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Studies in the *Potentilla nivea* group.

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By ERIC HULTÉN.

It has long been clear that *Potentilla nivea* L., as usually taken is a complex group. At least twenty different varieties belonging to it have been described since LINNAEUS, and at least ten more species very closely related to it. Many of the varieties are distinguished by such characters as strongly dissected leaflets or quinate leaves which doubtless occur within several different entities and have very little systematical value. These names have therefore been applied to many widely different plants. Neither in the four large *Potentilla* monographs nor elsewhere has any serious attempt been made to bring order into this chaotic situation.

When studying the *Potentilla nivea* material from Alaska and Yukon the present author found it necessary to differentiate it into various entities, and the problem of naming them correctly thus arose. A study of the Scandinavian material, carried out in order to ascertain what was the true *P. nivea* of LINNAEUS, revealed that a corresponding differentiation could be made in the Scandinavian material. I therefore found it necessary to undertake the revision of a larger body of material in order to get a correct idea of the conditions. All material of the entire group was kindly sent on loan from the Botanical Museums in Stockholm (S), Uppsala (U), Gothenburg (G) and Helsingfors (H), for all of which I express my gratitude to the directors of those museums, and this material, together with that of the Botanical Museum of Lund (L) and my own Alaska-Yukon herbarium, was subjected to a detailed examination. In the course of this work, further material — though on account of the risks of transportation owing to the war it had to be limited in scope — was also kindly sent for examination from the herbaria in Copenhagen and Oslo, and for this courtesy I would here express my best thanks.

The examination revealed that the Scandinavian material could be divided into two fairly distinct entities with different distribution and

that the extra-Scandinavian material could be referred to several distinct species.

A key to the *Potentilla nivea* group as represented in the Scandinavian herbaria, as well as synonymy and a discussion of the different groups, are given below. No doubt further study and a larger body of material will render it possible to distinguish still an additional number of systematical units within the complex.

- A. Petioles tomentose with floccose hairs, lacking straight hairs.
 - B. Style linear, lacking papillae at the base, Central Asiatic and Chinese species.
 - C. Highgrown (10–40 cm), multi-flowered; flowers 12–14 mm in diam., stems and petioles densely tomentose; leaflets ovate or prolonged ovate, rounded in the apex with 6–12 teeth on both sides *P. nervosa*.
 - C. Low-grown (4–8 cm), stems mostly single-flowered, flowers larger, stems and petioles sparsely floccose, leaflets obovate with 2–4 teeth on both sides *P. sino-nivea*.
 - B. Style thicker at the papillate basal end, arctic and boreal species.
 - D. Leaves with three elliptical leaflets, teeth 2–7 on each side, usually short, rounded, plant rarely decumbent. *P. nivea*.
 - D. Leaves with three to five leaflets, teeth long, blunt, 3–4 on each side, at least the basal teeth longer than half the distance between the margin and the median vein, plant usually more or less decumbent, flowers large. *P. nivea prostrata*.
- A. Petioles pilose with long straight appressed or patent hairs or puberulent and pilose with such hairs.
 - E. Leaves with long silky hairs below, terminating in brushes in the apex of the teeth. Teeth very long, reaching nearly to the base of the leaflet, leaflets thus merely lobed.
 - F. Bractlets lanceolate, pubescens white. *P. rubricaulis*.
 - F. Bractlets oval, pubescence yellowish. *P. Vahlana*.
 - E. Leaves tomentose below.
 - G. Petioles puberulent and pilose with long $\pm$ straight hairs. *P. Hookeriana*.
 - G. Petioles not puberulent, pilose with long $\pm$ straight hairs only.
 - H. Leaves glabrous or pilose above, not silky pubescent, tomentose white, plant usually more than 15 cm high, multi-flowered. *P. Chamissonis*.

- H. Leaves silky pubescent above, tomentose and silky pubescent below, tomentum grayish or grayish-green, plant 10–15 cm high, flowers single (except in Kamtchatka where several-flowered var.). *P. uniflora*.

Potentilla nivea L., Sp., pl. ed. 1 (1753) p. 499 pro parte.

Potentilla prostrata ROTTB. in Skr. Kjøbenh. Selsk. Lærdoms og Vidensk. Elskere 10 (1770) p. 453. — *Potentilla nivea* var. *vulgaris* CHAM. & SCHLECHT. in Linnaea 2 (1827) p. 21 — ? *Potentilla nivea* β *alpina* TURCZ. in Bull. Soc. Nat. Mosc. 16 (1843) p. 607. — *Potentilla nivea* type 1 pro parte SØRENSEN in Meddel. om Grøn. 101 Nr. 3 (1933) pl. 5 fig. 3–4 et type 2 Pl. 6 (var. *tomentosa*).

Scandinavia. Southern area.

Sweden. Härjedalen, Medskogsberget BIRGER (S, L, U); Ulvberget ÖSTMAN (S), KILANDER (S, L). Jämtland: Sylarna Vaktklumpen, N.E. slope HAGLUND & ARWIDSSON (S).

Norway. Ullensvang LID (L, Oslo); Kinsarvik LID (S, Oslo); Övre Sikkilsdalen JOHANSEN (S, L); Lomseggen ZETTERSTEDT (G, U), REUTERMAN (G); Lom h:d Smådalen NANNFELDT (U); Sogn og Fjordane: Flaam: Ravnanaasi BLYTT (U), LAGERSTEDT (S, U, L), NORDHAGEN (S); Dovre: Kongsvold LINDBLOM (U, L), HARTMAN (S, U), FALK (S, L), KINDBERG (S), ELGENSTIERNA (G), AHLBERG & AXELL (L, G), HARTMAN & THEEL (G), SCHEUTZ (G), AHLBERG (S, U), ZETTERSTEDT & WICKBOM (L, G), ZETTERSTEDT (L), SJÖVALL (G), NYMAN (S), HULT (H), LINDBERG (H), LENSTRÖM (S, G), JOHANSON (G, H), OLSSON (S, L, G, H), WALLIN (L), NORDENSTRÖM (S), BENGTSOON (G), NYMAN (G), TEDIN (G, L), VINGE (S, G), LILLIESKÖLD & SVEDELIUS (S), JOHANSEN (G), BERGGREN (S), NILSSON (G), KROK (S, H), BROBERG (G), CARLING (S, G), NEUMAN (U, L, G, H), HAGLUND (U), SONDÉN (S, H), ELLINGEN (G), LINNANIEMI (H), AHLFVENGREN (S), SÖDERBERG (U), LAGERCRANZ (S), ELIASSON (S), ENGSTEDT (S), DEGELIUS (S), LINDQUIST (G); Dovre: Hjerkin ZETTERSTEDT (L, S, U), FRIES (U), SAMUELSSON & ZANDER (S); Dovre: Drivstuen HARTMAN (U, G), FRIES (S, U, L), SCHOTTE (S, L); Dovre: Drivdalen BLOMBERG (G), FRIES (U), NILSSON (G, H), SKOTTSBERG (G); Dovre: Knudshö AHLBERG (G), NORDENSTRÖM (S); Dovre: Vaarstien AHLBERG (S, U), WICKBOM (U, H); Dovre, without locality specified, several sheets.

Northern area.

