

# Notes on Potentilla : IV. Classification of Wolf's group "Potentillae trichocarpae"

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# Notes on *Potentilla*. IV. Classification of Wolf's group "*Potentillae trichocarpae*"

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## RÉSUMÉ

SOJÁK, J. (1987). Notes sur *Potentilla*. IV. Classification du groupe de "*Potentillae trichocarpae*" de Wolf. *Candollea* 42: 491-500. En anglais, résumés français et anglais.

On recommande de diviser le groupe des "*Potentillae trichocarpae*" de Wolf en 19 sections (dont quatre sont décrites comme sections nouvelles). La description de toutes les sections et la clé de détermination sont ajoutées. Dans le deuxième groupe de ce genre, c'est-à-dire "*Potentillae gymnocarpae*", il est nécessaire de remplacer les noms de cinq sections, utilisés jusqu'à nos jours pour raison de priorité: *Closterostyles* par *Geoides*, *Anserina* par *Pentaphylloides*, *Grandiflorae* par *Quinquefolium*, *Argenteae* par *Terminales* et *Multifidae* par *Pensylvanicae*.

## ABSTRACT

SOJÁK, J. (1987). Notes on *Potentilla*. IV. Classification of Wolf's group "*Potentillae trichocarpae*". *Candollea* 42: 491-500. In English, French and English abstracts.

It is suggested that Wolf's group "*Potentillae trichocarpae*" be divided in 19 sections of which four are described as new. Descriptions of all sections and a key are provided. In the other group of the genus, "*Potentillae gymnocarpae*", it is necessary, for priority reasons, to change the names of five sections used hitherto: *Closterostyles* (correct name: *Geoides*), *Anserina* (*Pentaphylloides*), *Grandiflorae* (*Quinquefolium*), *Argenteae* (*Terminales*), and *Multifidae* (now *Pensylvanicae*).

## General part

WOLF'S (1908) infrageneric system of *Potentilla* well reflects the structure of this genus and has become the basis of the majority of subsequent classifications. Wolf divided the genus into two sections according to the presence or absence of hairs on carpels and further into six subsections characterized by the shape and position of styles. He chose the so-called "greges" as the lowest taxonomical unit of his system.

Wolf's system was later modified by various authors. Of these modifications the most important one was that of JUZEPCZUK (1941), who elevated Wolf's subsections to subgenera and Wolf's greges to sections. This approach has many positive features. On the other hand, both JANCHEN'S (1957) and PAWLOWSKI'S (1965) modifications introduced somewhat more complicated systems, with series as the basic unit corresponding to Wolf's greges. Similar concept was adopted by GUŞULEAC (1956) and YÜ & LI (1980).

After examining most of the species belonging to all 31 greges established by Wolf I concluded that although the genus has a more or less reticulate structure, it is possible to divide it into a large number (about 37) of parallel, natural groups. These groups are approximately equal in their taxonomical level and can best be treated as sections. Most of the sections correspond to Wolf's greges. It is not necessary to retain the category subgenus between the genus and its sections (for a similar opinion see SCHIMAN-CZEIKA, 1969).<sup>1</sup>

