Zeitschrift: Candollea : journal international de botanique systématique = international journal of systematic botany
Herausgeber: Conservatoire et Jardin botaniques de la Ville de Genève
Band: 43 (1988)
Heft: 2

Artikel: Notes on Potentilla (Rosaceae) : VII. Some Himalayan taxa
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DOI: https://doi.org/10.5169/seals-879748

Notes on Potentilla (Rosaceae). VII. Some Himalayan taxa

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RÉSUMÉ

SOJÁK, J. (1988). Notes sur Potentilla (Rosaceae). VII. Quelques taxa himalayens. *Candollea* 43: 437-453. En anglais, résumés français et anglais.

Les plantes himalayennes, déterminées jusqu'à présent comme *Potentilla microphylla* D. Don, appartiennent à six espèces différentes. Sous le nom *P. gelida* C. A. Mey., trois espèces indépendantes étaient réunies à tort. Les plantes himalayennes citées comme *P. multifida* L., appartiennent à quatre espèces et à deux taxons d'origine hybridogène. Au lieu de *P. sericea* L. il y a trois autres espèces semblables. Dans la région himalayenne, *P. bifurca* L. est représentée par deux sous-espèces, *P. supina* L. agg. par deux espèces et deux sous-espèces. Dans cette région *P. virgata* Lehm. et *P. interrupta* Yü & Li croissent aussi. On a décrit trois sous-espèces nouvelles (*P. doubjonneana* Cambess. subsp. *ossetica* Soják, *P. turczaninowiana* Stschegl. subsp. *nephogena* Soják et *P. griffithii* J. D. Hook. subsp. *yunnanensis* Soják) et cinq variétés nouvelles. Une nouvelle combinaison *P. glabriuscula* (Yü & Li) Soják (*Sibbaldia glabriuscula* Yü & Li) est faite et le statut de trois espèces est changé en sous-espèces. La classification du complex *P. leschenaultiana-P. griffithii* est proposée.

ABSTRACT

SOJÁK, J. (1988). Notes on Potentilla (Rosaceae). VII. Some Himalayan taxa. *Candollea* 43: 437-453. In English, French and English abstracts.

Himalayan plants referred to *Potentilla microphylla* D. Don belong to six different species. Three separate species have been incorrectly merged under the name *P. gelida* C. A. Mey. Himalayan plants cited as *P. multifida* L. belong to four species and two taxa of hybrid origin. Instead of *P. sericea* L., three similar species occur in the Himalaya. *P. bifurca* L. is represented by two subspecies, *P. supina* L. agg. by two species and two subspecies. *P. virgata* Lehm. and *P. interrupta* Yü & Li also occur in the region of the Himalaya. Three new subspecies (*P. doubjonneana* Cambess. subsp. *ossetica* Soják, *P. turczaninowiana* Stschegl. subsp. *nephogena* Soják and *P. griffithii* J. D. Hook. subsp. *yunnanensis* Soják) and five new varieties are described. A new combination *P. glabriuscula* (Yü & Li) Soják (*Sibbaldia glabriuscula* Yü & Li) is proposed and three species are reduced to subspecies. Classification of the *P. leschenaultiana-P. griffithii* complex is presented.

Potentilla bifurca L.

Potentilla bifurca L. consists of two subspecies distinct in morphological characters as well as in areas of distribution. *P. bifurca* subsp. *bifurca* has patent hairs on stems and petioles; it occurs in Mongolia and southern Siberia and rarely penetrates to eastern Europe (into the watersheds of the Kama and Volga rivers) and southward to Tibet and Sikkim. *P. bifurca* subsp. *orientalis* (Juz.) Soják has appressed hairs and extends from Rumania, Ukraine and Turkey to the Caucasian region, Iran, Soviet Central Asia (from whence it extends to southern Mongolia and possibly also to the Transbaikalia region), Afghanistan, the Karakoram, the Western Himalaya, and Tibet.

In the Himalaya *P. bifurca* subsp. *orientalis* is common from Kashmir to Himachal Pradesh whereas *P. bifurca* subsp. *bifurca* was collected only on the Tibet-Nepal frontier (Rongshar valley,

CODEN: CNDLAR
ISSN: 0373-2967
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Hingston 263, K) and in Sikkim (Lachen, *Hooker* s.n., K; Phulloong, *Hooker* s.n., K). In Tibet *P. bifurca* subsp. *orientalis* is also common while *P. bifurca* subsp. *bifurca* is rare (Central Tibet, Goorning valley, 30°12'N, 90°25'E, *Littledale* s.n., K).[1]

Because of the stability of morphological characters and clear geographical differentiation I consider *P. bifurca* subsp. *bifurca* and *P. bifurca* subsp. *orientalis* to be two distinct subspecies. Using the rank of variety for these two taxa would be incorrect. If we were to recognize *P. bifurca* subsp. *orientalis* as a distinct species, we would have to use the name *P. moorcroftii* Wall. ex Lehm. 1831 (holotype PR!; syn. *P. glauca* Cambess. in Jacquem. 1844, types P!, K!, PR! — non Moris 1827, *P. bidens* Bertol. 1863, holotype K!, *P. orientalis* Juz. 1934, type LE!). The name *P. orientalis* refers to the steppe form of lower elevations, and *P. moorcroftii* to the alpine form of the same subspecies.

The authentic herbarium sheet of *P. bifurca* (LINN 655.10!) is not homogeneous. For the sake of stability of the nomenclature of *P. bifurca* L., I select the left specimen on the sheet as the lectotype of this species. The lectotype plant thus bears the name *P. bifurca* subsp. *bifurca* while the right plant belongs to *P. bifurca* subsp. *orientalis.*

Potentilla cuneifolia Bertol.

The type specimens of *P. ambigua* Cambess. in Jacquem. 1844 (P!, K!, PR!) — non Gaudin 1828 — have stout leaflets with dense, thick, obliquely patent long hairs on the undersides, and sometimes also scattered, short, thinner hairs. The holotype of *P. cuneifolia* Bertol. 1863 (K!) consists of 12 specimens collected from two localities in Sikkim. The plants have thinner leaflets with thin, almost appressed dense hairs on the undersides. The type material of *P. dolichopogon* Lév. 1915 (E!) consists of 38 specimens which have leaflets with thick, appressed dense hairs on the undersides. These three taxa all belong to the same species, for which the correct name is *P. cuneifolia* Bertol. (cf. SOJÁK, 1969).

Potentilla microphylla agg.

P. microphylla D. Don (holotype BM!, isotype PR!) is a variable species. Some of the described varieties (*P. microphylla* γ *depressa* Wall., *P. microphylla* β *glabriuscula* Wall.), are taxonomically unimportant variants. On the other hand, *P. microphylla* δ *latifolia* Wall. ex Lehm. is undoubtedly a distinct species with a correct species name, *P. commutata* Lehm. (holotype PR!). Although *P. commutata* has not yet been distinguished from *P. microphylla,* it is not related to it at all. *P. commutata* has auricles of the stipules fused in the manner similar to other species of the section *Pentaphylloides (Anserina),* while *P. microphylla* has free auricles. These two species thus belong to two different sections.

In Bhutan and Sikkim yet another taxon related to *P. microphylla* was collected from several localities scattered throughout the area. It has leaves with 3-5 pairs of leaflets (instead of 6-14 in *P. microphylla*) with longer hairs on the leaflets' margins. I described this taxon as *P. tapetodes* (holotype BM). Since the differences between *P. microphylla* and *P. tapetodes* are stable there is no doubt that they are distinct species. In British herbaria there are rich collections of *P. tapetodes* from Bhutan and Sikkim and *P. microphylla* from Uttar Pradesh and Nepal. Both species were collected from various elevations and habitats. This herbarium material documents the fact that number of leaflets is a stable character not related to certain habitats. (For instance, in Nepal one finds alpine forms of *P. microphylla* with 10 pairs of leaflets and leaves 0.6-0.7 cm long at an elevation of 13.500 feet, whereas in Bhutan one finds *P. tapetodes* with 3-5 pairs of leaflets and leaves 1.5-2 cm long at an elevation of 11.500 feet.) I have not seen any sheet of either species that had specimens of other species mixed in and I did not find any specimen which could be designated as transitional.

Another similar species, *P. aristata* Soják (holotype E), occurs in Nepal, Sikkim and Bhutan. In contrast to two distantly related species, *P. microphylla* and *P. tapetodes,* it has unbranched

[1]Plants from Tibet have fewer pairs of leaflets than those from Siberia (probably a response to the higher elevation) and can be considered a distinct variety (var. *misera* Soják).

caudex, lateral (not subterminal) styles, achenes almost globular and hairy on the dorsal side, with a prominent sculpture, broad auricles of the stipules, and acute, triangular leaflet teeth.