Sweden. Pite Lappmark: Akaris LAESTADIUS (U), WIDMARK (S), Pjeskejaure distr.: Njarka ARWIDSSON (S), do Kiron ARWIDSSON (S), Lule Lappmark: Unna Titir BERLIN (S, L), FRISENDAHL (G), NANNFELDT (S), Stuur Titir TENGVAL (U); Kvikkjokk HARTMAN (U); Njammats ANDERSSON (U), ROSENDAHL (S), Virjaure WESTERLUND (S, L); Vastenjaure: Låtach WIDMARK (S); Stuur Tokivare Hb. WAHLENBERG (U), ROSENDAHL (S); Lill-Thokin Hb. WAHLENBERG (U), ÅHRLING & BRANDELIUS (S, L, G); Unna Pårövaratsj VESTERGREN (S); Mikajokk VESTERGREN (S); Unna Tuke NANNFELDT (S); Svalta BJÖRKMAN (S, U); Ruodnas ÅHRLING (G), HENRICI (G); Lulep Kerkau BJÖRKMAN (S); Kedäive SELANDER (S); Tjågnåris TENGVAL (S, L, G); Junkartjokko CLEVE[-EULER] (U); Tjåpores FRÖDIN (U, L); Tjakkeli INDEBETOU & JULIN (S, G); Tarra MÖLLER (S, G); Luoppalvaratj SELANDER & DAHL-

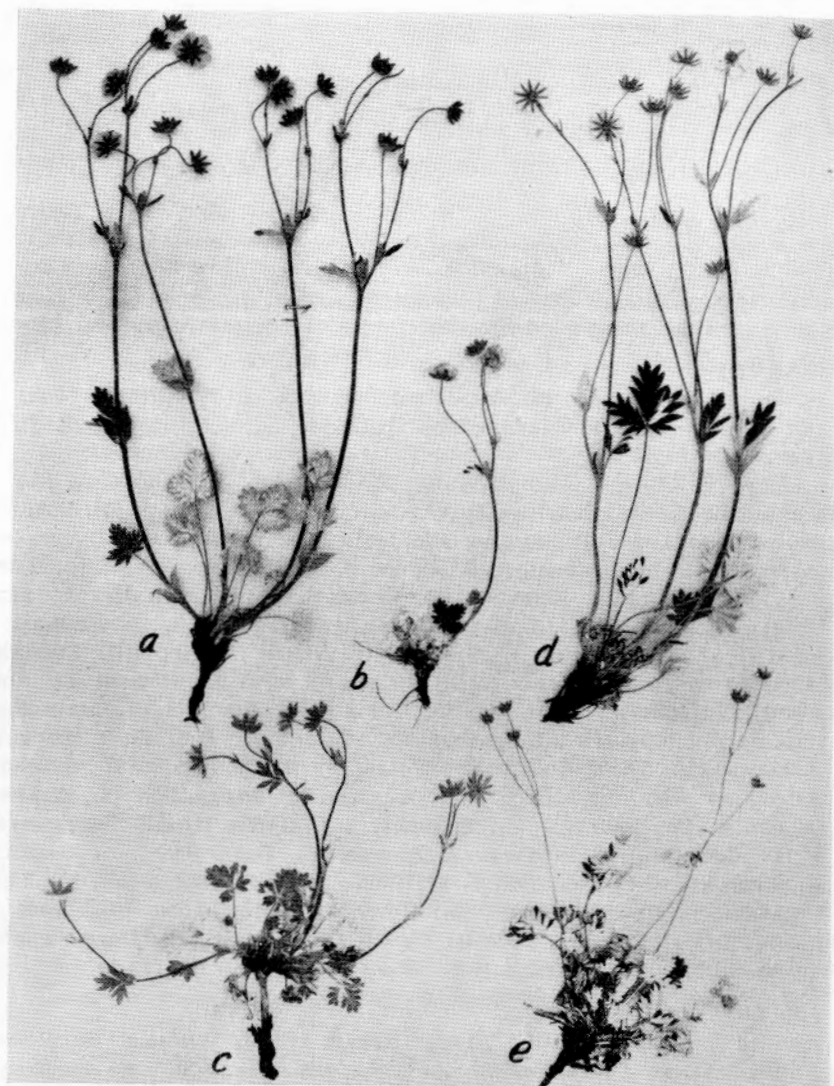


Fig. 1. a, b. *Potentilla nivea* a. from Dovre, Kongsvold NYMAN (S); b. from Njam-mats ROSENDAHL (S); c. *Potentilla nivea* subsp. *subquinata* from Spitzbergen, Wijde Bay WULFF (L); d. *Potentilla Chamissonis* from Njam-mats CEDERSTRÄHLE (S, type of the species); e. *Potentilla Hookeriana* from Yukon R. 27 miles below Rampart MURIE (Herb. HULTÉN).



Fig. 2. a. *Potentilla nervosa* Lu Yah Shan SMITH (L); b. *Potentilla sinonivea* from Dongrergo SMITH 3131 (U); c. *Potentilla nivea* var. with the teeth of the leaves few and long from Pummanki Pennins. ERLANDSSON (Herb. HULTÉN); d. *Potentilla uniflora* from Point Hope ANDERSON 3807 a (Herb. HULTÉN).

BECK (S); Staddatjåkko SELANDER (S); Skevonälke SELANDER & DAHLBECK (S); Sevvatjåkko SELANDER & DAHLBECK (S); Kuobberi SELANDER & DAHLBECK (S); Skejatjåkko FRÖDIN (S, U, L); Ridatjåkko BOHLIN (U). Torne Lappmark: Vittjavare FRÖDIN (L); Ruopsuok JOHANSSON (S); Sjängeli ASPLUND (U), SMITH (U); Stuur Allakats SMITH (U); Abisko HÄGERSTRÖM (U), SELANDER (S), NEUMAN (L, G), SONDÉN (S), ERDMANN (S), SAMUELSSON (S), SEGERSTRÖM (S); Nuolja FRISTEDT & BJÖRNSTRÖM (S), SELANDER (S), SONDÉN (S); Själlatjåkko SMITH (U); Atjaktjåkko SMITH (U); Njunjesvare ASPLUND (U), Björkliden—Kopparåsen FRIES (U); Loktatjåkko ALM (U), JOHANSSON (S, L), ENGSTEDT (S); Vassitjåkko ALMQVIST (U, L), HOLMBERG (L), NORDSTRÖM (G); Nissontjokk SCHAGER (S), SEGERSTRÖM (S); Nissontjåkko GRAPENGIESSER (S); Snuoratjåkko ALM (S), Waiwanenlaki FRISTEDT & BJÖRNSTRÖM (S, U, G, H); Kaisepakte SMITH (U); Lulletjärro BRUUN (U); Tuopti BRUUN (U); Kartetjåkko SMITH (U); Maivatjåkko ALM (U); Vuoskoäive NANNFELDT (U); Vittjatjåkko SMITH (U); Valfojokk ASPLUND (S, U); Järta ASPLUND (U); Jerbele SMITH (S, U); Krobletjåkko SMITH (U); Kaisepakte SMITH (S, G); Vilkisortas LAGERBERG (G); Vakkijokk SELANDER (S); Tjuonavagge FRÖDIN (U, G); Paddos FRÖDIN (L), ASPLUND (S), SAMUELSSON & ZANDER, ALM (U), PALMÉR (S), SANTES-SON (S); Ortovare FRIES (U), SMITH (G); Aurokjåkko—Ortovare SMITH (U); Ortovagge LIDMAN (S); Pesisvare ALM (U), NORDSTRÖM (G), LINDQUIST (G); Vaimasäive

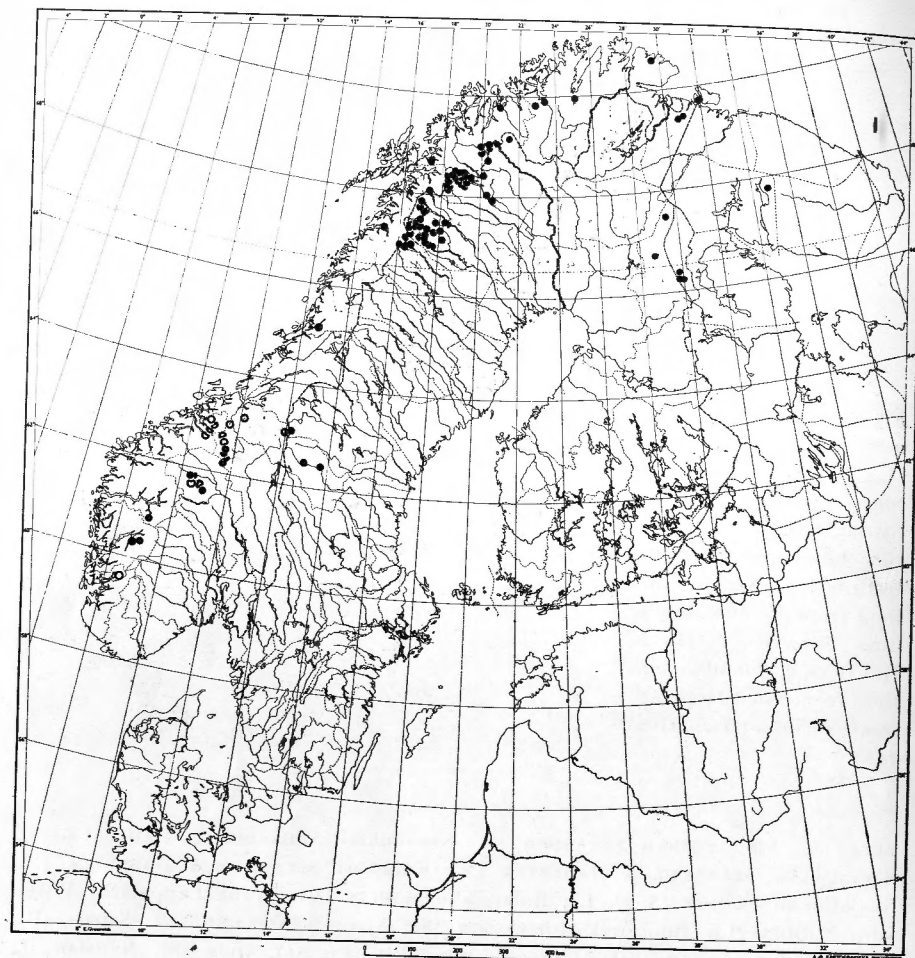


Fig. 3. Scandinavian area of *Potentilla nivea*.

