STUDIES IN THE GENUS JASMINUM I: SECTION ALTERNIFOLIA

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The eight species contained by this section are the only truly alternate-leaved members of the whole family Oleaceae except for *J. grahamii* mentioned below. Taylor (in Brittonia, v, 351 & 352: 1945) has rightly drawn attention to the artificial nature of De Candolle's sections based as they are on leaf characters, and the Section *Trifoliolata* certainly includes plants which are quite unrelated; there is no doubt, however, that the alternate-leaved species are all of close affinity. Not only have they many similarities in morphology but they have a temperate and subtropical distribution in what is a large and otherwise mainly tropical genus (fig. 1).

The section ranges right across the Old World from Madeira in the west to Hupeh in the east and contains the only Jasmine native in Europe. It is difficult to decide where the affinity of the group lies in the rest of the

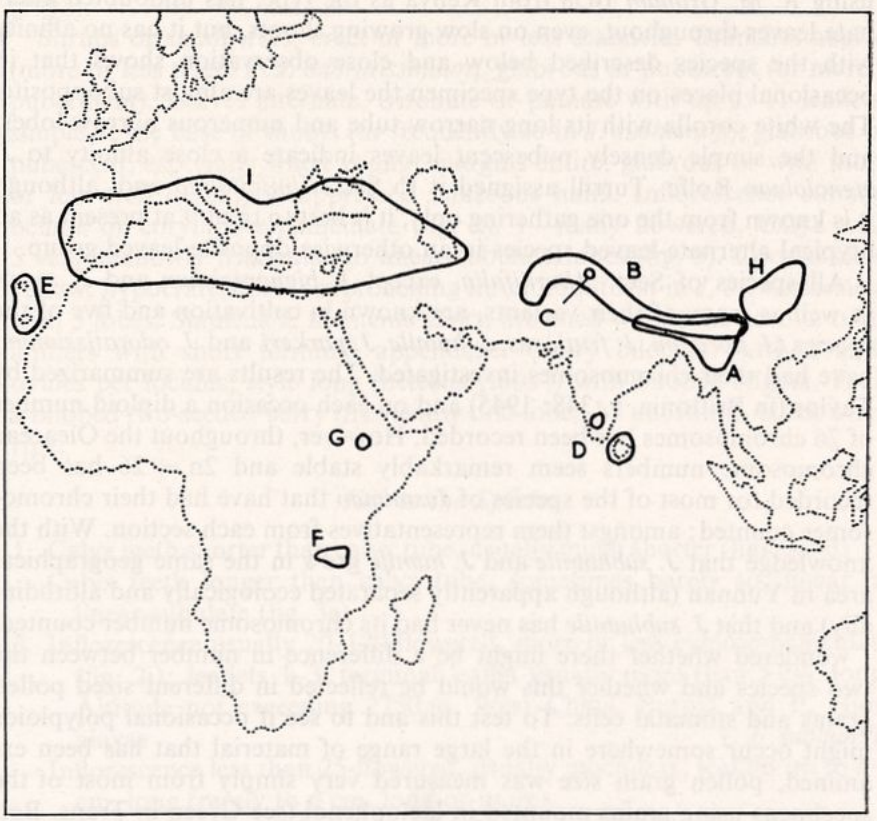

FIG. 1. Map of the distribution of species in *Jasminum* Sect. *Alternifolia:* A, *J. subhumile;* B, *J. humile;* C, *J. parkeri;* D, *J. bignoniaceum;* E, *J. odoratissimum* subsp. *odoratissimum;* F, *J. odoratissimum* subsp. *goetzeanum;* G, *J. stans;* H, *J. floridum;* I, *J. fruticans.*

genus; the whole section is distinct and closely related within itself. One fact of interest, and perhaps significance, is that apart from *J. mesnyi* Hance and *J. nudiflorum* Lindl. (Sect. *Trifoliolata* DC.) these species are the only Jasmines with clear yellow flowers. All others have flowers which are white or white tinged with red on the outside (in *J. beesianum* Forrest & Diels they are red). Sect. *Trifoliolata* contains such different plants as *J. mesnyi* Hance and *J. lanceolarium* Roxb., yet both these species show some similarities to species in this section. Until Sect. *Trifoliolata* has been revised it would be best to leave undecided the question of the affinity of Sect. *Alternifolia* within the genus.

Jasminum calophyllum Wall. ex G. Don, *J. bequaertii* De Wild. and *J. suavissimum* Lindl., to mention but three examples, have at times been said to bear leaves which are opposite or alternate and investigation has shown that in all such cases the leaves are fundamentally opposite and that the alternate or subopposite leaves are borne only on shoots which have undergone rapid extension and growth. *J. adiantifolium* Planch., of which no material has been seen, is probably a similar species too although the original description states that the leaves are "alternis (raro hinc inde suboppositis)". *J. grahamii* however, which was fairly recently described by Turrill (Kew Bull. 1952, 135 and Fl. Trop. E. Afr., Oleaceae, 24: 1952) using *R. M. Graham* 1658 from Kenya as the type, has undoubted alternate leaves throughout, even on slow growing shoots, but it has no affinity with the species described below and close observation shows that in occasional places on the type specimen the leaves are almost subopposite. The white corolla with its long narrow tube and numerous narrow lobes, and the simple densely pubescent leaves indicate a close affinity to *J. stenolobum* Rolfe. Turrill assigned it to Sect. *Unifoliolata* and, although it is known from the one gathering only, it is best to treat it at present as an atypical alternate-leaved species in an otherwise opposite-leaved group.

All species of Sect. *Alternifolia*, except *J. bignoniaceum* and *J. stans*, as well as many of their variants, are known in cultivation and five of the species (*J. floridum*, *J. fruticans*, *J. humile*, *J. parkeri* and *J. odoratissimum*) have had their chromosomes investigated. The results are summarized by Taylor (in Brittonia, v, 348: 1945) and on each occasion a diploid number of 26 chromosomes has been recorded. However, throughout the Oleaceae chromosome numbers seem remarkably stable and $2n = 26$ has been recorded for most of the species of *Jasminum* that have had their chromosomes counted; amongst them representatives from each section. With the knowledge that *J. subhumile* and *J. humile* grow in the same geographical area in Yunnan (although apparently separated ecologically and altitudinally) and that *J. subhumile* has never had its chromosome number counted, I wondered whether there might be a difference in number between the two species and whether this would be reflected in different sized pollen grains and stomatal cells. To test this and to see if occasional polyploids might occur somewhere in the large range of material that has been examined, pollen grain size was measured very simply from most of the specimens using grains mounted in lactophenol (see Green in Trans. Bot. Soc. Edinb., xxxvi, 289: 1955) and impressions of the lower epidermis were taken on collodion film and the stomatal cells measured (see Celarier & Mehra in Rhodora, lx, 89: 1958). In no case was there significant departure for any specimen from the average sizes for the whole section.

No observations have been made on living plants to investigate the apparent heterostyly in the Section. Heterostyly has been recorded in *Jasminum* and judging from a range of dissected corollas taken from herbarium sheets there is an undoubted variation in stylar length and staminal insertion but to what extent this is due to true heterostyly or to continuous morphological variation is uncertain.

I should like to take this opportunity of thanking Miss Jennifer Lamond for extensive technical assistance and for the drawings which have been used to illustrate this paper. Thanks are also expressed to the Directors and Keepers of the Herbaria at the British Museum (Natural History), Kew, University of Glasgow, the Botanical Museum, Oslo and the University of Florence for facilities to study in their herbaria or for the loan of material and to M. Gilbert Bocquet for a photograph of the type of *Jasminum revolutum* var. *peninsulare* and for advice and assistance with other Geneva material.

JASMINUM L. SECT. ALTERNIFOLIA DC.

Prodr. viii, 312 (1844); Knoblauch in Engler & Prantl, Die Natürlichen Pflanzenfamilien, iv (2), 16 (1895); Kobuski in Journ. Arn. Arb. xiii, 147 (1932).

Shrubs or small trees, erect or more or less scandent. Branches angled (more or less terete in *J. odoratissimum*), glabrous or pubescent (or merely puberulent). Leaves alternate, trifoliate or pinnate with up to 11 leaflets, simple at the base of shoots (or frequently so in *J. subhumile*), glabrous or pubescent, especially when young; margins entire, glabrous or with more or less well developed appressed setaceous hairs. Inflorescence subumbellate or corymbose-paniculate (fig. 2), 1—many flowered. Calyx with 5 very shallowly triangular to linear-subulate lobes (fig. 3). Corolla clear yellow, hypocrateriform (approaching infundibuliform in *J. bignoniaceum*) with 5 lobes. Stamens 2, filaments short, attached within the corolla tube, anthers with short terminal appendage. Ovary bilocular with 2 axile ovules per loculus, style long (heterostylous?) with bilobed stigma. Fruit a bilobed two-seeded berry (frequently one-lobed by abortion), black when ripe.

Key to the Species

1. Calyx teeth shorter than calyx tube, usually much shorter (figs. 3a–d) 2
   Calyx teeth longer than calyx tube, sometimes barely so, linear or linear-subulate (fig. 3e) 7
2. Inflorescence usually 20–120-flowered, more or less cymose-paniculate (fig. 2i); leaflets 1–3, terminal leaflet usually more than 5 cm. long. Altitude not exceeding 2750 m. West China, Burma and E. Himalayas . . . . . 1. *J. subhumile*
   Inflorescence less than 25-flowered, usually much less; leaflets up to 4·5 cm. long (rarely to 6 cm. long or more) 3
3. Corolla lobes more than $\frac{1}{3}$ length of tube, longer than broad. . 4
   Corolla lobes $\frac{1}{3}$–$\frac{1}{4}$ length of tube, as broad as long. Inflorescence with up to 6 flowers (fig. 2a & b). Peninsular India and Ceylon 6. *J. bignoniaceum*

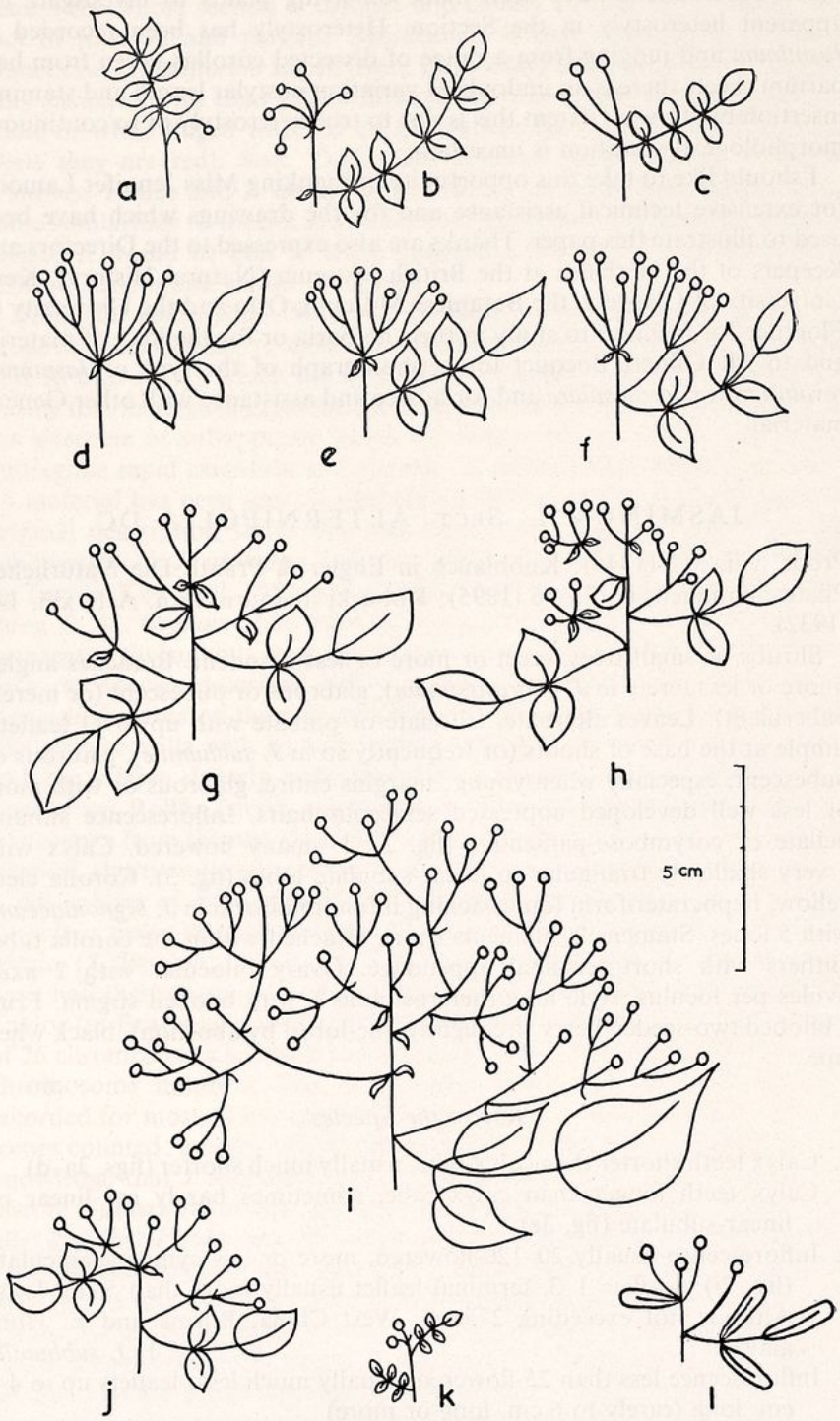

FIG. 2. Inflorescence types in *Jasminum* Sect. *Alternifolia:*
a–b, *J. bignoniaceum;* c, *J. stans;* d–f, *J. humile;* g, *J. odoratissimum* subsp. *goetzeanum;* h, *J. odoratissimum* subsp. *odoratissimum*; i, *J. subhumile;* j, *J. floridum;* k, *J. parkeri;* l, *J. fruticans.*

4. Number of flowers per inflorescence 6–25 5
   Number of flowers per inflorescence 1–3 6

5. Inflorescence more or less corymbose-paniculate (fig. 2g & h); pedicels usually less than 1 cm. long and subtended by bracts at least 1 mm. long; Atlantic Is., N. Rhodesia and Tanganyika
   5. *J. odoratissimum*
   Inflorescence umbellate or subumbellate (fig. 2d–f); pedicels usually more than 1 cm. long, rarely less, and then not subtended by a bract 1 mm. or more in length; Himalayas and W. China 2. *J. humile*

6. Leaflet up to 4 mm. long, usually acute; dwarf prostrate shrub to about 10 cm. high; N. W. Himalayas . . . 3. *J. parkeri*
   Leaflet 5–20 mm. long, blunt or rounded; erect shrub to 3 m. high; Ethiopia . . . . . 4. *J. stans*

7. Terminal leaflet ovate or obovate to elliptic; apex acute or acutate, leaflets (1–)3–5; inflorescence more or less cymose or cymose-umbellate (fig. 2j) with (4–)6–12(–23) flowers; corolla lobes acute; China . . . . . 7. *J. floridum*
   Terminal leaflet narrow elliptic to narrow oblanceolate, usually rounded, leaflets (1–)3; inflorescence subumbellate (fig. 2l) with 1–4(–8) flowers; corolla lobes rounded; Mediterranean and S. W. Asia
   8. *J. fruticans*

1. **Jasminum subhumile** W. W. Smith in Notes R. B. G. Edinb. viii, 127 (1913).