The last species of the *P. microphylla* group is *P. luteopilosa* Yü & Li (holotype PE!, duplicate E!). It is known to be confined to Yunnan and Sichuan (Muli, Mt. Mitzuga, W of Muli Gomba, 3050-4875 m, *Rock 16247,* E), and is characterized by lateral styles, smooth glabrous achenes, densely crowded pairs of leaflets, the latter with many blunt teeth (4-6 pairs); its leaves are widest in the middle, and narrowed towards the apex.

Potentilla commutata agg.

P. commutata Lehm. (holotype PR!) has leaves with 6-15 pairs of leaflets; leaflets have 3-5 pairs of teeth and greyish tomentose undersides covered with very fine thin hairs. It has 20 or only 10 stamens. Its geographical distribution extends from Kashmir to Sikkim.

A similar species, *P. oligandra* Soják (the typical forms of which are sofar known from the easternmost Himalaya), possesses leaves with 4-7 pairs of leaflets; leaflets have (1-)2-3 pairs of teeth, and green, sparsely hairy undersides. It always has only 10 stamens. It is very likely identical with *P. gracillima* Yü & Li 1980, non Kamelin 1977. It is not distinctly distinguished from *P. glabriuscula* (Yü & Li) Soják.

The typical *P. glabriuscula* (Yü & Li) Soják (*Sibbaldia glabriuscula* Yü & Li; holotype PE, photo!, duplicate E!) is frequent in Yunnan and SE Tibet and rare in N Burma and Sikkim (without precise locality, *Hooker* s.n., 1856, LE). It is characterized by glabrous petioles, leaves with 3-6 pairs of leaflets that have 1-2(-3) pairs of teeth and glabrous undersides (only margins are ciliate); its flowers have 5(-8) stamens. An aberrant form of this species occurs in Nepal (Arun Valley, Barun Khola, N of Num, *Stainton 545,* 1956, E) having long hairy petioles and the midribs on the leaflets' undersides.

Potentilla interrupta Yü & Li

This species described from Yunnan is frequent in Nepal and Sikkim and only rarely grows westwards (Uttar Pradesh: Mussoorie, Kidar Kantha, *Drummond 24269,* K). *P. interrupta* Yü & Li (holotype PE!) approaches *P. polyphylla* Wall. ex Lehm. (type PR!) in the shape of epicalyx-segments as well as in general habit but is different in having conspicuously thin, usually dense straight hairs on leaflets' undersides (often with scattered shorter flexuose hairs). In the indumentum of leaflets, *P. interrupta* occupies an intermediate position between *P. polyphylla* and *P. lineata* Trev. At least the distal parts of leaves of the latter two species have the doubly interruptedly pinnate form while *P. interrupta* always possesses interruptedly pinnate leaves. The name *P. fulgens* Wall. var. *intermedia* J. D. Hook. very likely represents a synonym of *P. interrupta.*

Potentilla tatsienluensis Wolf

P. tatsienluensis Wolf (holotype DR!) is a very rare taxon confined to SW China. There is a single specimen labelled as if collected in Uttar Pradesh (Garhwal, Pathar-Korí, 10.500', *Strachey & Winterbottom 19,* LE). The locality is so extremely isolated that I suspect it to be a result of a herbarium label confusion.

Potentilla gelida agg.

P. gelida C. A. Mey. s. str. (type LE!) does not occur in the Himalaya (its southernmost localities are in the Soviet and Chinese Tien Shan). In the Himalaya there is a scattered, closely related taxon which was described from the Pamir as *P. borissii* Ovcz. & Koczk. (holotype LE!) but which I prefer to treat as a subspecies of *P. gelida.* There are two other similar taxa in the Himalaya. One of them is the common *P. doubjonneana* Cambess. in Jacquem. (types P!, K!, PR!), the other is scattered *P. turczaninowiana* Stschegl. s.l. (holotype LE!). The majority of the Himalayan material deposited in Kew under the name *P. gelida* is referable to *P. doubjonneana,* about a quarter of the specimens belongs to *P. gelida* subsp. *borissii,* and some plants to *P. turczaninowiana* and *P. monanthes* Lindl. ex Lehm.

Both *P. doubjonneana* and *P. turczaninowiana* are similar to *P. gelida,* but not closely related to it. *P. gelida* subsp. *gelida* and *P. gelida* subsp. *borissii* have basal leaves that are distichous, while *P. doubjonneana* and *P. turczaninowiana* s.l. have leaves that are polystichous (according to the divergence 2/5). This difference is very important. The following key summarizes the morphological characters relevant in distinguishing the Himalayan taxa of the section *Aureae.*

Key

1. Basal leaves distichous; dead stipules dark brown ..... **P. gelida** subsp. **borissii**

1a. Basal leaves polystichous; dead stipules ± black 2

2. Flowers 1.5-2 cm in diameter; petals ± 8-9 mm long, anthers 0.7-0.8 mm long **P. doubjonneana**

2a. Flowers 1-1.4 cm in diameter; petals 4-5.5 mm long, anthers 0.25-0.5 mm long **P. turczaninowiana** 3

3. Leaves densely pubescent on both sides (not yet collected in the Himalaya) **P. turczaninowiana** subsp. **kuramensis**

3a. Leaves on both sides glabrous or sparsely pubescent 4

4. All leaves with glabrous petioles and with leaflets glabrous on undersides (in the typical forms glabrous also on the margins) .... **P. turczaninowiana** subsp. **turczaninowiana**

4a. At least some petioles and leaflets' undersides hairy **P. turczaninowiana** subsp. **nephogena**

Potentilla gelida C. A. Mey.

P. gelida subsp. *borissii* differs from *P. gelida* subsp. *gelida* in that it has dense, large, shortly stipitate glands on petioles, the lower sides of leaflets and on calyces. It occurs in the Himalaya [Kashmir and Himachal Pradesh (Lahul, *Jaeschke 178,* K)]. It also occurs in the Karakoram, Chitral, northern Afghanistan and very rarely in the Pamir.[1]

P. gelida subsp. *gelida* has petioles, leaflets and calyces that are either eglandular or have small, sparse, usually subsessile glands. In the Soviet Central Asia *P. gelida* subsp. *gelida* extends southward to the Tien Shan.

There are no plants similar to *P. gelida* subsp. *borissii* in the populations of *P. gelida* subsp. *gelida* in the Caucasus, Tien Shan, Siberia and Mongolia. On the other hand, in the Karakoram (e.g. Hispar Glac., *Russell 1436,* BM) and in the Western Himalaya one finds not only the typical forms of *P. gelida* subsp. *borissii,* but also forms transitional to *P. gelida* subsp. *gelida* with sparse, small glands. For this reason I prefer to treat *P. borissii* as a subspecies of *P. gelida* rather than a distinct species.

Potentilla doubjonneana Cambess. in Jacquemond

According to both the original description and treatments by later authors (such as WOLF, 1908) *P. doubjonneana* differs from *P. gelida* in that it has tridentate epicalyx-segments. This character, however, is totally useless as a means of classification in the section *Aureae* and in most other sections. Tridentate epicalyx-segments can occur occasionally in single plants of any species belonging to the section *Aureae,* including *P. gelida* (e.g., the Transcaucasian *P. seidlitziana* Bienert in Seidl. — type G-BOIS! — is only *P. gelida* s. str. with tridentate epicalyx-segments). In my opinion the main characters for separating *P. doubjonneana* from *P. gelida* are not the shape of epicalyx-segments, but multiseriate basal leaves and, to some extent, the different colour of stipules.

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[1]All specimens deposited in Dushanbe (TAD) and annotated by Ovczinnikov and Koczkareva as *P. borissii* Ovcz. & Koczk. are in fact *P. turczaninowiana* subsp. *nephogena.* In Leningrad (LE) there are only four herbarium sheets of *P. borissii* (incl. the holotype) from the Pamir.

P. doubjonneana is common all over the Kashmir and in Chitral, northern Afghanistan, the Pamir-Alay region, and western Tien Shan (west of 75°E). In the USSR and Afghanistan it has not been separated from *P. gelida.* I have not seen any gathering of it from Himachal Pradesh or Uttar Pradesh. It certainly does not occur in Nepal, Sikkim and Bhutan, nor does it occur in any mountains north of Tien Shan.