SELANDER (S); Peldsa LAESTADIUS (S, U, L, G, H), ALM & TENGWALL (S), SMITH (U, S); Moskana SMITH (U); Koltapakta MALMBERG (H).

Norway. Velfjord, Bindalen DAHL (S, Oslo) and Kvernhaten DAHL (S, Oslo), Balvand SCHLEGEL & ARNELL (S, U, L, G); Giken — Ny — Sulitjelma SJÖVALL (G); Brattfjell i Fauske NOTØ (U, L), Nordreisen NOTØ (L), SELANDER (S); Alten: Skaiovara FRIES (U), do Reipasfjeld DAHL (G); Gratangen: Stortind NAUMAN (S, L), Maalsel: Geivivarre NOTØ (L), do Rastafjeld NORMAN (G); Båsfjord: Milkar NANNFELDT (U); Porsangerfjord: Kistad NORDHAGEN (U).

Finland. Enontekis: W. Saana ROIVAINEN (H), MARKLUND (H); W. Toskalharji ROIVAINEN (H); Petsamotunturi CAJANDER, SÄYRINKI (H); Petsamotunturi, Haukilampi SÄYRINKI, KONTUNIEMI (H); Petsamotunturi-Pääskyspahan CAJANDER

(H); Kuolajärvi Pyhäkuru HÄLLSTRÖM (H); Takkatunturi AIRAKSINEN (H); Salla: Takkaselkätunturin (H); Kuusamo: Paanajärvi BACKMAN (H); Oulankajoki BACKMAN (H); Soñajärvi LAURILA (H); Lapp. tulomensis: Vagoaive FONTELL (H); Lapp. Imandr. Lujauri Urt KIHLMAN.

Central Europe. Dauphiné: Lautaret JAYET (S), GRENIER (S, U), PETIT (S), CARSON (S), PELLAT (G), VITASEK (L), FAURE (L), Hautes-Alpes: Monetièrles-Bains, au Perron (L); Switzerland: Valesia: Le Liaq prope Mauvoisin BERNOULLI (G); Valesia: Illhorn BERNOULLI (S); Valesia supra pagum Grimentz BESSE (S, H); Zermatt BROWN (U); Kitzbühel (L, name of collector illegible), do TRAUNSTEINER (U); Tirol, Riedberg at Sterzing HUTER (H).

Caucasus. Tersk prov. Mamisson Pass DESULAWI (H).

Asia. Altai without collector (S), Altai in jugo Tigeretskyi KRYLOV (S); Mongolia: Changai: Mt. Sabur-chair-čan IKONNIKOV-GALITZKY (S); »ad fl Ircut» TURCZANNINOV (U); Olenek R. at the sources of Weligna R. CZECANOWSKY & MÜLLER (U pro parte); Jakutsk prov.: Kumach-Sur NILSSON-EHLE (S, G) (also var. *tomentosa*); »Ost Sibirien» STUBBENDORFF (S, var. *tomentosa*, var. *elongata* TH. WOLF det. TH. WOLF); Dahuria Tibelti TURCZANNINOW (S, var. *tomentosa*); Ajan TILING (U); Kamtchatka: Pallan LOGINOFF (S, var. *tomentosa*), do Pushtchina KOMAROV (S), do Poperochnaja KOMAROV (S), do Tolbatchik NOVGRABLENOF (S); Anadyr: Main R. GORODKOV & TICHOMIROV (Hb. HULTÉN, var. *tomentosa*); Japan: Yezo, prov. Ishikari, mt Yubari HARA (L); Honshu, prov. Sinano, mt Shirouma (S, H collector not given).

America. N.W. British Columbia: Lake Atlin, Llewellyn Glacier EASTWOOD (Gray Herb.); British Columbia: Mt Selwyn RAUP & ABBE (S); Labrador: Port Manners POTTER & BRIERLY (L); Gaspé Penins.: Table-topped Mountain FERNALD & COLLINS (Gray Herb.), do Percé: Ste. Anne Mt. WILLIAMS, COLLINS & FERNALD (U, S Gray Herb.) do COLLINS FERNALD & PEASE (L), do FERNALD & WEATHERBY (S, L); Bic, l'Anse Original COLLINS & FERNALD (L); Saint Fabien: Mont Bic ROUSSEAU (S); Newfoundland, Cape Phipps (S).

W. Greenland. Godthaab VAHL (Copenh.); Sukkertoppen WORMSKJOLD (H); Ivigtut BERLIN (S); Naussausak KORNERUP (S); Holsteinburg VAHL (S, L); N. Strömsfjord KORNERUP (S, L); Christianshaab WARMING & HOLM (Copenh., U); Disco FRIES (U pro parte), SMITH (Copenh.), KLEIST (S, U, L, H), EKMAN (S), LAGERCRANZ (S); Zilertingnaq ENANDER (S); Alanidkuluk EKMAN (S); Engelskmandens Havn EKMAN (S); Ritenbenk LAGERCRANZ (S); Umanak HOLBOELL (Copenh.); Foulke Fjord SIMMONS (L); Greenland without collector several sheets.

E. Greenland. Ella I. SØRENSEN (»type 1» pro parte) (Copenh.); Strindberg Penins. SØRENSEN (Copenh.), Cape Hedlund SØRENSEN (»type 2») (Copenh., var. *tomentosum*).

Maps of the Scandinavian and of the total area of *P. nivea* are found in figs. 3 and 6 respectively.

LINNAEUS apparently included in his *P. nivea* both the plant now in question and the plant here called *P. Chamissonis*. In the photographic series of his herbarium preserved in the Library of the Uni-

versity of Uppsala are found two specimens of *P. nivea*, both very poor, one apparently being *P. nivea* as described here and the other being *P. Chamissonis*. The place where they were collected is not given. JUZUPCZUK in Fl. S.S.S.R. realized that *P. nivea* of LINNAEUS comprised two species and he retained the name *P. nivea* for the plant with tomentose petioles. I think it right therefore to retain the name *P. nivea* for that plant regardless of what happens to be preserved in the herbarium of LINNAEUS under that name, as any botanist who splits up a species ought to determine which part is to retain the old name and which is to be given a new one. For a discussion of the differences between *P. nivea* and *P. Chamissonis* see under the latter.

P. nivea as described above is a fairly variable species and it seems clear that it is built up of numerous minor races. Thus the population within the southern Scandinavian area (fig. 1 a) is markedly more high-grown than that within the northern (fig. 1 b). The population in the Alps more closely resembles that of the northern Scandinavian area, but is more strongly tomentose on the petioles, stems and leaves than the average Scandinavian plant and also more uniform than that population, at least to judge from the rather scanty material available in Swedish Museums. Specimens from the mouth of Lena R. to British Columbia as well as specimens from E. Greenland are strongly tomentose and pilose on the leaves above, and the study of a larger body of material may prove them to be a distinct geographical race worthy of the rank of a subspecies. As it does not seem to have been given a name earlier it may be called

var. *tomentosa* NILSSON-EHLE in sched. nov. var.

Folia superne tomento $\pm$ denso et pilis longis sericeis oblecta.

Japanese specimens have very broad rounded leaflets and probably constitute a minor race. Specimens from Eastern America resemble those from northern Scandinavia, while those from W Greenland fairly well match those in the southern Scandinavian area, although they are more variable.

Typical *P. nivea* is lacking in the ample material from Spitzbergen. It is there replaced by a geographical race here regarded as a subspecies, and which, if better distinguishing characters can be found than those which I have been able to elucidate, can equally well be regarded as a species.

