BULL. BOT. SURV. INDIA
Vol. 26, Nos. 1-4 : pp. 1-6, 1984

POLYGALA ARILLATA COMPLEX IN INDIA AND BURMA

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ABSTRACT

A critical review of the *Polygala arillata* complex is presented here. The study has resulted in five new combinations with higher status *viz.* **P. arillata** var. **chartacea** (*P. arillata* forma *chartacea*) ; **P. arillata** var. **revoluta** (*P. arillata* forma *revoluta*) ; **P. angustifolia** (*P. arillata* var. *angustifolia*) ; **P. angustifolia** var. **scandens** (*P. arillata* forma *scandens*) ; **P. globulifera** var. **kachinensis** (*P. arillata* forma *kachinensis*) and several new distributional records. A diagnostic key to *P. arillata* complex and few illustrations are also provided for easy identification.

INTRODUCTION

Polygala, the type genus of the family Polygalaceae was described by Linnaeus (Sp. Pl. 2 : 701. 1753) under *Diadelphia octandria.* D. Don (1825) described *P. arillata* based on the materials collected from Nepal Himalayas by Buchanan Hamilton. Bennett (1872) and several other authors also recorded *P. arillata* (*sensu lato*) and did not attempt to segregate the complex. Chodat (1893) in his monograph recognised only one variety under *P. arillata,* namely var. *angustifolia* from Sinchal, Darjeeling. Mukerjee (1954, 1958) first segregated the *P. arillata* complex and recognised six forms and two varieties including var. *angustifolia* Chodat.

The present authors after a critical study of the types and other materials available have segregated the *P. arillata* complex into two broad groups and also elevated the status of the variety and forms.

The first group includes *P. arillata* proper with forms *sikkimensis, revoluta, chartacea, meeboldii* and variety *purpurescens,* as postulated by Mukerjee (1954, 1958). The form *sikkimensis* found to be very close to the var. *purpurescens* excepting the broader leaves with acute to subrounded leaf base whereas in the typical var. *purpurescens* the leaves are lanceolate or elliptic-lanceolate with acute base. But many specimens show both kinds of leaves on one and the same plant. As such, the form *sikkimensis* is merged with var. *purpurescens.* Chandrabose & Nair (1981) merged the forms *chartacea, meeboldii* and *revoluta* with the typical species *P. arillata.* The forms *chartacea* and *revoluta* are very distinct and show distinct distributional pattern, and hence are elevated to the varietal status. The form *meeboldii* is characterised, as per protologue, by membranous, elliptic or elliptic-lanceolate leaves, of which the elliptic type merged with *P. arillata* var. *arillata* and the elliptic-lanceolate type merged with *P. arillata* var. *chartacea.*

The second group includes *P. angustifolia* which has been elevated to a specific rank which had been treated as a variety under *P. arillata* by Chodat (1893). *P. arillata* forma *scandens* is also transferred into this group as *P. angustifolia* var. *scandens* basing on taxonomic judgement.

P. globulifera, a Chinese species was first reported by Mukerjee (1958) from Burma. He also mentioned "in herb. CAL there are three sheets with leaves and fruiting racemes from Assam and Burma represent a variety of the above species." But he

Date of receipt : 16.11.83. Date of acceptance : 16.3.84

could not describe the same in absence of the flowering specimens. The study of the flowering specimens reveals that *P. globulifera* occurs in India and the specimens mentioned by Mukerjee from Assam area really belong to *P. globulifera,* but with smaller leaves. The forma *kachinensis* being much closer to *P. globulifera* than *P. arillata* is treated as a variety under *P. globulifera.*

The *P. arillata* complex is characterised by having racemes simple axillary, extra-axillary, leaf-opposed or terminal sparsely to densely puberulous ; bracts lanceolate to linear-lanceolate, 2.0-2.5 mm long. Sepals 3+2, caducous, outer sepals 3, two laterals, oblong to ovate-oblong with rounded apex and ciliated margin ; the posterior one keeled or boat-shaped with ciliated margin ; inner two wings or alae papery, finely veined inside with long ciliated margin. Petals typically a three-lobed structure, the largest lobes nearly as long as or shorter than the middle lobe, middle lobe keeled with a crest at the apex dorsally, crest very distinct. Stamens 8, arising from the base and adnate to the petals as a prominent staminal sheath and become separated into two equal bundles near the attachment of the petals. Fruits suborbicular, compressed, deeply or shallowly notched at the apex, shortly or broadly winged. Seeds two, one in each locule. Aril cupular, covering up to the different length of the seeds.

