

INFRAGENERIC CLASSIFICATION OF THE GENUS *POTENTILLA* L. (ROSACEAE) IN PAKISTAN & KASHMIR

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Infrageneric classification of the genus *Potentilla* L. (Rosaceae) for the Flora of Pakistan and Kashmir is presented. Nine subgenera and 15 sections are recognized within the genus. The two genera *Sibbaldiopsis* Rydb. and *Duchesnea* J. E. Smith have been reduced to subgenera, while subgenus *Potentilla* Syme and subgenus *Hypargyrium* (Fourr.) Juz. have been combined under subgenus *Potentilla* Syme.

INTRODUCTION

The genus *Potentilla* L. belongs to family Rosaceae, subfamily Rosoideae and tribe Potentilleae. It is readily distinguished from other closely related genera by its indefinite stamen and carpel number, its styles are articulated to the ovary and deciduous, and the receptacle generally does not become conspicuously fleshy in fruit (except in subgenus *Duchesnea*) with several dry and free achenes.

Potentilla has about 500 species in the world (Airy Shaw, 1973) and is generally confined to the Northern Hemisphere. Most occur in high alpine and cold regions in open sunny sites and a few are woodland plants. The genus is poorly represented in the warmer regions.

The main taxonomic studies of the genus *Potentilla* L. are the revision of Lehmann (1856), the monographic work of Rydberg (1898) for the North American Potentilleae and Wolf (1908) for the whole world. The floristic accounts of Hooker (1878) for the *Flora of British India*, Juzepczuk (1941) for the *Flora of USSR*, Schiman-Czeika (1969) for *Flora Iranica* and Panigrahi & Dikshit (1985) for the Indian flora, have provided useful information.

During the course of studies on the genus *Potentilla* L. for the Flora of Pakistan and Kashmir (Shah & Wilcock, 1991a-c) it has been observed that the genus is composed of a heterogeneous group of species with several distinct subgroups which can best be treated as subgenera. In the present account nine subgenera have been recognized: *Dasiphora* (Rafin.) Panigr. & Dikshit, *Trichothalamus* (Lehm.) Rchb., *Lasiocarpa* Dikshit & Panigr., *Schistophyllidium* Juz. ex Fedorov, *Sibbaldiopsis* (Rydb.) Shah & Wilcock, *Fragariastrum* (Heist ex Fabr.) Rchb., *Chenopotentilla* (Focke) Juz., *Duchesnea* (J. E. Smith) Shah & Wilcock, and *Potentilla* Syme, with 15 sections. The two genera *Sibbaldiopsis* Rydb. and *Duchesnea* J. E. Smith have been reduced to subgenera, whereas subgen. *Potentilla* Syme and subgen. *Hypargyrium* (Fourr.) Juz. have been united under subgen. *Potentilla* Syme.

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3. Subgenus **Lasiocarpa** Dikshit & Panigr. in J. Sci. Club, Calcutta 33–34: 39 (1983).
Lectotype: *P. salesoviana* Steph.

4. Subgenus **Schistophyllidium** Juz. ex Fed., Fl. Armen. 3: 87 (1958).
Lectotype: *P. bifurca* L.

5. Subgenus **Sibbaldiopsis** (Rydb.) Shah & Wilcock, **stat. nov.**
Lectotype selected here: *P. tridentata* Sol.

Basionym: *Sibbaldiopsis* Rydb. in Mem. Dept. Bot. Columb. Uni. 2: 187 (1898).

Section *Tridentatae* (Th. Wolf) Dikshit & Panigr. in J. Orissa Bot. Soc. 3(1): 31 (1981); Panigr. & Dikshit in Bull. Bot. Surv. Ind. 27(1–4): 180 (1985).

Panigrahi & Dikshit (1985) erroneously put *P. tridentata* Sol. under subgen. *Fragariastrum* (Heist. ex Fabr.) Rchb.; sect. *Tridentatae* (Th. Wolf) Dikshit & Panigr. However, the subgenus *Fragariastrum* is based on *Fragaria sterilis* (L.) Schur. = *Potentilla sterilis* (L.) Garke – a European endemic species which has subterminal styles and ditheous anthers.

6. Subgenus **Fragariastrum** (Heist. ex Fabr.) Rchb., Consp. Regn. Veg. 167 (1828).
Lectotype: *Fragaria sterilis* (L.) Schur.