It is probably this plant that was first described by WATSON as *P. nivea* var. *dissecta*, but as I have seen no specimen undoubtedly

belonging to that variety I prefer to accept LANGES' name *P. nivea* var. *subquinata*. As I here regard that plant as a subspecies of *P. nivea* its name should be:

Potentilla nivea subsp. *subquinata* (LANGE) comb. nov.

Potentilla nivea $\pm$ *subquinata* LANGE, Conspectus Fl. Groenl. 1 (1880) p. 9 et 2 (1887) p. 235 (Meddel. om Grønland 3: 1 et 3: 2).

Verisim. *Potentilla nivea* var. *dissecta* WATSON in Proc. Amer. Acad. 8 (1873) p. 559; *Potentilla nivea* $\pm$ *subquinata* LANGE loc. cit. — *Potentilla nivea quinquefolia* RYDB. in Bull. Torr. Club 23 (1896) p. 302. — *Potentilla quinquefolia* RYDB. in Mem. Dept. Bot. Columbia Univ. 2 (1898) p. 76 pl. 30. — *Potentilla subquinata* RYDB. in Bull. Torr. Club. 28 (1901) p. 181 pro parte. — *Potentilla modesta* RYDB. in N. Amer. Fl. 22 (1908) p. 331. — *Potentilla nipharga* auct. (incl. RYDBERG pro parte) (non RYDB. quoad spec. orig.). — *Potentilla nivea type 3* SØRENSEN in Meddel. om Grønland 101 No. 3 (1933) pl. 7 et type 5 pro parte pl. 9 fig. 4, 5.

Finland. Petsamo, Pummanki, Lintupahtaa CAJANDER (Hb. CAJANDER), do HÄYRÉN (H), do Samperinkurun HULKKONEN (H), do N.W. Plateau ERLANDSSON (S); Kuolajärvi, Oulanka AIRAKSINEN.

Spitzbergen. Bel Sound NORDENSKIÖLD (S, U); Isfjorden: Cape Thorsen WILANDER & NATHORST (S, U), do THORÉN (S, U), do NATHORST (S, U, H), do ANDERSSON & HESSELMAN (S); do JØRGENSEN (S), Nordfjord WILANDER & NATHORST (S); Mimersdal NATHORST (S); Advent Bay NATHORST & WILANDER (G); Hjorthamn LAGERKRANZ (S); Advent Bay JØRGENSEN (U), do ASPLUND (S, U, G); Skansbay KJELLMAN (S, U); Skansberget BJÖRLING (S); Wijde Bay WULFF (S, L).

E. Greenland. Muskoxefjord GREDIN (U), SEIDENFADEN (Copenh.); Ymer I. and Cape Hedlund SØRENSEN (type 3) (Copenh.); Jordanhill SEIDENFADEN (Copenh.); Mackenzie Bay 1900 (U, collector not given); Clavring I. SØRENSEN; type 5 pro parte (Copenh., Herb. HULTÉN); Sabine I. DUSÉN (S); Cap Borlase Warren DUSÉN (S).

W. Greenland. Sarkardlek BJÖRLING (S); Manetsok BJÖRLING (S); Tasiusaq KRUSE (U); Disco FRIES (U), KLEIST (S, U), EKMAN (S), LAGERKRANZ (S, U); Jacobshavn BERGGREN (S); Nugssuaq LANGE (G); Atanekardluk FRIES (U), EKMAN (S); Kisengiartak BERLIN (S); Umanak HOLBOELL (Copenh.), ENANDER (S), PORSILD & PORSILD (S); Prøven BJÖRLING (S, G); Zilertingnaq ENANDER (S pro parte).

America. Alberta Banff McCALLA (U. S. Nat. Herb.); »Rocky Mountains» BOURGEOIS (S); Wyoming Albany co: Telephone Mines NELSON (Gray Herb.); Utah: Mount Barette RYDBERG & CARLTON (Gray Herb.).

This plant is closely related to *P. nivea*, but it has a more decumbent growth and leaves with long teeth, at the base of the leaflets often reaching nearly to the midrib. It is very variable and presents a multitude of forms. The leaves are often trifoliate, but all transitions to five-foliate leaves frequently occur although it is very rare for all leaves of a specimen to be five-foliate and I am unable to distinguish the quinate-leaved specimens as a distinct species, although they have a very striking appearance. Such quinate-leaved specimens seem to

occur within the entire area of the type as well in Finland as in Spitzbergen, on Greenland and in W. America. Reports in literature prove that similar types also occur fairly frequently in Arctic America, although my material is too small to prove this. In the map of the distribution (fig. 8) such reports are marked with open rings in order to afford a better picture of the actual area of this type. The plant is illustrated in fig. 1 c.

The question of the oldest name for this plant is not easy to settle. The name *Potentilla prostrata* was given to a Greenland plant of the *P. nivea* affinity by ROTTBOELL as early as in 1770. ROTTBOELL at the same time gives a plate of what he calls *P. nivea*. This picture evidently represents *P. Chamissonis*. His *P. prostrata* is thus not that plant but either the real *P. nivea* or the plant now under discussion, seeing that, to my knowledge, only these three major types are present in Greenland. In the herbarium of Copenhagen only one specimen is preserved, which ROTTBOELL apparently had in his hands when he described *P. prostrata*, and this is a species in the »Herbarium vivum» collected by PAUL EGEDE ad Christianshaab and Gothaab in 1739. It was kindly sent to me for examination and found to be *P. nivea*. I therefore take *P. prostrata* ROTTB. to be a synonym of *P. nivea* L. as described here, and consider that that name cannot be used for the plant here called *P. nivea* subsp. *subquinata*. As that plant very closely resembles *P. nivea*, merely differing in one leaf-character and as transitional types seem to occur rather frequently in districts where both are present, I prefer to regard it as a major geographical race of that species and take it as a subspecies. It will probably be possible to divide it into several more or less distinct varieties when more material is available.

In spite of the very isolated situation of the localities in northern Finland I can see no essential difference between them and Spitzbergen or Greenland specimens, and I must thus refer them to subsp. *subquinata*.

It should be mentioned that in northern Scandinavia, especially in northern Finland, specimens of the *P. nivea* type occur which have fewer and longer teeth than the *P. nivea* from the southern Norwegian area or from Central Europe. At the same time they are usually small specimens. (Compare fig. 2 c.) They form a transition to subsp. *subquinata* and for the present I am unable to draw any sharp line of demarcation between these groups. They could be given a varietal name, but it is perhaps advisable not to give them a separate name until they

are better understood. In Scandinavia quinate-leaved specimens only were referred to subsp. *subquinata*, although probably some of the above-mentioned group belong here. In one single case I have seen a four-leaved specimen from Sweden. It was collected by BJÖRKMAN at Skajajaure, mt Kårsa in Lule Lappmark. It has one single leaf with four leaflets; the rest are ternate. Possibly it should be referred to subsp. *subquinata*, although in other respects it resembles typical *P. nivea*. In the ample material from southern Norway no single specimen with quinate leaves was seen.

The following specimens may be referred to the above-mentioned variety of *P. nivea* approaching subsp. *subquinata*. Still others form transitions between these and *P. nivea*, as it occurs in the southern Norwegian area.

Finland. Petsamo, Pummanki, Lintupahtaat CAJANDER (Hb. CAJANDER) do HÄYRÉN (H), do Samperinkurun HULKKONEN (H), do N.W. Plateau ERLANDSSON (S); Kuolajärvi, Oulanka AIRAKSINEN.

Sweden. Kvikkjokk: Skaitatstjåkko SELANDER (S), do Kerkevore SELANDER & DAHLBECK (S); Kvikkjokk Mts HOLLSTÉN (S); Njunjevare ALM (S).

Russia. Laponia Imandr.: Norrein Ortsana AIRAKSINEN.

Potentilla nervosa JUZ. In Fl. S.S.S.R. 10 (1941) p. 135, tab. 10, fig. 8 et addenda p. 610.

Potentilla nivea var. *elongata* TH. WOLF in Bibl. Bot. 16 (1908) p. 237 pro max. parte.

Siberia. Ajan TILING (S).

China. Chili: Hsiao-wu-tai-shan: Yang-kia-p'ing SMITH 1102 (U), 1166 (S), do Tien-lin-ssü SMITH 1259 (U, G); Shansi: Ta-wu-tai-shan SERRE A 706 (U), do Chiao-cheng distr.: Yun-ting-shan SMITH 7437 (U, G), do centr. Lu Yah Shan CHIN 8251 (S, U, L); Hupeh Hsi-Ling-shan KING 230 (S), do Kiang-Hsuai-Ho KING 143 (S).