I was surprised to find a specimen of this species from the Caucasus where it occurs from Svanetia to Dagestan and especially in Yugo-Osetinskaya A. O. Plants of *P. doubjonneana* from Central Asia and the Himalaya have large, 8-9 mm long petals and large, 0.7-0.8 mm long anthers. Caucasian populations of *P. doubjonneana* have slightly smaller petals (6-7.5 mm) and anthers (0.5-0.6 mm) and should be treated as a separate subspecies, *P. doubjonneana* subsp. *ossetica* Soják.

Potentilla turczaninowiana Stschegl.

P. turczaninowiana is related to *P. doubjonneana.* They both have multiseriate dead stipules of the basal leaves. Although the size of flowers is used to differentiate between these two taxa, it was my field observations that convinced me that they were two distinct species.

In *P. turczaninowiana* (as well as in *P. doubjonneana*) the indumentum on leaves and stems varies greatly. Since plants with a certain type of hairiness form distinctive populations, often differentiated geographically, the following three subspecies can be distinguished.

The typical forms of *P. turczaninowiana* subsp. *turczaninowiana* have glabrous petioles and its leaflets are glabrous not only on the surface, but also on the margins. *P. turczaninowiana* subsp. *nephogena* Soják, on the other hand, has hairy leaf margins and at least some petioles and some leaflets with hairy undersides. The transitional forms between these two subspecies are not rare, and it would be a mistake to treat these subspecies as separate microspecies. *P. turczaninowiana* subsp. *kuramensis* (Wolf) Soják (type G-BOIS!) is densely hairy.

P. turczaninowiana subsp. *turczaninowiana* is rare in the Himalaya (Himachal Pradesh, Lahul, *Jaeschke 52a,* K) and in the Pamir. It is more common from the Tien Shan to Dzungarskiy Alatau and Tarbagatay. *P. turczaninowiana* subsp. *nephogena* occurs scattered from the western margin of the Himalaya to the Himachal Pradesh (Rupin Pass, Simla Hill States, *Sherriff 7500,* BM). It is relatively common in Karakoram and Soviet Central Asia, and less common in the Altai, the Sayany Mts. and northern Transbaikalia (the Stanovoye Nagor'ye). It turned up unexpectedly in Sichuan (Dongrergo, *H. Smith 3473,* BM, S). *P. turczaninowiana* subsp. *kuramensis* is known only from the Kurram Valley in western Pakistan.

Potentilla multifida agg.

In the Himalayan region, four distinct species can be distinguished among plants which previous authors treated as the single species *P. multifida.* These are: *P. multifida* L. s. str., *P. ornithopoda* Tausch, *P. plurijuga* Hand.-Mazz. and *P. exigua* Soják. *P. multifida* and the very similar *P. ornithopoda* only occur in the Western Himalaya. In the whole Himalayan region, *P. plurijuga* is common and *P. exigua* scattered. In addition, two hybrids (or possibly hybridogenous species) were found in Kashmir that are difficult to differentiate from the parent species.

Potentilla multifida L. (holotype LINN!) occurs from the westernmost Himalaya to Himachal Pradesh, with one locality in Uttar Pradesh (Kumaun, Kutti Valley, Byans, *Duthie 2861,* K & E). It does not grow in the area from Nepal to Sichuan, but is common in the Karakoram, Chitral, and the ranges extending southwest from Chitral to the Kurram Valley. In China, *P. multifida* occurs in the areas bordering on Kashmir and Pamir (the vicinity of Kashgar), Tien Shan (eastward up to Bogda Shan), whole Kunlun Shan (from the Keriya Mountains to Burhan Budai Shan), Altun Shan and the Nan Shan. Near lake Lop Nur it occurs as low as 819 m above sea level. It also frequently grows in Soviet Central Asia, Mongolia, and Siberia, and is rare in the Elburz, the Caucasus, the SW Alps, and Scandinavia. In North America it is replaced by a similar species, *P. bimundorum* Soják.

Potentilla multifida is characterized by its epicalyx-segments without glands, petioles with appressed indumentum, and leaflets with a small number of long, narrow, obtuse segments. The distinguishing characters of members of the *P. multifida* group growing in the Himalaya are given in the following key.

Key

1. Petioles with patent hairs; basal leaves with 3-5 pairs of leaflets ..... **P. plurijuga**

1a. Petioles with appressed or erecto-patent hairs; basal leaves with 2-3 pairs of leaflets . 2

2. Sepals with numerous small subsessile, ± hyaline glands; fine hairs on petioles; base of the styles usually not thickened ..... **P. exigua**

2a. Sepals not glandular; hairs on petioles coarser; the base of the style usually slightly thickened 3

3. Segments of leaflets very long (more than 5 times longer than wide), remote, always linear, obtuse till rounded at the tip; leaflets with 2-5(-6) pairs of segments 4

3a. Segments of leaflets shorter (2.5-5 times longer than their width), not so remote, sometimes ± acute or ± triangular; leaflets with (4-)5-8(-10) pairs of segments 5

4. All basal leaves pinnate; leaflets with 2-4(-5) pairs of segments ..... **P. multifida**

4a. At least some (even if as few as 1-2) basal leaves palmate or almost palmate; leaflets with 3-6 pairs of segments ..... **P. × angustiloba (P. multifida × P. virgata)**

5. Epicalyx-segments linear-lanceolate, acute; leaflets with (4-)5-8(-10) pairs of segments **P. ornithopoda**

5a. Some epicalyx-segments ovate-lanceolate, blunt; leaflets with 4-5 pairs of segments **P. × breviscissa (P. ornithopoda × P. plurijuga)**

Potentilla ornithopoda Tausch

P. ornithopoda Tausch (types PR!, PRC!) is common in the Western Himalaya from Baltistan to Ladakh (both the var. *impexa* Soják and the typical var. *ornithopoda* occur there). It also occurs in Karakoram, Chitral, the USSR (Central Asia and Siberia), Mongolia and almost the whole northern half of China (I saw the specimens from Xinjiang, Qinghai, Gansu, Nei Monggol Zizhiqu, Ningxia, Shanxi, Hebei, and Heilongjiang). It does not occur in the Caucasus, which Tausch erroneously listed as the type locality.

Dwarf specimens of *P. ornithopoda,* which often occur in higher elevations or in dry habitats resemble *P. multifida* in habit. It is no surprise, therefore, that the species was forgotten and resurrected only in 1939 by Handel-Mazzetti. But even he did not clearly distinguished this species, since in the Viennese herbaria beside correctly identified the Chinese material of this species, he identified as *P. ornithopoda* all the Siberian material of patently pubescent *P. tergemina.* The first report of the occurrence of *P. ornithopoda* in the Himalaya was published only 22 years ago (SOJÁK, 1966).

Leaflets of *P. ornithopoda* have segments that are more numerous, broader, shorter and more acute than those of *P. multifida.* Although both species are morphologically very similar and grow together in some areas, they are very well differentiated. Both in the field and the herbaria, I have not found a single specimen which could be considered to be a transition between these two species.

P. ornithopoda is very stable in all taxonomically important characters, but varies greatly in characters that are ecologically plastic, such as the height of stems and size of leaves. Gigantic forms (such as cultivated type specimens, H. Smith's collections from China, and the Gerbariy Flori SSSR No. 5582) do not resemble the dwarf specimens which originated in dry trampled sites. One of these dwarf forms is an ecomorph which was described as *P. baltistana* Wolf (type DR!, LE!). It has extremely short stems and small leaflets with atypical segments (i.e., four pairs of blunt segments).

Potentilla × **angustiloba** Yü & Li *(P. multifida* × *P. virgata)*

P. multifida and *P. virgata* belong to two different sections and have entirely different leaf shapes. In some areas, however, there is a complete series of transitional forms of hybrid origin. There are typical examples of the introgression of these two species, such as the occurrence of blunt, remote segments (i.e., the influence of *P. multifida*) in the Kazakhstan populations of *P. virgata.* Conversely, in the Pamir populations of *P. multifida* one finds leaflets with a large number of approximated segments (i.e., the influence of *P. virgata*). The parent species rarely occur at the same locality due to their different ecological requirements and the hybrid probably spreads independently of the parent species.

Potentilla × *angustiloba* is quite variable. Those forms that are intermediate between the parents are easily identified. They usually have both digitate and pinnate leaves on the same plant. The forms that are closer to one of the parent species are difficult to distinguish from that species. In the Pamir, especially, there is no clear boundary between the pure species and their hybrids. Those hybrids that have only pinnate leaves can be distinguished from *P. multifida* by their large number of approximated leaflet segments. The hybrids in which all leaves are digitate differ from *P. virgata* in their small number of more remote, long, and obtuse leaflet segments.