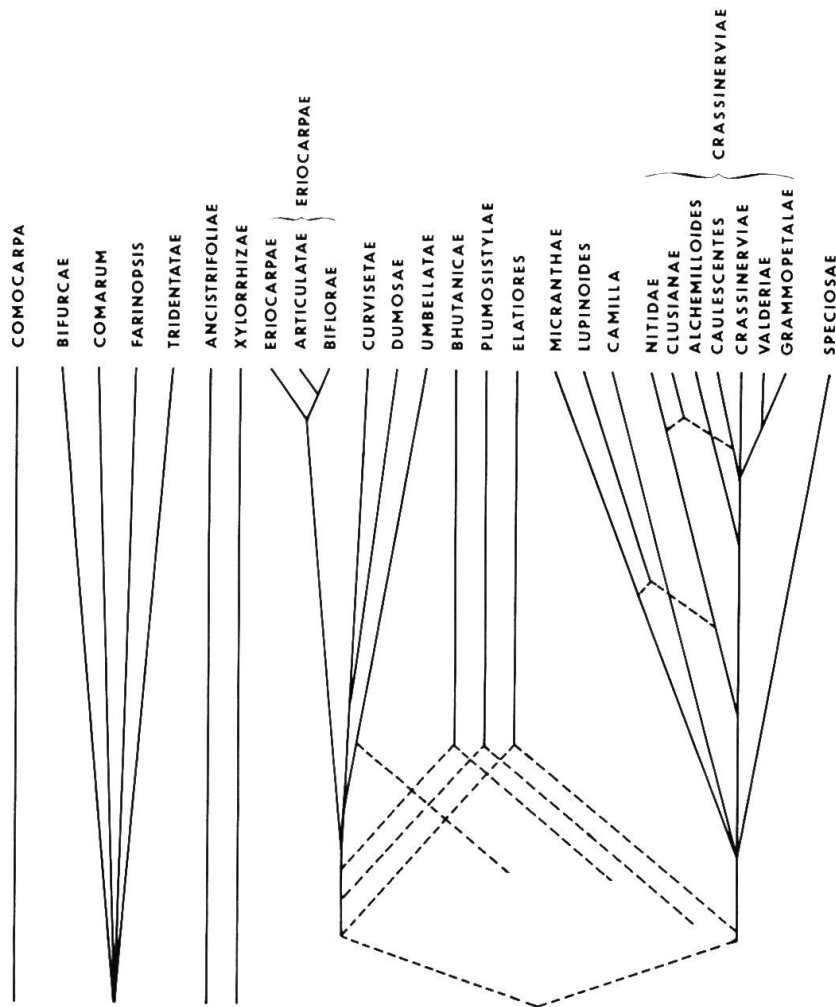


Fig. 1. — Putative phylogenetic relationships among the sections and series in the group “Potentillae trichocarpae”.

Wolf paid special attention to the indumentum of carpels and divided the genus into two large groups. “Potentillae trichocarpae”, made up of 13 greges, have mostly hairy carpels and “P. gymnocarpae”, with 18 greges, have glabrous carpels.<sup>2</sup> Wolf’s classification of “P. gymnocarpae” into smaller groups (subsections and greges) was successful and generally accepted by other specialists who have suggested changing the rank of Wolf’s groups but not their contents. Wolf was not so successful with his classification of “P. trichocarpae”. In this group he established not only natural, homogeneous greges (e.g. *Tridentatae* and *Speciosae*), but also some artificial greges that contain unrelated species (e.g. *Eriocarpae* and *Nitidae*). Although most of the shortcomings of Wolf’s treatment of “P. trichocarpae” were corrected by later workers (JUZEPCZUK, 1941; KAPPELLER, 1956; PAWLOWSKI, 1965), some problems are still unresolved. This is because no one after Wolf studied the group in its entirety.

I would like to propose the classification of “Potentillae trichocarpae” into 19 sections (cf. Fig. 1). This classification is based on the study of all morphological characters and include those (such as the structure of anthers and the presence or absence of a swollen ring around the receptacle) not utilized previously. The analysis of all characters produced some surprising results. A close affinity between *P. eriocarpa* and *P. biflora* was indicated. There were also affinities between *P. saxifraga* of southern France and *P. curviseta* of Swat and Kashmir, and between the sections *Dumosae* and *Curvisetae*. On the other hand, *P. bhutanica* and *P. eriocarpa* appear to be unrelated.

The first twelve sections in my classification are sharply delimited and cannot be disputed. The remaining sections are not as clearly delineated and their definition is a matter of opinion. For example, it would be possible to combine the sections *Plumosistylae* and *Camilla* with the section *Crassinerviae*, or conversely to divide the section *Crassinerviae* into several separate sections (one section would consist of ser. *Valderiae* and ser. *Grammopetalae*, the second of ser. *Crassinerviae* and ser. *Caulescentes*, the third of ser. *Nitidae* and ser. *Clusianae*, and the fourth would be represented by ser. *Alchemilloides*). The section *Lupinoides* is rather problematic and its affinity to other sections is uncertain.

There are two different types of anthers in *Potentilla*. Five sections of the group “*P. trichocarpae*“ and the section *Geoides* of “*P. gymnocarpae*“ have anthers with only one theca. At the same time they have subbasal or lateral styles. It appears that these sections are primitive. All other sections of the genus have anthers with two thecae. All of these have subterminal styles except the sections *Xylorrhizae* and *Pentaphylloides* (*Anserina*), which have lateral styles.

It is likely that all the sections with anthers having only one theca evolved from a common ancestor. This unique structure of anthers is not known in any American genera related to *Potentilla* (e.g. *Horkelia*, *Ivesia*). It only occurs in *Fragaria* and some species of *Sibbaldia*.

Members of the three sections of “*P. trichocarpae*“ have a swollen ring around the receptacle and broad, brownish or violet anthers. The other sections of “*P. trichocarpae*“ lack the swollen ring and usually have narrow, yellow anthers. Another character which I consider crucial is terminal versus lateral stems. The sections with terminal stems are apparently more primitive. In these sections either only stem leaves (e.g. *Comocarpa*, *Comarum*, *Farinopsis* and *Bifurcae*) or both stem leaves and basal leaf rosettes are formed (e.g. *Tridentatae* and *Ancistrifoliae*).

