

## Primula Davidii and its Allies.

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AT the time of Pax's elaboration of the genus *Primula* in Engler's *Pflanzenreich* only two species of this group were known, viz. *P. Davidii* and *P. ovalifolia*, both described by Franchet from David's Moupin plants. These species were placed by Pax in his section *Bullatae*, although Franchet had already correctly indicated their affinity to *P. petiolaris*. The consequent lack of uniformity in the section as understood by Pax has already been commented on by Professor Balfour\* in his account of the *Primulas* of the *Bullatae* section. Both from habit and from fruit characters *P. Davidii* and its allies must be placed as a rather well-defined group of the *Petiolaris* section. The members of the *Petiolaris* section would then have in common the "characteristic enlargement of the scape and pedicels in fruit ripening, and for the fruit itself a discoid operculate capsule occupied by a broad convex placenta upon which the seeds lie." †

The members of the *Petiolaris* section fall into several more or less well-defined groups: (1) the *petiolaris* group, as typified by *P. petiolaris*, *P. sessilis*, etc.; (2) the *sonchifolia* group, as typified by *P. sonchifolia*, *P. Whitei*, etc.; (3) the *Davidii* group, as typified by *P. Davidii*, *P. ovalifolia*, etc.; and (4) the *Griffithii* group, as typified by *P. Griffithii*, *P. Roylei*, etc.

Of the first two groups an account has already appeared in this publication.‡ Specimens of the *Griffithii* group have not yet been fully examined. In *P. hylophila* we have a transitional form between the *Davidii* group and such species as *P. odontocalyx* and *P. moupinensis* of the *petiolaris-sonchifolia* group. In the present group we find the thick, erect, closely adpressed rosette scales of *P. sonchifolia* replaced by brown lax, paleaceous scales. Except in *P. Esquirolii* a well-developed

\* Balf. f. in *Trans. Bot. Soc. Edin.*, xxvi, p. 188 (1913).

† Balf. f. in *Notes Roy. Bot. Gard. Edin.*, ix, p. 174 (1916).

‡ Craib in *Notes Roy. Bot. Gard. Edin.*, vi, p. 257 (1917).

scape is always present—in many members of the *petiolaris* group the scape is so reduced as almost to justify its being regarded as undeveloped. Farini-potential hairs are present on all the species, but the development of farina is so scanty that one may apply the term efarinose to the group. One solitary fruiting specimen shows a candelabroid tendency in the peduncle bearing a lateral verticil and a terminal umbel of flowers. This is the only case so far noted of superposed umbels in the whole *Petiolaris* section.

None of the species are at present in cultivation. Wilson succeeded in introducing plants which flowered and which were figured as *P. ovalifolia*,\* Franch. This plant is evidently not the true *P. ovalifolia* but is apparently *P. aequipila*, Craib. From Forrest's seed plants of *P. coerulea* were raised,† but the species is no longer in cultivation, the plants having died before flowering.

Up to the present the following species are known :—

- P. Davidii*, Franchet in Bull. Soc. Bot. Fr., vol. xxxiii (1886), p. 66, et in Nuov. Arch. Mus. Par., Ser. 2, vol. x (1887), p. 56, t. 14, fig. A—collected by David in Moupin.
- P. ovalifolia*, Franchet ll. cc., pp. 67 et 57—collected by David in Moupin.
- P. Esquirolii*, Petitm. in Bull. Soc. Sci. Nancy, Sér. 3, vol. viii (1907), p. 16, et in Fedde, Rep. Nov. Sp., vol. ix, p. 240—collected in Kweichow by Esquirol and Martin.
- P. coerulea*, G. Forrest in Notes Roy. Bot. Gard. Edin., vol. iv (1908), p. 221, t. xxxiv—collected by G. Forrest in Yunnan.
- P. hylophila*, Balf. f. et Farrer in Notes Roy. Bot. Gard. Edin., vol. ix (1916), p. 173—collected by Farrer and Purdom in Kansu.

Examination of the specimens preserved in the Royal Botanic Gardens of Edinburgh and Kew has necessitated the establishment of six more species :—

- P. aequipila*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 169.
- P. epilosa*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 171.
- P. fagosa*, Balf. f. et Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 172.

\* Gard. Chron., Ser. 3, xxxviii, p. 62 (1905), supplem. illustr.

† Balf. f. in Journ. Roy. Hort. Soc., xxxix, p. 147 (1913).

*P. leptophylla*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 174.

*P. macropoda*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 176.

*P. polia*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 177.