P. × *angustiloba* was collected from the westernmost Himalaya to Himachal Pradesh (Lahul). It is also frequent in Karakoram and Chitral. There are Chinese specimens from Xinjiang, Qinghai and Gansu. This taxon is common in the Pamir and rare in Mongolia and southern Siberia.

Potentilla exigua Soják

Recently I have studied the great amount of *Potentilla* specimens deposited in British herbaria. This material clearly shows that *P. exigua* is a species well distinguished from *P. multifida.* The distinguishing characters given by SOJÁK (1966) can be used to differentiate *P. exigua* from *P. multifida.* The most important character, however, is the presence of numerous subsessile, small glands on the sepals of *P. exigua.*

P. multifida always lacks glands on sepals. In the Himalaya two other members of the *P. multifida* group have glands on sepals: the Sino-Himalayan *P. plurijuga* and *P. karakoramica* from Kashmir. They both differ from *P. exigua* in that they have patent hairs on petioles and more pairs of leaflets.

P. exigua had been reported only from Nepal and the neighbouring parts of Tibet, but the material in British herbaria indicates that it grows from Kashmir (Ladak, *Thomson* s.n., K) to Sikkim (Lhonak, *Chapman 210,* K).

Potentilla plurijuga Hand.-Mazz.

P. plurijuga Hand.-Mazz. (holotype UPS!) is the most distinct member of the *P. multifida* aggregate. It has patent hairs on petioles and stems and (3-)4-5 pairs of leaflets. It is amazing that this conspicuous species was not described before 1939 (in China) and its occurrence in the Himalaya first reported much later (SOJÁK, 1964). The only species similar to *P. plurijuga* is the Siberian *P. tergemina. P. plurijuga* is distinguished from the latter by its broader epicalyx-segments, longer styles and petals, petioles with denser short hairs (in addition to longer hairs) and greater number of leaflets. Both species are entirely allopatric.

P. plurijuga is common all over the Himalaya from Baltistan in Kashmir to the eastern end. It also occurs in S and SE Tibet and from Sichuan to Gansu (Tao He) and Qinghai (Datong He). In Tibet and Nepal one finds not only the typical plants with a short indumentum, but also plants with long hairs. These were described as *P. plurijuga* var. *lhasana* Soják. There is no analogous long haired variant in the related Siberian *P. tergemina.*

Potentilla × **breviscissa** Bertol. *(P. ornithopoda* × *P. plurijuga)*

The holotype of *P. breviscissa* Bertol. (Ladak, *Thomson,* s.n., 6.7.1848, K!) consists of two specimens. The indumentum on their petioles and the number of leaflets match them with *P. ornithopoda,* but the shape of their epicalyx-segments and leaflets approaches that of *P. plurijuga.*

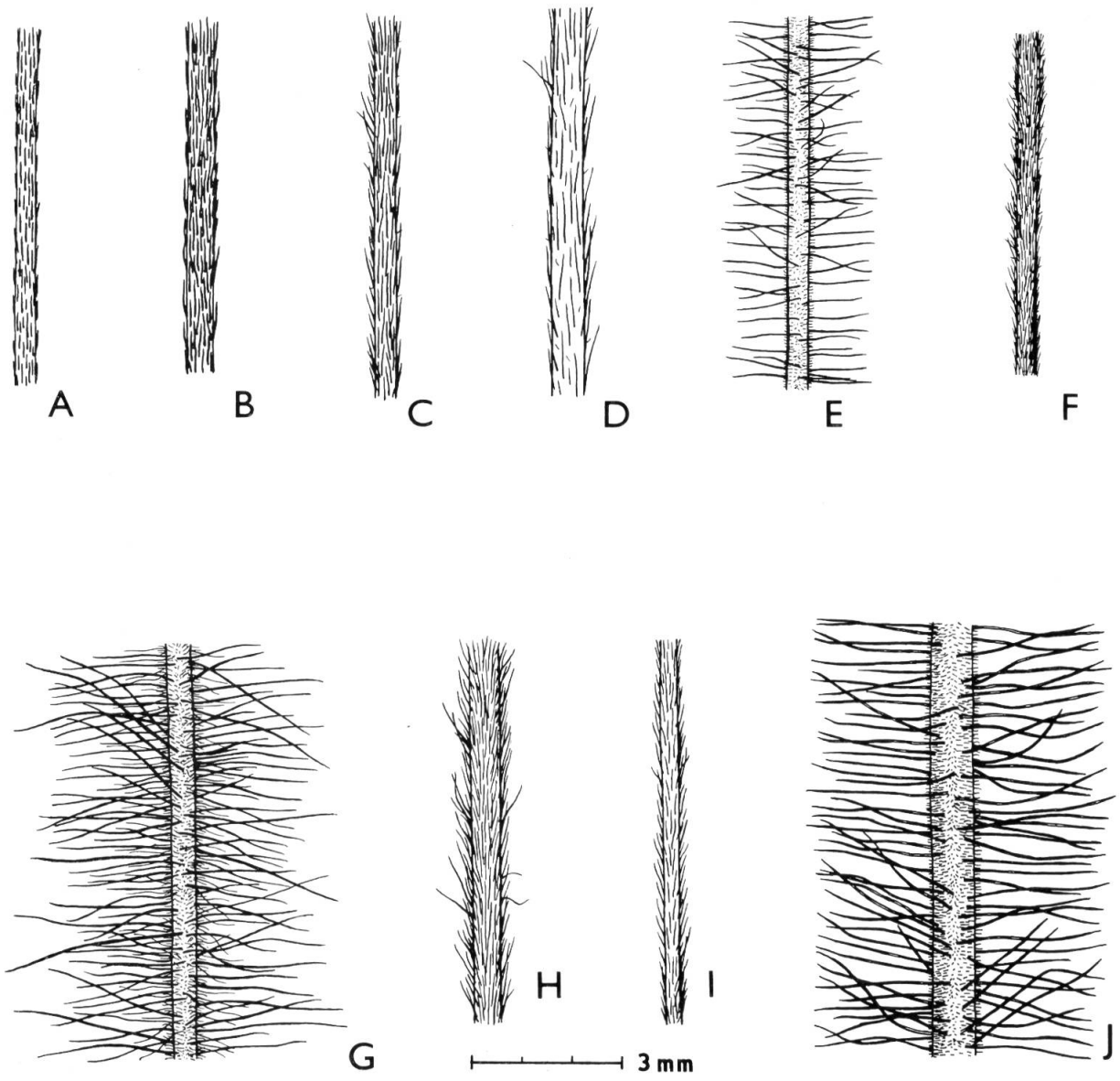

Fig. 1. — Indumentum of the petioles of basal leaves. **A,** *Potentilla multifida;* **B,** *P. angustiloba;* **C,** *P. ornithopoda;* **D,** *P. breviscissa;* **E,** *P. plurijuga;* **F,** *P. exigua;* **G,** *P. agrimonioides;* **H,** *P. pamiroalaica* var. *quasisericea;* **I,** *P. pamirica;* **J,** *P. sericea*.