   Syn.: *J. heterophyllum* Roxburgh, Cat. Hort. Bengal. 3 (1814), nomen, Fl. Ind. ed. Carey & Wallich, i, 99, 164 (1820) non Moench (1794), et ed. Carey, i, 100 (1832); Schultes, Mant. 92 (1822); D. Don, Prodr. Fl. Nepal. 106 (1825); Stokes, Bot. Comment. i, 19 (1830); Wallich, Pl. Asiat. Rar. iii, t. 275 (1832); G. Don, Gen. Syst. iv, 63 (1838); Loudon, Arb. Frut. Brit. ii, 1249, fig. 1075 (1838); DeCandolle, Prodr. viii, 312 (1844); Saunders, Refug. Bot. iii, t.156 (1869); C. B. Clarke in Hook. f., Fl. Brit. Ind. iii, 601 (1882); Brandis, Indian Trees, 452 (1906); Schneider, Ill. Handb. Laubh. ii, 840 (1912); Kanjilal et al., Fl. Assam, iii, 233 (1939); Kingdon Ward in Gard. Chron. ser. 3, cxxiv, 36 (1948).

   J. arboreum Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 106 (1825), nomen in syn., non Schultes (1822).

   J. macrophyllum Hort. ex DeCandolle, Prodr. viii, 312 (1844), nomen in syn.

   J. heterophyllum var. *macrophyllum* Wallich ex Voigt, Hort. Suburb. Calc. 552 (1845), nomen nudum.

   Jacksonia nitida Hort. ex Schlechtendal in Linnaea, xxvii, 512 (1854), nomen in syn.

   Jasminum heterophyllum Roxb. var. *glabricymosum* W. W. Smith in Notes R.B.G. Edinb. xii, 209 (1920); Handel-Mazzetti, Symb. Sin. vii, 1011 (1936).

   J. heterophyllum Roxb. var. "*glabricorymbosum*" Kobuski in Journ. Arn. Arb. xiii, 149 (1932), lapsus calami pro *glabricymosum*.

J. heterophyllum Roxb. var. *subhumile* (W.W.Sm.) Kobuski in Journ. Arn. Arb. xiii, 149 (1932); Handel-Mazzetti, Symb. Sin. vii, 1012 (1936).

J. diversifolium Kobuski in Journ. Arn. Arb. xx, 404 (1939); Rehder, Man. Cult. Trees and Shrubs, ed. 2, 793 (1940); Bailey & Bailey, Hortus Second, 397 (1941).

J. diversifolium Kobuski var. "*glabricorymbosum*" Kobuski in Journ. Arn. Arb. xx, 404 (1939), lapsus calami pro *glabricymosum*.

J. diversifolium Kobuski var. *subhumile* (W.W.Sm.) Kobuski in Journ. Arn. Arb. xx, 404 (1939) et xl, 386 (1959); Chia, Acta Phytotax. Sin. ii, 25 (1952).

J. diversifolium Kobuski var. *glabricymosum* (W.W.Sm.) Kobuski in Journ. Arn. Arb. xxi, 113 (1940) et xl, 386 (1959) et in Brittonia, iv, 166 (1941); Rehder, Man. Cult. Trees and Shrubs, ed. 2, 793 (1940); Chia, Acta Phytotax. Sin. ii, 25 (1952).

J. diversifolium Kobuski var. *tomentosum* Chia in Acta Phytotax. Sinica, ii, 26 (1952).

Shrub or small tree 1–3 m. high. Shoots glabrous to densely pubescent when young, slightly angled. *Leaves* unifoliate or trifoliate; petioles (0·5–)1–3·5(–6) cm. long, glabrous to densely pubescent; lamina glabrous or with midrib puberulous below, lanceolate or narrow ovate to broad ovate, terminal leaflet (2–)4–7(–12·5) cm. long by (1–)2–3(–6) cm. broad, lateral leaflets (2·2–)3–5·5(–10) cm. long by (0·7–)1·5–2·5(–5) cm. broad; margin entire, slightly recurved with occasional more or less appressed setaceous hairs; apex acute to acuminate; base acute to rounded; venation more or less obscure above and below, primary veins sometimes slightly raised below, 4–5 pairs per side. *Inflorescence* terminal on side shoots, more or less cymose-paniculate (fig. 2i) with (10–)20–120 flowers on glabrous or fairly densely puberulous pedicels (1–)3–10 mm. long; bracts subulate or more or less leafy. *Flowers* yellow, fragrant, heterostylous? *Calyx* glabrous, tube (1–)1·5–2 mm. long; lobes 0–0·75 mm. long (fig. 3b & d). *Corolla* tube 9–12 mm. long, 3–4 mm. broad at the top; lobes rounded, 4–9 mm. long by 3–4 mm. broad, at the apex papillate-hirsute inside and out or papillate-ciliolate. *Stamens* 2, attached 1–5 mm. below the base of the corolla lobes; filaments 1–1·5 mm. long; anthers 2·5–4·5 mm. long with small terminal appendage. *Ovary* about 1 mm. high with style 4·5–11 mm. long.

Holotype: Yunnan, Sha-yang valley, lat. 25°20′N., 1800 m., moist open situation, April 1910, *Forrest* 5529 (E).

CHINA. YUNNAN: P'u-piao valley, lat. 25°5′N., 1200 m., moist open situations, April 1910, *Forrest* 5502* and 1800–2100 m., May 1913, *Forrest* 9873; Langkong—Hoching divide, lat. 26°16′N., 2400 m., on ledges of limestone cliffs, May 1913, *Forrest* 9990 (holo. *J. heterophyllum* var. *glabricymosum*, E); mountains south of Likiang, Sungkwe Hochin Range, 2750 m., May 1923, *Rock* 8291; Yung-Pe mountains, lat. 25°45′N., 2750 m., open situations by streams, Sept. 1913, *Forrest* 11037 & 11177 and Oct.

* Unless otherwise stated all the material cited is in the Herbarium of the Royal Botanic Garden, Edinburgh.

1913, *Forrest* 11472; Chien chuan—Mekong divide, lat. 26°20′N., long. 99°20′E., 2150 m., amongst scrub on dry stony hillside, July 1923, *Forrest* 23475; slopes of Salween Valley, lat. 25°8′N., long. 99°E., 2400–2750 m., open rocky slopes amongst scrub, Apr. 1931, *Forrest* 29510; and without locality, *Forrest* 29100; Tali, middle part of Ma Nung Mountain, May, *McLaren's Collectors* C. 68 & C. 275; ad viam Yunnan fu—Tali fu, in-dumetis inter Hungngai et Dschaodschou copiose, 2000–2400 m., 11 May 1916, *Handel-Mazzetti* 8692; ad occidentem fluminis Dsolin-ho, fruticetis siccis inter opp. Dayao et vic. Lienhwang, 1900–2100 m., 6 May 1915, *Handel-Mazzetti* 6225; Ta Song pin, c. Pe-Yen Tsin, 26 Mar. 1916, *S. Ten* 99; Nanfantchoung, 9 July 1920, *S. Ten* 288; Lan ngy tsin près Lou-lan, 7 May 1904, *P. Py* (*Herb. Ducloux* 485) and 30 Apr. 1908, *Y. B. Lo* (*Herb. Ducloux* 874); above A-lu-shih, long. 24°50′N., lat. 100°E., 1550 m., forming part of the hedges on stony hillside, hot and dry situation, 4 May 1921, *Kingdon Ward* 3806; Shunning, Wenkuankuai, 1900 m., among thicket, 16 June 1938, *T. T. Yü* 16286; Shunning, Litah, 2100 m., among thicket, 10 Sept. 1938, *T. T. Yü* 17604; Mengtze, 1550 m., woods, *Henry* 9107B and 1400 m., *Henry* 9107A. Without locality: 1907, *Mombeig* 187.

TIBET: Kekrima, 1650 m., 16 Nov. 1935, *F. Kingdon Ward* 12513 (K).

BURMA: Southern Shan States, Taunggyi, 1200 m., May 1916, *A. E. English* 562; Chin Hills, 2300 m., Apr. 1916, *V. H. T. Fields Clarke* 33; West Central Burma, Mindat Ridge, 2300 m., 20 May 1956, *F. Kingdon Ward* 22250 (BM).

INDIA. MANIPUR: Descent from Khongiu hill towards Sirohifurar, 1500 m., 9 Apr 1882, *G. Watt* 6335; Sirohifurar, 1800 m., 13 Apr. 1882, *G. Watt* 6497 (E, K); Mao, 1800 m., 12 May 1882, *G. Watt* 6842 (E, K), and 1650 m., 27 Oct. 1885, *C. B. Clarke* 41411A (K); Ukrul, 1800 m., Dec. 1907, *A. E. Meebold* 6865 (K); Sirhoi, 1850 m., in thickets, apparently used as a hedge plant, 5 April 1948, *F. Kingdon Ward* 17202 (BM) and 24 April 1948, *F. Kingdon Ward* 17304 (BM).

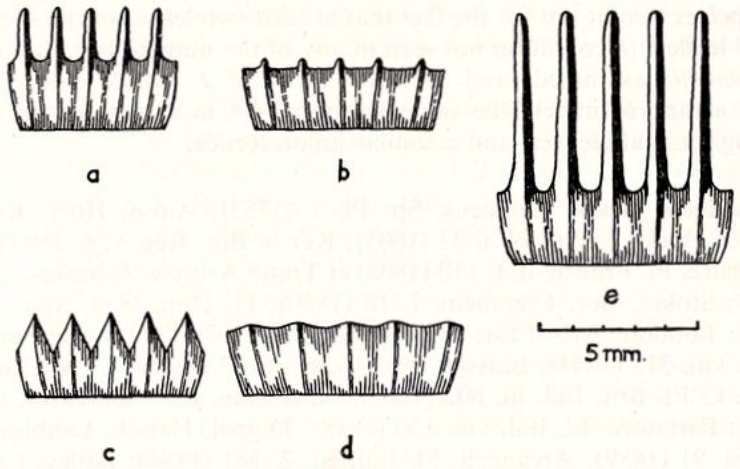

FIG. 3. Calyx range in *Jasminum* Sect. *Alternifolia*.

J. subhumile, b & d; *J. humile*, a, b & c; *J. parkeri* and *J. stans*, a; *J. odoratissimum*, a & b; *J. bignoniaceum*, b; *J. floridum* & *J. fruticans*, e. (a, *Stainton* 2551; b, *Stainton, Sykes & Williams* 693; c, *Forrest* 4659; d, *Forrest* 9873; e, *Davis* 21445).

ASSAM: Mishmee, Thumatkaya Summit, 1836, *Griffith* s.n. (K); Khasi Hills, 900–1200 m., June 1877, *G. Mann* 295 (K) and 900 m., June, *G. Mann* 518 (K).

NEPAL. Godarvari, S. Nepal Valley, 1500 m., light open jungle, 1953, *Mrs. Proud* 280 (BM); without locality, 1821, *Wallich* 2883a (E, K) and Sept. 1880, *J. Scully*, s.n. (K).

This species occurs in approximately the same geographical areas as the temperate *J. humile*; especially is this noticeable in Yunnan. But *J. subhumile* is a subtropical species, a fact reflected in the generally lower altitudes from which it is recorded.

As with *J. humile* and *J. floridum* there is considerable range throughout the species in the amount of indumentum on young stems, petioles and inflorescences. The type is densely villose, a less villose specimen is to be seen in *Handel-Mazzetti* 8692, puberulent ones in *McLaren's Collectors* C.275 and *Wallich* 2883 pro parte and completely glabrous ones in *Forrest* 9990 and others. In fact *Forrest* 5502 contains both glabrous and densely pubescent specimens and the glabrous portion of the mixed sheet in the Edinburgh herbarium has at some time been labelled No. 5502A. If at anytime it is thought desirable to separate off the glabrous variants at varietal rank the epithet *glabricymosum* is available but no Roxburghian type has been seen for the names *heterophyllum* and *diversifolium*. *Wallich* 2883 appears to contain both glabrous and puberulent specimens, and it is uncertain to which variety Roxburgh's *J. heterophyllum* would be assigned.

In September 1890, Sir George Watt collected a specimen (No. 7993) from between Urki and Siri near Simla in what is now Himachal Pradesh, which very closely resembles *J. subhumile*. Of it he says "A solitary small tree growing near a hut, said to be wild. Only one twig with flowers. Corolla yellow and somewhat like *Jasminum humile* but leaves much larger, thicker and a tree instead of a bush. Leaves all ternate or simple." The specimen also shows an inflorescence which with numerous flowers approaches that of *J. subhumile* and one would be inclined to regard it as that species were it not for the fact that at least two leaves of the specimen bear 5 leaflets (a condition not seen in any of the numerous gatherings of *J. subhumile* examined) and that specimens of *J. humile* cultivated in Nepal at approximately the same altitude (1400 m.) have equally large, although pinnate leaves, and a similar inflorescence.