The complete absence of flowers in some cases and restrictions imposed through lack of material for dissection in others have compelled me to fall back on leaf-characters for the construction of a key.

### KEY TO THE SPECIES.

Flowers single or shortly umbellate . . . . . 1. *Esquirolii*.  
Flowers always conspicuously arranged in umbels.

Lower surface of leaf with farini-potent hairs only.

Leaves erose-denticulate, thin, non-reticulate, lateral nerves up to 12 pair; corolla limb about 2.5 cm. diameter . . . . . 2. *hylophila*.

Leaves crenulate, chartaceous, reticulation elevated on lower surface, lateral nerves up to 16 pair; corolla limb about 3.4 cm. diameter . . . . . 3. *epilosa*.

Lower surface of leaf with long multicellular hairs in addition to the short farini-potent ones.

Leaf-margin sharply erose-denticulate, not recurved; leaves non-reticulate; corolla limb about 3 cm. diameter . . . . . 4. *Davidii*.

Leaf-margin with short hydathodal teeth, crenulate or sub-crenulate, usually recurved though often very narrowly so; reticulation nearly always elevated on lower surface of leaf.

Longer multicellular hairs more or less evenly distributed on lower leaf-surface, those occurring between the nervules but slightly shorter than those on the nervules . . . . . 5. *aequipila*.

Longer multicellular hairs on lower leaf-surface confined definitely to midrib and nerves.

Leaves sessile or with a short, broadly winged, scarcely differentiated petiole . . . . . 6. *fagosa*.

Leaves distinctly petioled.

Leaves membranous, with inconspicuous nervules which do not form a prominent reticulation, midrib without long hairs on upper surface unless towards the very base . . . . . 7. *leptophylla*.

Leaves thicker, nervules forming a more or less complete, close or open reticulation prominent on the lower surface; midrib with conspicuous long hairs on the upper surface, the hairs nearly always persistent.

Petiole at least as long as the lamina; farini-potent hairs on the lower surface few and scarcely conspicuous with a pocket-lens . . . . . 8. *macropoda*.

Petiole shorter than the lamina.

Long-styled corolla with a conspicuous annulus . . . . . 9. *polia*.

Corolla exannulate.

Corolla tube above the decidedly apiculate anthers  
with long conspicuous multicellular hairs . . .

10. *coerulea*.

Corolla tube of long-styled flower without conspicuous hairs; anthers blunt or obscurely apiculate . . . . . 11. *ovalifolia*.

#### ENUMERATION OF THE SPECIES, WITH SYNONYMY AND DISTRIBUTION.

1. *P. Esquirolii*, Petitm. in Bull. Soc. Sci. Nancy, Sér. 3, vol. viii (1907), p. 16, et in Fedde, Rep. Nov. Sp., vol. ix, p. 240; Balf. f. in Journ. Roy. Hort. Soc., xxxix (1913), pp. 133, 147; Dunn in Journ. Linn. Soc., vol. xxxix (1911), p. 480.

Kweichow, Gan-pin, 1350 m., Esquirol et Martin (Herb. Edin.!). Gan-pin et Gan-chouen, Cavalerie, 3804 (Herb. Edin.!). Environs de Gan-pin, Martin et Bodinier, 2068 (Herb. Edin.!).

2. *P. hylophila*, Balf. f. et Farrer in Notes Roy. Bot. Gard., Edin., vol. ix (1916), p. 173.

Kansu, from Chago to Thunder-crown above Siku, 7000–9000 ft. Very abundant in all the alpine forests in rich loam and on rotten trunks, not in dense shade. Early April–May. Farrer et Purdom, F. 38, P No. 1 (Herb. Edin.!).

3. *P. epilosa*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 171.

W. China, wet rocks, 6000 ft. Flrs. purple. Wilson, 4048 (Herb. Kew!).

4. *P. Davidii*, Franchet in Bull. Soc. Bot. Fr., vol. xxxiii (1886), p. 66, et in Nuov. Arch. Mus. Par., Ser. 2, vol. x (1887), p. 56, t. 14, fig. A; Pax in Engler Bot. Jahrb., vol. x (1889), p. 176; Diels in Engler Bot. Jahrb., vol. xxix (1900), p. 521; Pax in Engler Pflanzenr. Primul. (1905), p. 43; Forbes et Hemsl. in Journ. Linn. Soc., vol. xxxvi (1905), p. 504; Balf. f. in Journ. Roy. Hort. Soc., vol. xxxix (1913), pp. 132, 146.

