba* is still in cultivation, but it is obvious that the two illustrations of *A. potentilloides*, and the specimens so named by Cambessedes, refer to the same plant. It is apparent from the amount of material in the Edinburgh Herbarium of subsp. *obtusiloba* var. *obtusiloba*, that although there are small forms of it, the main difference between it and var. *potentilloides* is the size-ratio of the flowers and leaves. In var. *obtusiloba* one finds in both large and small plants that the flowers are always smaller than the leaves, whereas the opposite is the case in var. *potentilloides*. It is worth recording that all the

Hazara specimens have glabrous carpels, but the absence or presence of hairs has not been found to be a reliable taxonomic character, and separation on this character alone would introduce many more infraspecific categories which otherwise resemble each other closely.

In the literature the flowers are referred to as "bright blue", "dark blue" and "lilac", and yellow flowers are present in herbarium specimens indicating that the colour of the sepals is just as variable in var. *potentilloides* as in the typical variety.

Falconer 28 is cited by Brühl under *A. obtusiloba* subsp. *saxicola* Brühl and by Ulbrich under *A. biflora* DC.

subsp. **rockii** (Ulbrich) Lauener, **comb. nov.**

Syn.: *A. rockii* Ulbrich in Notizbl. Bot. Gart. Berl. x, 876 (1929)

W. CHINA: Top Mt. Wa, flowers white, lower half blue outside, July 1903, *E. H. Wilson* 3052 (K).

KANSU: upper Tebbu Country, near Djrakana Shimen, 3200 m., limestone crevices, forming cushions 2–3 ft. diam., leaf deep green, glossy, flowers white deep blue beneath, Oct. 1925, *J. F. Rock* 13626 (synt. E); Southern slopes of Minshan, 3230 m., south of Shimen in crevices of limestone cliffs, along streams, cushion plants, flowers white, June 1925, *J. F. Rock* 12520 (synt. E); gravelly slopes at foot of Shimen, 3650 m., flowers white, bluish beneath near peduncle, leaves rich green, July–Aug. 1925, *J. F. Rock* 13061 (synt. E); T'ao River basin, valley of Shiaoku, beyond Adjuan, 3050 m., on limestone cliffs, flowers large, white, July 1925, *J. F. Rock* 12838.

SHANSI: Hsiawutaishan, 29 May 1930, *H. W. Kung* 154.

SZECHUAN: Tchen-Keou-Tin, *P. G. Farges*, s.n. (K).

YUNNAN: Yangtze watershed, Prefectural District of Likiang, eastern slopes of Likiang Snow Range, Chin Hai Tze, 3350 m., carpeting meadow, flowers white, 13 June 1922, *J. F. Rock* 4445. Mt. Kenichunpo, eastern and western slopes, Salwin and Irrawaddy Divide, 4270 m., wet alpine meadows, flowers pale blue, May–July 1932, *J. F. Rock* 21952, and 3960 m., alpine meadows, flowers purplish blue, May–July 1932, *J. F. Rock* 21989; Western Range of Mekong on Kaakerpo, Dokerla and Tsarung, 3960 m., alpine meadows, flowers purple beneath, May–June 1932, *J. F. Rock* 23148; Mountains west of Hsiao Chung-tien, 3960 m., dry alpine meadows, flowers blue, April–May 1932, *J. F. Rock* 24666; Salwin-Kiu Chiang divide, lat. 28° 20′ N., long. 98° 27′ E., 4270 m., on open alpine meadows, plant of 4-7 inches, flowers deep indigo-purple, July 1921, *G. Forrest* 19883, sine loc. *G. Forrest* 28760, 30471, 30818, 30828; Ka-gwr-pu, 4570 m., grassland, flowers blue with white var., July 1913, *F. Kingdon Ward* 797; Hee-Chan-Men, 2800 m., in pratis paludosis ad Kan-hay-tse, *Delavay* s.n. (K.)

Ulbrich based the description of this species on several plants collected by Rock in Kansu. Other specimens from Szechuan and Yunnan match the Rock syntypes and all form a group of plants obviously related to typical *A. obtusiloba*. They are of somewhat the same stature with the same large flowers and similarly ternate but more divided leaves. The lobes of the leaves in subsp. *obtusiloba* are never cut to more than half of their

length, and the leaf segments are inclined to overlap. In the Chinese subsp *rockii* the lobes are cut to halfway or more and there is a more apparent sinus (Fig. F.).

subsp. **ovalifolia** Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 78, pl. 106B, figs. 23, 27–30 (1896).

Syn.: *A. obtusiloba* subsp. *ovalifolia* var. *geochares* Brühl in l.c. pl. 106B and figs. 8–11.

A. obtusiloba subsp. *ovalifolia* var. *orthocaula* Brühl in l.c. pl. 106, fig. 12.

A. rupestris Wall. var. *lobata* Brühl in l.c. 80, pl. 107 A1, et figs. 7, 11.

A. geum Lévl. in Bull. Acad. Géog. Bot. xxv, 25 (1915); Hand.-Mazz. in Acta Hort. Gotoburg. xiii, 177 (1939); Comber in Notes Roy. Bot. Gard. Edinb. xviii, 229 (1934).