2. **Jasminum humile** Linnaeus, Sp. Pl. 7 (1753); Aiton, Hort. Kew. i, 9 (1789); Vahl, Enum. Pl. i, 33 (1805); Ker in Bot. Reg. v, t. 350 (1819); St. Hilaire, Pl. France, ii, t. 110 (1808) et Traité Arbriss. Arbustes, ii, t. 90 (1825); Stokes, Bot. Comment. i, 18 (1830); G. Don, Gen. Syst. iv, 63 (1838); Loudon, Arb. Frut. Brit. ii, 1249, fig. 1074 (1838); DeCandolle, Prodr. viii, 313 (1844); Boissier, Fl. Orient. iv, 42 (1875); C. B. Clarke in Hook. f., Fl. Brit. Ind. iii, 602 (1882); Nicholson, Ill. Dict. Gard. ii, 207 (1885); Parlatore, Fl. Ital. viii, 150 (1888); Dippel, Handb. Laubholzk. i, 146, fig. 91 (1889); Arcangeli, Fl. Ital. ed. 2, 361 (1894); Bailey, Cyclop. Amer. Hort. ii, 843, fig. 1191 (1900) et Stand. Cyclop. Hort. ii, 1719, fig. 209 (1915); Collett, Fl. Simlensis, 307 (1902); Gamble, Man. Indian Timbers, ed. 2, 468 (1902); Halácsy, Conspec. Fl. Graecae, ii, 286 (1902); Brandis, Ind. Trees, 452 (1906); Schneider, Ill. Handb. Laubh. ii, 840

(1912); Léveillé in Fedde, Rep. Sp. Nov. xiii, 149 (1914); Bean, Trees and Shrubs Hardy in the Brit. Is. i, 662 (1914) et ed. 7, ii, 154 (1951); Bamber, Pl. of the Punjab, 181 (1916); Rehder in Sargent in Publ. Arn. Arb. iv (Pl. Wilson.) ii, 615 (1916) et Man. Cult. Trees & Shrubs, 765 (1927) et ed. 2, 793 (1940); Chung in Mem. Sci. Soc. China, i, 216 (1924); Osmaston, Forest Fl. for Kumaon, 337 (1927); Boynton in Addisonia, xii, 55, t. 412 (1927); Hayek, Prodr. Fl. Penins. Balcan. ii, 440 (1930); Kobuski in Journ. Arn. Arb. xiii, 150 (1932) et xx, 404 (1939); Rehder in Journ. Arn. Arb. xv, 306 (1934); Handel-Mazzetti, Symb. Sin. vii, 1012 (1936); Bailey & Bailey, Hortus Second, 397 (1941); Rechinger fil., Fl. Aegaea, 562 (1943); Bor & Raizada in Journ. Bombay Nat. Hist. Soc. xlvi, 211, fig. 4, t. iii (1946); Parsa, Fl. Iran, iv, 47 (1949); Chittenden, Dict. Gard. ii, 1087 (1951); Chia in Acta Phytotax. Sinica, ii, 26 (1952); Kobuski in Journ. Arn. Arb. xl, 386 (1959).

Syn.: *J. fruticans* L. var *β*, Lapeyrouse, Hist. Abrig. Pl. Pyren. 3 (1813).

J. revolutum Sims in Bot. Mag. xlii, t. 1731 (1815); Ker in Bot. Reg. iii, t. 178 (1817) et vi, notes 2 (1820); Loddiges, Bot. Cab. x, t. 966 (1824); D. Don, Prodr. Fl. Nepal. 106 (1825); Maund, Bot. Gard. i, t. 3 (1825–26); G. Don, Gen. Syst. iv, 64 (1838); Loudon, Arb. Frut. Brit. ii, 1249, fig. 1076 (1838); DeCandolle, Prodr. viii, 313 (1844); Brandis, Forest Fl. N.W. and C. India, 313 (1874); Boissier, Fl. Orient. iv, 42 (1879); Aitchison in Journ. Linn. Soc. Lond. Bot. xviii (Fl. Kuram Valley etc. Afghanistan) 78 (1880); Gamble, Man. Ind. Timbers, 255 (1881); C. B. Clarke in Hook. f., Fl. Brit. Ind. iii, 602 (1882); Nicholson, Ill. Dict. Gard. ii, 207 (1885); Dippel, Handb. Laubholzk. i, 148, fig. 93 (1889); Schneider, Ill. Handb. Laubh. ii, 839, figs. 527 m–n, 528 g–i (1912); Bean, Trees and Shrubs Hardy in the Brit. Is. i, 661 (1914) et ed. 7, ii, 154 (1951); Chittenden, Dict. of Gard. ii, 1088 (1951); Vassil'ev in Komarov, Fl. U.R.S.S. xviii, 525 (1952).

J. chrysanthemum Roxburgh, Cat. Hort. Bengal. 3 (1814) nomen, Fl. Indica, ed. Carey & Wallich, i, 98 (1820), et ed. Carey, i, 99 (1832).

J. pubigerum D. Don, Prodr. Fl. Nepal. 106 (1825); G. Don, Gen. Syst. iv, 64 (1838); Loudon, Arb. Frut. Brit. ii, 1250, fig. 1077 (1838); DeCandolle, Prodr. viii, 312 (1844); C. B. Clarke in Hook. f., Fl. Brit. Ind. iii, 602 (1882); Nicholson, Ill. Dict. Gard. ii, 207 (1885); Bailey, Cycl. Amer. Hort. ii, 844 (1900) et Stand. Cycl. Hort. iii, 1719 (1915); Brandis, Indian Trees, 452 (1906); Schneider, Ill. Handb. Laubh. ii, 839 (1912); Parsa, Fl. Iran, iv, 47 (1949); Chittenden, Dict. of Gard. ii, 1088 (1951).

J. humile L. var. *revolutum* (Sims) Stokes, Bot. Comment. i, 18 (1830); Kobuski in Journ. Arn. Arb. xx, 407 (1939); Rehder, Man. Cult. Trees and Shrubs, ed. 2, 793 (1940); Bailey & Bailey, Hortus Second, 397 (1941).

J. wallichianum Lindley in Bot. Reg. xvii, t. 1409 (1831); Schneider, Ill. Handb. Laubh. ii, 839, figs. 527 k–l, 528 d–f (1912); Bean, Trees and Shrubs Hardy in the Brit. Is. i, 662 (1914) et ed. 7, ii, 155 (1951); Chittenden, Dict. of Gard. ii, 1088 (1951).

J. inodorum Jacquemont ex Decaisne in Jacquemont, Voy. Bot. 139 (1844); DeCandolle, Prodr. viii, 312 (1844).

J. jacquemontii Decaisne in Jacquemont, Voy. Bot. Atlas, ii, t. 143 (1844).

J. pubigerum D. Don var. *glabrum* DeCandolle, Prodr. viii, 312 (1844).

J. flavum Sieber ex DeCandolle, Prodr. viii, 312 (1844), nomen in syn.

J. "*pubescens*" DeCandolle, Prodr. viii, 312 (1844), sphalm. *J. pubigerum* D. Don.

J. italicum Hort. ex Lavallée, Arb. Segrez. 174 (1877), nomen in syn.; Dippel, Handb. Laubholzk. i, 146 (1889), nomen in syn.

J. triumphans Hort. ex. Lavallée, Arb. Segrez. 174 (1877), nomen in syn.; Dippel, Handb. Laubholzk. i, 148 (1889), nomen in syn.; Schneider, Ill. Handb. Laubh. ii, 839 (1912), nomen in syn.

J. reevesii Hort. ex Schneider, Ill. Handb. Laubh. ii, 839 (1912), nomen in syn.

J. mairei Léveillé in Fedde, Rep. Sp. Nov. xiii, 337 (1914); Rehder in Journ. Arn. Arb. xv, 306 (1934).

J. mairei Léveillé var. *siderophyllum* Léveillé, Cat. Pl. Yun-Nan, 179 (1916); Rehder in Journ. Arn. Arb. xv, 306 (1934).

J. farreri Gilmour in Bot. Mag. xlvii, t. 9351 (1934); Rehder, Man. Cult. Trees and Shrubs, ed. 2, 793 (1940); Bean, Trees and Shrubs Hardy in the Brit. Is. ed. 7, ii, 150 (1951); Chittenden, Dict. of Gard. ii, 1087 (1951).

J. humile L. var. *glabrum* (DC.) Kobuski in Journ. Arn. Arb. xx, 407 (1939); Rehder, Man. Cult. Trees and Shrubs, ed. 2, 793 (1940); Bailey & Bailey, Hortus Second, 397 (1941).

J. humile L. var. *siderophyllum* (Lévl.) Kobuski in Journ. Arn. Arb. xx, 406 (1939); Rehder, Man. Cult. Trees & Shrubs, ed. 2, 793 (1940); Chia in Acta Phytotax. Sinica, ii, 27 (1952).

var. **humile**

Shrub or small tree, sometimes scrambling (0·3–)1–3(–6) m. high. Shoots glabrous or pubescent, angled, rarely only slightly angled. *Leaves* trifoliate or pinnate, unifoliate at the base of shoots, with (1–)3–9(–11) leaflets; petioles (0·5–)1–3 cm. long and, together with the rachis, glabrous or pubescent, especially on the upper surfaces, usually shorter, often much shorter, than the node above; lamina glabrous or pubescent, especially on the veins below, narrow lanceolate to ovate (rarely broad ovate) or elliptic to broad elliptic (rarely almost rotund), terminal leaflet (1–)2–4·5 (–6) cm. long by (0·4–)0·5–2·2(–3) cm. broad, lateral leaflets (0·5–)1·3–3 (–4·5) cm. long by (0·3–)0·4–2(–2·2) cm. broad; margin recurved, sometimes slightly so, entire, glabrous or bearing more or less appressed setaceous hairs (fig. 4), sometimes very few; apex long-acuminate to rounded, sometimes slightly emarginate and often with a small apiculum up to 1 mm. long; base angustate to rounded; venation with only primary veins visible, 2–4 pairs per side, sometimes more or less obscure. *Inflorescence* terminal on side shoots, umbellate or subumbellate (fig. 2d–f) with (2–)5–15(–25) flowers on pubescent or glabrous pedicels (0·5–)1–2(–3) cm.

long; bracts occasional, usually only at base of inflorescence, linear, up to 7 mm. long. *Flowers* golden-yellow, more or less fragrant, heterostylous? *Calyx* tube 1·0–2·5 mm. long with short teeth or triangular lobes 0·5–1·0 mm. long (fig. 3 a–c), glabrous or pubescent or sometimes ciliate. *Corolla* tube 10–18 mm. long, 2·5–4·5 mm. broad at the top; lobes rounded, sometimes with a slightly apiculate tip papillate-hirsute towards the apex and ciliolate, 4–9 mm. long and 3–6 mm. broad. *Stamens* 2, attached 4–6 mm. from the base of the corolla lobes; filaments 0·5–2 mm. long; anthers 2–6 mm. long with a fairly well developed terminal appendage. *Ovary* about 1 mm. high with style 7–15 mm. long.

Holotype: no. 17.6 in the Linnean Herbarium, London (LINN).

AFGHANISTAN. Nilkham, 2450 m., 4 June 1937, *W. Koelz* 11699. Without locality, *J. H. Lace* s.n.

W. PAKISTAN. Near Murdar Kach, 2000 m., 25 May 1889, *J. H. Lace* 3360 and (ex Herb Watt) 4048. Ziarat, near Quetta, 16 June 1886, *J. H. Lace* 48 and Sept. 1886, *J. H. Lace* s.n. and 2450 m., 1886, *J. H. Lace* 4000. Lakar Sar, Khyber, 2000 m., on scrub-covered hillsides and at nala bottoms, 8 June 1941, *D. Lowndes* 695. Ziarat, (Lowarai Pass), Chitral, 2150 m., on rock ledges, 1 June 1958, *J. D. A. Stainton* 2551. Murree Hills, 13 May 1851, *A. Fleming* 207. Hazara district (Tribal Area), Nilishang, 1250 m., on cliffs of nullah, 23 Sept. 1958, *B. L. Burtt* B1410.

INDIA. KASHMIR: Jhelam Valley, near Pirni, 1500–1850 m., 13 May 1892, *J. F. Duthie* 10876; Bringi Valley, 2150 m., dry rock faces, 1 June 1939, *F. Ludlow* 64.

PUNJAB: Amritsar, June 1855, *T. Anderson* s.n.; on the way to Mulgran, 3050 m., 6 June 1879, *G. Watt* 2399; Kangra district, 550 m., 2 April 1900, *G. S. Hart* 33; Parbatti valley, Kulu, 2000 m., 21 May 1934, *C. E. Parkinson* 3550.

HIMACHAL PRADESH: Chamba State; Cheri to Kilar, Pangi, 1850–2750 m., 19 Sept. 1895, *J. H. Lace* 1262, and Bre Forest, 2050–2750 m., 10 June 1896, *J. H. Lace* 1419. Bashahr State: Nachar, 2150 m., 20 May 1890, *J. H. Lace* 172, and Chakera Dogri near Lippa, 3050 m., 18 Aug. 1890 *J. H. Lace* 533. Simla Hill States: Sangla Rukti Gad, Baspa Valley, lat. 31°23′N., long. 78°15′E., 3650 m., dry situations among rocks and shrubs, 27 June 1939, *Ludlow & Sherriff* 7361; Simla, 6 May 1831, *Christina, Countess of Dalhousie* ("C.B.D.") s.n., 1885, *J. R. Drummond* 22624, 1887, *J. R. Drummond* 20779, 2 July 1887, *J. R. Drummond* 20781, and without date, *G. Watt* 8045; Mahasu, near Simla, July 1849, *A. Fleming* s.n.; S. of Simla, Nahan via Degshai to Solen, 850–2000 m., 17–24 May 1856, *Schlagintweit* 7709.

UTTAR PRADESH: Chakrata, 2200 m., Sept. 1958, *Lilly Chadha* s.n.; Mussoorie, 2000 m., May 1914 and Aug. 1915, *A. Anderson* s.n.; Jaunsar, Jadi, 1800 m., May 1890, *Keshava Nand* 81; Kumaon, May 1857, *T. Anderson* s.n.; Bandnee Devee near Almora, 1800–2250 m., *E. Madden* s.n.; Divali, West Almora division, 12 June 1933, *Bisram* 2343; without locality "N.W. Provinces", July 1890, *F. Beadon Bryant* 30.

NEPAL: Without locality, *Wallich* 2887d; Khading, 2450 m., 1928, *Lall Dhwoj* s.n.; Toketey, 3950 m.–4250 m., 1930, *Lall Dhwoj* 4959; Pulanto, 2150 m., among bushes on cultivated terrace, 20 April 1952, *Polunin, Sykes*

& Williams 804; Pina (Ping) near Rara, 2450 m., on open slopes, 15 May 1952, *Polunin, Sykes & Williams* 4094; Above Ghustung Khola, 3350 m., upon ridge, 11 Oct. 1953, *Stainton, Sykes & Williams* 4784; Okhaldhungagaon, S. of Dhorpatan, 2900 m., in forest, 1 May 1954, *Stainton, Sykes & Williams* 388; Near Bongakhani, 2100 m., among rocks in open places, 4 May 1954, *Stainton, Sykes & Williams* 2688; Bhurungdi Khola, 2900 m., 22 May 1954, *Stainton, Sykes & Williams* 5407; Lete, N. of Dana, 2450 m., amongst hillside shrubs, 26 May 1954, *Stainton, Sykes & Williams* 693; Ghasa, Kali Gandaki Valley, 2250 m., 31 May 1954, *Stainton, Sykes & Williams* 5503; Near Gurjakhani, 2450 m., beside open track, 11 Sept. 1954, *Stainton, Sykes & Williams* 4354; Tukucha, Kali Gandaki, 3050 m., in wood, 15 Sept. 1954, *Stainton, Sykes & Williams* 7857; Jomosum, N. of Tukucha, Kali Gandaki, 3050 m., amongst shrubs at edge of fields, 29 Sept. 1954, *Stainton, Sykes & Williams* 8047. Arun Valley, Piling Khola, N.E. of Chyamtang, 3050 m., in open woodland, 23 May 1956, *J. D. A. Stainton* 390.

