

SOME VASCULAR PLANTS FROM
SAGHALIN

COLLECTED BY

DR. LUDV. MÜNSTERHJELM

IN 1914

BY

HENRIK PRINTZ

WITH 4 PLATES

DET KGL. NORSKE VIDENSKABERS SELSKABS SKRIFTER 1916. NR. 3

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In the course of an expedition to Saghalin in the summer of 1914, the Finnish zoologist Dr. LUDV. MÜNSTERHJELM also collected a number of vascular plants, and at his request, I undertook to go through the material. Saghalin, the flora of which is up to the present comparatively little known, affords a rich and interesting field of work in botanical respects. Not only does the island form a link between the continental Asiatic flora and that of Japan, as pointed out by MAXIMOWICZ in his »*Primitivæ floræ amurensis*«, but it was noted already by FR. SCHMIDT, that very many of the species found there differ in various respects from the typical form. This is evident from all the morphological remarks concerning the different species in his »*Flora sachalinensis*« (Reisen im Amur-Lande und auf der Insel Sachalin in Memoires de l'Academie Imperial des Sciences de St. Petersburg, VII Ser. Tome XII, No. 2, St. Petersburg 1868). It has thus long been known, that a considerable number of plants found in Eastern Asia, especially Manchuria, also occur in Saghalin, but under slightly differing forms, as closely related species or varieties. These tracts were, as we know, during a former geological period, connected up with North America into one great united territory, doubtless with a certain continuity in the character of the vegetation, as is apparent from the finds of early tertiary plant-remains and coal-deposits, separation, however, subsequently taking place during the latter portion of the tertiary period. Thereafter, each of the separate regions thus created developed, owing to climatic or other conditions, a series of floristic types peculiar to itself.

Unfortunately, Dr. MÜNSTERHJELM's collection of vascular plants from the island was not very extensive, comprising in all but 89 sheets with a total of 47 species and varieties.

All the species were collected near the village of Sakachama, at the southernmost end of the island, during the months of May—July 1914. The following notes as to the general character of the vegetation are for the most part based upon information kindly furnished by the collector.

As the latest work upon the flora of the island I may quote that of KINGO MIYABE and TSUTOME MIYAKE »*Flora of Saghalin*«, published by the Government of Saghalin, March 1915. (In Japanese).

The village of Sakachama lies about 47° N. lat. on the shore of the Sea of Okhotsk. During the period of Russian occupation it was called Dobuki. The inhabitants are almost exclusively fishermen. The village itself lies on a large sandy heath, but its surroundings are for the most part humus swamps.

The climate here, as throughout the entire southern portion of the island, is cold and damp. Generally, the coast is ice-bound right down to the middle of May, and during the whole of this month snow is found here and there even in the lowlands.

All through May and June the weather is damp and cold, with an extraordinarily abundant rainfall; July, on the other hand, is warm and comparatively fine, as also August and the first half of September. Then rain sets in again and continues abundant until frost and snow return.

Despite the comparative severity of the climate, however, vegetation is fairly luxuriant, in some places remarkably so, and with a southerly character.

According to their nature the most important of the societies of plants in the area investigated may be thus divided into different groups:

- I. The Sea Shore.
- II. Swamps and Lagoons.
- III. Rivers and Streams.
- IV. Swampy fields.
- V. Pasture land.
- VI. Lowland forest region.
- VII. Highland forest region.

These societies may be further shortly described as follows:

I. The Sea Shore. The entire coast outside Sakachama is more or less uniform in character; its extreme seaward portion is formed by a flat sandy strand some 20—50 metres broad, for the most part washed by the waves at high water, and bounded on the landward side by a sandbank of more or less considerable thickness. The shore here is largely bestrewn with driftwood, wreckage and detached sea-weed.

Immediately inside this belt lies a stretch of dry sandy heath varying in breadth, which should most properly be included under this head. Here we encounter far extended growths of *Acer Mono*, *Quercus* and *Crataegus* species, *Betula alba*, *Pinus pumila*, *Rosa rugosa*, etc. with a rich undergrowth of various species of *Carex*. The bush is interspersed with open spaces of varying extent, bearing for the most part different species of *Carex*, *Empetrum nigrum*, *Vaccinium vitis idaea* and *Cladonia*.