A. bonatiana Lévl. var. *geum* (Lévl.) Lévl. in Cat. Pl. Yunnan, 219 (1917).

A. rupestris var. *pilosa* Marquand & Shaw in Journ. Linn. Soc. Lond. xlviii, 154 (1929).

A. rupestris var. *villosa* Marquand & Shaw, l.c.

A. wardii Marquand & Shaw, l.c., p. 155.

A. ovalifolia (Brühl) Hand.-Mazz., Symb. Sin. vii, 315 (1931).

TIBET: Gyangtse, July–Sept. 1904, *Capt. J. H. Walton* (K); 2 July 1907, *H. M. Stewart* s.n.; Reting, 60 miles N. of Lhasa, 4115 m., amongst shrubs on hillside, flowers white, green at back, 9 Aug. 1944, *Ludlow & Sherriff* 1112, and on damp meadows, 4720 m., flowers rich yellow, 25 July 1944, *Ludlow & Sherriff* 11069; Nyenchentang La, 4115 m., on rocky soil among shrubs, flowers white, 10 June 1943, *Ludlow & Sherriff* 9604, and on grassy meadows, 4270 m., flowers yellow, 13 June 1943, *Ludlow & Sherriff* 9675; hills N. of Lhasa 4270 m., on open rocky hillside, flowers vary from deep blue violet to reddish purple, 25 June 1943, *Ludlow & Sherriff* 9699, and 4570 m., alpine zone, flowers orange brown, dark on under surface of segments, 24 June 1942, *Ludlow & Sherriff* 8737; Chosam, Tsari Chu, 3960 m., on grassy banks in full sun, deep purple, 16 May 1936, *Ludlow & Sherriff* 1601; Nyima La, 3960–4270 m., in open pastures in the Rhododendron shrub belt, flowers purple, 22 June 1924, *F. Kingdon Ward* 5821 (holo. *A. rupestris* var. *villosa*, K); Temo La, 4270–4570 m., in pastures among dwarf Rhododendron on the open moorland, flowers snow white, violet on reverse, 6 June 1924, *F. Kingdon Ward* 5747 (holo. *A. rupestris* var. *pilosa*, K); Doshong La, Pemako, 3050 m., on muddy meadow slopes with Primulas, Pedicularis, dwarf Rhododendron, etc., all flowering in the snow, flowers deep violet, 25 Oct. 1924, *F. Kingdon Ward* 6262 (holo. *A. wardii*, K): Seinghku Wang, 2890–3510 m., on steep alpine grass slopes, petals white with a violet tinge, showing through from the dark violet reverse, 7 June 1926, *F. Kingdon Ward* 6871 (K); Tumbatse, 3650 m., flowers white, petals violet on the reverse, 3 July 1924, *F. Kingdon Ward* 5896; Shinden Gompa, Nagong, 4270 m., flowers golden yellow in sheltered spots among scrub, white on dry swept turf downs, 25 July 1933, *F. Kingdon Ward* 10641; Radja and Yellow River gorges, alpine slopes south of Yellow River, opposite Radja, 3650 m., flowers yellow, 10 June 1926, *J. F. Rock* 14105; forests and alpine regions of the Solo-La, 4420 m.,

alpine meadow, flowers blue, May–June 1932, *J. F. Rock* 22245, sine loc. in 1884, flowers yellow, *Przewalski*.

KANSU: Sine loc. in 1885, *Potanin* s.n.; Terra Tangutorum, silvis frondosis alpinis, 1873, *Przewalski* s.n.; 1880, *Przewalski* s.n.; sward on S. side of Chagola, 2130 m., very abundant generally and in better form in hedgerows and fields about Ga-ho-ba Satanee, etc., at 1830 m., 6 May 1914, *Farrer & Purdom* 52; sine loc., 2130–3350 m., a general weed in all open places, white and yellow, May, *Farrer & Purdom* 530. T'ao River basin, in alpine meadows, flowers dark blue, June 1925, *J. F. Rock* 12254.

SIKANG: Mt. Mitzuga, west of Muli Gomba, 3050–4875 m., flowers white above, blue beneath, June 1928, *J. F. Rock* 16219; Mt. Konka, Risonquemba, Konkaling, 3960–5335 m., flowers white, June 1928, *J. F. Rock* 16319; Djesi-La and Djesi-Longba, south of Tatsien-lu, flowers white, July 1929, *J. F. Rock* 17543; grasslands of Yulong-Hsi, Minya Country, south of Tatsienlu, 4770–4900 m., July 1929, *J. F. Rock* 17504; mountains of Kulu, Muli Territory, 4570 m., alpine meadows, flowers blue, 1932, *J. F. Rock* 23953, and flowers white, 1932, *J. F. Rock* 23955; western slopes of Mt. Mitzuga, Muli Territory, 3350 m., water courses, flowers yellow, May–June 1932, *J. F. Rock* 24033; neighbourhood of Tatsien-lu, 1923, *R. Cunningham* 40, 1924, *R. Cunningham* 468, 473; Tatsien-lu, *Pratt* 176 (synt. subsp. *ovalifolia* var. *geochares*, K); 2750–4115 m., *Pratt* 868; Tatsien-lu, 2750–2900 m., in thickets, 3 inches, flower white, 25 Sept. 1928, *W. P. Fang* 3553.

SZECHUAN: Sungpan-hsien, grassy slope, 8 Aug. 1928, *W. P. Fang* 4063; Sungpan, 3600 m., in prato alpino, 9 July 1922, *H. Smith* 2561?; Ningyueh, 3275 m., flowers white and bluish, 1914, *Handel-Mazzetti* 1757.

YUNNAN: Eastern flank of the Lichiang Range, 3050–3350 m., lat. 27° 12′ N., dry grassy opening in pine forests, plant of 3–6 inches, flowers deep rich blue, May 1906, *G. Forrest* 2129, and lat. 27° 25′ N., shady situations in pine and mixed forests, plant of 4–6 inches, flowers blue, June 1910, *G. Forrest* 5968, and lat. 27° 40′ N., 3350–3650 m., June 1913, *G. Forrest* 10270; Bei-ma Shan, lat. 28° 12′ N., 3960 m., open stony pasture, plant of 2–4 inches, flowers deep golden yellow, exterior purplish green, June 1917, *G. Forrest* 13975; duplicate of 1917, lat. 28° 18′ N., 4420 m., July 1918, *G. Forrest* 16571; sine loc. in 1931, *G. Forrest* 30071, 30802; grown in Hsieh Lung Mt., *McLaren's Collector* D. 307; sine loc., 3960 m., open grassy places on shrub belt, 1913, *F. Kingdon Ward* 371, 615; Bei-ma Shan, Mekong-Yangtze Divide between Atuntze and Pungtzera, on loose gravelly alpine slopes, flower whitish blue, June 1923, *J. F. Rock* 9300; Mount Fu-Chuan, southwest of Wei-Hsi, Mekong Salwin Divide, 4300 m., May–June 1928, *J. F. Rock* 16965; Ta-hai-tse, 3200 m., lagune du haut plateau, fl. blanches, toute ciliée, *E. E. Maire* s.n. (holo *A. geum*, E), 2800 m., flanc rocailleaux des mont., fl. jaunes, 1913, *E. E. Maire* s.n.; Pe-long-tsin, 3200 m., paturâges des mont., fl. blanches, *E. E. Maire* s.n., fl. bleues, *E. E. Maire* s.n.

SHANSI: Chien-hsui distr., Mien-shan-yeh, 2100–2500 m., in prato alpino, 19 June 1924, *H. Smith* 5811; T'angch'ihszu, Hsiaowutai Shan, height 5–6 inches, flower white, 6 June 1930, *H. W. Kung* 234, and height 2–3 inches, 6 June 1930, *H. W. Kung* 235; sine loc. *Potanin* in 1884.