### Special part

#### A. Petioli supra basin (loco ubi auriculae incipiunt) articulati.

- Sect. **Comocarpa** Torrey & Gray,<sup>3</sup> Fl. N. Amer. 1: 445. 1840. LT. (hic selectus): *P. fruticosa* L.  
 Syn. sect. *Fruticosae* Döll ex Gren. & Godr., Fl. France 1: 535. 1848. T.: *P. fruticosa* L.  
 sect. *Trichothalamus* Focke, Abh. Naturwiss. Vereine Bremen 10: 413. 1889 [non (Lehm.) Benth. & Hook., Gen. Pl. 1(2): 621. 1865 — quod est sect. *Xylorrhizae*].  
 T.: *P. fruticosa* L.  
 sect. *Dasiphora* (Raf.) Szafer & Pawlowski, Fl. Polska 7: 98. 1955 sine cit. bas. T.: *P. fruticosa* L.  
 sect. *Rhopalostylae* (Wolf) Guşuleac, Fl. Rep. Pop. Romine 4: 601. 1956. T.: *P. fruticosa* L.

*Note:* under this and all other sections dealt with in the present paper only synonyms in the rank of section are given.

Frutices (saepe humiles) e ramis lignescentibus consistentes. Styli subbasales, crassi, ad basin attenuati (saepe clavati), breves (1-1.5 mm), stigmatе indistincto (non dilatato). Carpella longe pilosa. Annulus circum receptaculum non vel parum incrassatus. Antherae uniloculares. Folia basalia nulla, ramealia pinnata vel digitata (interdum ternata), foliolis integerrimis, basi articulatis; auriculae stipularum aut omnino aut partim inter se (i.e. non cum petiolo) coalitae. Differt a sectionibus omnibus “*Potentillarum trichocarparum*“ auriculis coalitis. (Spec. ca. 8).

- Sect. **Xylorrhizae** (Wolf) Schiman-Czeika,<sup>4</sup> in Rechinger, Fl. Iran. 66: 85. 1969. LT. (hic selectus):  
*P. lignosa* Willd. ex Schlechtend.

Herbae caudice crasso lignescente praeditae; rosulae foliorum numerosae, quasi terminales; caules basi articulati, 1-2 flori. Styli laterales, tota longitudine aequicrassi vel in dimidio inferiore parum dilatati, longi (3-4 mm), stigmatе indistincto. Carpella longe pilosa. Annulus incrassatus circum receptaculum deficiens. Antherae biloculares. Folia pinnata, foliolis basi non articulatis, auriculis stipularum liberis. A sectionibus omnibus totius generis caulibus basi articulatis distat. (Spec. 2).

- A. Petioli supra basin non articulati.
- B. Antherae uniloculares. Styli laterales vel subbasales. Caules terminales (interdum pseudolaterales).

Sect. **Farinopsis** (Chrtek & Soják) Soják, **stat. nov.**

Bas. gen. *Farinopsis* Chrtek & Soják, Čas. Nár. Muz. (Praha) 153: 10. 1984. T.: *P. salesoviana* Steph.

Frutices humiles ramis lignescentibus. Styli laterales, tenues, tota longitudine aequicrassi, longi (3-4 mm), stigmatē indistincto. Carpella longe pilosa et farinosa. Annulus incrassatus deficiens. Petala apice rotundata, post anthesin decidua. Folia pinnata, foliolis dentatis subtus (saltem iuventute) farinosis, auriculis stipularum liberis, semper evolutis. A sectionibus omnibus totius generis foliolis farinosis distincta. (Spec. unica).

Sect. **Comarum** Tausch,<sup>5</sup> Hort. Canal. [sine pag.] 1823. T.: *P. palustris* (L.) Scop.

Herbae caudice repente tenui praeditae; rosulae foliorum paucae, laterales. Styli laterales, tenues, tota longitudine aequicrassi, breves (1-1.5 mm), stigmatē indistincto. Carpella glabra. Annulus incrassatus deficiens. Petala apice acuminata, post anthesin persistentia. Folia pinnata, foliolis dentatis subtus non farinosis, auriculis stipularum in dimidio caulis inferiore non evolutis, in dimidio superiore evolutis et liberis. A sectionibus omnibus aliis auriculis foliorum inferiorum deficientibus et petalis persistentibus differt. (Spec. unica).

Sect. **Bifurcae** (Wolf) Grossh.,<sup>6</sup> Fl. Kavk. ed. 2, 5: 68. 1952. LT. (hic selectus): *P. bifurca* L.

Syn. sect. *Schistophyllidium* (Juz.) Szafer & Pawlowski, Fl. Polska 7: 98. 1955 sine cit. bas. T.: *P. bifurca* L.

Herbae caudice repente tenui et rosulis foliorum lateralibus sparsis instructae. Styli subbasales vel laterales, fusiformes, incrassati, breves (1-1.5 mm), stigmatē indistincto. Carpella glabra. Annulus incrassatus deficiens. Petala apice rotundata, decidua. Folia pinnata, foliolis integris vel bifurcis, auriculis stipularum evolutis et liberis. (Spec. 4).

Sect. **Tridentatae** (Wolf) Dixit & Panigrahi,<sup>7</sup> J. Orissa Bot. Soc. 3: 31. 1981. T.: *P. tridentata* Soland. in Ait.