This locality is bounded on the inner side by a zone of *Abies sachalinensis*, *Larix sibirica* and *Betula alba*, which form a frontier between it and the mighty swampy fields farther inland.

II. Swamps and Lagoons. All the swamps in the vicinity of Sakachama are richly overgrown with various *Carex* and *Scirpus* species, *Juncus* and water-lilies, the shores having a dense growth of various *Carex* species. In these swamps there are as a rule small hillocks also bearing the above named plants, and here and there clumps of floating mud with no visible vegetation.

The lagoons occur mostly as isolated pools in the immediate neighbourhood of the sea shore; the banks are high and dry, generally with thickets of *Rosa rugosa*. SCHMIDT (l. c. p. 83) considers these lagoons as being old sea bays, which have been gradually cut off from the open water by the forming of sand-banks across their mouth. In course of time, the lakes thus formed become overgrown with vegetation, forming those swampy hollows just inside the shore which are so abundant on the island. The water in these lagoons is clear, and, as a rule, poor in vegetation.

III. Rivers and Streams. The larger rivers, as for instance, the Naibutski, flow between high sandy banks, partly begrown with various conifers, such as *Larix sibirica* and *Abies sachalinensis*, and with an undergrowth of *Empetrum nigrum*, *Vaccinium vitis idaea* and *Myrica gale* var. *tomentosa*; in other parts, the riparian vegetation consists of various foliferous trees, chiefly *Ulmus campestris* var. *laevis*, *Salix Caprea*, *Quercus* species and with an extraordinarily dense undergrowth, chiefly of *Urtica*, various lilies etc. Some of the plants here often reach the height of a man, and form thus an almost impenetrable wilderness, which renders progress difficult. The vegetation is here so dense, that the sunlight never penetrates to the soil. In such places, moreover, small streams and pools abound, with an luxuriant growth of aquatic plants, at times covering them almost entirely.

The nature of the streams varies with that of the country around. In the lowlands they are richly overgrown with aquatic plants, such as *Carex*, and the like; on the banks, many different shrubs abound, of which *Betula alba*, various *Salices* and *Quercus* being most richly represented. On dryer ground, they are generally surrounded by a luxuriant growth of *Myrica gale* var. *tomentosa*, single pines (*Abies sachalinensis*), birch (*Betula alba*) and larch (*Larix sibirica*).

IV. Swampy Fields. The vegetation of the swampy meadows consists mainly of various species of *Carex*, with here and there small patches of *Rubus chamaemorus* and *Rubus arcticus* var. *grandiflorus*. On very swampy ground we find tufts of rush and other aquatic plants with several species of lilies etc.; there are also some few trees in the fens, mainly *Larix sibirica* and large continuous fields of *Vaccinium uliginosum* and *Carex*; the water forms in places pools of greater or less extent, either with a rich abundance of aquatic plants, or clear, with mud bottom, and no particular vegetation. In some of the mossy meadows on the higher sites, dwarfed specimens of *Abies sachalinensis* and *Larix sibirica* are frequently found. The surface of the soil is here generally found to be covered by *Sphagnum*, with *Rubus chamaemorus* and *Vaccinium uliginosum*. Here and there little mounds exhibit a growth of small *Salix*- and *Betula nana*-bushes, and not infrequently *Empetrum nigrum*. In very swampy localities *Hippuris* and other marsh growths are also found, besides various *Carex* species.

V. Pasture land. This locality is lying in the immediate vicinity of the village. It is a sandy heath, closely overgrown with small trees and shrubs such as *Betula alba*, *Ulmus campestris* var. *laevis*, *Populus suaveolens*, *Quercus*, *Acer*, *Prunus Padus*, *Crataegus*, *Larix sibirica*, *Pinus*, etc. and with an undergrowth of *Hypnum* and *Cladonia* for the most part, in addition to *Empetrum nigrum* and *Vaccinium vitis idaea*. Where the soil is somewhat moister, in hollows and the like, *Abies sachalinensis* is also found. A good many years ago, these grounds were devastated by fire, and in consequence, we now find tracts of more or less considerable extent with a fairly luxuriant vegetation, mainly consisting of various species of *Carex*. Throughout almost the whole of this area charred and mouldering remains of tree trunks lie scattered about, and numbers of dry trees, now for the most part broken, are everywhere to be seen.