SIKKIM: Lachung, 2750 m., June 1910, *W. W. Smith* 3338.

BHUTAN: Tashenjo Timpu, 2750 m., 12 July 1914, *R. E. Cooper* 1520; Shabjiethang, Pumthang, 2750 m., 24 Sept. 1914, *R. E. Cooper* 2247; Phajudir Timpu, 2750 m., 13 Aug. 1914, *R. E. Cooper* 2545; Giehha, Punakha, 2450 m., 24 Aug. 1914, *R. E. Cooper* 2779; Tashichodjong Timpu, 3050 m., 13 July 1914, *R. E. Cooper* 3074; Giehha Punakha, 2450, 26 Aug. 1914, *R. E. Cooper* 3147; Damthang, Ha Valley, 3050 m., 8 July 1933, *Ludlow & Sherriff* 65; Chendebi, 2300 m., 12 May 1937, *Ludlow & Sherriff* 3030; Shambling, Kuru Chu Valley, Kurted, 2150 m., 5 May 1949, *Ludlow, Sherriff & Hicks* 18823; Drugye Dzong, 2600 m., dry hill slopes and hedges bordering fields, 10 May 1949, *Ludlow, Sherriff & Hicks* 16170; Gyasa Dzong, Mo Chu, 3050 m., 3 Oct. 1949, *Ludlow, Sherriff & Hicks* 17407.

BURMA: Hpimaw Hill, 2300 m., on open arid outcrop of limestone ridge just below the Dâk Bungalow, 25 Apr. 1919, *R. Farrer* 867 (holo. *J. farreri*, E); Feng-shui-ling, 2750 m., rain forest, limestone rocks, 7 June 1914, *F. Kingdon Ward* 1648.

TIBET: Chumbi, 9 July 1913, *R. E. Cooper* 253 and 3650 m., 24 Oct. 1916, *Ribu & Rhomoo* s.n.; Salween-Kiu-chiang divide, lat. 28°40′N., long. 98°15′E., in open scrub by stream, Sept. 1919, *G. Forrest* 18927; Upper Kiukiang Valley, (Clulung) Singolila, 2500 m., margin of mixed forest, 25 Aug. 1938, *T. T. Yü* 19638; Gyala, lat. 29°43′N., long. 94°56′E., 2850 m., 23 July 1938, *Ludlow, Sherriff & Taylor* 5376; Tongyuh Dzong, 2750 m., in moist situations, 20 May 1947, *Ludlow, Sherriff & Elliot* 13719; Le Nyam Jang Chu, 2450 m., in dense wet forest, 24 May 1947, *Ludlow, Sherriff & Elliot* 12551; Dri La, Rong To Valley, Zayul, 2750–3100 m., on sparsely forested granite cliffs facing south, 10 Dec. 1933, *F. Kingdon Ward* 11039 (BM); without locality 3650 m., 1913, *F. Kingdon Ward* 521.

CHINA. YUNNAN: Atuntze, 2850 m., among thickets, 14 Sept. 1937, *T. T. Yü* 10205; S.W. of Atuntze, 3200 m., among thickets, in valley, 25 Oct. 1937, *T. T. Yü* 10585; Atuntze, Dokerla, 2800 m., upon thickets, 9 Nov. 1937, *T. T. Yü* 7946; N.E. of Yung-pei 7 miles, 2400–2750 m., in open valley with other shrubs, 22 May 1921, *F. Kingdon Ward* 3931; Eastern flank of Tali Range, lat. 25°40′N., 2400–3050 m., open situations

in mixed and pine forests, June-Aug. 1906, *G. Forrest* 4659; Tali, in middle part of Ma Nung Mountain, July, *McLaren's Collectors* C66; side valleys on the eastern flank of the Lichiang Range, lat. 27°10′N., 2750 m., dry situations amongst scrub, May 1906, *G. Forrest* 2082; and lat. 27°15′N., 2750–3200 m., May 1910, *G. Forrest* 5621; Lichiang Snow Range, 3000 m., among thickets, 9 May 1937, *T. T. Yü* 15019; Chuegkang Snow Range, 3000 m., among thickets, 31 July 1938, *T. T. Yü* 17118; north of Chungtien, in Tonwa Territory, 3350 m., meadows, April 1932, *J. F. Rock* 24705; plateau de J'e-ma-tchouan, 3200 m., July 1912, *E. E. Maire* s.n.; pâturages des mont. à P'e-long-tsin, 3200 m., May, *E. E. Maire* s.n. (holo. *J. mairei*, E) and 878/1914; haut plateau de Ta-hai, 3200, July, *E. E. Maire* s.n. (holo. *J. mairei* var. *siderophyllum*, E); without locality, *G. Forrest* 29005.

SZECHUAN: Mountains between Muli and Kulu, 3050 m., May-July 1932, *J. F. Rock* 24144 and Sept.-Oct. 1932, *J. F. Rock* 24564; Muli, near Lamasery, 2750 m., margin of forest, 2 Sept. 1937, *T. T. Yü* 14133; in dumetis mont. inter Kalapo et Linku, 3000 m., 17 May 1914, *C. K. Schneider* 1302; in altiplanitiei ad oppidum Yenyüen prope vicum Tschabatscha, 2700 m., 12 May 1914, *Handel-Mazzetti* 2223.

NATURALIZED

ITALY: Venetia, dit. Potavina in nemoribus collium Euganesrum, 4 May 1871, *P. Porta* s.n.; prope pagum Rivoli in prov. Veronae, 200 m., 8 June 1884, *Rigo* s.n.

GREECE: Ile de Tinos, 1833, *Lenormand* s.n.; near Athens, 600 m., "woods damp and shady places, said to have come from Phassala (Thessaly)", May 1951, *S. C. Atchley* 646 (K). Crete, La Canée, 1914, *Gandoger* 2898 (K).

YUGOSLAVIA: Ragusa [Dubrovnik], Island of Lacroma, 20 May 1905, *F. C. Crawford* 78.

CULTIVATED

INDIA: Belgaum Garden, July, *D. Ritchie* 446; "In hortis Magadhar [Behar] et Nepalae", Patna, 6 May 1812, *F. Buchanan-Hamilton* 36; Saharunpur, 1850, *W. Jameson* s.n.

NEPAL: Mayangdi Khola, Beni, 950 m., garden shrub, 22 Apr. 1954, *Stainton, Sykes & Williams* 126; Pokhara, 900 m., cultivated areas, 24 Apr. 1954, *Stainton, Sykes & Williams* 2411.

MAURITIUS: *Sieber*, Fl. Maurit. II, no. 255.

PALESTINE: Jerusalem, 28 May 1908, *J. E. Dinsmore* 3065.

GREAT BRITAIN: Edinburgh, Royal Botanic Garden, specimens from 1825 to 1956; Kew, Royal Botanic Gardens, Arboretum, 2 June 1880, *G. Nicholson* 1033; Cambridge, University Botanic Garden, 16 July 1956, *P. F. Yeo* s.n.

TOBAGO: Scarborough, 7 June 1913, *W. E. Broadway* s.n.

PARAGUAY: Without locality, 1888–1890, *T. Morong* 836.

As treated here *J. humile* is a widely distributed and variable species, but examination of the full range of material seen leads to the conclusion that no consistent, clear and natural subdivision of the species can be made

(except for the localized variety *microphyllum* mentioned below). A very careful analysis of pubescence, leaf size, leaflet number, inflorescence size and number of flowers, leaf margin and calyx teeth was carried out on material throughout the range and attempts were made to correlate variation with geographical distribution but despite this, or rather because of it, it has not been possible to maintain the taxonomic status of any of the variants previously recognized.

For example, puberulous and glabrous specimens occur sporadically amongst the eastern, central and western representatives of the species. In the east *Farrer* 867 (the type of *J. farreri*) shows a well developed pubescence. *J. pubigerum* was described from Nepal in the central part of the range, and in the west, the most densely pubescent specimens of all those seen, are *Lace* 3360 and 4048 from Baluchistan. Yet completely glabrous material has also been seen from each of these areas.

The only consistent separation based on leaf size and shape that could be made was that of the particularly small-leaved group confined to a relatively small area around N. W. Yunnan and this is treated below as var. *microphyllum*. It may be said, however, that there is a tendency for the western representatives to have more rounded leaflets, but it is only a tendency, for occasional acute-leaved specimens occur in the same area and there is a gradual merging in N.W. India with the typical acute-leaved central Himalayan expression. It may be pointed out for future workers that this tendency for rounded leaves also goes with a tendency for fewer leaflets; for amongst the western material trifoliate leaves are the commonest, 5-foliate much rarer and 7 or more foliate leaves never occur. In addition the corolla lobes are perhaps more papillate-hirsute.

Some of the varieties and species that have been recognized in horticulture depend in large part on leaflet number for their differentiation, or a combination of this with the number of flowers in the inflorescence. *J. revolutum*, for example, is said to have 5 or 7 leaflets and many ("6–12 or more") flowers whilst *J. wallichianum* (*J. humile* var. *glabrum*) has 7–13 leaflets and fewer flowers. There is no doubt that certain individual clones in cultivation are distinct, some even more than others, but I cannot find any sound basis for recognition of these differences at botanical rank. It may be that differentiation by name will be required for some at least of the clones but this differentiation should be at the rank of cultivar.

The leaflet margins of many specimens bear numerous setaceous or almost spinulose hairs (fig. 4) and Léveillé described his var. *siderophyllum*

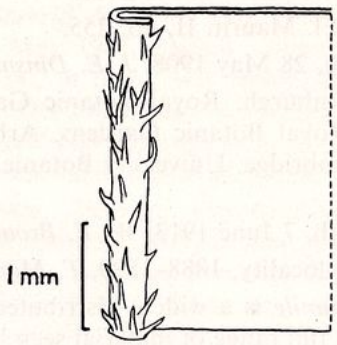

FIG. 4. Leaf margin with more or less appressed setulose hairs (*Forrest* 5621, *J. humile*).

from Yunnan based in the main upon this character. However great variability and all degrees of frequency exists in the presence or absence of these setaceous hairs: not only are there Chinese specimens without setaceous hairs but such specimens are not confined to China. The hairs may be seen in West Himalayan material, but although still sporadic, it must be admitted that their occurrence is less frequent the further west the origin of the specimen. Nevertheless, to base a taxon on this character alone would be artificial, for not only are no other characters correlated with it but the same type of variation in this same character occurs in *J. floridum* and *J. subhumile*.

J. humile has long been known in cultivation. According to Bean (Trees and Shrubs Hardy in the British Isles, i, 662: 1914 and ed. 7, ii, 154: 1951) it was cultivated by Tradescant as long ago as 1656 and it would appear that this original introduction was a less hardy form than those brought later direct from the Himalayas. The plant was known as Italian Jasmine and we may deduce that it was introduced into Europe via Italy, probably brought from further east by early traders, although the species is not actually mentioned by Laufer in his scholarly work on such introductions (Sino-Iranica: 1919). Certainly its native country of origin was unknown to Linnaeus at the time of his original description in 1753, yet the type specimen (a sterile, vegetative shoot) in the Linnean Herbarium in London may easily be matched with a typical medium-sized specimen from the central Himalaya.

Its early cultivation in Italy led to the suggestion that it was native there but Arcangeli in his Flora Italiana (ed. 2, 361: 1894) remarks that the plant is cultivated and at times occurs as if spontaneous. Records of "wild" plants of *J. humile* in other Mediterranean countries, especially Greece, may, I am sure, be accounted for in the same way. Halácsy (Conspectus Florae Graecae, ii, 286: 1902) treats the species as though native and cites a specimen "In collibus siccis pr. Methone Messaniae (Chaub.)" which I have not seen and is, I presume, the specimen referred to by Boissier (Flora Orientalis, iv, 42: 1875) together with one from the island of Chios cited earlier by DeCandolle (Prodromus, viii, 313: 1844). Boissier questions whether the species is truly spontaneous and is supported by Hayek (Prodromus Florae Peninsulae Balcanicae, ii, 440: 1930) who says that in the Balkans it is cultivated in gardens and subspontaneous in Greece. Over his comment that it is not truly native Boissier also cites a specimen (*Noë* 60) from near Bassora in Babylonia. This, and a record cited by Kobuski (Journ. Arn. Arb., xx, 405: 1939), "Teheran, on road to Doshantepe, ex *Herb. Bornmüller*" are the only records from Persia. I have not seen either of these specimens and Dr. Kobuski has kindly informed me in correspondence that he considers that this latter specimen must have been taken from a cultivated plant. There seems no doubt that *J. humile* is not native in any country west of Afghanistan.

It has even been doubted whether some of the early collections of Wallich's under his Catalogue number 2887 were from truly wild material, for Haines (Bot. of Bihar & Orissa, 1243: 1925) says of the Patna specimen no. 2887c that it was "doubtless cultivated". That *J. humile* is still cultivated in Nepal is borne out by *Stainton, Sykes & Williams* 126 and 2411 cited above; it must be remarked, however, that these two specimens bear particularly large leaves and more flowers per inflorescence than is

usual for this species. To judge from the field notes they were growing at far lower altitudes than those of the wild localities and so presumably in a warmer climate, more favourable to lush growth. I suspect too that *Polunin, Sykes & Williams* 3748 (Phalabang, 1360 m., 28 March 1952) also belongs here but Kingdon Ward 11039 from a much higher altitude has terminal leaflets up to 10 cm. long and in this respect is unique in all the material I have examined. The wide range of countries in which *J. humile* is cultivated may be judged from the specimens listed above and by the fact that material has also been seen from France, Spain, Japan and the United States, and it is believed that this list is not complete.