This plant (fig. 2 a) is related to *P. nivea*, but the different construction of the style, which is only very slightly thicker at the base and lacks the basal papillae indicates that it is a distinct species. The leaves are large and long and have more numerous teeth (up to fifteen on each side) than in *P. nivea*. Specimens occur with some of the leaves quinate. I have seen no other material of this species and the identification is made from the description and picture in Fl. S.S.S.R. loc. cit. It is there not reported either from China or from Ajan, but is regarded as endemic in Tian-shan and the Alaïsk mts. Type locality is the village of Sarytash in the Altai valley. Nevertheless it seems evident to me that the above specimens belong to it.

Potentilla sino-nivea nov. spec.

Caudex multiceps, reliquiis fuscis stipulorum vestitus; caules 6—10 cm alti, graciles, erecti vel adscendentes, sparse tomentoso-floccosi; folia radicalia longe petiolata, truncata, caulina breviter petiolata, stipulae foliorum radicalium scariosae, auriculis longis lanceolatis munitae; petioli sparse tomentoso-floccosi; foliola late obovata, sessilia, supra sparse pilosa subtus dense griseo-tomentosa, nervis pilosis, basi late cuneata, 5—10 mm longa profunde serrato-dentata, dentibus utrinque 4—5 angustis. Caules uniflori, floribus magnis circ. 1.5 cm diam., longe pedunculatis; episepala sepalis breviora, oblonge obovata obtusa; sepala deltoidea vel anguste deltoidea, acuta, petala sepalis multe longiora, late obcordata, emarginata, lutea; stamina circ. 20; receptaculum hemisphaericum longe pilosum; styli subapicales, filiformes, epappilosi, stigmatate paullo incrassati.

China: Sikang: Kanting (Tachienlu) distr.: Tapaoshan SMITH 11270 (U, G); Sze-ch'uan: Dongrergo SMITH 3131 (U, type of the species, G), do SMITH 3299 (U).

This little, characteristic plant (fig. 2 b) does not seem to be so closely related to *P. nivea*, the calyx and the style in particular appearing to be somewhat different. It was determined as »*P. nivea* v. *pinnatifida* LEHM. s. str. (= *P. altaica* BGE.)» by HANDEL MAZZETTI. Acc. to JUZUPCZUC in Fl. S.S.S.R. that plant is very obscure and was only collected once. Acc. to him it is possibly the hybrid *P. nivea* × *multifida* and somewhat resembles the latter species. *P. sino-nivea*, on the other hand, does not resemble *P. multifida* and is certainly a good species, as identical specimens were collected at two different places.

Potentilla Hookeriana LEHM. in Add. ad Ind. sem. hort. bot. Hamburg 1849 p. 10 No 16 (not seen) et in Nov. minus cogn. stirp. pugill. nonus add. nov. rec. gen. Potentill. (1851) p. 18.

Potentilla nivea var. *macrophylla* HOOK. in Curtiss' Bot. Mag. N. S. 4 (1830) no. 2982 (non *Potentilla nivea* β *macrophylla* SER. in DC., Prodr. 2, 1825 p. 571).

Verisim. *Potentilla nivea* δ *incisa* et »ε ? *pentaphylla*» TURCZ. in Bull. Soc. Imp. Nat. Mosc. 16 (1843) p. 607. — *Potentilla nipharga* RYDB. in N. Amer. Fl. 22 (1908) p. 332 quoad spec. orig., excl. syn. — *Potentilla Kuznetzowii* JUZ. in Fl. S.S.S.R. 10 (1941) p. 137 sec. descr.

The Urals. Perm prov. Kyshtym vill. (near Jekaterinburg) SIEGFRIED (S).

Siberia. Lower Yenisei R.: Ssopotschnaja Kargá 71° 53' TOLMACHEW (S); »Vallée du Yénissei inférieur 1876» (S); Nikulina ARNELL (G); lower Tunguska ARNELL (S); Stolba BRENNER (S, U); Turuchansk distr.: Medvjedschi Kamen (S); Krasnojarsk ARNELL (S, U); Taimyr, lower Jamu-Tarida TOLMACHEW (S); Olenek R., Ljutscha mts at the sources of Weligna R. CZEKANOWSKI & MÜLLER (U); Olek-

minsk CAJANDER (H); Kirensk NILSSON-EHLE (U, S); »Ircutia» Hb. KÜHLEWEIN (U); Nertchinsk distr., 2 verst below Voskresensk KUZNETSOV (S) »ex regione Jacutiensi» REDOWSKI (S); Verchne-Udinsk ODENVALL (H); Jakutsk NILSSON-EHLE (S); Bulun NILSSON-EHLE (S); Balaganach NILSSON-EHLE (S); Kamtchatka: Tigil RIEDER (S), do Mt Krashenninikof KOMAROV (S), do Mt Kaknan KOMAROV (S).

America. Alaska: head of Chitina R. LAING (Hb Ottawa); Copper Center WENT (L); Klutina R. POTO (Hb Washington); below Rampart MURIE; Deering ANDERSON (Hb HULTÉN); Yukon Carcross EASTWOOD (Gray Herb., Hb Washington); Whitehorse Rapids TARLETON (Hb Washington); »Yukon distr.» ANDERSSON (S); Dry Gulch GORMAN (Hb Washington); Dawson TYRRELL, EASTWOOD (Gray Herb.); Forty Mile Creek FUNSTON (Gray Herb., S); Sheenjek valley MERTIE (Hb Washington); 25 miles below Coleen MURIE (Hb Hultén); Rampart House FUNSTON 180 (Gray Herb., S); Mackenzie distr.: Fort Good Hope ONION, KENNICOTT & HARDISTY (Hb New York, type of *Potentilla nipharga* RYDB.); Victoria Land: Minto Inlet ANDERSON (S).

The exact place where the type specimen of *P. Hookeriana* was found is not known. Its type-locality was given as »Habitat in America Septentrionali». Presumably it originated from Saskatchewan or Alberta. LEHMANN gives a picture of it in Rev. Potentill. pl. 55 and RYDBERG a somewhat different one in his Monogr. N. Amer. Potentill. pl. 33 fig. 1—5. Both these plates show a plant with pilose petioles and the habitus of the plant here in question. As all material from Western America that I have seen has puberulent and pilose petioles, it may be assumed that the type of *P. Hookeriana* also has petioles with such an indument, although this is not stated by anyone who has seen the type. *P. Hookeriana* is often said to be characterized by stiff erect flowering stems and many-flowered dense and congested inflorescence. This seems to be due to the fact that the type illustrated by LEHMANN was a young and not yet fully developed plant with congested inflorescence. His figure tallies exactly with young specimens of the plant enumerated above, and I must take it to belong to *P. Hookeriana* LEHM. which to my knowledge is its first name. A specimen from Alaska is illustrated in fig. 1 e. The type-specimen of *P. nipharga* RYDB. From Fort Good Hope in the Mackenzie distr., which I have seen, also doubtless belongs here. According to the description in Fl. S.S.S.R. the Ural plant described as *P. Kuznetzowii* likewise belongs to this species. *P. Hookeriana* as described here is somewhat variable, although it forms a very close unit. The specimen from lower Yenisei, Sopotschnaja Karagá, collected by TOLMACHEW has only very slightly puberulent petioles and so closely resembles subsp. *Chamissonis* that it might almost as well be referred to that type. Specimens from southern Siberia have as a rule smaller leaves than the northern ones, and it

seems probable that JUZUPCZUK in Fl. S.S.S.R. refers such specimens to *P. arenosa* (TURCZ.) JUZ. characterized by smaller and short-petiolated leaves more pubescent on the upper surface. I cannot, however, find that the specimens enumerated above differ essentially from *P. Hookeriana*. Finally, it should be mentioned that specimens with quinate leaves occur in the material as in most species related to *P. nivea*.

At first I thought that the Scandinavian and Greenland plant of this type could also be referred to the form series of *P. Hookeriana*, but it is evident that specimens from that area differ from the rest in lacking the short puberulence of the petioles, which are only pilose. At the same time such specimens have leaves that are less pubescent above and larger flowers. They thus must form a separate unit, which I take to be a new species but which might possibly also be regarded as a geographical race of *P. Hookeriana*. A map of the areas of these two plants, which together occupy a nearly circumpolar area, is given in fig. 7.

