

ON THE GENUS *ARCTOPHILA*, RUPR.

By THEO. HOLM.

(With one plate.)

The old genus *Colpodium* of Trinius was founded upon two species: *monandrum* and *Steveni*, which by Trinius himself were considered as "species facie dissimiles", and they are indeed so unlike that Robert Brown a few years later segregated the former as *Phippsia algida*, R.Br., and retained the latter only as a *Colpodium*. To the latter genus was furthermore referred *C. latifolium* R. Br., although Robert Brown was not certain about the real affinity of this species with those of Trinius and especially not with *C. Steveni* and *compressum*. At present Robert Brown's species *latifolium* is generally placed under Grisebach's genus *Arctagrostis*: *A. latifolia* (R. Br.) Griseb.

While *Colpodium* of Trinius was adopted by Grisebach with the omission of *C. monandrum* (*Phippsia*), the genus was nevertheless augmented with certain species, placed as a section "*Arctophila*" in contrast to *C. Steveni* and its natural allies, representing the section "*Eucolpodium*." By including the species of *Arctophila*, Rupr., the genus *Colpodium* became actually an aggregate of incongruities, as it had been before with *Phippsia* and *Arctagrostis*. By Bentham the genus was finally restricted to the section *Eucolpodium*, while *Arctophila* became transferred to *Graphephorum* Desv., next to *Glyceria* R. Br.; another disposition was made by Hackel, who followed Grisebach by placing them both (*Eucolpodium* and *Arctophila*) as sections of the original genus *Colpodium*, and characterized as having the "spikelets one—to two-flowered etc." This same classification is, also, followed by Beal in his lately published monograph of North American Grasses, with the same erroneous characterization, erroneous, because it was originally intended for *Colpodium* alone in the sense of Trinius.

Three species are enumerated by Beal as representatives of the genus (*Colpodium*) in North America: *C. fulvum* (Trin.) Griseb., *C. pendulinum* (Laestad.) Griseb., and *C. mucronatum* (Hack.) Beal. Considering the fact that *Colpodium* in the sense of Trinius was originally intended for both *C. Steveni* and *Phippsia algida*,

it seems difficult to find any good ground for admitting species of so little affinity as those of *Arctophila*, and still crediting the genus to Trinius. And the species of *Arctophila* have themselves been transferred from one genus to another. Thus we find them as members of *Poa*, *Glyceria*, *Grapphephorum* and finally of *Colpodium*.

Considered by themselves the species of Ruprecht's *Arctophila* constitute an excellent little genus, and we might cite Ruprecht's own words, when he proposed the genus in his "Flores Samoëdorum cisuralensium":

"*Arctophila* a *Catabrosa* (*airoide*) praesertim differt glumarum conformatione et longitudine, hac nota etiam et insuper valvulis ecostatis a *Glyceria* R. Br. recedit. *Atropis* Trin. (*P. distans*) *Catabrosæ* quoad glumas proxima, spiculas habet (saltem in statu virgineo) lineares, fere teretes; in *Arctophila* nostra semper ex ovato-oblongæ vel lanceolatae. E conditione glumarum generum series fortasse sequens: *Dupontia*, *Arctophila*, *Poa*, *Atropis*, *Catabrosa*, *Phippisia*, *Coleanthus*. Conjunctioni *Arctophilæ* cum *Poa* obstant: valvulae dorso concavae vel saltem minus compressae; flosculi lana numquam cincti, nec ad nervos dorsales sericei, sed ad callum more *Avenacearum* pilis rigidis brevibus obsiti; valvula inferior apice vix integerrima, sed margo plerumque irregulariter denticulatus et erosus, saltem crenulatus et apex saepe obtusus vel truncatus; habitus etiam nobilior colore fulvo paniculae saepe intermixto; spiculae majores plerumque et flosculi demum patuli, remotiusculi."

The species that are best known are: *Arctophila fulva* (Trin.) Rupr., *A. pendulina* (Læstad.) Ands. and *A. effusa* Lge., especially the first of these since the Greenlandish plant, *A. effusa*, was for many years considered identical with *A. pendulina* by Fries, Grisebach and several other authors.