A dichotomous key is provided herewith for easy identification.

KEY TO THE TAXA

1a. Capsules shortly winged ; seeds 2-4 mm in diam., hairy ; crest laciniate :
  2a Younger and older branches and leaves, particularly beneath densely tomentose, flowers 14-20 mm long, sepals puberulous dorsally, wings ovate-oblong or narrowly obovate, crest only 6-8-lobed, ovary and capsules ciliated at margin :
    3a. Leaves lanceolate or elliptic-lanceolate ; raceme compact .. *Polygala angustifolia* var. *angustifolia*
    3b. Leaves broadly elliptic ; racemes long, lax .. *P. angustifolia* var. *scandens*
  2b. Older branches glabrous, younger branches sparsely puberulous ; leaves glabrous or sparsely hairy on the nerves beneath ; flowers 10-13 mm long, sepals glabrous dorsally, wings broadly oblong, crest many-lobed, ovary and capsules not ciliated at margin :
    4a. Main nerves of the leaves not impressed above, reticulations obscure :
      5a. Leaf margin revolute .. *P. arillata* var. *revoluta*
      5b. Leaf margin not revolute :
        6a. Leaves lanceolate or elliptic-lanceolate, broadest at the middle, apex acuminate .. *P. arillata* var. *arillata*
        6b. Leaves broadly oblanceolate, broadest above the middle, apex apiculate or cuspidate .. *P. arillata* var. *chartacea*
    4b. Main nerves on the leaves impressed above, reticulations prominent and forming distinct areolate structure .. *P. arillata* var. *purpurescens*
1b. Capsules broadly winged, seeds 5-6 mm in diam., glabrous ; crest globuliform, not laciniate :
  7a. Leaves elliptic or ovate-elliptic, apex acute or apiculate, racemes usually shorter than the leaves .. *P. globulifera* var. *globulifera*
  7b. Leaves lanceolate or elliptic-lanceolate, apex long acuminate, racemes usually much longer than the leaves .. *P. globulifera* var. *kachinensis*

Polygala angustifolia (Chodat) R. N. Ban. comb. et stat. nov.

P. arillata Buch.-Ham. ex D. Don var. *angustifolia* Chodat in Mem. Soc. Phys. Hist. Nat. Genev. 31(2) : 95. 1893 ; Mukerjee in Bull. Bot. Soc. Bengal 12 (1 & 2) : 31. 1958.

Type : *Anderson* 738, Sikkim (Darjeeling), Northside of Sinchul, 7200 ft (2190 m), August 1862 (CAL).

Shrubs, 2-2.5 m tall. Leaves (5.0-) 8.0-10.0 (-12.0) × 2.5-3.5 (-4.0) cm, apex apiculate to cuspidate, base acute to cuneate, margin entire, reticulations obscure ; petioles 8-10 mm long, densely puberulous. Racemes 5-10 cm long, somewhat condensed, rachis densely puberulous. Pedicels 2-2.5(-4) mm long, densely puberulous. Lateral sepals 4.5-5.5 × 2.5-3 mm, keeled 6-8 mm long ;

wing 14-17 × 5-6 mm. Petals joined above the middle, lateral lobes 4.5-5.5 mm long, middle lobe as long as or slightly longer than the laterals. Capsules shallowly notched at the apex, up to 10 mm diam., shortly winged, aril conical, covering less than ½ the seeds.

Distribution : INDIA : *Assam, *Meghalaya, *Nagaland, *Arunachal Pradesh, West Bengal, Sikkim. *BURMA.