Herbae caudice repente tenui et rosulis foliorum lateralibus (sed quasi terminalibus) numerosis praeditae. Styli laterales (interdum subbasales), tenues, tota longitudine aequicrassi vel parte inferiore paulo dilatati, longi (2.5-4 mm), stigmatē indistincto vel parum dilatato. Carpella longe pilosa. Annulus circa receptaculum deficiens vel interdum subincrassatus. Folia ternata foliolis antice 3(-5)-dentatis. (Spec. 3).

- B. Antherae biloculares. Styli subterminales. Caules laterales, tantum in sectione *Ancistrifoliae* terminales.
- C. Annulus incrassatus circum receptaculum adest. Antherae latae, plerumque subdidymae.

Sect. **Eriocarpae** (Wolf) Juz., Fl. URSS 10: 86. 1941 emend. Soják hoc loco. Emendatio: excl. *P. elatior*, *P. ancistrifolia* et *P. dickinsii*, incl. sect. *Biflorae* (Wolf) Schiman-Czeika 1969, vide descriptionem subsequentem. LT. (hic selectus): *P. eriocarpa* Wall. ex Lehm.

Styli inferne modice dilatati, ad apicem sensim attenuati, longi (2-4 mm), stigmatē indistincto. Carpella glabra vel longe pilosa. Folia ternata; foliola dentata vel integerrima; stipulae modice longae. (Spec. 4).

Sectio ista in tres series dividi potest:

1. ser. *Eriocarpae* (Wolf) Soják, **stat. nov.**; bas.: grex *Eriocarpae* Wolf, Biblioth. Bot. 71: 79. 1908. Foliola dentata; carpella longe pilosa (T.: *P. eriocarpa* Wall. ex Lehm.).

2. ser. *Biflorae* (Wolf) Soják, **stat. nov.**; bas.: grex *Biflorae* Wolf, Biblioth. Bot. 71: 70. 1908. Foliola segmentis 2-3 instructa; carpella glabra. (T.: *P. biflora* Willd. ex Schlechtend.).
3. ser. *Articulatae* Soják, **ser. nov.** Foliola integerrima; carpella glabra (T.: *P. articulata* Franch.).

Sect. **Curvisetae** (Wolf) Schiman-Czeika, in Rechinger, Fl. Iran. 66: 87. 1969. LT.(hic selectus): *P. curviseta* J. D. Hook.

Styli tota longitudine aequicrassi, tenues, modice longi (1.5-2 mm), stigmatate indistincto. Carpella glabra vel breviter pilosa. Folia ternata; foliola tantum apice dentata; stipulae (sed non auriculae) longae. (Spec. 3).

Sect. **Dumosae** Soják, Preslia 41: 349. 1969. T.: *P. dumosa* (Franch.) Hand.-Mazz.

Styli tota longitudine aequicrassi, tenues, breves (0.5-1.3 mm), stigmatate indistincto. Carpella glabra. Folia pinnata vel ternata foliolis 2-3 × pinnatisectis (solum in *P. pellita* folia digitata et foliola tota margine dentata); stipulae breves. Inflorescentia subumbellata vel caules uniflori. (Spec. 9).

- C. Annulus incrassatus circum receptaculum deest. Forma antherarum diversa.
- D. Styli breves (1-2.5 mm), tota longitudine aequicrassi, tenues.

Sect. **Umbellatae** Soják, **sect. nov.**

Styli 1.5-2 mm longi, inferne pilosi, stigmatate indistincto. Carpella ± breviter pilosa. Filamenta tenuia; antherae parvae, subdidymae, brunneo-violaceae. Folia digitata; foliola coriacea, subtus argentea. Inflorescentia subumbellata (nota hac a sectionibus omnibus subsequentibus differt). [Spec. unica (typus): *P. saxifraga* Ard. in De Not.].

Sect. **Bhutanicae** Soják, **sect. nov.**

Styli ± 1.5 mm longi, in dimidio inferiore pilis longis subflexuosis sparsis induti, stigmatate distincte dilatato, manifeste papilloso. Carpella longe pilosa. Filamenta tenuia; antherae parvae, subdidymae, luteae. Folia ternata. A sectionibus subsequentibus omnibus stylo piloso brevi et stigmatate dilatato distat. [Species unica (typus): *P. bhutanica* Ludlow.].

Sect. **Ancistrifoliae** Soják, **sect. nov.**

Styli 1-1.5 mm longi, glabri, stigmatate indistincto (non dilatato). Carpella longe ± disperse pilosa. Filamenta tenuia; antherae ± angustae. Folia ternata, saepe nonnulla pinnata. Caules terminales, foliis basalibus longiores. Caulibus terminalibus a sectionibus omnibus affinis distinguitur. (Spec. ca. 3; typus: *P. ancistrifolia* Bunge).

Sect. **Micranthae** Soják, **sect. nov.**

Styli 1-2 mm longi, glabri vel basi pilosi. Carpella ad umbilicum et ad partem ventralem ± longe sparse pilosa. Filamenta dilatata; antherae parvae, mediocriter latae. Folia ternata. Caules foliis basalibus breviores vel aequilongae. (Spec. 3; typus: *P. micrantha* Ramond ex DC.).