Moupin, David, March 1869 (Herb. Kew!).

5. *P. aequipila*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 169.

*P. ovalifolia*, Forbes et Hemsl. in Journ. Linn. Soc., vol. xxvi (1889), p. 41, quoad plantas Henryanas tantum; Diels in Engler Bot. Jahrb., vol. xxix (1900), p. 521.

quoad plantam Henryanam; Kew Bull., 1904, App. iii, p. 82; Duthie in Gard. Chron., Ser. 3, vol. xxxviii (1905), p. 62, suppl. illustr.; Pax in Engler Pflanzenr. Primul. (1905), p. 43, quoad plantas hupehanas citatas; Balf. f. in Journ. Roy. Hort. Soc., vol. xxxix (1913), p. 146, quoad plantam Wilsonianam, *vix* Franchet.

Hupei. Changyang, wet places, 5600 ft., fls. purple, Wilson, 52 (Herb. Edin. ! Kew !), Wilson, 52A (Herb. Kew !); Changyang Hsien, woodlands, 4000-6000 ft., fls. blue-purple, Wilson, 3140 (Herb. Edin. !); Patung and Changyang, Henry, 5286A (Herb. Kew !); Patung, Henry, 707, 1456, 3731 (Herb. Kew !); Patung, 6000 ft., fls. purple, Henry, 5286 (Herb. Kew !).

Szechwan, N. Wushan, 6000-8000 ft., Henry, 7148 (Herb. Kew !).

This species, if all the plants cited are correctly referred to it, is very variable, both in leaf shape and in its calycine characters. The plants collected in Hupei by Henry are especially variable in these directions.

The plant introduced by Wilson and figured as *P. ovalifolia* I have little hesitation in referring to this species. It did not persist long in cultivation.

6. *P. fagosa*, Balf. f. et Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 172.

Szechwan, Tchen-kéow-tin, Farges, 119 (Herb. Edin. ! Kew !).

7. *P. leptophylla*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 174.

Plateau de Tse-tchou-pa, 2500 m., fls. bleues, E. E. Maire (Herb. Edin. !).

8. *P. macropoda*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 176.

*P. ovalifolia*, Duthie in Gard. Chron., Ser. 3, vol. xxxviii (1905), p. 62, quoad plantam Prattianam, *vix* Franchet.

Szechwan, Pratt, 346, Henry, 8860 (Herb. Kew !).

9. *P. polia*, Craib in Notes Roy. Bot. Gard. Edin., vol. xi (1919), p. 177.

Forêts de bambous de Lo-han-lin, 2400 m., fls. bleues, E. E. Maire (Herb. Edin. !). Sous bois-rochers de Ou-tchai, 2000 m., fls. violettes, E. E. Maire (Herb. Edin. !). Collines boisées de Ou-tchai, 2000 m., fls. roses, E. E. Maire (Herb. Edin. !).

10. *P. coerulea*, G. Forrest in Notes Roy. Bot. Gard. Edin., vol. iv (1908), p. 221, t. xxxiv; Dunn in Journ. Linn. Soc., vol. xxxix (1911), p. 480; Balf. f. in Journ. Roy. Hort. Soc., vol. xxxix (1913), pp. 132, 147.

Yunnan. Eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 11,000–12,000 ft. Plant of 2–3 ins. Open exposed situations on rocks in side valleys. Flowers rich purplish-blue, eye and tube yellowish-green. G. Forrest, 1814. Ibid. G. Forrest, 6803.

11. *P. ovalifolia*, Franchet in Bull. Soc. Bot. Fr., vol. xxxiii (1886), p. 67, et in Nuov. Arch. Mus. Par., Ser. 2, vol. x (1887), p. 57; Pax in Engler Bot. Jahrb., vol. x (1889), p. 176; Forbes et Hemsl. in Journ. Linn. Soc., vol. xxvi p. 41, quoad *distr.* tantum; Diels in Engler Bot. Jahrb., vol. xxix (1900), p. 521, quoad *plantam Davidianam*; Pax in Engler Pflanzenr. Primul. (1905), p. 43, quoad *plantam Davidianam tantum*; Balf. f. in Journ. Roy. Hort. Soc., vol. xxxix (1913), pp. 136 et 146, quoad *plantam moupinensem*.

Moupin, David, March 1869 (Herb. Kew!).

In conclusion I wish to express my indebtedness to the Director of the Royal Gardens, Kew, for kindly placing the Kew herbarium material at my disposal, as also to Professor Balfour for free access to the herbarium specimens preserved here.