Specimens examined : INDIA : Assam—Roadside about 3 m from Kynshi, 17.6.1958, *Panigrahi* 16342, three specimens (ASSAM) ; Meghalaya—Khasi hills, 1520 m, June 1876, *Mann* 282 ; Khasi hills, 910-1220 m, May & June 1876, *Mann* 207 (ASSAM) ; Khasia, 1220-1520 m, *J. D. H. & T T* s. n. ; Khasi hills, Shillong, 1820 m, Oct. 1915, *Carter* 41436 ; Khasia & Jaintia Dist., Wahlyer, 14.6.1958, *Panigrahi* 16124 ; Khasi hills, Shillong, 1820 m, Oct. 1890, *Collett* 81 ; Nagaland—Naga hills, Tolloi, 1520 m, 4.6. 1948, *Mukerjee* 2963. Arunachal Pradesh—Chegum-Wakka, *Deb* 26487. West Bengal—Darjeeling, Mayapuri compound, on way to Jalapahar, 2250 m, 13.7.1969, *Yonzone* 65 ; Sinchal, 20.7.1857, *Thomson* s.n. ; Jalapahar, 2370 m, July 1880, *Gamble* 8254 ; Darjeeling, 1820 m, 5.7.1956, *Chatterjee* 41 (K) ; Darjeeling, 1820 m, *G. H. C.* 61 ; Sikkim-1520 m, 1874, *King* s.n. ; Regio temp. 1220-2430 m, *J. D. H.* s.n. ; three specimens (K) ; 10 Aug. 1877, *King's Nat. Coll.* 4454 ; Lachoong, 2580 m, May 1885, *King's collector* s.n. ; East Himalaya, *Mrs. Townaud* 696. UPPER BURMA : 1897, Comm. Messrs. I. Veilch sons, Recd. from Kew ; Fort Stedman, Dec. 1892, *Huk* s.n.

P. angustifolia (Chodat) R. N. Ban. var. **scandens** (Mukerjee) Giri et R. N. Ban., comb. et stat. nov.

P. arillata f. *scandens* Mukerjee [Cent Souv. Madras Herb. 49. 1954], in Bull. Bot. Soc. Bengal 12 (1 & 2) : 31. 1958.

Type : *Prain* s.n., Naga Hills, Kohima, 3500-6500 ft (1060-1980 m), July 1886 (Holotype, CAL).

Scandent shrubs. Leaves 8.0-14.0 × 3.0-5.5 cm, apex apiculate, base cuneate ; petioles 10-12 mm long, canaliculate, densely puberulous. Racemes 15-25 cm or more long, rachis densely puberulous. Capsule almost circular, emarginate at apex, *ca* 10 mm diam., very shortly winged, aril covering ¼ to ⅓ of the seeds.

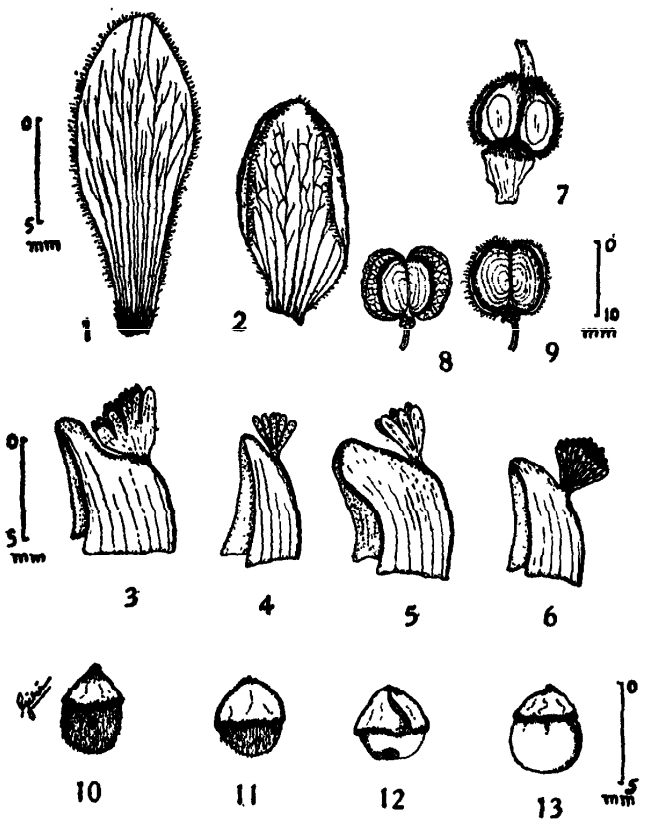
Distribution : INDIA : Nagaland. *BURMA.