Sect. **Lupinoides** Tausch, Hort. Canal. [sine pag.] 1823. LT. (hic selectus): *P. alba* L.

Syn. sect. *Fragariastrum* Ser. in DC. Prodr. 2: 583. 1825. T.: *P. alba* L.

sect. *Thermophyllum* Wallr.<sup>8</sup> ex Beck, Fl. Nieder-Österreich 1: 749. 1892. T.: *P. alba* L.

sect. *Campestres* (Poev. l.) Juz., Fl. URSS 10: 91. 1941. T.: *P. alba* L.

sect. *Nematostylae* (Wolf) Guşuleac, Fl. Rep. Pop. Romine 4: 602. 1956. T.: *P. alba* L.

Styli ± 2.5 mm longi, glabri. Carpella ad umbilicum et ad partem ventralem ± longe sparse pilosa. Filamenta tenuia, non dilatata; antherae magnae, angustae. Folia digitata vel ternata. Caules



foliis basalibus breviores vel aequilongi. Positio quasi inter *P. alchemilloidem* et sectionem *Micranthae* tenet. (Spec. 2).

Sect. **Elatiores** Kapeller, Not. Syst. Geogr. Inst. Bot. Thbiliss. 19: 21. 1956. T.: *P. elatior* Willd. ex Schlecht.

Styli  $\pm$  2 mm longi, glabri. Carpella glabra. Filamenta non vel modice dilatata; antherae parvae, latae. Folia ternata. Caules folia basalia multo superantes, bene foliati. (Spec. unica).

D. Styli longi (2.8-4 mm), aut in dimidio inferiore modice dilatati aut tota longitudine aequicrassi.

Sect. **Plumosistylae** Pawlowski, Fragm. Fl. Geobot. 11: 79. 1965. T.: *P. libanotica* Boiss.

Styli tota longitudine aequicrassi, saltem ad 3/4 pilosi. Carpella breviter pilosa. Filamenta non dilatata (aequicrassa), tenuia; antherae latae. Folia ternata. Caules dense foliati. (Spec. 3).

Sect. **Camilla** Kapeller, Not. Syst. Geogr. Inst. Bot. Thbiliss. 19: 18. 1956. T.: *P. camillae* Kolak.

Styli tota longitudine aequicrassi, glabri vel pilosi. Carpella breviter pilosa. Filamenta non vel modice dilatata; antherae angustae vel mediocriter latae. Folia ternata; foliola basi  $\pm$  articulata. Caules sparse foliati. (Spec. unica).

Sect. **Speciosae** (Wolf) Juz., Fl. URSS 10: 89. 1941. LT. (hic selectus): *P. speciosa* Willd.

Styli in dimidio inferiore paulum dilatati, ad apicem sensim attenuati, glabri. Carpella breviter pilosa vel glabra. Filamenta crassa vel dilatata; antherae  $\pm$  angustae. Petala ungue angusto, insigniter longo instructa. Folia ternata. A sectionibus omnibus aliis ungue petali longo differt. (Spec. 7).

Sect. **Crassinerviae** (Wolf) Juz., Fl. URSS 10: 90. 1941 emend. Soják hoc loco. Emendatio: excl. *P. libanotica* Boiss., incl. grex *Caulescentes* Wolf et grex *Nitidae* Wolf p.p. max., vide descriptionem subsequenter. LT. (hic selectus): *P. crassinervia* Viv.

Styli in dimidio inferiore paulum dilatati, ad apicem sensim attenuati, glabri vel in parte inferiore pilosi. Carpella longe pilosa vel glabra. Filamenta saltem modice dilatata. Antherae  $\pm$  angustae. Petala ungue brevi vel nullo. Folia digitata vel ternata.

Sectio heterogena, ca. species 14 includens, quae in series 7 dividi possunt:

1. ser. *Valderiae* Pawlowski, Fragm. Fl. Geobot. 11: 58. 1965. Folia 5(-7)-nata; foliola dentata, subtus viridula usque albida; petala sepalis breviora (raro aequilonga), apice orbiculata vel sinuata; flos subcampanulatus (T.: *P. valderia* L.).
2. ser. *Grammopetalae* Soják, **ser. nov.** Seriei praecedenti similis, foliis ternatis et petalis apice attenuatis distat (T.: *P. grammopetala* Mor.).
3. ser. *Crassinerviae* (Wolf ex) Pawlowski l.c., p. 56. Folia 5-nata; foliola lata, in dimidio superiore dentata, subtus viridula, modice rigidula; petala sepalis longiora; flos apertus, stellatus (T.: *P. crassinervia* Viv.).
4. ser. *Caulescentes* (Wolf) Soják, **stat. nov.**; bas.: grex *Caulescentes* Wolf, Biblioth. Bot. 71: 105. 1908. Folia 5-nata; foliola angustiora, apice denticulata, subtus viridia vel cana, non rigidula; petala sepalis aequilonga vel parum longiora; flos apertus, stellatus (T.: *P. caulescens* L.).
5. ser. *Clusianae* Soják, **ser. nov.** Folia (3-)5-nata; foliola angustiora, apice denticulata, subtus viridia vel cana, tenuia; petala sepalis longiora; flores 1-3, aperti, stellati (T.: *P. clusiana* Jacq.).
6. ser. *Nitidae* (Wolf ex) Pawlowski l.c., p. 56. Folia ternata; foliola apice tridentata, subtus sericeo-tomentosa; petala sepalis multo longiora, apice lata, sinuata; flos 1(-2), apertus, stellatus (T.: *P. nitida* L.).
7. ser. *Alchemilloides* Soják, **ser. nov.** Folia 5(-7)-nata; foliola angusta, apice denticulata, subtus albotomentosa, rigidula (subcoriacea); petala sepalis longiora; flores  $\pm$  numerosi, aperti, stellati (T.: *P. alchemilloides* Lap.).