Anemone obtusiloba subsp. *ovalifolia* was first described by Brühl in 1896, and was divided by him into two varieties—var. *geochares* representing the typical form with prostrate or procumbent scapes, and var. *orthocaula* with erect or ascending scapes. One of the syntypes of var. *geochares*, *Pratt* 176 from Tatsienlu, has been examined at Kew.

Specimens collected by Przewalski in N. Tibet and by Potanin in Kansu are in Edinburgh, and these may be the collections referred to var. *geochares* by Brühl. Although these two latter collections do not show strictly erect flowering stems there is no doubt from the mass of material available over sixty years later that subsp. *ovalifolia* may be prostrate, semi-prostrate, erect or ascending, and varies considerably in the length of the scape. The type of var. *orthocaula*, a Duthie specimen from Kumaon, has not been seen, but from the illustration of a leaf it seems best to unite the two varieties, although examination of the type might show that the affinity lies with subsp. *obtusiloba*, as might be expected on grounds of distribution.

In Symbolae Sinicae Handel-Mazzetti raised subsp. *ovalifolia* to specific rank, and placed in synonymy var. *geochares* together with part of *A. obtusiloba* subsp. *obtusiloba* (*typica* Brühl), *A. rupestris* D. Don var. *lobata* Brühl and *A. obtusiloba* subsp. *micrantha* (Klotzsch) Ulbrich, which has already been discussed.

Brühl gave the distribution of subsp. *obtusiloba* (*typica*) as Gilgit, temperate and alpine Himalaya and Yunnan. No collectors are listed and no Yunnanese material of typical *A. obtusiloba* has been seen by the writer. It is probably in respect of this supposed Yunnanese distribution that Handel-Mazzetti regarded part of Brühl's typical *A. obtusiloba* as synonymous with *A. ovalifolia*.

A. rupestris Wall. var. *lobata* Brühl was gathered by King's collector in Sikkim. The illustration of this variety in Brühl's paper shows very little difference from that of *A. obtusiloba* subsp. *ovalifolia* except that the pedicels are more erect and more elongated. The leaves show exactly the same formation and Handel-Mazzetti, in Symbolae Sinicae, remarked that if one compared figs. 106B and 107A.1 (*ovalifolia* and *rupestris* var. *lobata*) one looked in vain for a tangible difference.

The type specimen of *A. geum* is a compact plant with pedicels and leaves, including the petioles and sheathing bases, covered with long shaggy hair. The leaves are very crowded on short petioles, and the plant has a broad thick rootstock. *Handel-Mazzetti* 1757 is a very similar plant, and was cited by him under *A. ovalifolia* in Symbolae Sinicae, but both may be regarded as extremely hairy forms of subsp. *ovalifolia*. Comber recognised this, and in 1934 sank *A. ovalifolia* (Bruhl) Hand.-Mazz. under *A. geum*, but at subspecific rank *ovalifolia* is the earlier name.

The close affinity between subsp. *obtusiloba* and subsp. *ovalifolia* is shown by the range of more or less intermediate small forms from Tibet, i.e. between the main Chinese and Himalayan centres, although subsp. *ovalifolia* does extend as far west as Sikkim and possibly Kumaon (var. *orthocaula* Brühl).

The type of *A. wardii*, *F. Kingdon Ward* 6262, is not a perfect match with subsp. *ovalifolia* for its lateral leaf lobes are almost as large as the terminal lobe and the carpels are glabrous. Moreover, the degree of toothing of the leaves falls between subsp. *obtusiloba* and subsp. *ovalifolia*. However, both

in stature and distribution *K.W.* 6262 is obviously more akin to subsp. *ovalifolia*.

K. W. 6871 is very similar to No. 6262 but has hairy carpels. The number of teeth on the leaves of *K. W.* 5896 is characteristic of subsp. *obtusiloba*, but this plant has a tendency towards the smaller lateral lobes of subsp. *ovalifolia* . Intermediate expression between the two subspecies is also found in *Ludlow & Sherriff* 1601 and 8737, two collections which were formerly determined as *A. wardii* and *A. rupestris* respectively.

Not all the collections from Tibet are atypical, however, for *L. & S.* 1112, 9699, 11069 and *K. W.* 10641 are all easily identfiiable as subsp. *ovalifolia*.

Part of the holotype of *A. rupestris* var. *villosa*, *F. Kingdon Ward* 5821 from Nyima La, lies within the morphological range of subsp. *ovalifolia*, yet another sheet of this same number also at Kew, with a single specimen, shows a more luxuriant growth with larger leaves approaching small forms of subsp. *obtusiloba*. In their diagnosis Marquand & Shaw stated that var. *villosa* differed from *A. rupestris* in being hairy in all parts except the stamens and carpels and in having less dissected leaves. It is now apparent from more extensive study and more material that var. *villosa* should be considered synonymous with subsp. *ovalifolia*.

A. rupestris var. *pilosa* was also described by Marquand and Shaw and differentiated from *A. rupestris* by the shorter leaf petioles and hairiness of the leaves and carpels. All these characters may be encompassed within the orbit of subsp. *ovalifolia*. An annotation on the holotype sheet, *F. Kingdon Ward* 5747, equates it with *Forrest* 5802 which is, however, *A. obtusiloba* subsp. *ovalifolia*×*A. trullifolia* and has trilobed and cuneate leaves.

Anemone obtusiloba D. Don subsp. **ovalifolia** Brühl×**A. trullifolia** Hook. f. & Thoms.

Syn.: *A. trullifolia* Hook. f. & Thoms. var. *campestris* Diels in Notes Roy. Bot. Gard. Edinb. vii, 110 (1912), 323, 338 (1913) *pro parte nom. nud.*

A. coelestina var. *truncata* Comber in Notes Roy. Bot. Gard. Edinb. xviii, 226 (1934).

SIKANG: Mountains around Muli, lat. 28° 12′ N. long, 101° E., 3960 m., on open stony meadows, plant of 6–10 inches, flowers white flushed blue on exterior, July 1930, *G. Forrest* 28434; Muli, 3800–3950 m., 24 July 1915, *Handel-Mazzetti* 7179 (K). Both these collections are large-leaved forms.