VI. Lowland forest region. This may be divided into three categories, all rather sharply distinct as regards vegetation.

A. The foliferous tree tracts consist for the most part of *Ulmus campestris* var. *laevis*, a few *Betula nana* and *Populus suaveolens*. These localities, which have an extraordinarily luxuriant undergrowth of all kinds of herbs, are found for the most part on moist ground watered by rivers and streams.

B. The Larch forrests (*Larix sibirica*) are of high growth and almost entirely free from admixture with other trees. The

undergrowth consists chiefly of *Myrica gale* var. *tomentosa* averaging about 1 metre high. The soil is here swampy.

C. The Pine forests. (*Abies sachalinensis*). These are as a rule extremely dense, shutting out all light from the soil, which accordingly bears, as a rule, little else beyond moss and lichens.

A great part — the major portion, we may say, — of the forest on the island has been harried by fire, and such places are practically impenetrable owing to the tree trunks, large and small, which have fallen wholly to the ground or interlaced, in a chaotic disorder which renders it impossible to force a way.

VII. Highland forest region. The hills are, as a rule, covered only with pine (*Abies sachalinensis*). In places where in earlier times fires have taken place however, we find, in addition to the later growth of young pine, immigrant birch and mountain ash (*Sorbus aucuparia* var. *japonica*), these being, at any rate in places, very densely packed. The ground is here for the most part grassy, with occasional patches of moss and lichen.

Enumeration of the Plants.

Pinaceae LINDLEY.

Pinus pumila REGEL.

In full flower 26 May.

On dry sandy spots near the sea.

Juncaceae VENT.

Juncus balticus WILLD. var. *Haenkei* BUCH.

On wet meadow land. Young flowers 6 June.

Luzula campestris DC. var. *capitata* MIQ.

Specimens in flower 22 June. Moorland.

Cyperaceae ST. HIL.

Eriophorum vaginatum L.

Flowering specimens taken 21 May in swamps.

Carex longerostrata C. A. MEY.

Specimens almost past flowering and in incipient fruit formation taken 20 June on sandy heath and between 19—21 June on sandy heath and moorland.

Carex amblyolepis TRAUTV. ET MEY.

Specimens in bud and with fully opened flowers taken on sandy heath 20 June.

Carex Lyngbyei HORNEM.

Specimens taken in wet meadow, in full flower 6 June.

Carex sparciflora (WAHLENB.) STEND.

In full flower 27 May. Wet meadow land.

Carex nervata FR. ET SAV.

Past flowering, with some half-ripe fruits 22 June. Moorland.

Gramina ASCHERS. ET GRAEBN.

Poa viridula PALIBIN.

Young plants, not yet fully grown, 21. June. On moorland.

Hierochloë odorata (L.) Wg. var. **sachalinensis** nov. var.
Tab. nostr. I.

Caulis 30—40 cm. altus, teres sulcatus glaber. Vaginae leviter inflatae teretes sulcatae et pilis tenuibus longis deorsum directis dense vestitae. **Folia** culmorum steriliū elongata, longitudinem culmi floriferi vulgo fere aequantia, linearia, vulgo circiter 3 mm. rarius ad 7 mm. lata acuminata teretia utroque latere et marginibus scaberrima, neque vero pilosa. Folia omnia culmorum floriferorum laminae recte evolutas, vulgo 3—6 cm. longas et 5—7 mm. latas, habent. **Schedula** vulgo 2—4 mm. longa. **Panicula** satis brevis et lata 5—8 cm. longa et 3—5 cm. lata erecta valde densiflora et aliquantum contracta. **Pedunculus** paniculae teres glaber virgatus ramis lateralibus teneris vulgo flexuosis. **Spiculae** longae. **Glumae** fere aequales, 5—7 mm. longae, paleis multo longiores, apice acuminatae, vulgo aliquantulum recurvatae, membranaceae, pulchre argenteae basi viridi et circiter 1.5—2 mm. paleas superant. **Glumae** uno nervo dorsali perspicuo apicem versus sensim evanescente et duobus brevioribus lateralibus glumis ipsis quarta parte brevioribus praeditae. **Paleae inferiores** fuscae cymbiformes nitidae laeves raro pilis singulis sparsis vestitae vel levissime verruculatae sive punctatae, margine vero dense et longe ciliatae, nervis 3—5 levibus praeditae. **Nervus dorsalis**, nervorum validissimus alterius vel utriusque glumae interdum in aristam perbreven tenuem et oculo non armato vix conspicuam excedit, saepe leviter granulatus. **Paleae superiores** tenuissimae fere membranaceae manifeste bicarinatae et in carina serie pilorum sparsorum brevium praeditae, apice leviter acuminatae vel prope scissae, unde bifidae fiunt. **Paleae flosculi hermaphroditi** fuscae laeves apice tantum interdum sparse longe pilosae, et haud perspicue nervosae. **Apex flosculi hermaphroditi** numquam altitudinem flosculorum binorum masculorum adaequat, vulgo circiter 1 mm. humilior.