Specimens examined : INDIA : Nagaland-Kohima, 1060-1820 m, July 1886, *Prain* s.n. ; Kohima, Naga-hills, Sept. 1886, *Prain* s.n. ; Kegwima, Naga hills, 1760 m, 26 Oct. 1885, *Clarke* 41159 ; Upper Burma, Chin hills, June 1892. *Huk* s.n.

P. arillata Buch.-Ham. ex D. Don, Prodr. Fl. Nep. 199. 1825 ; Wall. Pl. Asiat. Rar. t. 100. 1831 ; Bennett in Hook. f. Fl. Brit. Ind. 1 : 200. 1872 ; Chodat in Mem. Soc. Phys. Hist. Nat. Genev. 31(2) : 94. 1893 ; Mukerjee [Cent. Souv. Madras Herb. 50. 1954] et in Bull. Bot. Soc. Beng. 12 ; 31. 1958 ; Chandrabose et Nair in Proc. Ind. Acad. Sci. 90(2) : 110-112. 1981.-*Chamaebuxus arillata* Hassk. in Ann. Mus. Bot. Lugd. 1 : 153. 1892.-*C. arillata* var. *brachybotrys* Hassk. in l.c. 154. 1892.-*C. arillata* var. *robustus* Hassk. in l.c. 154. 1892.-*P. arillata* f. *meeboldii* Mukerjee in l.c. 50. 1954, 32. 1958, pro parte, syn. nov.-*P. arillata* f. *sikkimensis* Mukerjee in l.c. 49. 1954, 31. 1958, pro parte, syn. nov.

Type : *Wall. list* no. 4191 a, Nepal 1821 (CAL, K).

Erect shrubs. Leaves (6-) 8-11 (-18) × (2-) 3-4 (-6) cm, base cuneate to subrounded, lateral nerves raised beneath, glabrous or sparsely hairy on the nerves beneath, chartaceous, dull green to dark tan on drying ; petioles 8-14 mm long, glabrous. Racemes 5-8 (-12) cm long, glabrous or very sparsely hairy, flowers bright yellow, pedicels 4-8 mm long. Lateral sepals 4.0-4.5 × 3 mm, keeled 4-5 mm long ; wing 12-13 × 6-6.5 mm,



1. Wing : *P. angustifolia* var. *angustifolia* and var. *scandens*.
2. Wing : *P. arillata* var. *arillata*, var. *chartacea*, var. *revoluta* and var. *purpurescens*.
3 & 6. Crest : *P. arillata* and all varieties under it.
4 & 5. Crest : *P. angustifolia* var. *angustifolia* and var. *scandens*.
7. Ovary : *P. angustifolia* var. *angustifolia* and var. *scandens*.
8. Capsules : *P. globulifera* var. *globulifera*.
9. Capsules : *P. angustifolia* var. *angustifolia* and var. *scandens*.
10. Seed & aril : *P. arillata* var. *arillata*.
11. Seed & aril : *P. arillata* var. *revoluta*.
12. Seed & aril : *P. globulifera* var. *kachinensis*.
13. Seed & aril : *P. globulifera* var. *globulifera*.

Middle lobe of the petal distinctly larger than the laterals, 4-5 mm long. Ovary glabrous, stigma bilobed, lobes equal. Capsules deeply notched at apex, shortly winged, glabrous. Seeds 2-4 mm diam., aril cupular, covering ⅓ of the seed.

Distribution : INDIA : Tamil Nadu, Karnataka, Maharashtra, Meghalaya, Nagaland, Arunachal Pradesh, Sikkim. NEPAL, BURMA.