One minor point of economic interest is that Aitchison (Journ. Linn. Soc. Lond. Bot., xix, 147: 1882) in his paper on the Flora of the Kuram Valley, remarks that " a yellow dye is extracted from the root of *J. revolutum*", but Watt in his Dictionary of the Economic Products of India, iv, 543 (1880) notes that "it is curious that this fact should apparently be unknown to the hill tribes in India where the plant is equally abundant".

var. **microphyllum** (Chia) P. S. Green, **stat. nov.**

Syn.: *Jasminum humile* L. forma *microphyllum* Chia in Acta Phytotax. Sinica, ii, 27 (1952).

A small shrub, 30 cm. to 2 m. high, branches glabrous or minutely puberulous (*Yü* 10590). Leaves trifoliate or pinnate, glabrous, with 5–7 leaflets, obovate to oblanceolate, often narrowly so, or elliptic-ovate to lanceolate in shape, terminal leaflets (6–)8–20 mm. long by (2–)3–5 mm. broad, lateral leaflets (2–)5–17 mm. long by (0·5–)3–5 mm., broad; margin recurved, glabrous; apex rounded or blunt, occasionally more or less acute; base cuneate or angustate, venation obscure above and below. Inflorescence of 1–6 flowers on glabrous or minutely puberulous pedicels 3–12 mm. long. Calyx tube 1–2 mm. long with distinct more or less subulate teeth 0·5–1 mm. long. Corolla, as for the species but the tube more slender, the base 1–2 mm. wide in dried specimens, lobes glabrous or with a few papillate hairs at the apex.

Holotype: Yunnan, Ta Pin Tze, *Delavay* 2551 (?SYS, not seen, iso. K).

CHINA. YUNNAN: Atuntze, Yangtza (Bank of Mekong Riv.), 2300 m., amongst thickets on open slope, 12 Nov. 1937, *T. T. Yü* 7975; Atuntze, Mt. Kaakerpu, 2600 m., among thickets in valley, 25 Sept. 1937, *T. T. Yü* 10457; S.W. of Atuntze, 3200 m., among thickets, 25 Oct. 1937, *T. T. Yü* 10590; arid foothills on the eastern flank of the Bei-ma-Shan, lat. 28°12′N., 3050 m., in open situations, June 1917, *G. Forrest* 13832; arid region of Mekong Valley, 2450 m., 1913, *F. Kingdon Ward* 395; Weihsi, W. of Tungchuling, 3000 m., mountain grassy places, among thickets, 14 Nov. 1937, *T. T. Yü* 10704; Pin tchoan kai, near Pe yen tsin, 15 May 1917, *S. Ten* 375; Kau-ty, near Pe yen tsin, 18 June 1918, *S. Ten* 515; pâturages des mont. à Ma-po-tse, 2800 m., June, *E. E. Maire* (389/1913); vallons de Suen-oui, 2400 m., July, *E. E. Maire* 451 (K).

SZECHUAN: Tachien-lu, 11 June 1930, *W. C. Cheng* 1150 (BM); Ta Tsien-lou, 1893, *J. A. Soulié* 592 (K); Monkong Ting, descent of Hsao-chin-ho valley, 2300–3000 m., June 1908, *E. H. Wilson* 2809 (K); Maochou, dry arid places, 1300–1600 m., 24 May 1908, *E. H. Wilson* 2811 (K); without

locality, 3000–3300 m., June 1904, *E. H. Wilson* 4077 (BM) and 2300 m., Aug. 1903, *E. H. Wilson* 4078 (K).

TIBET. Salween-Kiu-chiang divide, lat. 28°40′N., long. 98°15′E., amongst rocks on dry stony slopes in side valleys, Sept. 1919, *G. Forrest* 19251.

This small leaved variety seems to be confined to a small area in N.W. Yunnan, W. Szechuan and immediately adjacent Tibet (although the localities of the Maire and Ten specimens cited above have not actually been located on a map).

The three features which mark it off from the rest of the species are the small size and rounded apex of the leaves, the relatively prominent calyx lobes and the slender corolla tube which at the base of the corolla lobes appears to be as wide as in the typical variety, but on dried specimens the tube is only 1–2 mm. wide at its base as compared with (2–)2·5–3 mm. in var. *humile* from the same area.

From the few specimens, some of them rather poor, that have been examined it is difficult to assess the status of this taxon but with a well defined geographic area of occurrence and two or three distinctive characters it is felt that the rank of variety is more appropriate than that of mere form. An isotype (*Delavay* 2551) has been examined at Kew and a duplicate of the other specimen cited by Chia (*W. C. Cheng* 1150) was seen at the British Museum (Natural History).

3. **Jasminum parkeri** Dunn in Kew Bull. 1920, 69; Bean, Trees and Shrubs Hardy in Brit. Is. iii, 195 (1933) et ed. 7, ii, 153 (1951); Anon. in Journ. Roy. Hort. Soc. Lond. lix, 149 (1934); Stoker in Quart. Bull. Alp. Gard. Soc. ii, 358 (1934); Fisher in Quart. Bull. Alp. Gard. Soc. iii, 201 (plate) (1935); Rehder, Man. Cult. Trees and Shrubs, ed. 2, 793 (1940); Bailey & Bailey, Hortus Second, 397 (1941); Anon. in Gard. Chron. ser. 3, cxiii, 227, fig. 115 (1943); Chittenden, Dict. Gard. ii, 1087 (1951).

A prostrate *shrub*. Branches angled, minutely puberulous when young. *Leaves* trifoliate or pinnate, unifoliate at the base of shoots, with (1–)3–5 (–7) leaflets; petiole 1–3 mm. long, puberulous; lamina glabrous and puberulous when young, leaflets narrow ovate to ovate or elliptic to broadly elliptic, terminal leaflet 3·5–5·5 mm. long by 2–2·5 mm. broad, lateral leaflet 2·5–4 mm. long by 2–2·5 mm. broad; margin slightly recurved, entire, with occasional setaceous hairs; apex acute or obtuse; base acutate, rarely blunt; venation quite obscure. *Inflorescence* terminal on side shoots with 1–3 flowers borne on puberulous pedicels up to 2 mm. long (fig. 2k). *Calyx* with a few short scattered hairs, tube 1·5 mm. long, lobes variable in length, from half to slightly over 1 mm. long. *Corolla* lemon yellow, tube 12–13 mm. long, breadth at base of lobes 2 mm., lobes 5–6 mm. long, at the apex papillate-hirsute inside and ciliolate. *Stamens* 2, filaments 1 mm. long, anthers 3 mm. long with a small terminal appendage. *Ovary* about 1 mm. high with style 5·5 mm. long.

Holotype: India, Chamba State, Tiari, Barmaor, on rocks 1850 m., 2 July 1919, *R. N. Parker* s.n. (K)

INDIA: Himachal Pradesh, Rupani Forest, Chamba State, 2150 m., 7 June 1899, *J. H. Lace* 1960; near Swai, Ravi valley, on rock at 2450 m., 6 May

1920, *R. N. Parker* s.n. (K); between Grima and Siunr, Bharmaor, 2150 m., 15 August 1920, *R. N. Parker* s.n. (K).

CULTIVATED: Royal Botanic Garden, Edinburgh, rock garden, June 1960, C.3520.

When Lace collected his specimen cited above he remarked in his field note that it was "probably a starved state of *J. humile*". However it is worthy of higher taxonomic recognition than this, for it has maintained all its dwarf characteristics throughout many years of cultivation. When plants which are merely starved produce flowers these, whilst reduced in number, are usually full-sized; but the flowers of *J. parkeri* are smaller than those of *J. humile* and of a distinct lemon-yellow as compared with golden-yellow in the latter. Furthermore, although it has only been collected three or four times in the wild, the localities, relatively near one another, are yet distinct. The limited distribution is thus similar to that exhibited by *J. stans* in Ethiopia.

It was introduced into cultivation in 1923 and has been prized amongst rock gardeners for many years, having been given an Award of Merit by the Royal Horticultural Society in June 1933.

4. **Jasminum stans** Pax in Engl., Bot. Jahrb. xxxix, 641 (1907); Cufodontis in Bull. Jard. Bot. Bruxelles, xxx, 674 (1960).

Evergreen *shrub*, 1–3 m. high. Shoots glabrous or minutely puberulent when young, angled. *Leaves* pinnate, only at the base of shoots trifoliate or unifoliate, with (1–)5–9 leaflets; petioles 3–14 mm. long, glabrous, and with the rachi deeply grooved and more or less winged; lamina glabrous, thickish, leaflets elliptic to broadly elliptic, sometimes slightly ovate, terminal leaflet (5–)7–20 mm. long by (3–)4–11 mm. broad, lateral leaflets (3–)5–16 mm. long by (2–)3–9 mm. broad; margin slightly thickened, often recurved and with a few appressed tooth-like hairs or glabrous; apex blunt or rounded, with a small terminal apiculus; base of terminal leaflet angustate or cuneate, and of lateral acute or blunt; venation obscure, completely so above, but sometimes 2–3 pairs of primary veins just visible below. *Inflorescence* terminal on side shoots with 1–3 flowers on pedicels (6–)10–15 mm. long (fig. 2c), minutely scattered puberulent towards the base. *Flowers* golden yellow (*Gillett* 14823), heterostylous? *Calyx* tube 3–4 mm. long with 5(–6) triangular-subulate and ciliolate lobes 1–2 mm. long. *Corolla* tube (15–)18–25 mm. long, 3–4·5 mm. broad at the top; lobes 4–5 ovate, more or less acute or rounded at the apex, papillate-hirsute inside and out and ciliolate, 8–10 mm. long, 4–6 mm. broad. *Stamens* 2, attached 2–6 mm. from the base of the corolla lobes; subsessile or on filaments up to 1 mm. long, attached towards the base of the anthers; anthers 5–8 mm. long with a fairly well developed terminal appendage. *Ovary* about 1–2 mm. high with style 13–18 mm. long and 2 stigmatic lobes 1·5 – 2 mm. long.

Holotype: Ethiopia, Ost-Schoa, Akaki, wesentlicher Bestandteil der Macchien in Akaki-Tale, 2250 m., 7 Feb. 1905, *Felix Rosen* s.n. (BRSL, not seen).

ETHIOPIA. 64 km. N.E. of Addis Ababa on Dessie road, lat. 9°15′N., long. 39°10′E., 2700 m., edge of lava plateau, *Triticum*, *Hordeum* and *Eragrostis tef* cultivation; relics of the climax *Juniperus* forest only here and there on steep slopes, rainfall c. 1250 mm., 11 Jan. 1953, *J. B. Gillett*

14823 (K); Managaschia, in open glade with *Erica*, 3200 m., 12 May 1953, *H. F. Mooney* 4823 (K); Addis Ababa, in open hilltop behind British Embassy, 2650 m., 3 May 1953, *H. F. Mooney* 4737 (K); Embassy Hill, Addis Ababa, 2630 m., common in scrub jungle on clay over trachyte with *Carissa edulis* and *Rosa abyssinica*, rainfall 1270 mm., 20 Apr. 1957, *H. F. Mooney* 7041 (K); Mt. Wochacha, near Addis Ababa, lat. 8°57′N., long. 38°36′E., 2650 m., in rather open juniper-Erica forest on trachyte, rainfall, c. 1000 mm., 6 May 1959, *H. F. Mooney* 7893 (E, K).

In affinity this species lies nearest to *J. humile* and to *J. odoratissimum* subsp. *goetzeanum* and geographically also it lies intermediate between the two. Vegetatively it resembles *J. bignoniaceum*, from the hills of Peninsular India and Ceylon, which also bears few flowers in each inflorescence, but these flowers are quite different in their proportions.

In addition to the material cited above I understand that *J. stans* was also collected by Mr. P. R. O. Bally on 5 Feb. 1944 (Addis Ababa, in scrub near river beds, 2430 m., *Bally* 3050). I have not seen a specimen but it is worth noting that Mr. Bally states in his field notes that the Amharic name for the species is 'Katchemo' and that the twigs are used as toothbrushes.

Jasminum stans bears the largest flowers of the section and might prove a handsome shrub in cultivation so it is a pity that the flowers are apparently unscented (fide Pax, l.c., p. 603).

5. **Jasminum odoratissimum** Linnaeus, Sp. Pl. 7 (1753); Curtis, Bot. Mag. viii, t. 285 (1794); Vahl, Enum. Pl. i, 33 (1805); Stokes, Bot. Comment. i, 19 (1830); G. Don, Gen. Syst. iv, 63 (1838); Loudon, Arb. Frut. Brit. ii, 1254 (1838); DeCandolle, Prodr. viii, 312 (1844); Lowe, Man. Fl. Madeira, ii, 29 (1872); Nicholson, Ill. Dict. Gard. ii, 207 (1885); Bailey, Cycl. Amer. Hort. ii, 843 (1900); Menezes, Fl. Archep. Madeira, 11 (1914); Léveillé in Fedde, Rep. Sp. Nov. xiii, 149 (1914); Bailey, Stand. Cycl. Hort. iii, 1719 (1915); Knocke, Kanarische Ins. 247 (1923); Lindinger, Beitr. Kennt. Veg. Kanar. Ins. 68 & 247 (1926); Hayek, Prodr. Fl. Penins. Balcan. ii, 440 (1930); Grabham, Plants Seen in Madeira, 99 (1934).

Syn.: *J. odorum* Salisbury, Prodr. 12 (1796), nomen illeg.
J. barrelieri Webb & Berthelot, Phyt. Canar. iii, 165 (1845); Pitard & Proust, Iles Canar. 267 (1909).
J. barrelieri Webb & Berth. var. *angustifolia* Pitard in Pitard & Proust, Iles Canar. 268 (1909).
J. barrelieri Webb & Berth. var. *latifolia* Pitard in Pitard & Proust, Iles Canar. 268 (1909).
J. augeronii Cabrera y Diaz in Bot. Soc. Esp. Hist. Nat. ix, 163 (1909).
J. gomeraeum Gandoger in Bull. Soc. Bot. France, lxv, 57 (1918).