Hierochloë odorata (L.) Wg. is a widely distributed species, found under somewhat varying forms throughout almost the

whole of the cold and temperate zones of the northern hemisphere. From Eastern Asia *Trinius* has described a species *H. dahurica* or *H. glabra*, which is distinguished by the extreme shortness of its stem, with very few flowers in the panicle, considerably smaller spikelets (as a rule 2.5—3.5 mm. long), very short glumes with smooth, or at any rate only slightly dotted, pales save for the margin, which is long-haired, and with hairy sheath.

Despite the differences observable between this *Hierochloë* in its typical form for Eastern Asia and the typical European form, of *H. odorata*, I must nevertheless agree with KOMAROV (*Flora Manshuriae*, Vol. I, Pag. 264) in classing it only as a special form under *H. odorata*. With a large amount of material, it has proved impossible to draw a sharp limit between them, as I had occasion to convince myself of in dealing with the specimens I have observed in Siberia. The Asiatic forms of this species are on the whole distinguished from the European species by possessing, to a greater or lesser degree, the very qualities which mark *H. dahurica* as distinct from *H. odorata*, particularly in having, on an average, the panicle less close, with the branches more spread out. My Siberian material of this species, which I collected in the Minusinsk district, presents, as a matter of fact, distinct transition forms between the two, both as regards the structure of the single spikelets and in that of the panicle and vegetative shoots.

The fairly extensive material of this species collected by Dr. LUDV. MÜNSTERHJELM in Saghalin differs in several respects so considerably from the usual forms, both European and Asiatic, of the species, that I have considered it right to class it as a special variety. It is particularly characterised by its high, strong growth, and in having all the leaves on the flowering stem with fully developed lamina, as a rule 3—6 cm. long and 5—7 mm. broad. The leaf-sheathes are round and grooved, closely beset with long white downward-pointing hairs. The leaves, both on the barren and the flowering shoots, are very rough, the upper as well as the under side being furnished with short, sharp spines, but no hairs.

The panicle is short and broad, very rich, the branches short and somewhat closed. The spikelets are very large. The glumes are of equal length, 5—7 mm., and always considerably (1—2 mm.) longer than the florets. They are gradually tapering towards the apex and as a rule here somewhat recurvate, membranous, of a fine shining silvery grey colour with distinct green base; they are furnished with one marked median vein, which disappears gradually towards the top, and two shorter lateral veins. The pales are smooth, save for the margin and the point of the per-

fect floret, which is beset with long hairs. The perfect floret never reaches as high as the two male florets; as a rule it is abt. 1—2 mm. shorter.

Var. sachalinensis is thus distinctly divergent from the usual East-Asiatic form, *Hierochloë dahurica* or *glabra*, in its large, coarse growth, the strongly developed leaves on the fertile stem, the very closed and rich inflorescence, which is not expanded, but as a rule compressed, and further by the large spikelets with the glumes 1—2 mm. longer than the pales.

In contrast to the European form, which it somewhat resembles in point of habitus, it is distinguished — apart from the well-developed leaves on the fertile shoots — by its smooth pales only the margin of which is hirsute, and the close, long hairs of the sheath, which are distinctly downward-pointing. With regard to this last character, by the way, I have in the collections of this species at the University of Christiania found some few specimens from Norway with distinctly, albeit not very prominently hirsute sheath, a feature which is said to have proved constant for the latter on cultivation. In these Norwegian specimens, moreover, the leaves were fairly markedly long-haired on the upper side, which is not the case with *var. sachalinensis*. The leaves of the latter, on the other hand, are distinctly rough, both on the upper and under side, being beset with series of fine spines.