Potentilla Chamissonis nov. spec.

Potentilla nivea L., Sp. pl. ed. 1 (1753) p. 499 pro parte. — *Potentilla nivea* var. *Lapponica* CHAM. & SCHLECHT. in Linnaea 2 (1827) p. 21. — *Potentilla nivea* SØRENSEN in Meddel. om Grønland 101 No. 3 (1933) »type 1» pro parte, Pl. 5 fig. 1—2; »type 4» Pl. 8.

Caudex multiceps, residuis fuscis stipulorum vestitus; caules 20—30 cm alti, erecti, pilis longis mollis vestiti vel subtomentosi; folia radicalia longe petiolata ternata vel rarissime quinate; folia caulina sessilia vel breviter petiolata, inferiora ternata, superiora simplicia; stipulae foliorum radicalium scariosae elongato-ovatae, acutae; petioli pilosi, pilis longis albis $\pm$ strictis $\pm$ patentibus, mollis, foliola obovata, lateralibus sessilia, apicalia saepe sat longe petiolata, grosse serrato-dentata, dentibus utrinque 2—4 longis angustis acutis instructa, superne glabra vel sparsissime et longe pilosa, subtus niveo-tomentosa. Inflorescentia multiflora, floribus longe pedunculatis 1,2—1,5 cm diam; episepala sepalis vix breviora, linearia vel lanceolata, acutiuscula, pilosa; sepalis anguste deltoidea, acutiuscula; petala sepalis vix longiora, obcordata, emarginata, lutea; receptaculum hemisphaericum, longe pilosum; styli subapicales, inferne papilloosi, stigmatibus vix incrassati.

Sweden. Lule Lappmark: Kvikkjokk LAESTADIUS (S); HARTMAN (U); ANDERSSON (S), ALM & REUTERSKJÖLD (L); Njuonjes MÖLLER (S, L), SELANDER (S);

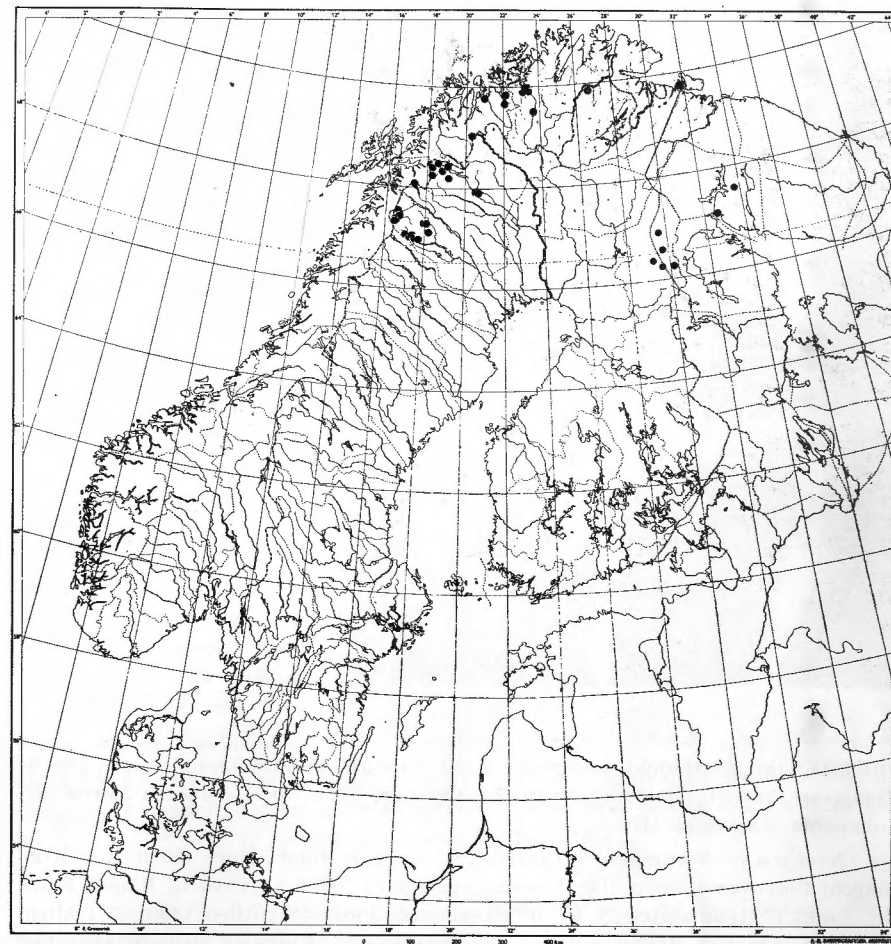


Fig. 4. Scandinavian area of *Potentilla Chamissonis*.

Tarra MÖLLER (S); Tjackeli (collector not given) (L); »Riphja beken» (collector not given [LAESTADIUS]) (S); Lill-Thokin WAHLENBERG (U pro parte), ÄHRLING & BRANDELIUS (S pro parte); Sitasjaure distr.: Ritatjåkko BJÖRKMAN (S); Rischjajocko (?) LAESTADIUS (S, L); Roudnas DAHLBERG (S), HEINRICI (G); Virjaure HOLM (U); Kåtnjunjes, SELANDER & SKOTTSBERG (G); Haddit SELANDER & SKOTTSBERG (G also var. with five leaflets); Säämartjåkko SELANDER & DAHLBECK (S); Kuobberi SELANDER (S); ex alpinis Lapponiae Lulensis WAHLENBERG (S); Njammats LAESTADIUS (S), ANDERSSON (S, L, H, U), CEDERSTRÄHLE (S, U, type collection), ÄHRLING & BRANDELIUS (S, U, G), HEINRICI (S), FREDRIKSSON (S, H), WIDMARK (S), KLEEN (U, L), ALM & REUTERSKJÖLD (L), ROSENDAHL (S), SIMMONS (L), BERLIN (L), ENGSTEDT (S), NANNFELDT (S, U), SELANDER (S). Torne Lappmark: Vittjatjåkko BRUUN (S); Njutum ALM (U); Ropivaara SMITH (U); Sjängeli JOHANSSON (S).



Fig. 5. Petioles of: a. *Potentilla nivea*; b. *Potentilla Chamissonis*; c. *Potentilla Hookeriana*.

BJÖRKMAN (S); Abiskojoek LAGERKRANZ (S); Vassitjåkk HOLMBERG (L pro parte); Njunjevare ALM (L); Paddos LEVAN (L); Ortovare ASPLUND (U); Peldsa SMITH (S); Koltapahta MALMBERG (H).

Norway. Nordreisen SELANDER (S); Lyngen: Guolasjaure NOTØ (L); Kvænangen: Corrovarre NOTØ (L); Kvænangen: Slaaro NOTØ (U); Alten: Raipas FRIES (U), FRIES & HENRIKSSON (S, G), do Skaadavara FRIES (S); Alten LUND (S); Alten: Sakkobani FRIES & HENRIKSSON (G), HENRIKSSON (S), FRIES (U, H), ZETTERSTEDT (U, L), KROOK (S); Habatluoppakke (near Macé) MÖRNER (U).

Finland. Enontekis Skadjajaure LINKOLA (H); Kaltapakta MALMBERG: Pikku Maattivuona CAJANDER (H), HÄYRÉN (G, H); Petsamo Yläluostari HÄYRÉN (H); Petsamotuntari — Pääskypahdan CAJANDER (H); Kuolajärvi AIRAKSINEN (H); Nivajärvi RANTANIEMI (H); Apajärven PESOLA (H); Kuusamo: Paanajärvi NYBERG (H), SILÉN (H), SAHLBERG (H), HIRN (H), MONTELL (S, G, L, H), RUORANEN (H), BACKMAN (S, H), BROTHERUS (H), BRENNER (H), PESOLA (H), FORTELIUS (H), MALMIÖ (G, H); Oulankajoki BACKMAN (H); Avenajoki PESOLA (H); Kitkajoki BROTHERUS & WRIGHT (H); Utsjoki: Kevujoki EKWALL (G).

Russia. Seredna MALMBERG, (S, U, H); Mt. Sheljesna BROTHERUS (H); Hibinä SELIN (H); BROTHERUS (H).

Spitzbergen. Bel Sound NORDENSKJÖLD (S); Adventbay ASPLUND (U); Cape Thordsen NATHORST (S, U), GYLLENCREUTZ (U); Wijde Bay EATON (U). WULFF (U, L).