YUNNAN: Eastern flank of the Lichiang Range, lat. 27° 15′ N., 3050–3350 m., moist shady pine forests, plant of 3–6 inches, flowers white or blue, May 1910, *G. Forrest* 5640 (holo. *A. coelestina* var. *truncata*, E); eastern flank of the Lichiang Range, lat. 27° 20′ N., 3350 m., in open pine forests, plant of 5–8 inches, flowers lavender blue, June 1906, *G. Forrest* 2289; western flank of the Lichiang Range, lat. 27° 20′ N., 3660–4260 m., shady pine and rhododendron forests, plant of 4–9 inches, interior of perianth white or lavender, exterior dark blue, June 1910, *G. Forrest* 5802; Lichiang Range, 27° 30′ N., 3050–3350 m., June 1913, *G. Forrest* 10135; north end of the Lichiang Valley, 27° 12′ N., 2590 m., arid stony plain, plant of 2–4 inches, exterior of perianth blue, interior white, June 1906, *G. Forrest* 2232; sine loc. *G. Forrest* 2152; Likiang Snow Range, Yangtze

Watershed, flowers dark blue, 26 May 1922, *J. F. Rock* 3929; in limestone meadow, flowers blue, 28 June 1922, *J. F. Rock* 4767; Lichiang Snow Range, 2800 m., alpine meadow, herb of 4–6 inches, blue, 15 Sept. 1937, *T. T. Yu* 15595 *pro parte*.

When describing *A. coelestina* var. *truncata* Comber said: "This variety differs from the typical plant in the truncate or cordate, and not cuneate bases of the leaves. The leaves are more or less trilobed, but not trisect as in *A. geum* Lévl., and in this respect intermediate between the latter and *A. coelestina*. This character is purely artificial, but seems to be the most definite one in an extremely variable group of plants".

Having regard to the fact that *A. geum* and *A. coelestina* are synonymous respectively with *A. obtusiloba* subsp. *ovalifolia* and *A. trullifolia*, Comber made an accurate assessment of the affinities of his variety. Nevertheless, not all the collections he cited belong to it. *Forrest* 30471, for instance, is subsp. *rockii*, *Forrest* 2129, 5968, 10270 and 30071, and the Maire gathering must undoubtedly be referred to subsp. *ovalifolia*. The leaves of these specimens are trisect almost to the base, not trilobed and they have the characteristically short lateral lobes of subsp. *ovalifolia*.

The holotype specimen of var. *truncata*, *Forrest* 5640, consists of several plants some of which are cordate-leaved, others truncate-leaved. The individuals comprising *Forrest* 5640A are all cuneate-leaved and belong to *A. trullifolia*. They appear to have been separated in the herbarium from *F.* 5640, by virtue of their different foliage, rather than in the field by Forrest himself, and were all collected at the same place on the Lichiang Range. From this same locality several specimens of subsp. *ovalifolia* were gathered, including *Forrest* 5968, which has its leaves broader than long, and divided almost to the base with smaller lateral lobes.

It is likely that in this area, common to both *A. trullifolia* and subsp. *ovalifolia*, hybrids are produced with leaves intermediate between the two —sometimes truncate, sometimes cordate, either trilobed or cut nearly to the base, and often broader than long (Figs. H–I). There are also two large-leaved forms from Muli where once again the two probable parents have been collected.

Anemone imbricata Maxim., Fl. Tangut. i, 8, t. 22, figs. 1–6 (1889); Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 77, pl. 106, figs. 21–22, 33 (1896); Fin. & Gagnep. in Bull. Soc. Bot. Fr. li, 73 (1904) et in Fl. As. Or. i, 85 (1905); Ulbrich in Engler, Bot. Jahrb. xxxvii, 243 (1906) et in Notizbl. Bot. Gart. Berl. x, 873 (1929).

Syn.: *A. obtusiloba* D. Don subsp. *imbricata* (Maxim.) Brühl l.c. 79, in obs.

TIBET: *Przewalski* in 1884 (iso?, E); Alpine region between Radja and Jupar Range, 4420 m., among rocks in alpine meadows of Wajo La, flowers blackish, June 1926, *J. F. Rock* 14146; region of Wotila, 4420 m., flowers blackish red, June 1926, *J. F. Rock* 14231; Totuch Nira, 4360 m., in gravel, flowers blackish red, July 1926, *J. F. Rock* 14371.

SIKANG: Djesi-La and Djesi Longba, south of Tatsienlu, 4750 m., flowers white, bluish beneath, June–July 1929, *J. F. Rock* 17704.

In his discussion on the variation within *A. obtusiloba* Brühl says . . . "nor does *A. imbricata* Maxim. lie outside the group of forms which have diverged from the typical *A. obtusiloba*". The leaves figured in his Pl. 106A are referred to as subsp. *imbricata*.

Nevertheless the imbricate nature of the leaves separates this species readily from any other in the group. Certainly some of the specimens of *A. rupestris* subsp. *gelida* var. *wallichii*, e.g. *Ward* 5911, look like minute forms of *A. imbricata* because their leaves have the pinnae so close to each other, but apart from the difference in size of the leaves and of the whole plant, the leaves of *A. imbricata* are also covered with long white hairs, a feature not present in *A. rupestris* var. *wallichii*.

Anemone trullifolia Hook. f. & Thoms., Fl. Ind. i, 22 (1855).

var. **trullifolia**

Syn.: *A. trullifolia* Hook. f. & Thoms.; Fl. Brit. Ind. i, 9 (1872); Ulbrich in Engler, Bot. Jahrb. xxxvii, 243 (1906).

A. coelestina Franchet in Bull. Soc. Bot. Fr. xxxii, 4 (1885); Ulbrich in Engler, Bot. Jahrb. xxxvii, 243 (1906); Hand.-Mazz., Symb. Sin. vii, 316 (1931) et in Acta Hort. Gotoburg. xiii, 178 (1939).

A. obtusiloba D. Don subsp. *trullifolia* (Hook. f. & Thoms.) Brühl var. *spatulata* Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 77, pl. 106A, et figs. 14–18, 26 (1896).