Found in a moist meadow, where specimens with young flowers were collected on the 27th May.

Liliaceae DC.

Hemerocallis Middendorffii TRAUTV. et MEY.

In full flower 3 July. On dry sunny hills.

Lilium davuricum K. GAWL.

In flower 3 July. On dry sunny hills, together with the last mentioned.

Fritillaria camtschaticensis K. GAWL.

Flowering 21—26 June. On the sea shore.

Polygonatum humile FRISCH.

In bloom 15 June. By moist meadows.

Gagea lutea K. GAWL.

In full bloom 21 May, in moist meadow.

Trillium obovatum LEDEB.

With young flowers 25 May. In shady swampy spots near banks of streams.

Majanthemum canadense DESF.

This species is usually noted, as for instance in the previously mentioned work on the flora of Saghalin by MIYABE and MIYAKE as a variety of *Majanthemum bifolium* FR. SCHMIDT but differs nevertheless so distinctly from the form in question that KOMAROV is certainly right in recording it (*Flora Manshuriae* Pag. 474) under DESFONTAINE'S primary name. Besides being of coarser growth, it has larger, entirely scentless flowers with distinctly recurvate petals. The leaves are also thicker, fleshier, and more glistening.

In bud and flower 19 May. At moist places.

Orchidaceae JUSS.

Orchis aristata FRISCH.

In full bloom 21 June. In moist thicket.

Caryophyllaceae TORR. et GRAY.

Stellaria radians L.

Flowering and with buds 3 July. In meadows.

Moehringia umbrosa BUNGE var. *nitida* nov. var.

Tab. nost. IV, Fig. A.

Caulis humilis 6—8 cm. altus tener, at tamen rigidus tenuis teres rectus erectus (neque curvatus flaccidus neque ascendens) vulgo simplex pilis plus minus densis brevibus curvatis deorsum directis vestitus, colore suffusco vel saepe rubello.

Folia semper sessilia anguste ovalia adulta vulgo 7—10, raro ad 12 mm. longa et 2.5—4 mm. lata. Lamina uno nervo dorsali, rarius etiam duobus lateralibus nervis conspicuis, praedita. Folia erectissima semiamplectentia margine integro aliquantum revoluto et sicut nervis paginae inferioris pilis brevibus aduncis firmis ad basim folii directis vestito. Pagina inferior folii de cetero glabra, superior e contrario plus minus dense pilosa et siccata utique punctata. Flores vulgo singuli, raro bini. *Pedunculi* tenues erecto crassi numquam flaccidi et vulgo tam breves, ut flos apicem foliorum summarum vix superet, vulgo bracteolis binis parvis cymbiformibus carinatis secundum nervum medium pilis brevibus aduncis obsitis, praediti. Bracteolae tamen saepe desunt. *Sepala* apice plus minus evidenter acuminata, 2—2.5 mm. longa, interdum margine membranaceo conspicuo vulgo autem nervo medio manifeste prominente serie una pilorum brevium aduncorum rigidis erectis obsito praedita. *Petala* angustiuscula aequalia — neque ovalia — apice paulatim contracta rotundata neque emarginata 4—4.5 mm. longa et calyce fere dublo longiora. Stamina adulta brevissima petalis quarta — sexta parte breviora dimidia inferiore parte pilosa et antheris flavidis. Styli tres longi et prominentes.

This variety differs markedly from the typical species in having the stem shorter, straight and upright, never recumbent, slanting or limp, but stiff, and as a rule not ramified.

The leaves are comparatively narrow, broadest at the middle, tapering evenly towards either end, and the limb is generally thicker. The leaves have no petioles whatever, and are set as a rule pointing stiffly upward along the stem, not pointing outwards. The margin of the leaf is wholly and distinctly recurvate, and like the ribs on the underside, with a growth of short, strong curving hairs. The peduncle is stiff, and as a rule so short that the blossom does not reach much above the point of the uppermost pair of leaves. The bractlets, where visible, are small, often slightly membranous at the margin, boat-shaped, carinated, and with short, thick crooked hairs along the median rib. The sepals are egg-shaped, towards the top generally tapering, with or without a distinct membranaceous margin, and have, as a rule, a more or less marked median rib, beset with hairs.