Specimens examined : INDIA : Tamil Nadu—Neelgherry hills, August 1845, *Herb. Wight* Peninsula Indiae Orientalis No. 93 ; Nilgiri Dist., Kodanad, Kotagiri, 1833 m, 25 Oct. 1956, *Subramanyam* 1145 ; Nilgiri Dist., Kateri Road to Kundha, 1667 m, 27.3.1957, *Sebastine* 2700 ; Nilgiri Dist., High wavy mountain, 1220-1520 m, May 1917, *Blatter & Hallberg* 354 ; Nilgiri Dist., Ootacamund, Lovedale. 2130 m, May 1883, *Gamble* 11667. Karnataka—Kulhutty, Bababudan hills, 1520 m, Oct. 1908, *Meebold* 10192 ; Bababudan hills, *Talbot* 2398 ; Laulaieri, Mysore, 7.9.1893, *Talbot* 2957 ; Chickmagalur Dis.., Bababudan hills, Attigundi-Dattatreya-Peetha Road, 1550 m, 27 July 1979, *Saldanha & Sreenath*, KFP 8534 ; Chickmagalur Dist., Bababudangiri range, along stream in Shola, 1 Dec. 1978, *Ramesh & Murthy* KFP 4739. Maharashtra-Concan, Reg. Trop., *Stocks* s.n. ; *Gibson* s.n. Meghalaya-Cherrah, 610 m, Nov. 1878, *Gallatley* 708 ; Nagaland-Sarpung, 1520 m, Dec. 1907, *Meebold* 6406. Arunachal Pradesh-Kameng Dist., Senge, on the slope of hills inside the forest, *Joseph* 40149 ; Tirap F. D., Nonglo (Burma Border), 29.6.1961, *Deb* 26343. Sikkim-Lachung, Sept. 1903, *White* s.n. ; Youmthang, 1901 ; *Prain's collector* 251 ; Gangtok, 1500 m, June 15, 1960, *Hara et al.* 2768 ; Lachung hills, 1980 m, 16.9.1892, *Gammie* s.n. UPPER BURMA : Mogok, 1220 m, 16.6.1914, *Rodger* 135 ; Mogok, 1370 m, July 1910, *Rodger* 108.

P. arillata Buch.-Ham. ex D. Don var. **purpurescens** Clarke ex Mukerjee [Cent. Souv. Madras Herb. 51. 1954], Bull. Bot. Soc. Bengal 12 : 32. 1958 ; *P. arillata* f. *sikkimensis* Mukerjee [Cent. Souv. Madras Herb. 49. 1954], Bull. Bot. Soc. Bengal 12 : 31. 1958 pro parte syn. nov. *Type* : *Clarke* 45444, Meghalaya, Khasia, Mamloo, 4000 ft (1220 m) (Holo. CAL, Iso. K).

Leaves (10-) 12-16 (-18) × (2-) 3-4.5 (-5) cm, petioles 10-15 mm long. Racemes 6-10 cm long, pedicels 8-10 mm long, glabrous or sparsely hairy. Lateral sepals 3.0-3.5 × 2.5 mm ; keeled, 4.0-5.0 mm long, wing 10.0-

12.0 × 6.0-6.5 mm. Ovary glabrous, stigma funnel-shaped, upper lobe short pointed, lower lobe bent downwards, appendaged. Capsules *ca* 10 mm diam., aril covering ¼ to ½ of the seeds.

The raised reticulations in leaf venation in this taxon is so distinct that it can be regarded as a specific character within the Indian taxa of *Polygala*. The raised reticulation may be confused with *P. tricholopha* Chodat, but in the latter the inflorescence is paniculate, capsules broadly winged whereas in the former the inflorescence is a simple raceme and capsule very shortly winged. *Clarke* 45444 (K) is annotated as *P. tricholopha* Chodat but is really the type of *P. arillata* var. *purpurescens* Clarke ex Mukerjee.

Distribution : INDIA : Assam, Meghalaya, *West Bengal, *Sikkim ; *Bhutan (BHUTAN).