Fragariastrum Heist. ex Fabr., Enum. Meth. Pl. 64 (1759).

1a. Leaflets deeply divided up to the midrib, segments linear and revolute; achenes glabrous _____ sect. **Biflorae**

1b. Leaflets quarter to half toothed, teeth ovate, not revolute; achenes pubescent or villose _____ 2

2a. Caudices with remnants of decurved petioles; stipules of basal leaves thick, connate and adnate to the petioles nearly to the middle; achenes pubescent _____ sect. **Curvisetae**

2b. Caudices without remnants of decurved petioles; stipules of basal leaves thin, connate and adnate to the petioles only at the base; achenes sericeo-villose _____ sect. **Eriocarpae**

6i. Section **Biflorae** (Th. Wolf) Schiman-Czeika in Rech. f., Fl. Iranica 66: 85 (1969).
Lectotype: *P. biflora* Willd. ex Schldl.

6ii. Section **Curvisetae** Schiman-Czeika in Rech. f., Fl. Iran. 66: 87 (1969).
Lectotype: *P. curviseta* Hook. f.

6iii. Section **Eriocarpae** (Th. Wolf) Juz. in Kom., Fl. URSS 10: 86 (1941).
Lectotype: *P. eriocarpa* Wall. ex Lehm.

7. Subgenus **Chenopotentilla** (Focke) Juz. in Kom., Fl. URSS 10: 164 (1941).
Lectotype: *P. anserina* L.

- 1a. Stem prostrate, stoloniferous, indeterminate; leaves irregularly imparipinnate with short intermediary leaflets; flowers axillary and solitary; achenes dorsally sulcate, corky _____ sect. **Pentaphylloides**
- 1b. Stem ascending to erect, not stoloniferous, determinate; leaves regularly imparipinnate, without short intermediary leaflets; flowers more than one, generally terminal; achenes not sulcate or corky _____ sect. **Luconotae**

7i. Section **Pentaphylloides** Tausch, Hort. Canal. [without page no.] (1823).

Lectotype: *P. anserina* L.

7ii. Section **Luconotae** Dikshit & Panigrahi in J. Orissa Bot. Soc. 3(1): 33 (1981).

Lectotype: *P. luconota* D. Don.

8. Subgenus **Duchesnea** (J. E. Smith) Shah & Wilcock, **comb. et stat. nov.**

Lectotype: *Duchesnea indica* (Andr.) Th. Wolf.

Basionym: *Duchesnea* J. E. Smith in Trans. Linn. Soc. London 10: 372 (1811).

Subgenus *Potentilla* L. section *Duchesnea* (J. E. Smith) Panigr. & Dikshit in Bull. Bot. Surv. Ind. 27(1-4): 181 (1985).

9. Subgenus **Potentilla** Syme in Smith & Sowerby, English Bot. ed. 3, 3: 143 (1864).

Lectotype: *P. reptans* L.

Subgenus *Hypargyrium* (Fourr.) Juz. in Kom., Fl. URSS 10: 101 (1941).

Subgenera *Potentilla* Syme and *Hypargyrium* (Fourr.) Juz. are usually distinguished on the basis of the shape of styles which is clavate in the former and coniform in the latter. There is no other significant difference between the two subgenera. In addition, the character of the shape of the style is not consistent, e.g. *Potentilla pamirica* Th. Wolf and *P. sino-nivea* Hulten that are generally placed in subgen. *Hypargyrium* have styles not thickened at the base. Moreover, Sino-Himalayan *P. blanda* Sojak generally has styles which are evenly thickened from the base to the top, unlike the Tien Shan populations of *P. blanda* with coniform styles. Accordingly, we have combined the two subgenera under subgen. *Potentilla*.

1a. Leaves ternately divided _____ 2

1b. Leaves pinnate or digitately 5-foliolate _____ 6

2a. Leaflets sparsely to densely tomentose on the undersides _____ 3

2b. Leaflets pilose on the undersides _____ 4

3a. Styles short (up to 1.4mm); epicalyx segments narrowly linear to lanceolate
sect. **Niveae**
(*P. nivea*, *P. grisea* & *P. evestita*)

3b. Styles long (2-2.5mm); epicalyx segments broader, elliptic ovate
sect. **Haematochroae**
(excl. *P. nepalensis*)