The petals are characteristic in their narrow shape and equal breadth throughout their whole length, which is twice or three times the breadth; they are evenly rounded at the apex, and about twice as long as the sepals. The stamens are rather short, as a rule $\frac{2}{3}$ — $\frac{1}{2}$ shorter than the length of the calyx.

Noted by the finder as growing on sandy heath by the roadside. In full flower 21 June.

Ranunculaceae Juss.

Anemone flaccida FR. SCHMIDT.

Young flowering specimens taken on the 25 May at moist places near river. The specimens are characteristic in having the peduncle extremely short, possibly due to the fact that they are young plants.

Anemona amurensis (KORSCH.) KOM.,

Flora Manshuriae Pag. 262, MIYABE et MIYAKO, Flora of Saghalin Pag. 9, Tab. II, Fig. 1—4.

On moist spots in woods. In full flower 25 May.

Anemone Raddeana REGEL.

In full bloom 23 May. Near moist river banks.

Anemone debilis FISCH.

In bloom 25 May. Moist meadow.

Coptis trifolia SALISB.

Full bloom 21 May. On swampy ground in *Larix*- and *Salix*-woods.

Papaveraceae DC.*Corydalis ambigua* CHAM. et SCHLECHT.

Flowering 13 May. In swampy meadows near fresh water.

Cruciferae JUSS.*Arabis Stelleri* DC. var. *genuina* FR. SCHMIDT.In full flower and some with incipient fruit formation 26 May.
On sandy sea shore.**Violaceae DC.***Viola Langsdorffi* FISCH.

Flowering 25 June. In meadows.

Viola sachalinensis H. Boiss.

Flowering 20 May. On dry sandy heath.

Geraniaceae DC.*Geranium erianthum* DC.

In flower and bud 21 June. Sandy hill.

Aceraceae DC.*Acer Mono* MAXIM.

With flowers and young leaves 13 June. Sandy heath near sea shore.

Rosaceae JUSS.*Potentilla fragarioides* L. var. *Sprengeliana* MAXIM.

Tab. nostr. II.

The specimens are distinguished by their strong growth, the leaves as a rule tri- or quadripinnate, the leaflets generally circular-oval (breadth often exceeding length) and closely serrate at the margin, with broad, short teeth, often almost rounded at the top. Flowers fairly large, petals up to 1 cm. long, more or less broadly heart-shaped, and one and a half times to twice as long as the calyx. The entire plant is closely covered with long, white, straight extended hairs, those at the points of the teeth in the leaves forming small tufts.

The stolons altogether lacking.

In full bloom 22 June, on moorland.

Rubus arcticus L. var. *grandiflorus* LEDEB.

Tab. nostr. III et IV, Fig. B.

The description of this variety by LEDEBOUR, *Flora Rossica* II Pag. 70, »*laciniis calycinis angustioribus, petalis obovato-oblongo*«, is rather insufficient, and it is no doubt often confounded with the typical form, as also noticed by JOHN MACOUN, Catalogue of

Canadian Plants I, Pag. 129. I, therefore, think it expedient to give the following detailed diagnosis of this variety based upon material collected from Saghalin.

Differt ab specie typica caule viridi et herbaceo, saepe flaccidulo et cacumine nutante — numquam rigido et lignoso — articulis rectis non flexuosis, ramis et pedicellis numquam divaricatis.

Foliolum terminale vulgo petiolo longiore quam formae typicae, vulgo 10—13 mm. longo, praeditum. Basis folioli semper recte abscissa vel vulgo angulum obtusum formans, nec in petiolum cuneatim decurrens sed petiolo distinctissimo. Flores magni, bene evoluti, petalis ad 14 mm. longis duplo longioribus quam latioribus deorsum ad basim versus aliquantulum productis, colore pulchre roseo.

Tota planta pilis densiusculis et longis, calyx et folia non recte evoluta pilis albis appressis vestita.

The stem is as a rule fairly coarse, upright and straight, often somewhat limp, not stiff and zigzag, and is always green and herbaceous, whereas the typical form is more rigid and firm (lignified) and in colour frequently yellowish-brown or often reddish. The whole plant is dark green.