Specimens examined : INDIA : Assam, 1520 m, April 27, 1892, *Mann* s.n. ; Jowai, 1520 m, Oct. 1892, *King's collector* s.n. ; Cherra Ponji, Oct. 11,....., *Griffith* 376. Meghalaya—Khasia, *Oldham* s.n. (DD) ; Khasia, 1851, *Hook. f. & Th.* s.n. ; West Bengal—Darjeeling, Tukda, 1220 m, 25 Sept. 1859, *Clarke* 9154C, 9154F (K) ; Sikkim-Mungpoo, 2.10.1908, *Smith* 353 ; Umsong, 910 m, 20.11.1908, *Craib* 484 ; Sureil, 1610 m, 21.10.1908, *Smith* 624 ; Nov. 1952, *Forest Manager* s.n. ; 1220 m, King s.n. ; *Cave* 6819 (holotype of forma *sikkimensis* Mukerjee) ; Deberay Pantce, 26.10.1941, *Biswas* 5652 ; 13.7.1891, *Gammie* 275 (BHUTAN) : 1885, *Parkes* s.n.

P. arillata Buch.-Ham. ex D. Don var. **revoluta** (Mukerjee) Giri comb. et stat. nov.

P. arillata f. *revoluta* Mukerjee [Cent. Souv. Madras Herb. 50. 1954], Bull. Bot. Soc. Bengal 12 : 32. 1958.

Type : *Watt* s.n., Ootacamund, Nov. 1899 (Holo. CAL).

Leaves elliptic or elliptic-lanceolate, (5-) 6-9 (-12) × (2-) 2.5-3.0 (3.5) cm, apex acute to acuminate, base acute to cuneate. Racemes 3.0-8.5 cm long, pedicels 6-10 mm long. Capsules 8-12 mm diam., ½-⅔ of the seeds covered by aril.

Distribution : INDIA : Tamil Nadu, endemic.

Specimens examined : TAMIL NADU : Ootacamund, 8 Aug. 1878, *King* s.n. ; Nilgiris, Conoor, Jan. 1899, *Prain* s.n.

P. arillata Buch.-Ham. ex D. Don var. **chartacea** (Mukerjee) Giri comb. et stat nov.

P. arillata f. *chartacea* Mukerjee [Cent. Souv. Madras Herb. 50. 1954], Bull. Bot. Soc. Bengal 12 : 32. 1958 ; *P. arillata* f. *meeboldii* Mukerjee [Cent. Souv. Madras Herb. 50. 1954], Bull. Bot. Soc. Bengal 12 : 32. 1958, pro parte.

Type : *Bourdillon* s.n., Travancore 4500 ft (1500 m) (Holo. CAL).

Shrubs up to 1.82 m, high. Leaves (7-) 10-14 (-20) × (2.5) 4-5 (-6) cm, base cuneate ; petioles 7-15 mm long. Racemes 6-9 (-12) cm long. Capsules 12-17 mm diam., aril covering ⅓-½ of the seeds.

Distribution : INDIA : Tamil Nadu, Kerala, endemic.

Specimens examined : INDIA : Tamil-nadu-Ootacamund, 2430 m, Oct., 1910, *Meebold* 13843 (holotype of forma *meeboldii* Mukerjee) ; Shembaganur, Madura, collector unknown, no. 509 ; Tinevelly hills, 3rd km on the way to Naterikal from Sengalteri, 500 m, 21.12.1980, *Sanjappa* 731, 2 sheets ; Muthukuzhi vayal, Kanyakumari dist., 1500 m, 27.8.1976, *Henry* 47574 (MH) ; Conoor, Nilgiris, 31 July 1878, *King* s.n., 2 sheets ; South Malabar, Attapadi valley, anavai, 1060 m, 13.10.1910, *Fischer* 2317 ; Ootacamund, Nilgiris, 2130 m, April 1882, *Brandis* s.n. ; Hulical Droog, Nilgiri dist., 1733 m, *Sebastine* 4138 (MH) ; Sangampatti F.D., Tinnevelly dist., 1333 m, 12.10.1957, *Sebastine* 4420 ; Naterical, Tinnevelly dist., 1220 m, 13 Feb. 1913, *Hooper* & *Ramaswamy* 38536, 3 sheets ; Ooty, Nilgiri dist., June

1886, *Gamble* 17473; Kerala-Travancore, Oct. 2, 1894, *Bourdillon* 344, two specimens; Udambanshola, Travancore, 1520 m, Dec. 1910, *Meebold* 716 (13109); High range, Dec. 1899, *Bourdillon* 128; High range, Dec. 1899, *Bourdillon* 1113.