A. obtusiloba subsp. *coelestina* (Franch.) Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 78 (1896).

A. trullifolia var. *typica* Fin. & Gagnep. in Bull. Soc. Bot. Fr. li, 61 (1904) et in Fl. As. Or. i, 73 (1905).

A. trullifolia Hook. f. & Thoms. var. *coelestina* (Franch.) Fin. & Gagnep. in l.c.

A. bonatiana Lévl. in Fedde, Rep. Sp. Nov. vii, 98 (1909); Hand.-Mazz. in Acta Hort. Gotoburg. xiii, 178 (1939).

A. trullifolia Hook. f. & Thoms. var. *campestris* Diels in Notes Roy. Bot. Gard. Edin. vii, 148 (1912), 323, 338 (1913) *pro parte nom. nud.*

A. coelestina Franch. var. *polygyna* Comber in Notes Roy. Bot. Gard. Edinb. xviii, 226 (1934).

SIKKIM: 3350–4570 m., *J. D. Hooker* (synt. E.). Llonok, 4570 m., 22 July 1909, *Smith & Cave* 1711 (this is a large-leaved and tall specimen.) Zemu and Llonakh Valleys, Yeumthang, 3650 m., in shallow water, flowers yellow, 13 Sept. 1947, *G. H. Cave* 167.

BHUTAN: *Griffith* 1718 (synt. E); Sharithang, 3350 m., grassy glades in forest, colour bright yellow, 25 May 1933, *Ludlow & Sherriff* 29; Lingshi Timpu, 4570 m., 21 July 1914, *R. E. Cooper* 1631.

CHUMBI: Pey-goong-la, colour yellow, 3 July 1884, *Dr. King's Collector* 645.

SIKANG: Litang-Yalung Divide, lat. 28° 20′, long. 101° 05′, 3660–3960 m., on open windy grass-clad slopes, flowers at first lemon yellow turning darker with age, eventually reddish orange, 8 Aug. 1921, *F. Kingdon Ward* 4416—*pro parte*; Mount Mitzuga, west of Muli Gomba, 3050–4875 m., flowers white and lavender blue, June 1928, *J. F. Rock* 16206.

YUNNAN: Sommet du Mt. Hee-chan-men, environs de Tali, 11 July 1883, *Delavay* 3 (synt. *A. coelestina*, P); Mt. Hee-chan-men, supra Lankong, fleurs bleues, ou blanches en dedans, 2 June 1884, *Delavay* 48 (synt. *A. coelestina*, P); Lao Kouy Chan, pres My Le, 1906, *Ngueou* 607, Herb. G. Bonati (holo. *A. bonatiana*, E); eastern flank of Lichiang Range, 3050–3350 m., moist shady forest, plant of 3–6 inches, flowers white or blue, May 1910, *G. Forrest* 5640A; Sine loc. *G. Forrest* 28484, 28855, 30817A; mountains west of Hsiao Chung-tien, water courses, alpine meadows, 3960 m., flowers white, April–May 1922, *J. F. Rock* 24664. Stony pasture-land at base of the eastern flank of the Lichiang Range, 2750–3050 m., lat. 27° 12′ N., plant of 1–2 inches, flowers white striped bright green, July 1906, *G. Forrest* 2634 (holo. *A. coelestina* var. *polygyna*, E).

The Edinburgh syntypes of *A. trullifolia* and the Paris syntypes of *A. coelestina* have been compared, and there is no doubt that the only difference between them is one of colour.

A. trullifolia sensu stricto has only been recorded from India and with predominantly yellow flowers. It is a constant species with subtrilobed or trilobed, hairy, oval, cuneate leaves on short petioles (Fig. G). The Smith and Cave specimen from Llonok is at present included here although it has a larger involucre, much larger leaves on longer petioles and larger flowers on very long scapes. It has a very thick rootstock and may be just a much more luxuriant plant.

A. coelestina was based on two specimens collected by Delavay in Yunnan. In a footnote to his description Franchet remarked that it was very near *A. trullifolia* and perhaps only a remarkable variety of it. It differed, he said, from *A. trullifolia* by its longer cuneiform leaves, with fine punctations; but above all, the colour of the flowers was the most certain distinction between the two species—yellow in *A. trullifolia* and blue in *A. coelestina*.

With regard to the punctations, every sheet in the *A. coelestina* group has been examined, and on only three specimens were they not found: nor was this phenomenon visible on var. *linearis*. It was apparent, however, on some specimens of *A. obtusiloba* and on some of subsp. *ovalifolia*. As soon as water or lactophenol was applied to the leaf the punctations disappeared. They probably become manifest in dried specimens, and although the cause of their presence or absence is not known, they appear to have no value as a diagnostic character.

The varieties *linearis* and *holophylla* are discussed later, but it is necessary at this point to make observations on them.

Var. *linearis* is found in E. Himalaya, Tibet and W. China with yellow flowers, as in *A. trullifolia*. It also occurs in W. China with blue and white flowers as in *A. coelestina*.

Var. *holophylla*, on the other hand, has been collected only in W. China and with blue or white flowers.

It seems reasonable to assume, therefore, that these two varieties are both extensions of one blue- or yellow-flowered species, and that *A. coelestina* is, in fact, conspecific with *A. trullifolia*.

Brühl divided his subsp. *trullifolia* into three varieties, of which var. *spatulata* obviously refers to the typical variety as he cites the Sikkim and Bhutan collections. Of var. *rotundifolia* from Sikkim no specimens have

been seen, and it is unfortunately not illustrated. However, until it is certain what var. *rotundifolia* is, it is better regarded as a separate variety. The third variety is var. *linearis*.

A. bonatiana, as with many other species described by Léveillé, is a synonym, and examination of the holotype confirms Handel-Mazzetti's opinion.

Comber's variety *polygyna*, placed under *A. coelestina*, hardly merits separate recognition. It differs from the typical plant in its dwarfer habit, numerous carpels and virescent flowers. Only one specimen, the type (*Forrest* 2634) has been seen with these characters, amongst all the material examined.

This is one of the collections upon which Diels bestowed the undescribed name of *A. trullifolia* var. *campestris*.

var. **linearis** (Brühl) Hand.-Mazz. in Acta Hort. Gotoburg. xiii, 178 (1939).

Syn.: *A. obtusiloba* Hook. f. & Thoms. subsp. *trullifolia* (Hook f. & Thoms.) Brühl var. *linearis* Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 77, pl. 106, fig. 19 (1896).

A. trullifolia var. *souliei* Fin. & Gagnep. in Bull. Soc. Bot. Fr. li, 62 (1904) et in Fl. As. Or. i, 74 (1905).

E. HIMALAYA: Tang La, 4570 m., 12 Sept. 1912, *Rohmoo Lepcha* 308; Temo La, 3960 m., on open grassy banks, flowers lemon yellow, 8 June 1924, *F. Kingdon Ward* 5761.