The terminal leaflet is generally longer petiolated, up to 10—13 mm. The shape of the leaflets, also, varies considerably, from an egg-round oval, especially in those at the base, to a completely rhomboid form; singly or more often doubly serrate, less frequently with triple or quadruple teeth, or even bilobate, more rarely round toothed.

Occasionally, the leaf may be imperfectly tripartite, giving a digitate appearance, such as may now and again also be observed in the typical forms. The hair growth is as a rule fairly close, more or less depressed, often almost velvety, especially on the upper part of the plant, in leaves not yet fully developed, and on the sepals, which may also in addition have glandular hairs here and there. The flowers are large and well developed, the length of the petals up to 14 mm., rounded at the top, rarely somewhat marginated. The sepals are long, narrow and triangular, often tapering at the top to a fine awlpoint about 1 mm. long. The calyx at flowering time is not always so distinctly recurvate as in the typical forms.

In bud and with fully opened flowers 26 May, and in full bloom 14 June on swampy meadows.

LEDEBOUR l. c. states this variety only from »America arctica ad sin. Kotzebue (Beechey ex Hook. et Arn.)«. It has not till now been recorded from Saghalin, having probably escaped observation. It is not at all mentioned from Eastern Asia either by MAXIMOWICZ, TURCZANINOW, FR. SCHMIDT, S. KORSCHINSKY, KOMAROV or other authors, nor does it seem to occur in the

Jenisei region or in the Sayansk mountains in Southern Siberia and North-West Mongolia. Neither KRYLOV nor PRICE have observed it in these regions, nor does it occur in my own collections from these tracts. KRYLOV does not mention it in his Flora of the Government of Tomsk (Flora Altaia).

KOMAROV, in »Flora Manshuriaë« pag. 481, states, however, that the individuals of *Rubus arcticus* L. found by him in Manchuria distinctly deviate in having flowers rose coloured and red odoriferous fruits.

There is a possibility that the form may have to be referred to *var. grandiflorus* LEDEB.

Rosa rugosa THUNB.

In flower and bud 3 July. On dry and sandy shore of the Sea of Okhotsk.

Sorbus sambucifolia ROEM.

In bud or half-opened flower 26 May. Moorland.

Leguminosae ENDL.

Thermopsis fabacea DC.

Young flowers 19 June. On sandy sea shore.

Lathyrus maritimus BIGEL.

With buds and fully grown flowers 12 June. On sandy sea shore.

Cornaceae DC.

Cornus Canadensis L.

With buds 21 May. On swampy and hillocky ground.

Cornus suecica L.

Young specimens, mostly with not yet fully opened flowers, found in swampy *Larix*-wood 21 May.

Specimens with incipient fruit formation found 24 June on moorland.

Ericaceae DC.

Vaccinium vitis idaea L.

Found together with the last mentioned in swampy *Larix*-wood, with young flowers and buds 24 June.

Primulaceae VENT.

Lysimachia thyrsoflora L.

In full bloom 3 July.

The collector's statement of this from growing on sandy heath — is likely due to a mistake.

Trientalis europaea L. *var. arctica* LEDEB.

In full bloom 21 May. Meadow.

Scrophulariaceae R. BR.

Veronica serpyllifolia L.

With flowers and incipient fruit formation 14 June. Swampy *Larix*-wood.

Caprifoliaceae JUSS.

Lonicera Chamissoi BUNGE.

With buds and fully opened flowers 26 June. Moist thicket near banks of lake.

Compositae ADANS.

Petasites japonicus MIQ.

With almost opened flowers 25 May. Banks of still water.

Antennaria dioica GAERTN.

The leaves are felty-haired on both sides (*f. hyperborea* G. DON) often lacking distinct point at the end, where they are quite rounded.

Flowering 14 June on dry sandy hill.



Hierochloë odorata (L.) Wg. var. *sachalinensis* nov. var. (2/3).



Potentilla fragarioides L. var. *Sprengeliana* Maxim. (2/3)



Rubus arcticus L. var. *grandiflorus* Ledeb. (1/1).



A. *Moehringia umbrosa* Bunge var. *nitida* nov. var. ($\frac{1}{4}$).
B. *Rubus arcticus* L. var. *grandiflorus* Ledeb. ($\frac{1}{1}$).