P. globulifera Dunn in J. Linn. Soc. 35 : 486. 1903; Mukerjee in l.c. 33. 1958.

Type : *Henry* 12805A, forests south and south-east of Szemao Mts. 4000-6000 ft (1220-1820 m), Yunnan, 1899 (Iso. CAL).

Shrubs 1-2.5 m tall, branches glabrous or sparsely puberulous. Leaves (8-) 10-20 (-24) × (4-) 5.0-6.5 (-8.5) cm, glabrous above, sparsely pubescent on the nerves beneath, margin entire, base acute; petioles 8-15 mm long, glabrous. Racemes leaf-opposed or terminal, 8-12 cm long. Flowers yellow, 7-10 mm long; pedicels 6-10 mm long, sparsely puberulous. Lateral sepals ovate, 2-2.5 mm long, solitary keeled sepals 4-4.5 mm long; wings narrowly oblong, 7-10 mm long. Petals joined above the middle, lobes almost similar in length, crest globular, plicate and convolute. Capsules red, 10-14 mm diam. including wing, wing 1.0-1.5 (-2.0) mm broad, glabrous; seeds 5-6 mm diam., smooth; aril cupular, covering ½ of the seeds.

Distribution : INDIA : *Meghalaya, *Arunachal Pradesh; BURMA.

Specimens examined : INDIA : Meghalaya-Jowai, 1520 m, Dec. 1892, *King's collector* s.n.; Jowai, Jaintia hills, 1220 m, Feb. 1897, *King's collector* s.n.; Arunachal Pradesh-Tirap Frontier Division, 7.7.1961, *Deb* 26571 (UPPER BURMA) : Chin hills, June 1892, *Huk* s.n.; Putan, 400 m, Jan. 1912, *Toppin* 5015, two specimens.

P. globulifera Dunn var. **kachinensis** (Mukerjee) R. N. Ban., comb. et stat. nov.

P. arillata f. *kachinensis* Mukerjee [Cent. Souv. Madras Herb. 49. 1954], Bull. Bot. Soc. Bengal 12 : 30. 1958.

Type : *Shaik Mokim* s.n., Kachin hills, Burma, Nov. 1897 (Holo., Iso. CAL).

Shrubs up to 3 m tall. Leaves (8-) 10-18 (-22) × (2-) 2.5-5.0 (-6) cm, 10-15 pairs of lateral nerves, glabrous, petioles 10-16 mm long. Racemes 20-40 cm long. Capsules blackish, *ca* 15 mm diam. including wings, wings 2.0-2.5 (-3.0) mm broad, orange; aril cleft at one side, almost covering the seeds.

Distribution : INDIA : *Arunachal Pradesh; BURMA.

Specimens examined : INDIA : *Arunachal Pradesh-Lohit F. D., Dreyi to Shoeling, 13.11.1957, *Rao* 10506 (ASSAM); Siang F.D., Geling to Kepangla, 820-1520 m, 10.11.1958, *Rao* 17527, 3 specimens. BURMA : Kajen Tap, N'Maikha, 790 m, Jan. 1912, *Toppin* 6159; Teneasserim, Moolyet, 1520 m, 24.2.1877, *Gallatley* 401, two specimens.

While indicating distribution of the taxa, *denotes extended and new distribution. All the cited specimens are located in Calcutta herbarium (CAL). Additional locations are indicated by herbarium acronyms mentioned within brackets.

ACKNOWLEDGEMENTS

The authors wish to express their gratitude to Dr. K. Thothathri, Joint Director, Botanical Survey of India, for valuable comments and suggestions for improvement of the paper. Thanks are also due to Dr. R. R. Rao, Deputy Director, Northern Circle and Dr. V. S. Agarwal, Editor of Publications, Botanical Survey of India, for kindly going through the manuscript, helpful suggestions and necessary corrections.

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