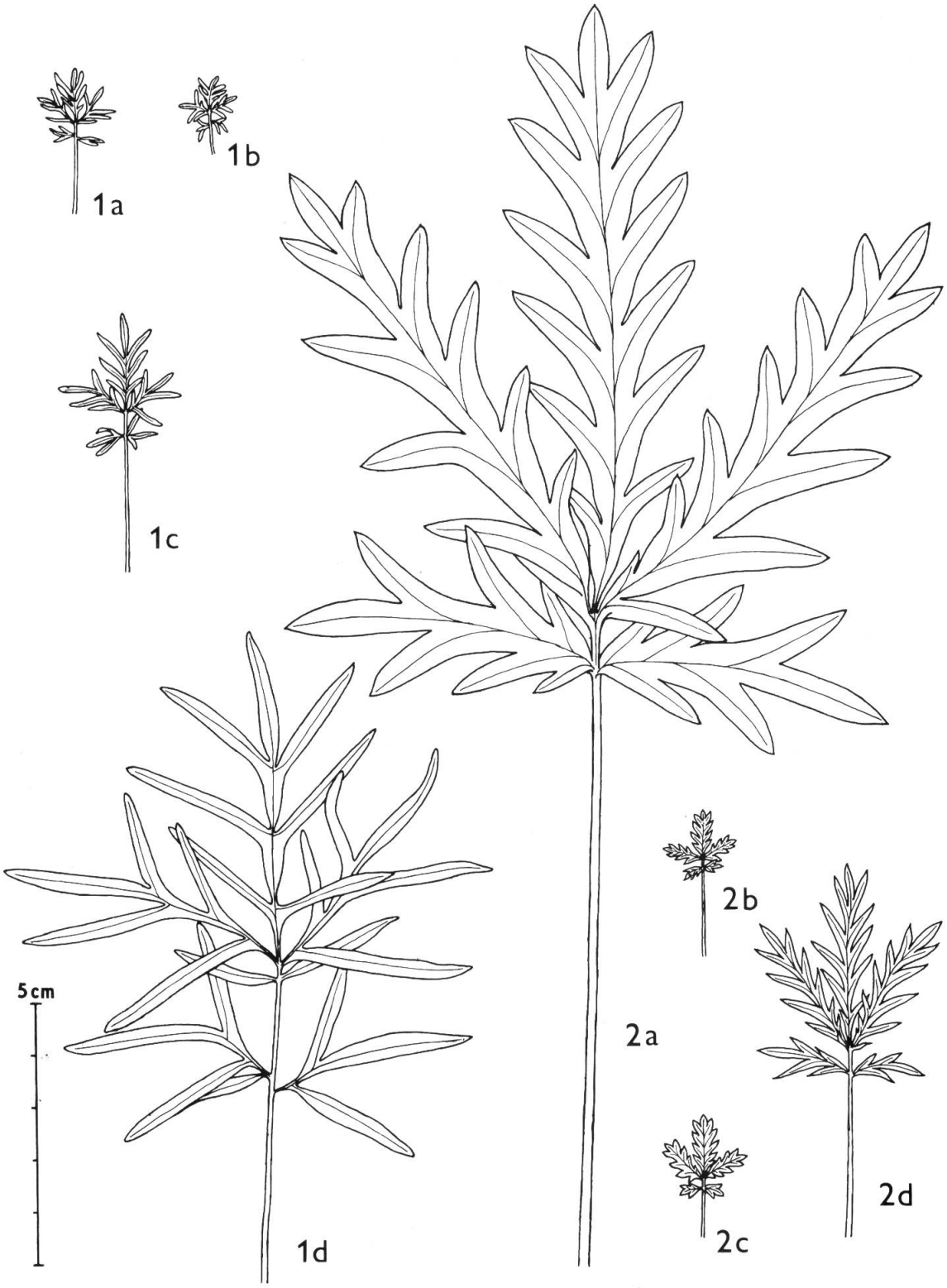

Fig. 2. — Basal leaves. **1,** *Potentilla multifida* (1b, extremely small leaf; 1d, extremely large leaf); **2,** *P. ornithopoda* (2a, extremely large leaf from Tausch's type specimen; 2b, extremely small leaf from the type specimen of *P. baltistana;* 2c, similar small leaf from a Mongolian population of *P. ornithopoda*).

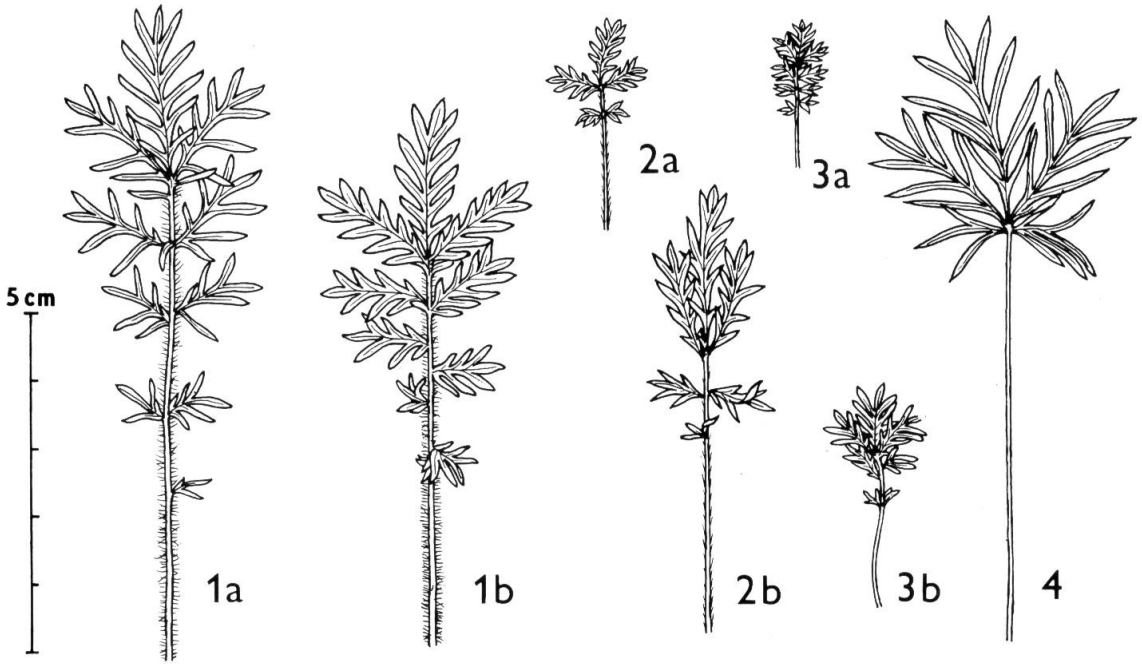

Fig. 3. — Basal leaves. **1**, *Potentilla plurijuga;* **2**, *P. breviscissa;* **3**, *P. exigua;* **4**, *P. angustiloba*.

In my opinion *P. breviscissa* is a nothomorph of a hybrid *P. ornithopoda* × *P. plurijuga* in which the indumentum on petioles is closer to that the first parent and the shape of epicalyx- and leaflet segments is closer to that of the second one.

On the sheet with the type specimens there is one plant that belongs to *P. multifida* and originated in a different locality. It was the striking contrast between this plant (with long, remote segments of leaflets) and the other two specimens (with short, approximated segments) which led Bertoloni to describe a new species. A duplicate of Thomson's specimen deposited in Uppsala was annotated by Handel-Mazzetti as *P. ornithopoda* var. *tenella* (Turcz.) Hand.-Mazz. The type material of *P. tenella* Turcz. (types LE!, PR!), however, is identical with *P. multifida.*

In addition to several collections from Ladakh I have seen a sheet of *P.* × *breviscissa* collected by Stoliczka in southern Kashmir (Rupshu). It is possible that *P.* × *breviscissa* is a hybridogenous species rather than a recent hybrid.

Potentilla sericea L.

P. sericea L. does not occur in the Himalaya. Most of the specimens in the Kew herbarium and in the British Museum originally identified as *P. sericea* were various forms of two polymorphic species, *P. agrimonioides* M.-Bieb. and *P. pamirica* Wolf, but also *P. pamiroalaica* Juz. var. *quasisericea* Soják and in rare cases *P. flavida* Soják, *P. subtrijuga* (Wolf) Juz., etc. *P. sericea* does not occur in Chitral and northern Afghanistan (where SCHIMAN-CZEIKA, 1969 erroneously reported it). It is very likely that *P. sericea* does not occur in the Pamir, since there are no collections of it in Leningrad (LE). The southern limit of its distribution is apparently in the Tien Shan.

P. sericea is characterized by long, patent, stiff hairs on petioles, non-glandular sepals and usually unbranched caudex.

Potentilla agrimonioides M.-Bieb. *(P. pensylvanica* × *P. sericea).*

All derivatives of the hybrid combination *P. pensylvanica* × *P. sericea* are treated as *P. agrimonioides* M.-Bieb. (types LE!, DR!, H!, PR!) in what follows. This taxon has all the characteristics of a hybridogenous species since it grows in areas where none of the parent species occur,

such as in Iran, Afghanistan, Karakoram, the Himalaya and southern Tibet. In the Himalaya *P. agrimonioides* occurs from the western margin as far as Himachal Pradesh (Kinnaur).

In spite of the rather great variability of *P. agrimonioides* in the Himalaya, all plants can be assigned to a group of forms which are intermediate between *P. pensylvanica* and *P. sericea.* I call these plants *P. agrimonioides* var. *intercedens* Soják. I have not seen any forms closer to *P. sericea* from the Himalaya, and have encountered only one specimen that was closer to *P. pensylvanica.* This latter specimen, however, lacked basal leaves.