## Key

- |      |  |                             |
|------|--|-----------------------------|
| 1.   | Petioles articulated above the base (where auricles are attached to the petiole) . . . . .   | 2                           |
| 1a.  | Petioles not articulated above the base . . . . .  | 3                           |
| 2.   | Stem woody, not articulated; free parts of stipules (auricles) at least partly fused together; anthers with one theca surrounding the connective; styles short (1-1.5 mm), thick; leaflets articulated at the base . . . . . | sect. <b>Comocarpa</b>      |
| 2a.  | Stem herbaceous, articulated at the base; auricles of stipules unconnected; anthers distinctly two-locular; styles long ( $\pm$ 4 mm), thin; leaflets not articulated at the base . . . . .                                  | sect. <b>Xylorrhizae</b>    |
| 3.   | Styles lateral or subbasal; anthers with one theca surrounding the connective (both thecae merged at the apex); stems terminal . . . . .   | 4                           |
| 3a.  | Styles subterminal; anthers with two thecae; stems lateral (terminal in sect. <i>Ancistrifoliae</i> ) . . . . .  | 7                           |
| 4.   | Leaves pinnate; basal leaves few or absent . . . . .   | 5                           |
| 4a.  | Leaves trifoliolate; basal leaves numerous . . . . .   | sect. <b>Tridentatae</b>    |
| 5.   | Petals deciduous after anthesis, obtuse or sinuate at the tip; all stipules auriculate . . . . .   | 6                           |
| 5a.  | Petals persistent, acuminate at the tip; stipules of the lower leaves without auricles . . . . .   | sect. <b>Comarum</b>        |
| 6.   | Herbs; carpels and undersides of the leaves not farinose; styles short (1-1.5 mm), fusiform . . . . .  | sect. <b>Bifurcae</b>       |
| 6a.  | Small shrubs; carpels and undersides of leaves farinose at least when young; styles long (3-4 mm), filiform . . . . .  | sect. <b>Farinopsis</b>     |
| 7.   | Receptacle with a swollen ring around it; anthers broad, subdidymous . . . . .   | 8                           |
| 7a.  | Swollen ring around the receptacle absent; anthers of various shapes . . . . .   | 10                          |
| 8.   | Styles not dilated at the base, slender, short (0.5-2 mm) . . . . .  | 9                           |
| 8a.  | Styles slightly dilated at the base, long (2.2-4 mm), continuously tapered towards the tip . . . . .   | sect. <b>Eriocarpae</b>     |
| 9.   | Leaflets dentate at the tip; stipules very long . . . . .  | sect. <b>Curvisetae</b>     |
| 9a.  | Leaflets 2-3 $\times$ dissected (only in <i>P. pellita</i> dentate along the whole margin); stipules shorter . . . . .   | sect. <b>Dumosae</b>        |
| 10.  | Styles short (1-2.5 mm) . . . . .  | 11                          |
| 10a. | Styles long (2.8-4 mm) . . . . .   | 16                          |
| 11.  | Inflorescence not resembling an umbel; anthers and leaves of various sizes and shapes . . . . .  | 12                          |
| 11a. | Inflorescence resembling an umbel; anthers small, subdidymous; leaves palmate, silvery underneath . . . . .  | sect. <b>Umbellatae</b>     |
| 12.  | Stigma not thickened; style glabrous . . . . .   | 13                          |
| 12a. | Stigma thickened, clearly papillate; style $\pm$ 1.5 mm long, its lower part with long subflexuose hairs . . . . .   | sect. <b>Bhutanicae</b>     |
| 13.  | Stem much longer than basal leaves . . . . .   | 14                          |
| 13a. | Stem about equal to or shorter than basal leaves . . . . .   | 15                          |
| 14.  | Stems terminal; styles 1-1.5 mm long; leaves ternate or pinnate . . . . .  | sect. <b>Ancistrifoliae</b> |