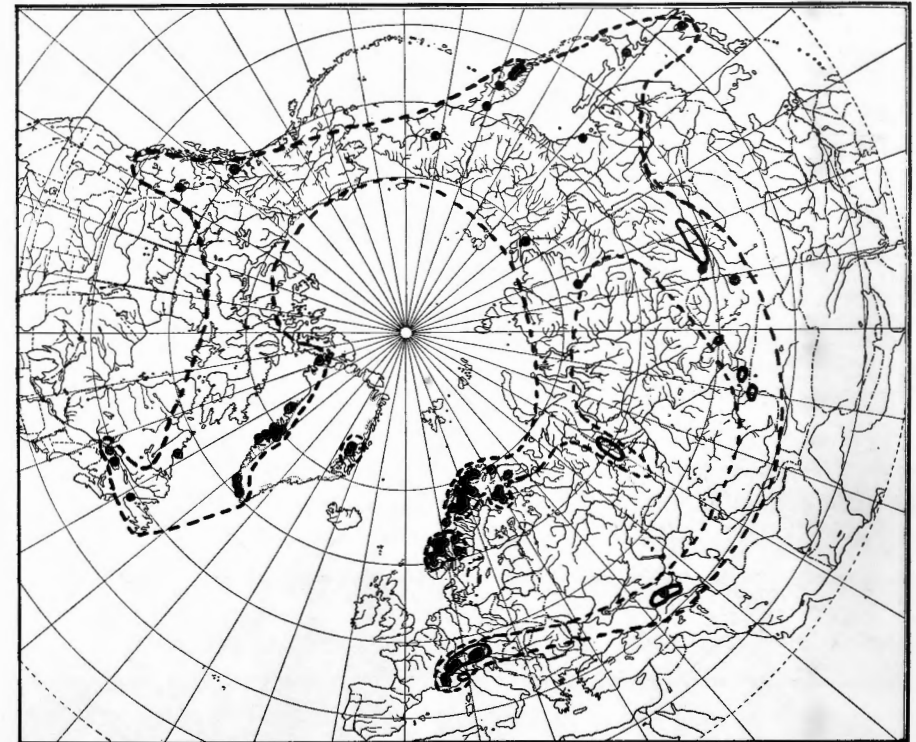


Fig. 6. Total area of *Potentilla nivea*. Dots: specimens seen; open rings: reports in literature. A spaced line surrounds the arctic-montane area of this species. Gaps are doubtless found in that area.

Quebec. Hudson Strait: Wakenham Bay MALTE (S, L), do Digges I. BELL (U); Port Harrison MALTE (H, Hb. HULTÉN).

W. Greenland. Sukkertoppen WORMSKJÖLD (H); Arfersiorfik Fjord PORSILD (S, U, unusually small variety); Manertook BERLIN (S); Anuleitsivik Fjord BERGREN (S); Christianshaab VAHL (Copenh.), MATHIESEN (Copenh.). Disco FRIES (U), PEDERSEN [PORSILD] (U, Gray Herb.), EKMAN (S), LAGERCRANZ (S, G); Sofiehamn BERLIN (S); Kutdligssat ANDERSON (G); Atanekrdluk FRIES (G); Kangek BJÖRLING (S); Umanak HOLBOELL (Copenh.); Risek (Gray Herb.), THALBITZER (H); Cape York PULLEN (S); Foulke Fjord SIMMONS (L).

E. Greenland. Scoresby Sound HAGERUP (H); Trail I. SØRENSEN (Copenh.); Röss Fjord SØRENSEN (Copenh.); Strindberg Penins. SEIDENFADEN (Copenh.); Kjerulfs Fjord VAAGE (G); Jackson I. »Germania» exp. (S); Myskoxefjord GREDIN (S, U, H); Mackenzie Bay GREDIN (S); Hurry Inlet NATHORST (S); Clavering I. GELTING (Copenh.).

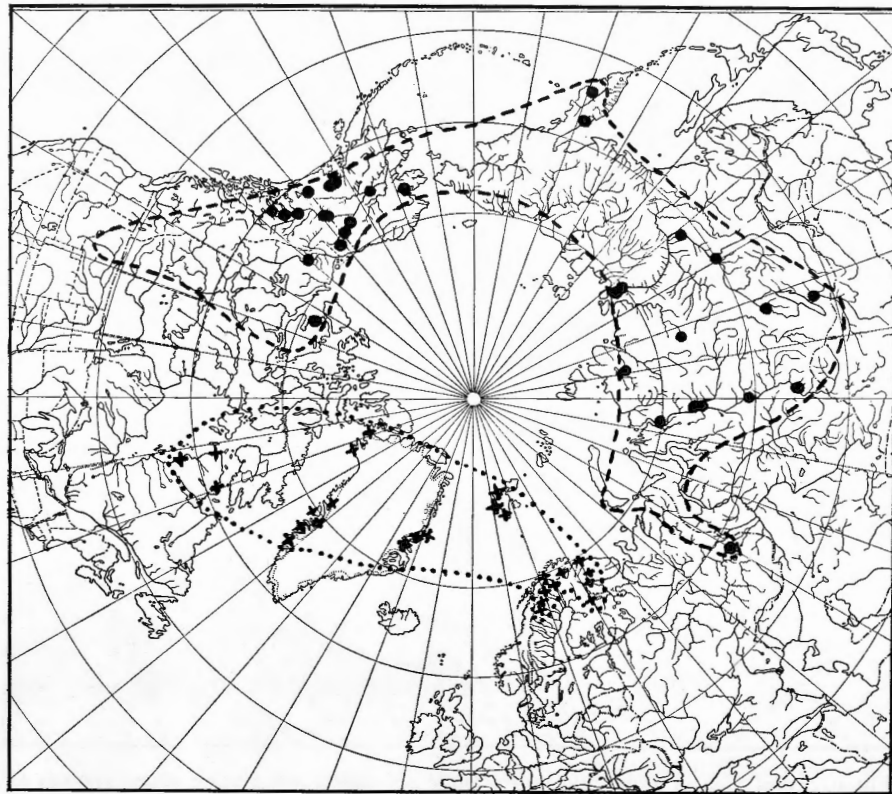


Fig. 7. Crosses: specimens of *Potentilla Chamissonis* seen; a dotted line surrounds the area of *Potentilla Chamissonis*; dots: specimens of *Potentilla Hookeriana* seen; a spaced line surrounds the area of *Potentilla Hookeriana*.

var. *umanakensis* nov. var.

Foliola maxima, longa, utrinque dentibus longis 4—6 instructa, medium longe petiolatum.

Nugssuaq LAGERCRANZ (S); Qáersut PORSILD (S); Kisengiartak BERLIN (S, U); Umanak EKMAN (S), LAGERCRANZ (S, G, type of var. *umanakensis*).

CHAMISSO seems to have been the first to realize that this plant was different from *P. nivea*. He called it »*P. nivea* 1) *Lapponica*» and took it to be the typical *P. nivea* of LINNAEUS. It is not impossible that this view is right, as in Sp. pl. ed. 1 LINNAEUS gives the area of his *Potentilla nivea* as »Habitat in Alpibus Lapponiae, Sibiriae» but says two years later in Flora Suecica ed. 2 p. 179 that the Lapland plant has

larger leaves more glabrous above than that collected in Siberia. This seems to indicate that his Lapland plant is the one here under discussion but that his Siberian specimens belong to *P. nivea* as described here. Compare also the discussion under *P. nivea*. CHAMISSO took what is here regarded as *P. nivea* sensu strictu to be »*P. nivea* 2) *Vulgaris*». It might be consistent to accept CHAMISSO's name *lapponica* for the new species, but as that name is already occupied I call it *P. Chamissonis* in honour of the famous botanist who first noticed that it was different from *P. nivea*. It is illustrated in fig. 1 d. One might suspect that the plant described as *P. nivea* var. *Kuznetsowii* GOWOR. (Fl. Ural., 1932 p. 532 [not seen]) and later taken to be a species *P. Kuznetsowii* by JUZUPCZUK in Fl. S.S.S.R. 10 (1941) p. 137 is the same plant. The description of *P. Kuznetsowii* in Fl. S.S.S.R. says, however, that the petioles are covered with »not dense felt mixed with thin and soft mostly upright-patent straight hairs» (translated from the Russian text). This fits *P. Hookeriana* but not *P. Chamissonis*. Furthermore, the single specimen of this group seen by me from the Urals belongs to *P. Hookeriana*.