P. agrimonioides was described from the Caucasus. The type specimens have a slightly shorter indumentum on the petioles than that of the average Himalayan material, and there is no other substantial difference between the Caucasian and Himalayan specimens. *P. cinerascens* Bertol. is a later synonym of *P. agrimonioides.* Its holotype (Sassar Pass, Ladak, *Thomson* s.n., August 1848, K!) consists of 7 morphologically identical specimens which are precisely intermediate between *P. pensylvanica* and *P. sericea.*

P. agrimonioides is easily distinguished from *P. pamirica* and *P. pamiroalaica* in that it has numerous large glands on its sepals and a patent indumentum on petioles.

Potentilla pamirica Wolf

In the Himalaya *P. pamirica* Wolf (holotype LE!) has been mistaken for *P. sericea* L. (holotype LINN!). It differs from the latter, however, in several important characters. It has short, fine, appressed or erecto-patent hairs on petioles, a copiously branched caudex and styles not thickened at the base. Some specimens of *P. pamirica* have been identified by HOOKER (1878) and later collectors as *P. sericea* var. *polyschista* (Boiss.) Lehm. In doing so they came close to the correct conception, because Iranian *P. polyschista* Boiss. is indeed closely related to *P. pamirica. P. pamirica* differs from *P. polyschista* by having 3-5 pairs of leaflets rather than 2 pairs. *P. pamirica* differs from *P. agrimonioides* in that it lacks large dense glands on sepals and has more or less appressed indumentum on petioles. It differs from *P. pamiroalaica* by having at least partly reduced tomentum on the undersides of some leaflets.

P. pamirica is common in the whole Kashmir, Soviet Central Asia and SW Mongolia. It is scattered in northern Iran, Afghanistan, and Chitral. In China it occurs in Tibet and all over the Kunlun Shan.

Potentilla pamiroalaica Juz.

This taxon, not clearly differentiated from *P. pamirica* differs from the latter in that all its leaves are densely tomentose on the undersides. The typical variety of this species occurs in Soviet Central Asia (in the Pamir-Alay region, Tien Shan, Dzhungarskiy Alatau), the neighbouring regions of China (Xinjiang), Afghanistan and Chitral. An endemic variety of *P. pamiroalaica,* var. *quasisericea* Soják, occurs in the Western Himalaya (cf. SOJÁK, 1987).

Potentilla hololeuca agg.

I have seen only one sheet of *P. hololeuca* Boiss. ex Lehm. (holotype PR!) from the Himalaya (Changar, *Thomson* s.n., 29 Aug 1847, K). It consists of four plants, all of which have two strongly approximated pairs of leaflets and thus belong to *P. hololeuca* var. *minor* Wolf. The typical variety of *P. hololeuca* occurs in Chitral (SCHIMAN-CZEIKA (1969) reported it mistakenly under the name *P. argyrophylla* Wall. ex Lehm.).

I have seen several sheets of *P. subtrijuga* (Wolf) Juz. (types LE!, DR!) from Chitral and Kashmir (Karakoram, Ladakh). I consider this taxon to be a hybrid of *P. hololeuca* × *P. pamirica* vel *P. pamiroalaica* (cf. SOJÁK, 1986), but cannot rule out the possibility that within *P. hololeuca* one can find plants with three pairs of leaflets (cf. the occurrence of *P. hololeuca* with three pairs of leaflets in eastern Turkey).

Potentilla leschenaultiana agg.

Since the last century there have been many reports of *P. leschenaultiana* Ser. in DC. (type G-DC, photo!, duplicate PR!) from the Himalaya. This species, however, is in fact an endemic confined to southern India (Tamil Nadu: Nilgiri; Pullney Hills). In the Himalaya it is replaced by a related species, *P. griffithii* J. D. Hook. *P. leschenaultiana* has small petals (± 5 mm) and a receptacle which is strongly enlarged in the fruit (upper achenes thus reach the sepal apices). All or at least some styles have a slightly dilated stigma. Veins on the undersides of the leaflets have stiff, thick, long hairs (those on the midrib are 1-2.5 mm long), and the tomentum consists of medium-thin hairs. All forms of the polymorphic *P. griffithii,* on the other hand, have large petals (± 6-10 mm long), a receptacle which is only slightly enlarged in the fruit (the upper achenes do not reach the top of the calyx), and styles that are not dilated in the stigmatic region. Veins on the undersides of leaflets have fine, rather short hairs and the tomentum is formed of extremely thin hairs.

Potentilla griffithii J. D. Hook.

This is a very variable species. In spite of a number of individual variants and different local populations, one can trace a strong geographical tendency in some morphological characters. The western populations of *P. griffithii* (mistakenly called *P. leschenaultiana* by many previous authors), growing in the Himalaya (Uttar Pradesh, Nepal, Sikkim, the Chumbi valley, Bhutan and Arunachal Pradesh) have short styles, 0.9-1.2(-1.4) mm long, petioles with long hairs and short, strongly flexuose or crispate hairs, and stems usually with appressed or erecto-patent indumentum. These plants belong to *P. griffithii* subsp. *griffithii.* All the leaves of this subspecies are white tomentose on the undersides; the upper sides are either green with sparse hairs, dull (var. *griffithii*), or densely sericeous and shiny (var. *metallica* Soják).

Eastern populations of this species, which occur in China (abundantly in Yunnan and scattered in Sichuan), have longer styles (1.3-2.3 mm) and stems with patent hairs; there are no flexuose or crispate hairs on the petioles. These populations represent a heterogeneous group of variants which can be divided into two subspecies.

The first subspecies, *P. griffithii* subsp. *beauvaisii* (Cardot) Soják (holotype P!), has basal leaves with (1-)2 pairs of leaflets which are all white tomentose on the undersides with concolor veins (var. *beauvaisii*) or with discolor veins [var. *reticulata* (Franchet) Soják]. The other subspecies, described here as *P. griffithii* subsp. *yunnanensis* Soják, has leaves with (2-)3-4 pairs of leaflets. Some basal leaves are white tomentose beneath, while others on the same plant are green, without tomentum. A variety of this subspecies, var. *intercedens* Soják, occurs in Bhutan together with the typical *P. griffithii* subsp. *griffithii.* It is an intermediate taxon between *P. griffithii* subsp. *griffithii* and *P. griffithii* subsp. *yunnanensis.* This variety has some leaves that lack tomentum on the lower side (as in typical *P. griffithii* subsp. *yunnanensis*), but has short styles (0.9-1.5 mm) and erecto-patent hairs on stems (as in *P. griffithii* subsp. *griffithii*).

The complex taxonomy of *P. griffithii* can be summarized in the following scheme:

Key

1a. Plants with some basal leaves tomentose on the underside, and some without tomentum **P. griffithii** subsp. **yunnanensis** 2

1b. Plants with all the basal leaves tomentose beneath 3

2a. Non-tomentose leaves distinctly glandular on the underside; styles 1.5-2.3 mm long; stems with patent hairs ..... var. **yunnanensis**

2b. Non-tomentose leaves without glands beneath or indistinctly glandular; styles 0.9-1.5 mm long; stems with erecto-patent hairs ..... var. **intercedens**

3a. Basal leaves with (1-)2 pairs of leaflets; stems with ± patent hairs; styles 1.3-1.5 mm long **P. griffithii** subsp. **beauvaisii** 4

3b. Basal leaves with (2-)3-4 pairs of leaflets; stems with appressed or erecto-patent (rarely ± patent) hairs; styles 0.9-1.2(-1.4) mm long ..... **P. griffithii** subsp. **griffithii** 5

4a. Veins on the undersides of the leaflets concolor, midrib with appressed hairs; leaflets greyish above ..... var. **beauvaisii**

4b. Veins on the undersides of the leaflets discolor, midrib with patent hairs; leaflets green above ..... var. **reticulata**

5a. The upper pair of leaflets strongly decurrent ..... var. **decurrens**

5b. Leaflets not decurrent or only weakly decurrent 6

6a. Leaflets dull on the upper sides, only sparsely pubescent ..... var. **griffithii**

6b. Leaflets on the upper side densely sericeous ..... var. **metallica**

As the lectotype of *P. griffithii,* I selected a specimen from Sikkim, collected in Lachen July 9, 1849 and marked by Hooker as *P. griffithii* 15 α (K!). It best agrees with the description of the species and contains two morphologically similar plants that are complete with basal leaves. Plants on another sheet from the same location and with the same annotation by Hooker (collected August 4, 1849, K!) also belong to the same form of *P. griffithii.* This sheet, however, contains plants without basal leaves. The selected lectotype belongs to the western subspecies of *P. griffithii.* It has short styles, all leaves are tomentose on the undersides, and on the upper sides green and sparsely pubescent. Another two sheets in Kew, marked by Hooker as 15 β, were also collected in Sikkim. They are heterogeneous. They both contain plants belonging to the western subspecies, as well as small specimens which in my classification belong to *P. griffithii* subsp. *yunnanensis* var. *intercedens.* The Griffith collection from Bhutan (No. 2124, K!; duplicates in BM!, E!) also belongs to this variety.