- 14a. Stems lateral; styles 2 mm long; leaves ternate . . . . . sect. **Elatiores**
15. Styles 1-2 mm long; filaments dilated; petals small; leaves trifoliolate sect. **Micranthae**
- 15a. Styles  $\pm$  2.5 mm long; filaments not dilated; leaves digitate or ternate sect. **Lupinoides**
16. Styles very slender, equally thin along their length; filaments not dilated; carpels with short hairs . . . . . 17
- 16a. Styles at the base slightly dilated, continuously tapered towards the tip; filaments at least slightly dilated . . . . . 18
17. Leaflets  $\pm$  articulated at the base; anthers narrow; stem leaves sparse . sect. **Camilla**
- 17a. Leaflets not articulated at the base; anthers broad; stem leaves numerous  
sect. **Plumosistylae**
18. Petals without a claw or with a very short one; carpels glabrous or with long hairs  
sect. **Crassinerviae** 19
- 18a. Petals with a long narrow claw (about as long or longer than the broad part of the petal); carpels glabrous or with short hairs . . . . . sect. **Speciosae**
19. Leaves ternate . . . . . 20
- 19a. Leaves quinate (or septenate). . . . . 21
20. Petals shorter than sepals, tapering, not sinuate at the apex; sepals  $\pm$  erect; carpels glabrous; leaflets dentate . . . . . ser. **Grammopetalae**
- 20a. Petals much longer than sepals, broad and sinuate at the apex; sepals patent; carpels densely hairy; leaflets tridentate at the tip . . . . . ser. **Nitidae**
21. Flowers stellate; the sepals and petals patent; petals longer than (sometimes equal to) the sepals . . . . . 22
- 21a. Flowers broadly cylindric or subcampanulate; the sepals and petals erect or erecto-patent; petals shorter than (or rarely equal to) the sepals . . . . . ser. **Valderiae**
22. Petals evidently longer than the sepals. . . . . 23
- 22a. Petals either equal or slightly longer than sepals . . . . . ser. **Caulescentes**
23. Leaflets thick; filaments distinctly dilated . . . . . 24
- 23a. Leaflets thin; filaments slightly dilated (intermediate position between *Caulescentes* and *Nitidae*) . . . . . ser. **Clusianae**
24. Leaflets whitish tomentose underneath, with  $\pm$  tridentate tips . . ser. **Alchemilloides**
- 24a. Leaflets not tomentose underneath, greenish, dentate in the upper half  
ser. **Crassinerviae**

#### Results of a revision of sectional names in the "Potentillae gymnocarpae" group

JUZEPCZUK (1941) used the names of Wolf's "greges" as the names of sections of *Potentilla*, without taking into account older valid names of sections published in 1823-1912 which have priority. Later authors did not notice it. Some of the old, unused and more or less forgotten names may be eliminated by suitable selection of the lectotype. Nonetheless, the names of following five sections remain that cannot be ignored or rejected and that should be re-established (the names of all other sections of "P. gymnocarpae" group are not threatened by the priority of older names, they remain unchanged).

- Sect. **Geoides** Tausch, Hort. Canal. [sine pag.] 1823. LT. (selected here): *P. geoides* M.-Bieb.  
 Syn. sect. <sup>9</sup> *Closterostyles* Torrey & Gray, Fl. N. Amer. 1: 445. 1840. LT. (selected here): *P. arguta* Pursh.  
 sect. *Bootia* (Bigel.) Benth. & J. D. Hook., Gen. Pl. 1(2): 621. 1865. T.: *P. arguta* Pursh.  
 sect. *Pentaphyllastrum* Focke, Abh. Naturwiss. Vereine Bremen 10: 414. 1889. T.: *P. arguta* Pursh.  
 sect. *Rupestres* Pöevertl. in Aschers. & Graebn. Syn. Mitteleur. Fl. 6(1): 669. 1904. LT. (selected here): *P. rupestris* L.  
 sect. *Closterostylae* (Wolf) Guşuleac, Fl. Rep. Pop. Romine 4: 607. 1956. T.: *P. arguta* Pursh.
- Sect. **Pentaphylloides** Tausch, Hort. Canal. [sine pag.] 1823. LT. (selected here): *P. anserina* L.  
 Syn. sect. *Anserina* Gaudin, Fl. Helv. 3: 370, 405. 1828. T.: *P. anserina* L.  
 sect. *Chenopotentilla* Focke, Abh. Naturwiss. Vereine Bremen 10: 415. 1889. T.: *P. anserina* L.  
 sect. *Leptostylae* (Wolf) Guşuleac, Fl. Rep. Pop. Romine 4: 656. 1956. T.: *P. anserina* L.
- Sect. **Quinquefolium** Tausch, Hort. Canal. [sine pag.] 1823. LT. (selected here): *P. grandiflora* L.<sup>10</sup>  
 Syn. sect. *Triphyllon* Gaudin, Fl. Helv. 3: 370, 377. 1828. T.: *P. grandiflora* L.  
 sect. *Aurastrum* Beck in Reichenb., Icon. Fl. Germ. Helv. 25: 21. 1912. T.: *P. grandiflora* L.  
 sect. *Grandiflorae* (Wolf) Juz., Fl. URSS 10: 179. 1941. T.: *P. grandiflora* L.
- Sect. **Terminales** (Döll) Gren. & Godr., Fl. France 1: 532. 1848. LT. (selected here): *P. argentea* L.  
 Syn. sect. *Makropotentilla* Beck in Reichenb., Icon. Fl. Germ. Helv. 25: 13. 1912 [1911?]. T.: *P. argentea* L.  
 sect. *Argenteae* (Wolf) Juz., Fl. URSS 10: 142. 1941. T.: *P. argentea* L.  
 sect. *Hypargyrium* (Fourr.) Szafer & Pawlowski, Fl. Polska 7: 99. 1955 sine cit. bas. T.: *P. argentea* L.  
 sect. *Conostylae* (Wolf) Guşuleac, Fl. Rep. Pop. Romine 4: 608. 1956. T.: *P. argentea* L.
- Sect. **Pensylvanicae** Pöevertl. in Aschers. & Graebn., Syn. Mitteleur. Fl. 6(1): 669. 1904 [“Pennsylvanicae“]. LT. (selected here): *P. pensylvanica* L.  
 Syn. sect. *Multifidae* (Rydb.) Juz., Fl. URSS 10: 113. 1941. LT. (selected here): *P. multifida* L.