TIBET: Reting, 60 miles N. of Lhasa, 4115 m., on open grassy plain, flowers pale yellow, 12 July 1944, *Ludlow & Sherriff* 9976; Reting, 60 miles N. of Lhasa, 4880 m., flowers dingy yellow, dark on outside surface of perianth segments, 31 July 1942, *Ludlow & Sherriff* 8975; Nyengchengtang La, 4 days N.W. of Lhasa, 4270 m., on open grassy hillside, flowers bright yellow, 15 June 1943, *Ludlow & Sherriff* 9673; Ata Kang La, Nahong, 4270 m., 15 July 1933, *F. Kingdon Ward* 10583.

SIKANG: Litang-Yalung Divide, lat. 28° 20′ N., long. 101° 5′ E., 3660–3960 m., on open windy grass-clad slopes, flowers at first lemon yellow turning darker with age, eventually reddish-orange, 8 July 1921, *F. Kingdon Ward* 4416 *pro parte*; Djesi-La and Djesi-Longba, south of Tatsienlu, 4600m., flowers white, bluish beneath, June–July 1929, *J. F. Rock* 17708.

SZECHUAN: In montis Liuku-Liangdse, 27° 48′ N., 3700–4200 m., flowers white and bluish, 18 May 1914, *Handel-Mazzetti* 2347—cited under *A. coelestina* in Symb. Sin. but as No. 2437; Mt. Siga, west and overlooking the Yalang River, north of Karadi, 3660 m., alpine meadows, flowers white, May 1932, *J. F. Rock* 23871.

YUNNAN: Bei-ma Shan, lat. 28° 12′ N., 3960 m., open stony pasture, plant of 1–2½ inches, flowers yellow, greenish purple on exterior, June 1917, *G. Forrest* 14014; duplicate of 14014—*G. Forrest* 18715; Bei-ma Shan, lat. 28° 18′ N. long. 99° 10′ E., 4270 m., moist stony meadows, plant of 3–9 inches, flowers canary yellow, greenish on exterior, June 1921, *G. Forrest* 19590; sine loc. *G. Forrest* 30817; Bei-ma Shan, Mekong-Yangtze Divide between Atuntze and Pungtzera, 3960–4270 m., on snowy alpine slopes, flowers yellow, bluish outside, June 1923, *J. F. Rock* 9270; Haba shan,

north of the Yangtze loop, third peak of Likiang Snow Range, Bardar, 4420 m., alpine meadows, flowers white, 1932, *J. F. Rock* 24793; Bei-ma Shan, Mekong Yangtze Divide, south-east of Atuntze, 4420 m., alpine meadows, flowers white, May–June 1932, *J. F. Rock* 22764; between Yungning and Mutichin, 2400 m., in pratis silvisque, June 1923, *Schneider* 3494.

Although the type specimen of var. *linearis*, *Pratt* 493 from the Tatsienlu region, has not been seen, there is no doubt as to its identity. The variety differs from *A. trullifolia* in its entire or 3–5 dentate leaves which are not trilobed (Figs. J–K). Handel-Mazzetti realised that Finet and Gagnepain's var. *souliei* was the same as var. *linearis*, and published the name *A. trullifolia* var. *linearis* (Brühl) Hand.-Mzt. However, although Finet and Gagnepain gave the flower colour of var. *souliei* as yellow, there are in Edinburgh several collections with white and/or blue flowers, which cannot be separated morphologically.

It is significant that whilst *Forrest* 30817 is var. *linearis*, *Forrest* 30817a agrees with the typical variety, and *Ward* 4416 is a mixture of both.

var. **holophylla** Diels in Notes Roy. Bot. Gard. Edinb. v, 263 (1912) and vii, 103, 109 (1912), 323, 338 (1913); Hand.-Mazz., Symb. Sin. vii, 316 (1931).

Syn.: *A. coelestina* Franch. f. *holophylla* (Diels) Comber in Notes Roy. Bot. Gard. Edinb. xviii, 226 (1934); Hand.-Mazz. in Acta Hort. Gotoburg. xiii, 178 (1939).

SIKANG: Mount Mitzuga, west of Muli Gomba, 3050–4875 m., flowers deep purple, June 1928, *J. F. Rock* 16255.

YUNNAN: Eastern flank of the Lichiang Range, 3050–3350 m., forming large patches on open, grassy, rocky slopes, plant of 2–5 inches, perianth white, exterior bluish, May 1906, *G. Forrest* 2166 (holo. E); eastern flank of the Lichiang Range, 27° 20′ N., 3200–3350 m., open situation in pine forests, plant of 6–10 inches, interior of perianth white, exterior blue, June 1906, *G. Forrest* 2226; Yangtze watershed, Prefectural District of Likiang, eastern slopes of Likiang Snow Range, 3960–4270 m., alpine meadows, flowers bluish white, 15 May 1922, *J. F. Rock* 3433; Yangtze watershed, etc., at Pe Shwe Ho (White Water River), flowers deep blue, stamens yellow, 17 May 1922, *J. F. Rock* 3571; Lichiang Snow Range, 2800 m., alpine meadow, herb of 4–6 inches, blue, 15 Sept. 1937, *T. T. Yu* 15595 *pro parte*; Yungning, grass flower, May bloom, *McLaren's Collector*, N. 61.

When Diels described var. *holophylla* he said, "This variety is very much like the var. *souliei* Fin. & Gagnep. but has white (exterior blue) flowers, not yellow ones". Handel-Mazzetti remarked that var. *holophylla* was nearer to *A. coelestina*, and in 1934 Comber published the new combination *A. coelestina* f. *holophylla*, pointing out that the form only differed from the type species (*A. coelestina*) by the leaves being evenly toothed and not trilobed (Fig. L).

Rock 16206 and 16255 come from the same locality, but the former is var. *trullifolia* and the latter matches var. *holophylla*. 16206 is only just trilobed, and there is here a leaf state where the trilobed leaf becomes more or less crenate-dentate, so that it is hard, if not impossible, to distinguish between the two varieties.

There is a marked similarity in size and habit between var. *linearis* and var. *holophylla*, but the leaves of the latter are always crenate-dentate and the flowers are always blue. It will be seen from their respective distributions that many specimens of var. *linearis* are found on the Bei-ma Shan and most of var. *holophylla* on the Lichiang Range. These two areas both run approximately north-south and are separated by the Yangtze River and the Chungtien Plateau. However, there is an overlap in distribution for both varieties are found at Yungning and the leaf difference is maintained.

Anemone rupestris Hook. f. & Thoms., Fl. Ind. i, 21 (1855); Hook. f., Fl. Br. Ind. i, 9 (1872).

subsp. **rupestris**

Syn.: *A. obtusiloba* subsp. *saxicola* Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 78, pl. 105C et 106, fig. 20 (1896).