- 4a. Terminal leaflet deeply trisect, divided up to the midrib; lateral leaflets bisect
nearly to the midrib _____ sect. **Persicae**
- 4b. Terminal and lateral leaflets not segmented _____ 5
- 5a. Styles cone-shaped _____ sect. **Rivales**
(*P. monanthes*)
- 5b. Styles club-shaped _____ sect. **Aureae**
- 6a. Leaves pinnate _____ 7
- 6b. Leaves digitately 5-foliolate _____ 9
- 7a. Leaflets often pinnatisect, undersurface of leaflets (between the nerves) with
dense or sparse floccose or crispatе hairs or with curved or flexuous thin hairs
_____ sect. **Pensylvanicae**
- 7b. Leaflets dentate, undersurface of leaflets with thick, pilose straight hairs only _____ 8
- 8a. Annuals or short lived perennials. Leaflets irregularly dentate, petioles with short
(c.1mm) eglandulose hairs; stigma dilated, style short (up to 0.8mm) _____ sect. **Rivales**
(*P. supina* complex)
- 8b. Perennials; leaflets regularly dentate, petioles with very long (c.3–4mm)
glandulose hairs; stigma not dilated; style long (1.4–2mm) _____ sect. **Tanacetifoliae**
- 9a. Stem prostrate, trailing, indeterminate, flowers solitary _____ sect. **Potentilla**
- 9b. Stem erect or ascending, not trailing, determinate; flowers more than one _____ 10
- 10a. Undersides of leaflets pilose _____ 11
- 10b. Undersurface of leaflets densely floccose or argenteo-tomentose _____ 13
- 11a. Flowers crimson-red; stigma not dilated; styles 1.5–2mm long
_____ sect. **Haematochroae**
(*P. nepalensis*)
- 11b. Flowers yellow; stigma dilated; styles shorter, less than 1.4mm _____ 12
- 12a. Stem often branching above the middle; stem leaves very poorly developed;
leaflet segments ± acute; style 1.1–1.4mm long _____ sect. **Chrysanthae**
- 12b. Stem often branching from the base; stem leaves well developed; leaflet
segments blunt; style short (0.8–0.9mm) _____ sect. **Rivales**
(*P. desertorum* & *P. sundaica*)
- 13a. Flowering stem usually terminal, tomentose; stem leaves well developed;
petioles tomentose or with additional villose hairs _____ sect. **Terminales**
- 13b. Flowering stem usually lateral, floccose; stem leaves poorly developed;
petioles floccose
_____ sect. **Niveae**
(incl. *P. blanda* & *P. saundersiana*)

9i. Section **Terminales** (Doll.) Gren. & Godr., Fl. France 1: 532 (1848).

Lectotype: *P. argentea* L.

- 9ii.** Section **Tanacetifoliae** (Lehm.) Juz. in Kom., Fl. URSS 10: 152 (1941).
Lectotype: *P. tanacetifolia* Lindley ex Lehm.
- 9iii.** Section **Aureae** (Lehm.) Juz. in Kom., Fl. URSS 10: 197 (1941).
Lectotype: *P. aurea* L.
- 9iv.** Section **Pensylvanicae** Poevrl. in Aschers. & Graebn., Syn. Fl. Mitteleur. 6(1): 669 (1904).
Lectotype: *P. pensylvanica* L.
Section **Multifidae** (Rydb.) Juz. in Kom., Fl. URSS 10: 113 (1941).
- 9v.** Section **Rivales** Poevrl. in Aschers. & Graebn., Syn. Fl. Mitteleur. 6(1): 669 (1904).
Lectotype: *P. rivali* Nutt.
- 9vi.** Section **Niveae** (Rydb.) Juz. in Kom., Fl. URSS 10: 133 (1941).
Lectotype: *P. nivea* L.
- 9vii.** Section **Chrysanthae** (Th. Wolf) Juz. in Kom., Fl. URSS 10: 180 (1941).
Lectotype: *P. chrysantha* Trevir.
- 9viii.** Section **Persicae** (Th. Wolf) Juz. in Kom., Fl. URSS 10: 175 (1941).
Lectotype: *P. persica* Boiss. & Hausskn.
- 9ix.** Section **Haematochroae** Schiman-Czeika in Rech. f., Fl. Iran. 66: 91 (1969).
Lectotype: *P. atrosanguinea* Lodd.
- 9x.** Section **Potentilla**
Lectotype: *P. reptans* L.

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