Shrub 3–6 mm. high sometimes scrambling. Shoots glabrous, very rarely pubescent, terete or very slightly angled when young. *Leaves* trifoliate or pinnate with 5 (very rarely 7) leaflets, unifoliate at the base of shoots; petioles, glabrous or very rarely pubescent, (0·7–)1–2(–2·5) cm. long, often equal to or longer than the node above; lamina glabrous, rarely pubescent on the midrib below, lanceolate to ovate or narrow elliptic to broad elliptic, terminal leaflet (2–)2·5–4·5(–6) cm. long by (1–)1·5–2(–3·5)

cm. broad, lateral leaflets (1·3–)1·5–3(–4) cm. long by (0·5–)1–1·5(–2·5) cm. broad; margin entire, glabrous, flat or slightly recurved; apex acutate to blunt with an apiculus 1–2 mm. long; base angustate to blunt or rounded; venation with primary veins only just visible, especially below, (1–)2–4 per side. *Inflorescence* terminal on side shoots, more or less corymbose-paniculate (fig. 2g & h) with (6–)10–20 flowers on glabrous or very rarely pubescent pedicels 1–12 mm. long; bracts at every dichotomy at least 1 mm. long or more, often more or less leafy. *Flowers* heterostylous?, yellow, fragrant or inodorous. *Calyx* glabrous or rarely pubescent, tube 1·5–4 mm. long; lobes 0·25–2 mm. long. *Corolla* tube 10–17 mm. long, 2–4 mm. broad at the top; lobes blunt or rounded with a small apiculus, 4–10 mm. long by 3–5 mm. broad, densely shortly puberulous to glabrous on both surfaces and towards the margins. *Stamens* 2, attached 1–4 mm. below the base of the corolla lobes; filaments 0–2 mm. long; anthers 3–5 mm. long with a small pointed terminal appendage. *Ovary* 1 mm. long or slightly more with a style 5–11 mm. long.

subsp. **odoratissimum**

Leaflets glabrous, 1–3 (rarely 5 in cultivation); primary veins on lamina (1–)2–3 per side. Inflorescence (fig. 2h) with pedicels glabrous 1–10 mm. long. Calyx glabrous, tube 1·5–2 mm. long; lobes 0·5–2 mm. long. Corolla lobes glabrous, or at the apex only, very slightly papillate-hirsute inside or ciliolate. Staminal filaments 1·5–2 mm. long.

Holotype: no. 17.7 in the Linnean Herbarium, London (LINN).

MADEIRA. Eastern sea-cliffs near Funchal, July 1837, *Sippelt* s.n.; in rupibus maritimis, ad Portella, May-June 1866, *G. Mandon* 171; Deserta Is., June 1837, *Sippelt* s.n.

CANARY Is. Tenerife: in rupestribus, Cuevas Negras, 27 Apr. 1845, *E. Bourgeau* 945 (BM, K); in saxosis convallium, Baxamar, 11 Mar. 1855, *E. Bourgeau* 1423 (K); in rupestribus pr. portum Orotavae, 50 m., *O. Burchard* 187.

CULTIVATED. Tenerife: Acclimatization Garden, Puerto Oratava, 1930, *A. H. Maude* s.n. (BM). Britain: Chelsea Physic Garden, London, sent to the Royal Society, 1743, No. 1072 (BM). Netherlands: Utrecht Univ. Bot. Gard. "Cantonspark", No. 3004, 22 Aug. 1957, *E. A. Mennega.*

There is a close affinity between *J. odoratissimum* and the Sino-Himalayan *J. humile*. In fact their differentiation has several times been in doubt. Webb and Bertholet in proposing the name *J. barrelieri* were convinced that Linnaeus had confused the species, although an examination of the type specimens shows that he distinguished them clearly. Other authors, as for example C. Bunbury (in Journ. Linn. Soc. Lond., Bot., i, 26: 1856), have however referred to the Canary Island plant as *J. humile*. They may be most readily separated by the habit of the inflorescences; in the former species the inflorescence is leafier and the flowers are borne on shorter pedicels which tend to give the impression that the flowers are more immersed in the inflorescence. Linnaeus in his Species Plantarum distinguished the two species by the presence of a terete stem in *J. odoratissimum* and an angled stem in *J. humile*, however careful observation of

specimens of *J. odoratissimum* shows that the stem often develops a slight angle on drying, even though this may not be apparent in fresh material, nevertheless in degree it is far less angled than in the other species. In *J. humile* the leaves are most commonly pinnate with five or more leaflets although three are found towards the base of the shoots and more frequently in some of the western representatives, but in *J. odoratissimum* subsp. *odoratissimum* no pinnate-leaved specimen of wild origin have been seen. In cultivation, however, the leaves are occasionally five-foliate and the leaflets apparently somewhat more acute, but this is probably attributable to favourable conditions of growth; even the specimen from a plant cultivated in Tenerife which is cited above shows a single five-foliate leaf. Finally, the comparative lengths of the petiole and the node immediately above it help to distinguish between *J. humile* and *J. odoratissimum*. In the former the petiole is shorter, often much shorter, than the node whereas in the latter it is of the same length or longer.

In 1909 A. Cabrera y Diaz described a new species, *J. augeronii*, from the Island of Gomera in the Canaries. He distinguished it chiefly by its oval leaves with a retuse apex and the middle nerve prolonged into a mucro. He stated that in this it was quite distinct from any other *Jasminum* he had ever seen from the Canary Isles. However the range of leaf shape is very considerable and in Edinburgh there is a specimen from Deserta Is., Madeira, collected in 1837 which exactly matches the description of *J. augeronii* and it appears that this so called species is only an extreme variant. Lowe (Man. Fl. Madeira ii, 30: 1872) also remarked that the Deserta Island plant has a "more rounded leaf and larger handsomer flowers" but he referred to it as a "mere maritime form".

Lindinger, Beitrage zur Kenntnis von Vegetation von Flora der kanarischen Inseln, 247 (1926) lists a "*Jasminum pumilum* Lk." in synonymy under *J. barrelieri* var. *angustifolium*. This name is not listed in the Index Kewensis and this is the only reference to it that I have come across.

subsp. **goetzeanum** (Gilg) P. S. Green, **stat. & comb. nov.**

Syn.: *J. goetzeanum* Gilg in Bot. Jahrb. xxviii, 451 (1900); Baker in Thiselton-Dyer, Fl. Trop. Afr. iv, 12 (1902); Gilg & Schellenberg in Bot. Jahrb. li, 83 (1913); Brenan, Check-Lists Forest Trees & Shrubs Brit. Empire, No. 5, Tanganyika Terr. pt. ii, 389 (1949); Turrill in Fl. Trop. E. Afr., Oleaceae, 18 (1952).

Leaflets glabrous or rarely pubescent, 3–5 (very rarely 7) or unifoliate only at the base of shoots. Primary veins of lamina 3–4 per side. Inflorescence (fig. 2g) with pedicels 3–12 mm. long, glabrous or rarely pubescent. Calyx glabrous or rarely pubescent, tube 2–4 mm. long; lobes 0·25–1 mm. long. Corolla lobes papillate-hirsute, often inside and outside and especially towards the apex. Staminal filaments 0–1 mm. long.

Holotype: Tanganyika, Uhehe, nördl. Utschungwe-Berge, auf dem Higulu-Plateau, um 1800 m., *Goetze* 562 (B, not seen, †).

TANGANYIKA. Ufipa District: Malonje, long. 31°45′E., lat. 8°15′S., triangulation point, 2450 m., among rocks, 22 Nov. 1949, *A. A. Bullock* 1908 (E, K); Mbisi Mts. 2150 m., 1 Nov. 1933, *A. P. G. Michelmore* 710 (K). Iringa district: Kigogo, 1900 m., Dec. 1953, *Carmichael* 325 (K); Mufindi

area, Nyamalala, 1950 m., 28 Oct. 1955, *J. Benedicto* 76 (K); Dabaga, 6 Feb. 1932, *H. Lynes* Dabaga 7 (K); Gendoya—Iringa district, 1850 m., fringing bush on streamsides, Nov. 1936, *H. J. A. Rea* 79 (BM). Njombe district: Njombe, 14 Dec. 1931, *H. Lynes* D.g. 148 (K); N.W. Elton Plateau 2600 m., forest clumps, 11 Nov. 1931, *R. M. Davies* E44 (K); Stomgebiet des oberen Ruhudje, Landschaft Lupembe, nördlich des Flusses, Jan. 1931, *H. J. Schlieben* 35 (BM, K); *ibid.*, Pflanzen Upurva, 10 Nov. 1931, *H. J. Schlieben* 1411 (BM, K); Njombe plateau, very common everywhere, 3 Dec. 1931, *H. Lynes* F.j. 19 (K); Njombe, Iringa, 1850 m., occasional in hillside grassland, Oct. 1931, *R. R. Staples* 216 (K); Livingstone Mts., Upangwa, Uwemba–Madunda Mission road, 2150 m., May 1953, *W. J. Eggeling* 6539 (K). Rungwe district: Rungwe Forest Reserve, Jan. 1954, *S. R. Semsei* 1576 (K); West slopes of Rungwe mountains, also N. & S. slopes of Porotos, well distributed shrub, marginal to forest, Rungwe north slopes 2000–2350 m., west slopes to 2300 m., south Porotos 1900–2000 m., north Porotos to 2300 m., 11 Mar. 1932, *G. W. St. Clair-Thompson* 855 (K); Kyimbila district, 25 Oct. 1910, *A. Stolz* 364 (A, BM, K), 1 April 1912, *A. Stolz* 1340 (K), 22 Oct. 1912, *A. Stolz* 1601 (A, BM, E, K), 4 Nov. 1912, *A. Stolz* 1657 (BM, K), 4 Nov. 1912, *A. Stolz* 1715 (A, BM, E, K).

N. RHODESIA. South of Kazimolwo Hill, near Abercorn, Oct. 1933, *O. B. Miller* D163 (K).

There is no doubt in my mind that this plant from E. Africa belongs to the same species as that from Madeira and the Canary Islands. Such a geographic distribution, completely disjunct as it is, is remarkable, yet similar affinities between the floras of the Atlantic Islands and E. Africa exist in other groups. To take examples from three quite unrelated families: the genus *Canarina* (Campanulaceae) has one species in the Canary Islands and three in E. Africa and in conversation I have also learned of a similar distribution in *Osyris* (Santalaceae) from Dr. H. U. Stauffer of Zurich, whilst Dr. N. K. B. Robson of Kew has mentioned a similar affinity in related species of *Hypericum*.

All the material of *J. odoratissimum* that has been examined has been consistently glabrous except one specimen of subsp. *goetzeanum*, *Schlieben* 1411, which exhibits dense pubescence on the young stems, petioles and inflorescence. Turrill (Fl. Trop. E. Afr., Oleaceae, 18: 1952) remarks that "when more specimens become available it may be useful to give it a varietal name" but it is suspected that the situation is comparable to that in *J. humile*, *J. subhumile* and *J. floridum* where pubescent variants have at times been given specific and varietal names.

An indumentum character which is better developed in this subspecies than anywhere else in the Section is the presence on some specimens of subsp. *goetzeanum* (e.g. *Carmichael* 325, *Semsei* 1576, *Schlieben* 1411, *Lynes* D.g. 148 etc.) of short and dense almost papillose hairs on the lobes of the corolla, both inside and out. These hairs with their papillate nature are, however, quite distinct from the longer and thinner ones present in the throat of the corolla of *J. fruticans*, the only other case of indumentum of the corolla observed in this Section.

6. **Jasminum bignoniaceum** Wallich ex G. Don, Gen. Syst. iv, 63 (1837); Wallich, Cat. No. 2888 (1829), nomen; DeCandolle, Prodr. viii, 313 (1844);

Fyson, Fl. Nilgiri & Pulney Hill-Tops, i, 276 (1915), iii, t. 415 (1920); Gamble, Fl. Presidency of Madras, ii, 791 (1923); Fyson, Fl. S. Indian Hill Stations, i, 387, ii, t. 327 (1932).

Syn.: *J. revolutum* Sims var. *peninsulare* Alph. DeCandolle, Prodr. viii, 312 (1844); Drury, Handb. Ind. Fl. ii, 176 (1866).

Shrub or small tree 1–4·5 m. high. Shoots glabrous angled. *Leaves* glabrous pinnate with 5–9(–11) leaflets, trifoliate and unifoliate towards the base of shoots; petioles 0·5–1·5(–2·5) cm. long, glabrous; lamina glabrous, narrow elliptic to broad elliptic or narrow obovate to obovate, terminal leaflet (0·7–)1–2(–4) cm. long by (0·3)–0·5–0·8(–1·5) cm. broad, lateral leaflets (0·5–)1–1·5(–3) cm. long by (0·3–)0·5–0·8(–1·3) cm. broad; margin entire more or less recurved with a few setaceous hairs especially towards the apex, or glabrate; apex acutate to blunt, tip acute or slightly apiculate; base angustate to cuneate; venation with primary veins obscure or invisible, rarely clear, 1–2 per side. *Inflorescence* terminal on side shoots, more or less umbellate (fig. 2 a & b) with 1–5(–6) flowers on glabrous pedicels (2–)4–8(–10) mm. long. Flowers heterostylous?, yellow, not fragrant (fide *Sedgwick* 396) more or less nodding. *Calyx* tube 1·5–2 mm. long; lobes 0·25–1 mm. long. *Corolla* slightly funnel-shaped; tube (12–)14–17 (–18) mm. long, about 6 mm. broad at the top; lobes rounded or slightly emarginate 3–4 mm. long by 3–5 mm. broad, papillate-ciliolate at the apex. *Stamens* 2, attached about 3 mm. below the base of the corolla lobes; filaments 1·5–2 mm. long; anthers 2·5–3·5 mm. long with a very small blunt terminal appendage. *Ovary* about 1 mm. high with a style 15–19 mm. long.

Holotype: Nilgiri Hills, *Wallich* 2888 (K).

S. India. Nilgiri Hills: Coonoor, 1800 m., May 1883, *J. S. Gamble* 11523 (K), 24 May 1896, *A. G. Bourne* s.n. (K); Ootacamund, July 1850 & April 1851, *Foulkes* s.n. (K), 1856, *H. F. C. Cleghorn* s.n. (E), 2150 m., May 1885, *J. S. Gamble* 16181 (K) and 2150 m., June 1886, *J. S. Gamble* 17356 (BM); Kotagiri, 1950 m., April 1915, *L. J. Sedgwick* 396 (K); without locality, 1830, *Perrottet* s.n. (holo. *J. revolutum* var. *peninsulare*, G), *Perrottet* 753 & 759 (K), *G. Gardner* s.n. (K), *Herb. Watt* s.n. (E), *R. Wight* s.n. (E, GL), 1851, *R. F. Hohenacker* 1079 (BM, E, K).

Pulney Hills: Sept. 1836, *R. Wight* 2171 (E, GL), Glen Falls, 31 May 1897, *A. G. Bourne* 228 (K).

Travancore Hills: 2150 m., 1890, *T. F. Bourdeleon* s.n. (K).

Without Locality: *R. Wight* 1753 (K).

Ceylon. 1847, *G. Gardner* 549 (BM, K), 2150 m., *Thwaites* 1811 (BM, K).