P. Chamissonis grows in northern Scandinavia as well as in NW Greenland together with *P. nivea*. The best characteristic differentiating them is, as seen from the key, the indument of the petioles. In scarcely any descriptions of *P. nivea* is this characteristic mentioned, but instead the pubescence of the leaves, which can be about the same in the two types. *P. nivea* has tomentose petioles with floccose curly hairs, while *P. Chamissonis* has pilose petioles with long straight or slightly wavy hairs. (Compare fig. 5.) This difference is especially easily observed in young specimens, where the indument is in both cases denser, becoming thinner as the organ extends. If the northern Scandinavian material of the *P. nivea* type is separated into two groups on account of this characteristic it is easy to see that other properties of the two groups also differ. The group with tomentose petioles here regarded as *P. nivea* is, on an average, of lower growth, although specimens from low altitudes are sometimes fairly high-grown, it has elliptical leaflets and sessile apical leaflets with usually 4—7 short, rounded teeth on each side, elliptical outer sepals, broad and short acuminate stipules and large flowers, although there is a wide variation in the latter respect. The group with pilose petioles is usually fairly high-grown and has obovate, usually larger, leaves with long cuneate base and usually 2—4 large, acute, long and broad teeth

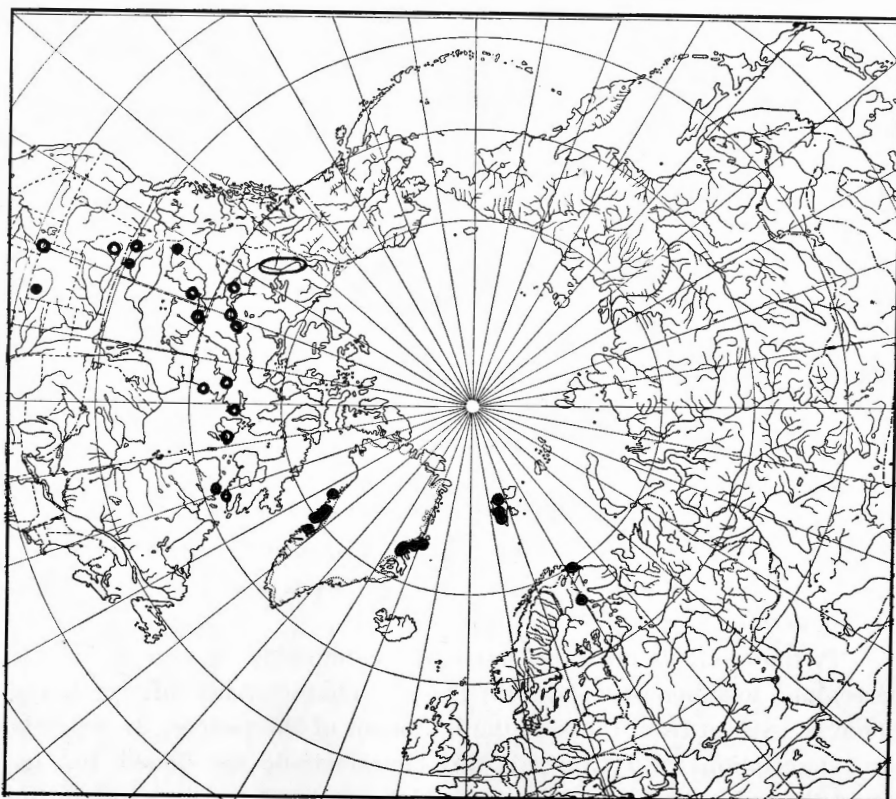


Fig. 8. Area of *Potentilla nivea* subsp. *subquinata*; dots: specimens seen; open rings: reports in literature.

or lobes on each side, narrower outer sepals, more long acuminate stipules and, on an average, somewhat smaller flowers.

The differences are thus fairly large, and as a rule there is no difficulty in deciding to which group a given specimen should belong. As the two types are only rarely found on the same sheet it may be presumed that they occupy ecologically different habitats. Very rarely do specimens with quinate leaves occur, as is apparently the case with most species of the *P. nivea* group except in *P. nivea* itself, where it was never seen.

Finally, it may be mentioned that Professor A. MÜNTZING, Lund, collected a *Potentilla* at Njammats in Lule Lappmark which was cultivated at Lund and which proved to be *P. Chamissonis*. It has 77 chromosomes, while the *P. nivea* of northern Scandinavia probably has 56

chromosomes. This seems to indicate that *P. Chamissonis* is pseudogamic.

In a few cases, however, specimens with the general appearance of *P. Chamissonis* or with a slight tendency towards *P. nivea* occur which have traces of tomentum on the petioles, especially towards their distal ends. Such specimens are:

Sweden. Lule Lappmark: Sitasjaure distr., Ritatjåkko BJÖRKMAN (S); Suorva dist.: Jollmapakte BJÖRKMAN (S); Torne Lappmark: Sjangeli JOHANSSON (S), BJÖRKMAN (S); Riksgränsen-Njutum ERDTMAN (S); Njutum ALM (U); Ortovare ASPLUND (S, U).

The nature of such forms — whether they are hybrids, aberrant biotypes or something else — might be ascertained by cultivation and cytological investigation.

A map of the Scandinavian area of *P. Chamissonis* is given in fig. 4.

Potentilla uniflora LEDEB. in Mém. Acad. Sc. St. Petersb. 5 (1815) p. 543.

»*Potentilla nivea* 4) *Arctica*». CHAM. & SCHLECHT. in Linnaea 2 (1827) p. 21. — *Potentilla villosa* γ *uniflora* LEDEB., Fl. Ross. 2 (1844) p. 58. — *Potentilla nivea uniflora* RYDB. in Bull. Torr. Club 23 (1896) p. 303.

P. uniflora (fig. 2 d) is characterized by large flowers, mostly single-flowered stems, greenish-grey tomentum on the lower surface of the leaves and leaflets with 2—3 deep acute teeth on each side of the leaflets. Specimens occur which, so far my present knowledge goes, can only arbitrarily be separated from *P. Vahlia*, which has the lower surface of the leaflets covered with long silky, somewhat yellowish, hairs with or without a tomentum at the bottom. *P. Vahlia* seems to me to be merely the arctic race of the montane *P. uniflora*. *P. uniflora* occurs in Eastern Siberia from the mouth of Lena R. to Chukch Penins. and Kamtchatka, in America in the mts from Alaska to Oregon and Colorado.

Potentilla Vahlia LEHM., Monogr. gen. Potentillarum (1820) p. 172.

? *Potentilla nivea* β R. BR. in Suppl. to Appendix Parry's Voy. (1824) p. CCLXXVII. — *Potentilla nivea* γ TORR. & GRAY, Fl. N. Amer. 1 (1838—40) p. 441 pro parte. — *Potentilla nivea* var. *Vahlia* SEEMANN, Bot. Voy. Herald (1857) p. 29. — *Potentilla nivea* var. *hirsuta* DURAND in Proc. Acad. Philad. 1863 p. 94 sec. Rydb.

For differences from *P. uniflora* see under that species. *P. Vahlia* is distributed from Wrangel I. and easternmost E. Siberia over W. and N. Alaska, Melville I., Ellesmereland and Baffin Land south to N. Hudson Bay, also in N.W. Greenland.

Potentilla rubricaulis LEHM. Nov. stirp. Pugill. 2 (1830) p. 11.

Potentilla subquinata Pedersenii RYDB. in Bull. Torr. Club 28 (1901) p. 182 sec. spec. originale. — *Potentilla Pedersenii* RYDB. in N. Amer. Fl. 22 (1908) p. 332. — *Potentilla nivea* SØRENSEN in Meddel. om Grønland 101 No. 3 (1933) »type 5» pro parte Pl. 9, saltem fig. 1, et Pl. 10.

P. rubricaulis has caudex with light-brown stipules, leaves strongly villous on both sides cleft similarly to *P. nivea* subsp. *prostrata*. The styles are broader below and more papillate than in the other species treated here. It is distributed from the N. shore of Mackenzie distr. over Melville I., Ellesmere Land to Apokak I. in Hudson Straits south at least to 66° N. at Great Bear Lake (type locality) and N. Hudson Bay, also in N.W., N. and N.E. Greenland.