The authorship of sect. *Rivales* (Wolf) Juz., Fl. URSS 10: 165. 1941 has to be changed to sect. *Rivales* Pöevertl. in Aschers. & Graebn., Syn. Mitteleur. Fl. 6(1): 669. 1904.

The synonymy of the type section of the genus is as follows:

- Sect. **Potentilla** — LT.: *P. reptans* L.  
 Syn. sect. *Tormentilla* Tausch, Hort. Canal. [sine pag.] 1823. T.: *P. tormentilla* Neck. [*P. erecta* (L.) Rauschel].  
 sect. *Potentillastrum* Ser. in DC., Prodr. 2: 571. 1825. T.: *P. reptans* L.  
 sect. *Potentillotypus* Dumort., Fl. Belg. 96. 1827. T.: *P. reptans* L.  
 sect. *Pentaphyllon* Gaudin, Fl. Helv. 3: 370, 385. 1828. T.: *P. reptans* L.  
 sect. *Laterales* (Döll) Gren. & Godr., Fl. France 1: 522. 1848. T.: *P. reptans* L.  
 sect. *Eupotentilla* Beck, Fl. Nieder-Österreich 1: 749. 1892. T.: *P. reptans* L.  
 sect. *Tormentillae* (Rydb.) Juz., Fl. URSS 10: 218. 1941. T.: *P. reptans* L.  
 sect. *Dynamidium* (Fourr.) Szafer & Pawlowski, Fl. Polska 7: 99. 1955 sine cit. bas. T.: *P. reptans* L.  
 sect. *Gomphostylae* (Wolf) Guşuleac, Fl. Rep. Pop. Romine 4: 641. 1956. T.: *P. reptans* L.

## NOTES

- [1] To retain the subgenera in the genus *Potentilla* it would be necessary to revise the subgeneric classification; for example, the subgenera *Hypargyrium* and *Potentilla* (*Dynamidium*) would have to be amalgamated and the group "P. trichocarpae" divided into several (about nine) subgenera.
- [2] A few very rare exceptions are some taxa from the section *Niveae*. These taxa occur from Kamchatka to British Columbia but were not known to Wolf. *P. borneensis* (sect. *Pentaphylloides* = sect. *Anserina*) from SE Asia also has hairy carpels.
- [3] This section may be treated as a separate genus *Pentaphylloides* Duh.
- [4] Some authors consider this section to be a separate genus *Tylosperma* Botsch.
- [5] This section is often separated as a genus *Comarum* L.
- [6] IKONNIKOV (1979) considers this section to be a distinct genus *Schistophyllidium* (Juz.) Ikonn.
- [7] RYDBERG (1908) and HUTCHINSON (1964) treat this section as a separate genus *Sibbaldiopsis* Rydb.
- [8] WALLROTH (1822) designated almost all infrageneric units as sections but in *Potentilla* the two groups are not designated and it seems to follow from his note on p. 235 that he considered them to be tribes.
- [9] Under this and all other sections dealt with in the present paper only synonyms in the rank of section are given.
- [10] From the etymological point of view, it may seem illogical that *P. grandiflora*, a species with ternate leaves, was selected as the type of sect. *Quinquefolium*. Both Tausch's diagnosis and his list of species make this solution possible. When making the decision, I meant to retain frequently used, established names of the large sections *Rectae* and *Aureae*. On the other hand, a half of the species in the section *Grandiflorae* have quinate leaves and the similar name *Pentaphylloides* has been traditionally used for species having pinnate leaves with a large number of leaflets.

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