There has been much indecision over the status of this plant which is nevertheless distinct enough from the other species both in morphological characters and distribution to be considered a species.

In distribution it is confined to the hills or mountains at the southern end of the Indian peninsula and to those of nearby Ceylon. In Trimen's Handbook of the Flora of Ceylon (iii, 115: 1895), where it is described as "very rare" and in the earlier Enumeratio Plantarum Zeylaniae of Thwaites (190: 1860) the species was treated as *J. humile*, the temperate Himalayan species. However their descriptions do not accurately fit *J. humile* and the only specimens I have seen from Ceylon are undoubtedly the same plant as that of the South Indian mountains. There is a tendency for the Ceylon

plant to exhibit much larger leaves, more like the average size for *J. humile*, and this is probably where the confusion has entered, for vegetatively *J. bignoniaceum* is very similar at first glance to some specimens of *J. humile*. At one time in this investigation it was thought that the Ceylon plant ought perhaps to be distinguished from the Indian but whilst most of the mainland specimens have small leaves, on occasional ones they are much larger, and the specimen of *Wight* 2171 in the herbarium of Glasgow University bears leaves every bit as large as those from Ceylon.

Similarly, the South Indian plant has not always been regarded as specifically distinct from the Himalayan, for an illustration of it was published twice by Wight under the name *J. revolutum* (Ic. Pl. Ind. Orient., iv, 14, t. 1258: 1848 and Spicil. Neilgherr., ii, 44, t. 151: 1851).

As has been said, vegetatively *J. bignoniaceum* is very similar to some medium-leaved representatives of *J. humile* and to *J. stans*, but the flowers are distinct, in fact quite distinct from all the other species of the section. In none of the others is the corolla tube so broad at the top and the lobes so short in proportion and rounded. Furthermore it is apparent from illustrations, descriptions and even herbarium specimens that the relatively few flowers in this species hang down and nod far more noticeably than in the other species.

7. **Jasminum floridum** Bunge in Mém. Div. Sav. Acad. Sci. St. Petersb. ii, 116 (Enum. Pl. Chin. Bor. 42: 1833) ("1835"); DeCandolle, Prodr. viii, 313 (1844); Blume, Mus. Bot. Lugd.-Bat. i, 281 (1850); Miquel in Ann. Mus. Lugd.-Bat. ii, 263 (1866) et Prol. Fl. Jap. 151 (1866–67) et Cat. Mus. Bot. Lugd.-Bat. 57 (1870); Franchet & Savatier, Enum. Pl. Jap. i, 314 (1874); Nicholson, Ill. Dict. Gard. ii, 207, fig. 340 (1885); Hooker fil. in Bot. Mag. cix, t. 6719 (1883); Hemsley in Journ. Linn. Soc. Lond. Bot. xxvi, 78 (1889); Dippel, Handb. Laubholzk. i, 147 (1889); Diels in Bot. Jahrb. xxix, 534 (1900); Schneider, Ill. Hand. Laubh. ii, 839, figs. 527 k–i, 528a–c (1912); Matsumura, Index Pl. Jap. ii, 493 (1912); Léveillé in Fedde, Rep. Sp. Nov. xiii, 149 (1914); Bean, Trees & Shrubs Hardy in the Brit. Is. i, 659 (1914) et ed. 7, ii, 151 (1951); Bailey, Stand. Cycl. Hort. iii, 1719 (1915); Léveillé in Mem. Acad. Ci. Art. Barcelona, ser. 3, xii, 557 (Cat. Pl. Kiang-Sou, 17) (1916); Rehder in Sargent in Publ. Arn. Arb. iv (Pl. Wils.) ii, 614 (1916) et Man. Cult. Trees & Shrubs, 767 (1927) et ed. 2, 792 (1940); Kobuski in Journ. Arn. Arb. xiii, 147 (1932); Chung in Mem. Sci. Soc. China, i, 216 (1932); Bailey & Bailey, Hortus Second, 397 (1941); Chittenden, Dict. Gard. ii, 1087 (1951); Chia in Acta Phytotax. Sin. ii, 28 (1952); Steward, Man. Vasc. Pl. of the Lower Yangtze Valley, 311 (1958); Kobuski in Journ. Arn. Arb. xl, 386 (1959).

Syn.: *J. subulatum* Lindley in Bot. Reg. xviii, misc. notes, 57 (1842); DeCandolle, Prodr. viii, 312 (1844).

J. floridum Bunge var. *spinescens* Diels in Bot. Jahrb. xxix, 534 (1901).

J. giraldii Diels in Bot. Jahrb. xxix, 534 (1901); Pampanini in Nuov. Giorn. Bot. Ital. N.S. xvii, (Piante Vascolari dell' He-peh, 141) 689 (1910); Schneider, Ill. Handb. Laubh. ii, 839 (1912); Léveillé in Fedde, Rep. Sp. Nov. xiii, 149 (1914);

Bailey, Stand. Cycl. Hort. iii, 1719 (1915); Rehder in Sargent in Publ. Arn. Arb. iv (Pl. Wils.) ii, 614 (1916), et Man. Cult. Trees & Shrubs, 765 (1927) et ed. 2, 793 (1940); Chung in Mem. Sci. Soc. China, i, 216 (1924); Kobuski in Journ. Arn. Arb. xiii, 148 (1932); Bailey & Bailey, Hortus Second, 397 (1941); Chia in Acta Phytotax. Sin. ii, 29 (1952); Kobuski in Journ. Arn. Arb. xl, 386 (1959).

J. argyi Léveillé in Mem. Acad. Ci. Art. Barcelona, ser. 3, xii, 557 (Cat. Pl. Kiang-Sou, 17) (1916); Rehder in Journ. Arn. Arb. xv, 306 (1934).

J. tsinlingense Lingelsheim in Fedde, Rep. Sp. Nov. Beih. xii, 463 (1922).

J. humile L. var. *kansuense* Kobuski in Journ. Arn. Arb. xx, 405 (1939); Rehder, Man. Cult. Trees & Shrubs, ed. 2, 793 (1940); Chia in Acta Phytotax. Sin. ii, 28 (1952).

Shrub 1–3 m. high. Shoots more or less angled, glabrous or occasionally villous. *Leaves* trifoliate or pinnate, unifoliate at base of shoots, with (1–)3–5 leaflets; petioles (2–)4–7(–15) mm. long. glabrous, pubescent or villous; lamina glabrous or pubescent, or villous especially on the midrib and nerves beneath, elliptic to broad elliptic, narrow ovate to ovate or narrow obovate to obovate, terminal leaflet (0·5–)1–2·5(–5) cm. long by (0·3–)0·7–1·5(–2·5) cm. broad, lateral leaflets (0·4)1–1·4(–3) cm. long by (0·2–)0·5–0·7(–1·4) cm. broad; margin recurved, rarely flat, entire, bearing setaceous hairs often more or less appressed, sometimes very few; apex acutate or acute, rarely acuminate, more or less apiculate, rarely obscurely so; base angustate or acute; venation obscure above and below, occasionally 1–2 primary veins per side visible below. *Inflorescence* terminal on side shoots, glabrous or occasionally slightly villous, more or less cymose or cymose-umbellate (fig. 2j) with (4–)6–12(–23) flowers on pedicels (0·3–)0·5–1(–2·5) cm. long. *Flowers* heterostylous?, yellow. *Calyx* ciliate, glabrous or more rarely slightly villous, tube 1–2 mm. long with linear-subulate teeth (1·25–)1·5–2(–3) mm. long. *Corolla* tube 9–12 (–15) mm. long, 3–4 mm. broad at the top; lobes acute 5–8 mm. long by 2·5–4 mm. broad, papillate-ciliolate at the apex. *Stamens* 2, attached 1–4 mm. from the base of the corolla lobes; filaments 0–0·5 mm. long; anthers 3–4·5 mm. long with a well developed pointed terminal appendage up to 1 mm. long. *Ovary* about 1 mm. long with a style 5–11 mm. long.

Holotype: N. China, Kantai, 1831, *Bunge* (LE, not seen).

China. Kansu: Pei-schui, 19 June 1885, *Potanin* s.n. (K); Siku, 20 Oct. 1914, *F. N. Meyer* 1806 (K); near Kua tsa, 5 Nov. 1914, *F. N. Meyer* 1817 (K); Tsi-ying-tcheun, 15 June 1918, *E. Licent* 2530 (K); Lower Tebbu country, outskirts of forests along stream in Wantsang Valley, 2100–2200 m., 31 Aug. 1926, *J. F. Rock* 14653 (paratype *J. humile* var. *kansuense*, E); Lower Tebbu country, gorge of Chulungapu, dry slopes with Kolreuteria, 2000 m., Sept.–Oct. 1926, *J. F. Rock* 15035 (paratype *J. humile* var. *kansuense*, E, K).

Shensi: In-kia-po, Aug. 1896, *G. Giraldi* 1518 (synt. *J. giraldii*, FI); Huo-kia-zaez, ai piedi del Lao-y-huo, Aug. 1896, *G. Giraldi* 1519 (synt. *J. giraldii*, FI); Lao-y-san, 4 June 1897, *G. Giraldi* s.n. (K); north west

Hancheng Hsien, 1910, *W. Purdom* 368; Tai-pei-shan, *W. Purdom* 907 (K); near Pai dja dien, 18 Sept. 1914, *F. N. Meyer* 1943 (K).

HUPEH: Ichang, *A. Henry* 1082 (K); north and south of Ichang, 300–700 m., June and Dec. 1907, *E. H. Wilson* 789; Nan T'o, *A. Henry* 2700 (K); Changlo, *A. Henry* 6288 (K); dry rocky places, Fang hsien, 1000 m., May and Oct. 1907, *E. H. Wilson* 598; Fang, June 1907, *E. H. Wilson* 2036 (K); Patung Hsien, 15 June 1934, *H. C. Chow* 521; Chienshih Hsien, 4 Sept. 1934, *H. C. Chow* 1512; without locality *A. Henry* 351; April 1900, *E. H. Wilson* 83; *Wilson* 1279 (K).

SZECHUAN: Taha-Kou, Nanch 'uan, 30 July 1891, *C. Bock & A. v. Rosthorn* 163 (O); Kon ti ya, Fupei-tsui, Nanch 'uan, 8 Oct. 1891, *C. Bock & A. v. Rosthorn* 1151 (holo. *J. floridum* var. *spinescens*, O); Nanchuan Hsien, side of a river, 1500–1800 m., 15 May 1928, *W. P. Fang* 788; Sungpan Hsien, side of brook, 17 Aug. 1928, *W. P. Fang* 4239; Mow-hsien (Mow-chow), at roadside, 30 Sept. 1928, *W. P. Fang* 5595; Pao-hsing-hsien, 2 July 1936, *K. L. Chu* 3036 and 1700 m., among bushes, 5 Sept. 1936, *K. L. Chu* 3794.

CULTIVATED. CHINA: Chili, Pekin, *Bretschneider* 498 (K); Yunnan, vicinity of Yun-nan-sen, *E. E. Maire* 1325; Kiangsu, Le Kien, May, *Ch. d'Argy* s.n. (holo. *J. argyi*, E), Sou kien, 7 June, *Ch. d'Argy* s.n.; Without province, 1845, *Fortune* A62 (K).

JAPAN: without locality, *Blume* s.n. (K, O).

BRITAIN: Kew, Herbarium Wall, 12 Aug. 1882, *G. Nicholson* s.n., Arboretum, 6 Aug. 1880, *G. Nicholson* 1605.

This species shares with the Mediterranean *J. fruticans* the character of long calyx lobes (fig. 3e), which mark them off from all the other species in this Section. However *J. floridum* and *J. fruticans* possess quite different leaf shapes, with the apex acute or acutate in the former and rounded or blunt in the latter. Geographically too they are widely separated, *J. floridum* occupies the most easterly and northerly area of all the species in the section. Most of the material examined comes from a fairly small area in Kansu, Shensi, W. Hupeh and E. Szechuan. However, specimens have been seen from Chili (Pekin), Kiang-su and Yunnan and it is strongly suspected that they were gathered from cultivated plants. Likewise *J. floridum* has been recorded from Japan but here too it cannot be truly native. Franchet and Savatier (Enum. Pl. Jap. i, 314: 1875) and Matsumura (Index Pl. Jap. ii, 493: 1912) say that it is cultivated, although Miquel (Prol. Fl. Jap. 151: 1866–67) states that it is native. Fortune collected it in China in 1845, probably from a cultivated plant and it was introduced to Britain about this time. Even Bunge's type from Kantai (near Pekin) was described as being " quasi spontaneum ".

Two characters which have been used to distinguish taxa now treated as synonyms are vegetative pubescence and setose hairs on the leaf margins. However with the wide range of material now available for examination, coupled with knowledge of how these same characters vary in other species of this section, one is inevitably led to the conclusion that they cannot be used for specific delimitation. *J. giraldii* was distinguished by the possession of puberulous leaves but in every other character, together with geographical distribution, it does not differ from typical *J. floridum*. In

both *J. humile* and *J. subhumile* there is great variability in the pubescence of leaves and stems and the situation is very comparable: plants with puberulous leaves might be separated at the rank of variety but a considerable range in the character exists.

The leaf similarly exhibits great variability in the development of setose hairs on the margins (fig. 4). This variation is also to be observed very clearly in *J. humile* and to a variable extent in all the species of the section except *J. odoratissimum*.