Both *A. fulva* and *A. pendulina* possess spikelets with as many as six or seven flowers, at least the spikelets fully developed, but it is not uncommon to find two or three-flowered spikelets upon the basal rays of a panicle in which all the others are from five- to seven-flowered. Typical *A. pendulina* has usually 5- to 7- flowered spikelets, as figured in *Flora Danica*, and the species differs in this respect from *A. effusa*, in which the number of flowers does not exceed three, and there are often only

two. The empty glumes are relatively longer and more acute in *A. fulva* (Fig. 2.) than in *A. pendulina* (Fig. 1.) and *A. effusa* (Fig. 3.); the flowering glume is also narrower and longer in *A. fulva*. We might state, moreover, that the base of the spikelets seems to afford an additional character by being more or less acute in *A. fulva* and *A. pendulina*, but obtuse in *A. effusa*, during the anthesis; this character follows the relative number of flowers in the spikelet, thus where more than three or four flowers are developed, the spikelets are generally acute at base, but obtuse, where a smaller number is present as for instance in *A. effusa*. The panicle of *A. effusa* is erect with the capillary rays deflexed, while the whole inflorescence is nodding in the two other species.

In regard to the geographical distribution of these species, *A. fulva* has been reported from a number of places in arctic Russia and Siberia, but the only specimens which we have seen from North America were collected at Muckelung River in British Columbia and on the west coast of Hudson Bay, Lat. 56.; the specimens from the former locality were by Beal, referred to *A. pendulina*, but they do not agree with this species, of which we have studied typical material from arctic Europe.

*A. fulva* occurs in Lapland under two forms: *maxima* and *minima*, as recorded by Brotherus, but in accordance with Nylander none of these are referable to the type, but represent his var. *Lapponica*: "panicula laxa ramis undique sparsis, pendulis, flexuosis, spiculis 2-5 floris versicoloribus, valvulis basi pilorum fasciculo barbati."

In regard to *A. pendulina* no definite geographical range can be given at present since Grisebach included *A. effusa* in this species, and since Kjellman in reporting *A. effusa* from the Siberian coast refers to both Lange's *A. effusa* and Grisebach's *Colpodium pendulinum* as synonyms; we only know for certain that it occurs in arctic Europe in the places recorded by Hartman and Hjelt, while we have not, so far, seen any specimens from this continent.

The third species *A. effusa* is known from the west coast of Greenland, Spitzbergen and Arctic Siberia; the plant from Spitzbergen formerly considered as a distinct species: *Colpodium*

*Malmgreni* Ands., is now generally referred to *A. effusa* as "*forma depauperata*."

While thus *A. fulva* and *A. pendulina* are the only species recognized by Grisebach, seven others have been described previously by Ruprecht, but merely referred to as synonyms in *Flora Rossica*; they were collected on the island Kolgужew and on the Russian coast near Kambalnitz and Bjelaja. Judging from the diagnoses and figures in the work of Ruprecht, cited above, it seems very unsafe to include all these species under *A. fulva* and *A. pendulina*, and we have thought it worth while to insert his diagnoses in this paper, in order to give as complete as possible a representation of the genus. These seven species of Ruprecht are described as follows:

*Poa (Arctophila) deflexa.*

Differt a *Poa* s. *Arctophila Laestadii* (*Glyceria pendulina* Laest. e loco classico! et Herb. norm, Suec.!) spiculis latoribus, flosculis majoribus, acutioribus, radiis paniculæ rigidioribus et culmo plerumque duplo tenuiori.

*Poa (Arctophila) trichoclada.*

Proxima *P. Laestadii*, sed differt habitu triviali, panicula densiflora, forma spicularum magis ovata, flosculis infimis longioribus, aliter coloratis; semiverticillis radiorum infimorum vix callosis, densius floriferis. *A. Poa deflexa* diversa: radiis paniculæ minus strictis, fere squarrosulis, culmo (et quoque rachi) intra paniculam triplo crassiore, ultra lineam fere lato; spiculis bilinealibus et minoribus, subtrifloris et c.

*Poa (Arctophila) fulva* Trin.