Potentilla spodiochlora Soják

P. sikkimensis Wolf, 1908, non Prain, 1904, described from a garden plant grown from seeds from Sikkim, is identical with *P. spodiochlora* Soják according to type material deposited in Wolf's herbarium in Dresden (DR!).

P. spodiochlora differs from *P. griffithii* subsp. *yunnanensis* in that all its basal and stem leaves (including the uppermost ones) are sparsely tomentose, and grey or green on the undersides. All forms of *P. griffithii,* on the other hand, have at least upper stem leaves white tomentose on the undersides. According to the data on labels, *P. spodiochlora* collected in its natural habitats has white petals when alive. Wolf's specimen had whitish petals.

P. spodiochlora stands between *P. griffithii* and *P. concolor* Rolfe. It occurs in areas which lack *P. concolor.* In addition to Nepal and Sikkim it occurs in SE Tibet (Kongbo, Lusha, Tsangpo Valley, 29°27'-94°35', *Ludlow, Sherriff & Taylor 4833,* BM). There is even a specimen from Uttar Pradesh (Kumaun, Tolu, *Strachey & Winterbottom 16,* K).

Potentilla mutabilis Soják

The middle stem leaves of *P. mutabilis* Soják are either palmate (e.g., Kashmir, Koraghal, Kichenganga Valley, *Stewart 22566,* K), or pinnate with 2 pairs of leaflets (e.g. Kashmir, Mapnun, *Meebold 2882,* PR). Rarely are all stem leaves palmate, with the middle leaflet trisect (Kashmir, Gulmarg, *Prescott-Decie* s.n., K). It is possible that *P. mutabilis* is derived from *P. argentea* × *P. gerardiana.*

Potentilla gerardiana Lindl. ex Lehm.

This is a rather variable species. It can be divided into two varieties with many transitional forms. *P. gerardiana* var. *gerardiana* (holotype PR!) has small flowers and leaflets that are grey beneath with dense straight hairs. *P. gerardiana* var. *minor* Cardot (types P!; syn. *P. leschenaultiana*

var. *biharensis* Haines, type K!) has larger petals and leaflets green beneath (hairs are not too dense). *P. clarkei* J. D. Hook. (holotype K!), in my opinion, should be considered a synonym of *P. gerardiana* var. *minor.*

P. gerardiana occurs in Pakistan (the Kurram Valley, Swat, Chitral, Kashmir) and India (Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh). It has not been collected in Nepal. Surprisingly it also occurs on mountains (about 1000 m high) in the southern parts of the state of Bihar.

Potentilla bannehalensis Cambess.

P. bannehalensis Cambess. in Jacquemond (types P!, PR!) is closely related to *P. gerardiana,* from which it differs in that it has three pairs of leaflets in both lower and upper stem leaves, as well as conspicuously large flowers. I have not seen a collection of this taxon other than the type specimen. Whether it is a distinct species or just an extreme variety of *P. gerardiana* can only be determined by field studies.

Potentilla potaninii Wolf

Himalayan plants, previously referred to as *P. potaninii* Wolf (lectotype LE!; cf. SOJÁK, 1986), have two pairs of remote leaflets. At the present time, this classification appears as questionable. These plants either represent a typical *P. potaninii,* or they can be regarded as an aberrant form of *P. illudens* Soják (Nepal, southern Tibet, Sikkim and Bhutan).

Potentilla nivea agg.

P. nivea L. sensu Hultén does not occur in the Himalaya. Himalayan plants which have ternate leaves belong to *P. sino-nivea* Hult. (type UPS!), those which have five leaflets belong to one of three closely related and rather similar species, *P. saundersiana* Royle (holotype LIV!, isotypes K!, DR!, PR!), *P. jacquemontii* (Franchet) Soják (lectotype P!), and *P. thibetica* Cardot (lectotype P!; cf. SOJÁK, 1986). Plants with mixed ternate and digitate leaves are the result of hybridization and are to be designated as *P.* × *forrestii* W. W. Sm. All the Himalayan taxa of the sect. *Niveae* mentioned above have petioles with straight hairs mixed with crispate (or floccose) hairs, styles that are not thickened at the base and at least some epicalyx-segments that are tomentose. The true *P. nivea* L. sensu Hultén has ternate leaves, petioles with only floccose hairs (i.e., no straight hairs), styles slightly thickened at the base and epicalyx-segments that are never tomentose. *P. blanda* Soják var. *homotricha* Soják has similar indumentum on petioles and epicalyx-segments. This taxon, however, has digitate leaves, and reaches its southeastern limit in Karakoram. *P. nervosa* Juz. (holotype LE!), a Tien-Shan-Pamirean species, might also penetrate to Karakoram. It has styles thickened at the base, ternate leaves, petioles with both floccose and straight hairs (the straight ones were by mistake omitted from the original diagnosis), and leaflets with many approximate teeth.

Potentilla evestita agg.

P. williamsii Soják, occurring in Nepal, is the only Himalayan member of the group *Niveae-Evestitae,* which is characterized by leaflets with sparse grey tomentum on the undersides.

P. grisea Juz. (type LE!) extends from Tadzhikistan to Karakoram (without precise locality, *C. B. Clarke 30218,* C, K; Hispar Glacier, *Scott Russell 1400,* BM) and it is possible that it also occurs in the Western Himalaya. *P. evestita* Wolf (types LE!, DR!) has been collected in Chitral (Chumarkhan Pass, *Stainton 2913,* BM; Yarkhun, Gurawr, *Bowes Lyon 929,* BM) but I have not seen any specimen of it from the Himalaya. *P. vilijuga* Soják, recently described from Kashmir, is close to *P. grisea* but has a small proportion of pinnate leaves. It therefore occupies an intermediate position between *Niveae-Evestitae* and *Pensylvanicae (Multifidae).*

Potentilla virgata Lehm.

This species extends from the Pamir to Afghanistan, not only to its border areas, but also as far as the province of Ghazni (*Rechinger 17919,* LD). SCHIMAN-CZEIKA (1969) does not list *P. virgata* Lehm. (holotype PR!) for Afghanistan because she treated it as *P. multifida* L. This is

rather surprising. *P. multifida* has pinnate leaves whereas *P. virgata* has digitate leaves and thus belongs to a different section. Typical forms of *P. virgata* also occur in the Western Himalaya (Kashmir, Zaskar, Kargia, *Koelz 5541* and *5476,* S), but have not been reported yet. In China *P. virgata* occurs from Xinjiang (Kashgar) to Gansu (Suchow, *Friis-Johansen 2581,* S).

Potentilla subdigitata Yü & Li

This species, originally described from Xinjiang, was also found in Karakoram (Makerum, Hispar Glacier, *Scott Russell 1435,* BM) and it is not unlikely to be found in the Western Himalaya. *P. subdigitata* Yü & Li (holotype PE!) has trifoliate leaves (rarely together with few quinate ones), densely glandulose leaflets and sepals, and styles slightly thickened at the base. In my opinion, it represents a hybridogenous species *(P. desertorum* × *P. gelida).*

Potentilla heynii Roth

P. heynii Roth 1821 (type PR!; syn. *Comarum flavum* Buch.-Ham. ex Roxb. 1832, type LIV!, *P. amurensis* Maxim. 1859, type LE!, *P. obovata* Bertol. 1863, type K!) occurs in all parts of the Himalaya from Kashmir to Bhutan and SE Tibet. In the Himalaya it has not been separated from *P. supina,* from which it can easily be recognized by its small petals.

P. heynii has petals that are 0.8-1.2 mm long, and 0.4-0.7 mm wide, either rounded or tapering to the tip. Anthers are 0.15-0.2 mm long. Styles are not thickened at the base, up to 0.6 mm long. Some achenes are small (0.6-0.7 mm), smooth or with minute ribs while others on the same plant are longer (0.7-0.9 mm) with strong ribs. The lowermost stem leaves are either palmate with 5 leaflets from which the middle one is trisect, or pinnate with 2-3 pairs of leaflets.