A. polycarpa Evans in Notes Roy. Bot. Gard. Edinb. xiii, 154 (1921).

NEPAL: Lamjung, 4420 m., on open slopes among boulders, sepals white above purple beneath, 13 July 1954, *Stainton, Sykes & Williams* 6326; 3960 m., petals white flushed purple beneath, or entirely blue-purple, 16 July 1954, *Stainton, Sykes & Williams* 6366.

SIKKIM: 4570 m., *J. D. Hooker* s.n. (lecto. *A. rupestris* Hook. f. & Thoms. non Wall., K, iso. E); N. of Tumtso La, 4570 m., flowers very dark purple, achenes compressed, 12 July 1909, *Smith & Cave* 1292 (K).

BHUTAN: Meha, 4270 m., 5 Aug. 1933, *Ludlow & Sherriff* 405.

TIBET: Northern slopes of Mt. Kenichunpo, north of Sikitung, Upper Salwin River, May–June 1932, *J. F. Rock* 22179.

YUNNAN: Mekong-Salwin divide, lat. 28° 10′ N., 3650 m., open stony pasture, plant of 10–12 inches, flowers deep purple, Sept. 1914, *G. Forrest* 13320 (holo. *A. polycarpa*, E), lat. 27° 54′ N., long. 98° 30′ E., 3960 m., stony meadowland on the margin of thickets, plant of 6–10 inches, flowers deep indigo purple, June 1921, *G. Forrest* 19578; Doker La, Mekong-Salwin divide, lat. 28° 25′ N., 3350 m., moist shady situations on boulders and cliffs by streams, plant of 12–18 inches, flowers interior bluey-grey, exterior deep blue, July 1918, *G. Forrest* 16671, lat. 28° 20′ N., long. 98° 40′ E., 3350–3650 m., on moist shady rocks in side valleys, plant of 10–14 inches, flowers greyish white interior, exterior deep indigo blue, Sept. 1921, *G. Forrest* 20738; Mekong-Salwin divide, Sila, 4000 m., grassy slope, herb 1 inch, white, purplish outside, common, 16 Aug. 1938, *T. T. Yu* 22374. Upper Kiukiang Valley, (Chulung), S. of Lungtsahmuru, 3800 m., alpine grassland, herb perennial 4–6 inches, white, violet purple outside, common, 10 Aug. 1938, *T. T. Yu* 19858.

The first occurrence of the name *A. rupestris* was in Wallich's Catalogue 4696, and applied to his collection of that number from Gossain Than in Nepal. The first description against that name was by Hooker & Thomson in Flora Indica, and there they cited—"Kashmir ad Pir Panjal jugum, Jacquemont! Nepal ad Gossain Than, Wall.! Sikkim, alt. 15,000 ped.!" This last specimen was collected by J. D. Hooker. Again in Flora of British India, the Hooker and the Wallich specimens were referred to *A. rupestris* Wall. Cat. 4696.

This position remained for a further twenty years until Brühl's paper in 1896. In a general discussion on *A. obtusiloba* he said, "The *A. rupestris* of the Calcutta Herbarium—there is an original Wallichian type-sheet here—is different from the *A. rupestris* distributed under this name from Kew, and evidently the one described as such in the Flora of British India. . . . As however the form described by Hooker & Thomson in the Flora of British India has to be reduced to *A. obtusiloba*, I have changed its name to *A. saxicola* (sic), leaving the name *A. rupestris* to the species which doubtlessly Wallich originally meant to give it."

Now Brühl associated *Wallich* 4696 with the name *A. rupestris* and rightly perceived that the Hooker & Thomson description could only be applied to a different plant. But he assumed that not only were the Kew and Calcutta specimens of *Wallich* 4696 different—("Wallich as has happened pretty frequently with him, appears to have distributed quite different species under the same name"), but also that the Kew *Wallich* 4696 agreed with Hooker's Sikkim specimen. In this, however, he was not correct. A photograph of the Calcutta sheet of *Wallich* 4696 agrees with the Kew specimen of the same number. But both these, however, *are* different from the plant Hooker collected in Sikkim and to which the description in Flora Indica applies. Hooker did not mention why he based the description of *A. rupestris* on his Sikkim plant unless he considered it conspecific with *Wallich* 4696, or that the latter was perhaps a depauperate form. Therefore, although the Sikkim and Nepal specimens are not similar, in view of the fact that Wallich published no description, the name *A. rupestris* must apply to the Sikkim plant described and named as such by Hooker & Thomson (Fig. M).

A. rupestris exhibits both hairy and glabrous carpels. In the type specimen they are glabrous, but in two specimens gathered near each other, *Stainton, Sykes & Williams* 6366 has glabrous carpels whilst *S.S.W.* 6326 has hairy ones. The leaves of the former are slightly less in accord with typical *A. rupestris* in having fewer teeth than usual.

All the Yunnanese material cited was originally separated as *A. polycarpa*. Evans distinguished this species from *A. obtusiloba* by the pinnatisect leaves and numerous hairy carpels, but it has a much closer affinity with *A. rupestris* and only differs from it by the hairy carpels, a feature which does not have much significance, and *A. polycarpa* is therefore reduced to synonymy.

There are minor differences within these Yunnan collections which are worth recording. The lobes of the leaves are much more obtuse on all the specimens other than the holotype of *A. polycarpa*, although the leaf form is similar. *Yu* 22374 has leaves which are a perfectly good match with those of *Forrest* 16671 but are considerably smaller, as in fact is the whole plant, being only 5–10 cm. high as compared with the normal 20–30 cm.

subsp. **gelida** (Maxim.) Lauener, **comb. et stat. nov.**
Syn.: *A. gelida* Maxim. in Act. Hort. Petrop. xi, 21 (1890).
var. **gelida**
Syn.: *A. gelida* Maxim.; Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 80 (1896); Fin. & Gagnep. in Bull. Soc. Bot. Fr. li, 74 (1904) et in Fl. As. Or. i, 86 (1905); Ulbrich in Engler, Bot. Jahrb. xxxvii, 232 (1906); Ulbrich in Notizbl. Bot. Gart. Berl. x,

875 (1929); Hand.-Mazz., Symb. Sin. vii, 314 (1931) et in Acta Hort. Gotoburg. xiii, 177 (1939).