8. **Jasminum fruticans** Linnaeus, Sp. Pl. 7 (1753); Gaertner, Fruct. i, 196, t. 42 (1789); Curtis, Bot. Mag. xiii, t. 461 (1799); Brotero, Fl. Lusitanica, i, 12 (1804); Vahl, Enum. Pl. i, 33 (1805); Sibthorp & Smith, Fl. Graecae Prodr. i, 3 (1806); Marschall von Bieberstein, Fl. Taurico-Caucasica, i, 4 (1808); Stokes, Bot. Comment. i, 17 (1830); Bertoloni, Fl. Ital. i, 35 (1833); G. Don, Gen. Syst. iv, 63 (1838); Loudon, Arb. Frut. Brit. ii, 1248, fig. 1073 (1838); DeCandolle, Prodr. viii, 313 (1844); Munby, Fl. Algérie, 1 (1847); Grenier & Godron, Fl. France, ii, 476 (1853); Reichenbach, Ic. Fl. Germ. xvii, t. 1077 (1854); Willkomm & Lange, Prodr. Fl. Hisp. ii, 674 (1870); Nicholson, Ill. Dict. Gard. ii, 207 (1885); Parlatore, Fl. Ital. viii, 150 (1888); Colmeiro, Enum. & Rev. Pl. Pen. Hisp.-Lusitana, iv, 39 (1888); Battandier & Trabut, Fl. Algérie, i, 580 (1890); Arcangeli, Fl. Ital. ed. 2, 361 (1894); Post, Fl. Syria Palestine & Sinai, 519 (1896) et ed. 2, ii, 185 (1933); Lipsky, Fl. Kaukaza, 389 (1899); Bailey, Cycl. Amer. Hort. ii, 844 (1900); Halácsy, Conspec. Fl. Graecae, ii, 286 (1902); Coste, Fl. France, ii, 544 (1903); Rouy, Fl. France, x, 219 (1908); Frere, Guide to the Fl. of Gibraltar, 99 (1910); Schneider, Ill. Handb. Laubh. ii, 839, figs. 527f–g, 528k–n (1912); Bean, Trees & Shrubs Hardy in the Brit. Is. i, 660 (1914) et ed. 7, ii, 151 (1951); Thompson, Fl. Pl. Riviéra, t. 21 (1914); Wolley-Dod in Journ. Bot. lii, suppl. (Fl. Gibraltar) 69 (1914); Bailey, Stand. Cycl. Hort. iii, 1718 (1915); Jahandiez in Mém. Soc. Sci. Nat. Maroc, iii, 88 (1923); Krause in Fedde, Rep. Sp. Nov. xxvi, 331 (Beitr. Fl. Kleinasien, iv, 571) (1929); Hayek, Prodr. Fl. Penins. Balcan, ii, 440 (1930); Maire in Bull. Soc. Hist. Nat. Afr. Nord. xxiii (Contrib. Fl. Afr. Nord No. 1462) (1932); Jahandiez & Maire, Cat. Pl. Maroc, iii, 575 (1934); Rechinger fil. in Fedde, Rep. Sp. Nov. Beih. xcviii (Enum. Fl. Constant.) 47 (1938); Coutinho, Fl. Portugal, ed. 2, 571 (1939); Rehder, Man. Cult. Trees & Shrubs, ed. 2, 792 (1940); Bailey & Bailey, Hortus Second, 397 (1941); Rechinger fil., Fl. Aegaea, 562 (1943); Parsa, Fl. Iran, iv, 47 (1949); Chittenden, Dict. Gard. ii, 1087 (1951); Sauvage & Vindt, Fl. Maroc, i (Trav. Inst. Sci. Chérifien No. 4) 98 (1952); Vassil'ev in Komarov, Fl. U.R.S.S. xviii, 524 (1952); Kutateladze in Ketskhoveli, Fl. Grusii (Fl. Georgia) vii, 80 (1952); Briquet & Litardière, Prodr. F. Corse, iii (2), 35 (1955); Spence in Notes R.B.G. Edinb. xxi, 263 (1955); Visyolina in Fl. R.S.S. Ucrain. viii, 216, fig. 46 (1957); Prilipko in Karyagin, Fl. Azerbaidzhana, vii, 80 (1957); Stankov in Wulff, Fl. Taurica, iii, 83 (1957); Rechinger fil., in Arkiv. Bot. Ser. 2, v, 323 (1960).

Syn.: *J. humile* Gueldenstaedt, Reisen, i, 421 (1787), nomen.
J. luteum Gueldenstaedt, Reisen, i, 422 (1787), nomen.
J. frutescens Gueldenstaedt, Reisen, i, 423 (1787), nomen.
J. heterophyllum Moench, Meth. Pl. 467 (1794), nom. illeg.

J. "*fruticosum*" Willdenow in Mém. Acad. Berl. 1790–91, t. 2, fig. 9 (1796), sphalm. *J. fruticans*.

J. collinum Salisbury, Prodr. 12 (1796), nom. illeg.

J. fruticans L. var. *simplifolium* Stokes, Bot. Comment. i, 18 (1830).

J. syriacum Boissier & Gaillardot, Diag. iii, sér. 2, vi, 120 (1859).

J. fruticans L. var. *speciosum* Reverchon & Debeaux, Pl. Espagne No. 1182 (1900), in sched.; Hervier in Bull. Acad. Int. Geogr. Bot. xv, 108 (1905); Jahandiez & Maire, Cat. Pl. Maroc, iii, 575 (1934); Sauvage & Vindt, Fl. Maroc, i (Trav. Inst. Sci. Chérifien No. 4), 98 (1952).

J. fruticans forma *syriacum* (Boiss. & Gaill.) Hayek, Prodr. Fl. Penins. Balcan. ii, 440 (1930).

J. mariae Sennen & Mauricio, Pl. D'Espagne No. 7925 (1931), in sched.

J. fruticans L. var. *mariae* (Sennen & Mauricio) Sennen, Pl. D'Espagne No. 8454 (1932), in sched.

J. fruticans L. subsp. *mariae* (Sennen & Mauricio) Sennen & Mauricio, Catalogo Fl. Rif. Oriental. 76 (1933).

J. fruticans L. var. *typicum* Jahandiez & Maire, Cat. Pl. Maroc. iii, 575 (1934); Sauvage & Vindt, Fl. Maroc, i (Trav. Inst. Sci. Chérifien No. 4), 98 (1952).

Shrub 0·3–1(–3) m. high. Shoots angled, glabrous but sometimes puberulous at the base of young shoots. *Leaves* trifoliate, sometimes unifoliate, especially at the base of shoots; petiole glabrous, 2–8(–10) mm. long; lamina glabrous, narrow elliptic to narrow oblanceolate, undivided leaves obovate or rarely broad elliptic, terminal leaflet (0·5–)1–2(–3) cm. long by (0·2–)0·4–1(–1·5) cm. broad, lateral leaflets (0·2–)0·5–2(–2·5) cm. long by (0·1–)0·2–0·5(–0·8) cm. broad; margin slightly recurved, sometimes flat, glabrous or fringed with fine stiff hairs; apex rounded or blunt, sometimes slightly emarginate and slightly apiculate; base angustate to cuneate; venation quite obscure above and below. *Inflorescence* terminal on side shoots (fig. 2l), glabrous, with 1–4(–8) flowers on pedicels (1–)6–10(–15) mm. long. *Flowers* heterostylous? yellow, fragrant. *Calyx* glabrous, tube 1·5–2·5 mm. long with linear lobes (2·5–)3–5(–8) mm. long. *Corolla* tube (9–)10–14(–15) mm. long, 3–5 mm. broad at the top; lobes blunt or rounded 5–10 mm. long by 3–6 mm. broad, throat more or less pilose inside, at the apex glabrate, ciliolate or papillate-hirsute inside. *Stamens* 2, attached 3–6 mm. from the base of the corolla lobes; filaments about 2 mm. long; anthers 2–3·5 mm. long with a well developed terminal appendage 0·25–0·75 mm. long. *Ovary* a little over 1 mm. high with a style 7–12 mm. long.

Holotype: Jasminum no. 3, Hort. Sic. Cliff. (BM).

ALGERIA. Environs d'Oued-Imbert, pelouses rocailleuses et broussailles, 15 Mar. & 28 May 1937, *A. Faure* s.n.; Oran, Haies, July 1909, *A. Faure* s.n.

MOROCCO. Moyen Atlas: Daiiet Achlef, bois des montagnes, rochers calcaires, 1850 m., 8 June 1923, *E. Jahandiez* 471; Col du Iaghzeft, rochailles calcaires, 2100 m., 14 Aug. 1924, *E. Jahandiez* 959; Xauen, 14 Apr. 1939, *P. H. Davis* 467. Grand Atlas: Irhil Igoudamen, ungrazed ledges of limestone cliffs, 2300 m., 6 Aug. 1951, *D. H. N. Spence* S165; Hidum,

fissure des colonnes basaltiques, 12 Mar. 1931, *Sennen & Mauricio* 7925 (iso. *J. mariae*, BM, MT); Melilla, Hidum, Yacinen, roches basaltiques, 17 Feb. 1932, *Sennen* 8454 (BM, MT).

PORTUGAL. In asperis editioribus ad. lat. occidentale in Serra da Arrabida, June 1840, *Welwitsch* 108.

SPAIN. Burgos: Cast. Pancorbo, 2 June 1895, *M. Gandoger* s.n. Granada: La Puebla de Don Fadrique, lieux ombragés et rocheux, sur le calcaire, 1200 m., June 1900, *E. Reverchon* 1182 (iso. *J. fruticans* var. *speciosum*, E). Malaga: in montis circa Ronda, 600 m., May 1837, *E. Boissier* s.n.; in mte. Jorcal de Anteguera, loc. rupestribus, 7–900 m., 13 June 1879, *Huter, Porta & Rigo* 626; Sierra de Cartania, 19 May 1888, *E. Reverchon* s.n.

FRANCE. Alpes Maritimes: between Nice and Villefranche, 1862, *C. Rüdt* s.n. Aude: Quillan, 27 Aug. 1903, *J. W. White* s.n. Basse Alpes: Annot, 19 May & 20 Aug. 1894, *E. Reverchon* s.n. Hautes Alpes: Bois arides à Montmort, 8 June 1892 *E. Reverchon* s.n. Isère: Grenoble, *A. Huguenin* s.n. Var: Hyères, May 1839, *T. Kugel* s.n.

ALBANIA. Ad fauces Klisjura, distr. Prèmeti, 20 July 1894, *A. Baldacci* 46.

BULGARIA. Ad Pelovo(?), Bulgaria australis, 1 Sept. 1932, *L. Tamvudjiev* s.n.

U.S.S.R. CRIMEA: Felsen bei Sudak, 25 May 1896, *A. Callier* s.n. and 6 June 1896 *A. Callier* 252; Nikita, 100 m., shrubby slopes, 30 May 1959, *P. H. Davis* 33135.

TURKMENISTAN: Kopet-dag. in dumetis Paliuri australis in angustis Jol-dere, 20 May 1928, *Baranov* 441; Kisil-Arwat, Karakala, in declivibus saxosis vallis Joldere, 26 May 1901, *P. Sintenis* 1838.

GEORGIA: Tiflis, *Bayern* s.n.; Schangirei-Thal, *Bayern* s.n.; without locality, *W. Massalsky* s.n. and 8 May 1844, *Kolenati* s.n.

ARMENIA: without locality, *Szovits* s.n.

TURKEY. Çanakkale: Renkoei, in dumetis, 11 May 1883, and Seitinly, Arablar-Depessi, 26 June 1883, *P. Sintenis* 192. Izmir: Smyrna, *E. Whittall* 701; in sepibus Smyrnae, Apr. 1827, *Fleischer* s.n. Denizli: Babadağ above Kadiköy, 800 m., 24 Aug. 1950, *P. H. Davis* 18378. Mersin: Between Tarsus & Namrun, near Şamlar, 500 m., rocky limestone slopes in phrygana, 4 Apr. 1957, *Davis & Hedge* (D.26382); above Yenege, 200 m., open slopes among limestone rocks, 7 Apr. 1934, *E. K. Balls* 696. Adana: Kozan (Anti-taurus), 300 m., under cliffs above the village, 12 Apr. 1957, *Davis & Hedge* (D.26605); Gaziantep–Adana, west side of summit of Amanus, 1150 m., oak scrub, 13 Sept. 1956, *J. McNeill* 842; between Misis and Ceyhan, 25 m., roadside, 17 Apr. 1956, *Davis & Polunin* (D.26077). Maraş: Akir dağ above Maraş, 1300 m., rocky limestone slopes, 2 May 1957, *Davis & Hedge* (D.27393). Gaziantep: 25 km. west of Gaziantep, c. 900 m., stony ground, oak scrub, 13 Sept. 1956, *J. McNeill* 824; Kara Tash, 1050 m., running through loose non-lime stone walls and banks between vineyards etc., 3 May 1935, *E. K. Balls* 2217; Env. d. Kilis, 600–750 m., 26 May–3 June 1911, *M. Haradjian* 4472. Ankara: Ravli–Kalecik, rocky slopes in gorge, 4 June 1954, *P. H. Davis* 21445; Hadjikadun valley near Keçiören, 9 Aug. 1947, *P. H. Davis* 13190; and in

wooded valley-bottom, 11 June 1952, *Davis & Dodds* (D. 18760). Sinop, Kastamonu: Boyabat—Taşkopru, 400 m., on gravel hills, 7 Sept. 1954, *Davis & Polunin* (D. 25029). Erzurum: "Armenia", *H. H. Calvert & J. Zohrab* s.n. Artvin: Artvin, 400 m., stony slopes, 28th Apr. 1960, *J. D. A. Stainton* 8282.

SYRIA. Duma, 25 Aug. 1865, *Post* s.n.

LEBANON. In Libani borealis declivitatibus orientalibus silvaticis, inter Der-el-Akmar et Aineta, 15–1700 m., 27–28 May 1910, *J. & F. Bornmüller* 12145.

JORDAN. Castle of Subebeh, hillsides, 760 m., 10 May 1911, *F. S. Meyers & J. E. Dinsmore* G. 1065; Ouad Beka, Antilebanon, portant ouest, 19 May 1857, *Gaillardot* 2049 (? iso. *J. syriacum*, K).

ISRAEL. Jerusalem, cliffs, 800 m., 11 Apr. 1908, *J. E. Dinsmore* 1175.

In addition to the material cited above specimens have been examined from Roumania, Yugoslavia, and Greece.

A very distinct plant, with its nearest affinity in the E. Asiatic *J. floridum*, which, in fact, the occasional broad-leaved specimens resemble very closely.

The size of the leaf, and especially of the flower, varies considerably and specimens with flowers larger than usual have on three occasions been selected for differentiation, twice at the rank of species (*J. syriacum* and *J. mariae*) and once at the rank of variety (var. *speciosum*). Later, as the synonymy above shows, this was followed by indecision as to the correct rank, whether subspecies, variety or form. After examining a wide range of material I must conclude that whilst the rank of form may be appropriate, there is no discontinuity to be seen in the range of variation from the smallest to the largest flowered individuals and any separation as subspecies or variety would be purely artificial.

Except at the base of the shoot, the leaf of *J. fruticans* is consistently trifoliate and no pinnate leaves, like those found in the other species, have been seen. On two gatherings however: *Reverchon* 1182 from Spain and *Kolenati* s.n. from the Caucasus a certain number of five-foliate but digitate leaves are to be observed. The terminal leaflet is still the largest and this indicates that it is the two lateral ones which have proliferated. In a very few cases the terminal leaflet has proliferated as well and developed a small basal offshoot producing a more or less digitate six-foliate leaf. It is suspected that the specimens were gathered from particularly lush plants and it is perhaps not without significance that it was upon *Reverchon* 1182 that Reverchon and Debeaux based their var. *speciosum*.