P. supina, on the other hand, has petals that are 2-3.5 mm long and 1.8-2.5 mm wide, and retuse or truncate at the tip. Anthers are 0.2-0.5 mm long. Styles are thickened at the base, and 0.6-0.8 mm long. Achenes are 0.7-0.9 mm long, either rusty coloured with narrow ribs (subsp. *paradoxa*) or brown with broad ribs (subsp. *costata*). The lowermost stem leaves are pinnate with (2-)3-5(-7) pairs of leaflets.

P. heynii occurs in Pakistan, India, Nepal, Bhutan, Bangladesh, Sri Lanka, Burma, Thailand, Vietnam, the whole of China (from Yunnan to Amur), Korea and the Soviet Far East.

Potentilla supina L.

In the Himalaya *P. supina* L. is represented by the following two subspecies. *P. supina* subsp. *costata* Soják has brown, dull achenes, with thick, blunt, brown ridges. *P. supina* subsp. *paradoxa* (Nutt. ex Torr. & Gray) Soják has achenes that are slightly shiny and reddish brown, with very narrow, sharp, ± whitish ribs. *P. supina* subsp. *supina* occurs neither in the Sino-Himalayan region nor in Central Asia.

Potentilla monanthes Lindl. ex Lehm.

P. monanthes Lindl. ex Lehm. (type PR!) is very variable species. Its typical variety is characterized by yellowish subsessile glands on the leaves and small flowers. An interesting variety, *P. monanthes* var. *violacea* Soják, with violet, long stipitate glands on the petioles and stems and large petals occurs in Bhutan and less typically in Sikkim and SE Tibet. Another variety, *P. monanthes* var. *alata* Soják, is eglandulose, small-flowered and its achenes have conspicuous white narrow lamellae. It grows in E Nepal.

New taxa and combinations

Potentilla bifurca L. subsp. **bifurca** var. **misera** Soják, **var. nova**

Folia basalia 1-3-jugo-pinnata. Notis aliis cum var. *bifurca* congruit.

Typus: Tibet, Goorning valley, *Littledale* s.n., 1895 (K).

Potentilla doubjonneana Cambess. subsp. **ossetica** Soják, **subsp. nova**

A subspecie typica petalis 6-7.5 mm et antheris 0.5-0.6 mm longis differt.

Typus: Caucasus, Yugo-Osetiya, Rokskiy per., *Lachashvili* s.n., 1961 (PR).

Potentilla turczaninowiana Stschegl. subsp. **nephogena** Soják, **subsp. nova**

A subspecie typica petiolis sicut foliolis subtus ad costam (interdum tota facie) et ad margines modice pilosis discrepat.

Typus: Kazakhstan, Zailiyskiy Alatau, Bolshaya Almaatinka, *Soják* s.n., 1981 (PR).

Potentilla griffithii J. D. Hook. subsp. **griffithii** var. **metallica** Soják, **var. nova**

Foliola supra sericeo-micantia, densissime pilosa, summa lateralia breviter decurrentia vel subsessilia, dentibus utrinque ± 5-8; caules tomentosi, pilis rectis subappressis et item flexuoso-crispatis numerosis tecti.

Typus: Nepal, near Maikot, *Stainton, Sykes & Williams 4757* (E).

Potentilla griffithii J. D. Hook. subsp. **griffithii** var. **decurrens** Soják, **var. nova**

Foliola supra dense pilosa, submicantia, summa lateralia longe decurrentia, foliolum terminale ca. 2.5-5 × 0.9-1.5 cm, dentibus utrinque 10-13; caules pilis subpatentibus tecti.

Typus: Assam, Rupa, *Kingdon-Ward 13915* (BM).

Potentilla griffithii J. D. Hook. subsp. **yunnanensis** Soják, **subsp. nova**

Folia radicalia (2-)3-4-jugo-pinnata, subtus nonnulla dense albotomentosa, nonnulla (ad eandem plantam) cana, laxe tomentosa et nonnulla viridia, etomentosa. Folia caulina subtus albotomentosa. Petioli pilis ± patentibus longis et item brevibus rectis vel subflexuosis vestiti, ± glandulosi.

Typus: Yunnan, Ta-pin-tze, Ta-Tang, *Delavay* s.n., 1885, BM (holo), E (iso).

Potentilla griffithii subsp. **yunnanensis** var. **yunnanensis** Soják, **var. nova**

Stylus 1.5-2.3 mm lg. Folia etomentosa subtus ad nervos pilis rectis, in pagina glandulis luteolis induta. Caules patenter pilosi.

Typus: idem sicut apud subsp. **yunnanensem.**

Potentilla griffithii subsp. **yunnanensis** var. **intercedens** Soják, **var. nova**

Stylus 0.9-1.5 mm lg. Folia etomentosa subtus ± eglandulosa. Caules saepe subappresse pilosi.

Typus: Bhutan (Bootan), without precise locality, *Griffith,* E (holo), BM (iso).

Potentilla monanthes Lindl. ex Lehm. var. **violacea** Soják, **var. nova**

Petioli (sicut caules) pilis 0.3-0.7 mm lg. ± modice flexuosis ± dispersis (vel deficientibus) et glandulis ± densis longe stipitatis (0.1-0.7 mm) atroviolaceis vestiti. Dentes foliolorum 2-3-denticulati. Flores (1.2-)1.4-1.7 cm in diam.; episepala lata, apice ± rotundata, ± divisa; petala 6-8 mm lg.; antherae 0.5-0.7 mm lg., nuculae exalatae.

Typus: NE Bhutan, Me La, Ludlow, *Sherriff & Hicks 20748* (BM).

Potentilla monanthes Lindl. ex Lehm. var. **alata** Soják, **var. nova**

Planta eglandulosa. Petioli pilis ± 1 mm lg. ± rectis tecti. Foliola simpliciter dentata. Flores parvi; episepala lanceolata, ± subacuta, indivisa; petala 3-4 mm lg., antherae 0.3-0.5 mm lg.; nuculae lamellis albis ornatae.

Typus: E Nepal, Taplejung Distr., Dhoban, *Norkett 9162* (BM).

Potentilla glabriuscula (Yü & Li) Soják, **comb. nova;** basion. *Sibbaldia glabriuscula* Yü & Li, Acta Phytotaxonomica Sinica 19: 516. 1981.

Potentilla gelida C. A. Mey. subsp. **borissii** (Ovcz. & Koczk.) Soják, **stat. novus;** basion. *P. borissii* Ovczinnikov & Koczkareva, Flora Tadzhik. SSR 4: 539. 1975.

Potentilla turczaninowiana Stschegl. subsp. **kuramensis** (Wolf) Soják, **stat. novus;** basion. *P. kuramensis* Wolf Bibliotheca Botanica 71: 527. 1908.

Potentilla griffithii J. D. Hook. subsp. **beauvaisii** (Cardot) Soják, **stat. novus;** basion. *P. beauvaisii* Cardot, Notulae Systematicae 3: 234. 1916.

Potentilla griffithii J. D. Hook. subsp. **beauvaisii** var. **reticulata** (Franchet) Soják, **comb. nova;** basion. *P. leschenaultiana* var. *reticulata* Franchet, Plantae Delavayanae 3: 213. 1890.

REFERENCES

HANDEL-MAZZETTI, H. (1939). Plantae sinenses a Dre. H. Smith annis 1921-1922, 1924 et 1936 lectae. XXXVII. Rosaceae. 1: Potentillinae. *Acta Horti Gothob.* 13: 289-334.

HOOKER, J. D. (1878). Potentilla. *In: Flora of British India* 2: 345-360. London

SCHIMAN-CZEIKA, H. (1969). Potentilla. *In:* RECHINGER, K. H., *Flora Iranica* 66: 78-114. Graz.

SOJÁK, J. (1964). Potentilla tergemina sp. n., eine neue Art der sibirischen Flora. *Preslia* 36: 23-27.

SOJÁK, J. (1966). Some new taxa of Potentilla. *Folia Geobot. Phytotax.* 1: 341-355.

SOJÁK, J. (1969). Nomenklatorische Anmerkungen zur Gattung Potentilla. *Folia Geobot. Phytotax.* 4: 205-209.

SOJÁK, J. (1986). Notes on Potentilla I. Hybridogenous species derived from intersectional hybrids of sect. Niveae × sect. Multifidae. *Bot. Jahrb. Syst.* 106: 145-210.

SOJÁK, J. (1987). Notes on Potentilla (Rosaceae) III. Some new taxa from Asia. *Bot. Jahrb. Syst.* 109: 25-48.

WOLF, T. (1908). Monographie der Gattung Potentilla. *Biblioth. Bot.* 71: 1-714.

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