A. geum Lévl. var. *multisecta* Comber in Notes Roy. Bot. Gard. Edinb. xviii, 229 (1934).

SZECHUAN: Valle fl. Kserntso alpe Sü-ye-shan 2700 m., ad limitem nivis aeternae, 11 Aug. 1885 deflorescens, *Potanin* (iso. *A. gelida*, K); in montium Daliangschan (territorii Lolo) ad orientem urbis Ningyuen regione temperata, in pratis turfosis ad vicum Lanba, fl. albi, 25 April 1914, *Handel-Mazzetti* 1658; inter Woloko and Choso, in dumetis, 2900 m., fl. dilute violacei vel albi, 13 June 1914, *Schneider* 1583.

YUNNAN: Kari Pass, Mekong-Yangtze divide, lat. 27° 40′ N., 3660 m., open moist stony ground, plant of 2–3 inches, flowers white, Aug. 1914, *G. Forrest* 13018 (holo. *A. geum* var. *multisecta*, E); Lichiang Valley north of the city, lat. 27° N., 2590 m., boggy clayey pasture around a lake, plant of 3–6 inches, perianth white on interior, exterior varying shades of blue, May 1906, *G. Forrest* 2064. Yangtze watershed, western slopes of Likiang Snow Range, in pasture lands of Kau Hai Tze, south-west side of range, flowers white, purplish blue outside, 6 June 1922, *J. F. Rock* 4219; Yung Ning, grass flower, flowers white, *McLaren's Collector*, N 73; Chung river valley, 3350 m., in peat bog, open meadow in pine forest, May 1913, *F. Kingdon Ward* 274; in monte Hee-chan men, supra Lankong, 1883–1885, *Delavay* 1855 (K); sine loc. *G. Forrest* 160.

Forrest 13018 was first identified by Evans as "*A. obtusiloba* D. Don *forma foliis multisectis*". However, this collection bears a marked similarity to subsp. *gelida*, the only difference being that the Forrest specimen has hairy carpels, as in some of the other collections, and the leaves are more dissected. *Delavay* 1855, with hairy carpels, was determined as *A. obtusiloba* by Finet and Gagnepain, and as *A. gelida* by Handel-Mazzetti. Although naming a specimen of his own collecting, No. 1658, *A. obtusiloba*, Handel-Mazzetti later changed it to *A. gelida* in Symbolae Sinicae.

A. gelida does bear a general resemblance to *A. obtusiloba* but may be distinguished from it fairly readily by the distinctly stalked terminal leaflet and by the smaller leaves and less robust habit (Fig. N). It is not recorded outside China, and is therefore morphologically and geographically distinct from *A. obtusiloba*. It has a much closer affinity with *A. rupestris* Hook. f. & Thoms. and differs only in having the leaflets less toothed, and for this reason is here treated as a subspecies.

var. **wallichii** (Brühl) Lauener, **comb. nov.**

Syn.: *A. rupestris* Wall. Cat. 4696 (1831) ex Brühl in Ann. Roy. Bot. Gard. Calc. v (2), 79 (1896), non Hook. f. & Thoms.

A. rupestris Wall. ex Brühl var. *wallichii* Brühl l.c., 80.

A. rupestris Wall. ex. Brühl var. *pusilla* Brühl l.c., 81, pl. 107A, figs. 2, 5, 6, 12.

NEPAL: Gossain Than, *Wallich* 4696 (holo. CAL, iso. K); Khimti, 3960–4270 m., flowers dark purple, 1930, *Lall Dhwoj* 487, flowers white, *Lall Dhwoj* 488.

SIKKIM: Jongri, 4270 m., Aug. 1881, *G. Watt* 5779; Changu, in meadow and on hill sides, 2½–3 inches, spreading, showy wine colour, 28 June 1913, *R. E. Cooper* 30; above Lake Changu, 4270 m., perianth segment blue

underside, white above, stamens blue, fragrant, 9th Sept. 1913, *R. E. Cooper* 850 (very poor specimen).

BHUTAN: Tare La, above Ha, 3350–4420 m., 17 July 1938, *B. J. Gould* 1201 (K).

TIBET: Sang La, 4570–4880 m., on alpine turf slopes, exposed flank, flowers deep purple, 8 July 1924, *F. Kingdon Ward* 5911; Yatung, lat. 27° 51′ N., long. 88° 35′ E., 1897, *Hobson* s.n. (K).

E. HIMALAYA: Yampung, 4270 m., flowers blue, 12 Aug. 1913, *Rohmoo Lepcha* 1095; Megu, 4270 m., 1 July 1922, *G. H. Cave* s.n.

As has already been shown in the discussion under *A. rupestris* Hook. f. & Thoms., *A. rupestris* Wall. Cat. 4696 is a nomen nudum, and since this specific epithet now applies in any case to the Hooker specimen, Wallich 4696 must be renamed.

Brühl divided *A. rupestris* Wall. into var. *lobata* (see under subsp. *ovalifolia*), var. *wallichii*—the typical variety, and var. *pusilla*. In Symbolae Sinicae Handel-Mazzetti remarked that there was very little difference between var. *wallichii* and var. *pusilla*, and it is also the writer's opinion that the differences between these two varieties are not sufficient to warrant the maintenance of two separate taxa.

Wallich 4696 finds its nearest affinity in *A. rupestris* Hook. f. & Thoms. subsp. *gelida*, from which it only differs in its smaller leaves and size (Fig. O). Indeed, Brühl pointed out that it was quite possible that *A. gelida* "may finally have to be reduced to the rank of a subspecies of *A. rupestris* (Wall.)" showing that he had already noticed the close relationship between Maximowicz's and Wallich's species.

REFERENCES

BRÜHL, P. (1896). *Ann. Roy. Bot. Gard. Calcutta*, v (2), 76–81, pl. 105C, 106 and 107.

COMBER, H. F. (1934). *Notes Roy. Bot. Gard. Edinb.* xviii, 226–229.

FINET, A. & GAGNEPAIN, F. (1904). *Bull. Soc. Bot. France*, li, 56–76.

HANDEL-MAZZETTI, H. (1931). Symbolae Sinicae, vii. Wien.

—— (1939). Acta Hort. Gotoburg. xiii, 177–178.

HOOKER, J. D. (1872). Flora of British India, i. London.

—— & THOMSON, T. (1855). Flora Indica, i. London.

ULBRICH, E. (1906). Über die systematische Gliederung und geographische Verbreitung der Gattung *Anemone* L. *Engler, Bot. Jahrb.* xxxvii, 172–334.