*Poa (Arctophila) latiflora.*

Habitus *P. fulvæ*, sed differt statura minore 6-9 poll., panicula rigidior, apice non nutante; spiculis latoribus, basi minus attenuatis, apice multo obtusioribus (ob flosculos fere truncatos) trifloris tantum, hinc etiam brevioribus, vix ultra 1½ lin. longis.

*Poa (Arctophila) pæcilantha.*

Similis quidem *P. trichocladae* et *deflexæ*, sed radii infimi magis contracti, a basi fere spiculis obsessi, non refracti. Culmus 15-20 poll., crassus, nodis 3 exsertis; folia plana ut in antecedentibus; spiculæ variegatæ, 3 lin., 4 floræ, flosculus infimus 1½ lin., superiores duo remotiusculi; panicula erecta.

*Poa (Arctophila) remotiflora.*

Culmus  $\frac{1}{2}$ -1 pedalis, minus crassus ac in præcedentibus, nodo uno alterove exserto; folia præced. angustiora, ad summum lineam lata, flaccidiora, complicata; panicula apice erecta, radii infimi semiverticillati, divaricati et unus sæpe deflexus; longiores ultra medium nudi; spiculæ 3-3 $\frac{1}{2}$  lin. longæ, 3-4 floræ: flosculi satis remoti, erecti, acutiores quam in reliquis specc. hujus sectionis, pedicellis partialibus (jam flosculi secundi) visilibus.

*Poa (Arctophila) similis.*

Valde similis quoad habitum *P. arcticæ* R. Br. et commutatu facilis, differt vero; spiculis subbifloris, e fulvo et purpurascenti variegatis; flosculo secundo longius pedicellato, basi setulis (nec lana) obvillato, dorso et lateribus glabro, ecostato, glumisque angustioribus, longioribus. *A. P. remotiflora* (quacum promiscue? crescit) diversa: statura minori: 3-5 pollicari, nodis omnibus obtectis; radiis infimis geminis vel ternis; spiculis minoribus, vix bilinealibus et c. Vix var. hujus esse crederem.

*Poa (Dupontia?) scleroclada.*

Transitus quasi inter *Arctophilas* et *Dupontias*; habitus plane idem ac *P. latifloræ*, *remotifloræ* et rel.; folia eadem, nodus unus alterve exsertus. Spiculæ sequentis, sed gluma quælibet flosculo suo distincte brevior. Culmus 12-15 pollicaris, radii infimi paniculæ semiverticillati, patuli, unus interdum deflexus ut in *P. remotiflora*, cujus habitu gaudet, sed tota panicula multo rigidior est, spiculæ crassiores, majores, color fulvus magis prædominans; spiculæ interdum 4-floræ cum rudimento.

The genus seems to be rare in North America, but has been collected in various parts of Alaska and on the adjacent islands, besides in the British provinces, mostly south of the arctic circle. These specimens have been generally identified as *A. fulva* or *A. pendulina*, but as stated above, the former is not with certainty known except from Muckelung River and the Hudson Bay region, while we have seen no specimens of the latter from this continent. A very peculiar plant was collected on the arctic coast near Point Barrow by Dr. Murdoch (1883) and having been submitted to Professor Hackel for identification, it was at once distinguished from all the others and described as *A. mucronata* Hack. As indicated by the specific name the midrib of the flowering glume is produced

into a short mucro, while in all the other known species, the midrib does not protrude beyond the apex of the glume. The species shows in all other respects a close resemblance to *A. effusa*, being of low stature with very broad leaves, thick culm, with the branches of the loose-flowered panicle deflexed and, furthermore, by the spikelets being two-flowered and rounded at the base. Hackel (in litteris) placed it nevertheless under *Arctophila* even if it be somewhat anomalous in this genus on account of the mucro, but as stated by him, it would be still more anomalous in *Colpodium* Trin. (as understood by Bentham), because there the midrib never reaches the top of the undivided glume. It would seem as if this interesting addition to the genus *Arctophila* would warrant its final segregation altogether from *Colpodium* of Trinius, but strange to say, it is placed together with *A. fulva* and *pendulina* as a true *Colpodium* by Beal, in his lately published Monograph of the North-American *Gramineæ*.

And besides this species of *Arctophila* with the flowering glume mucronate, there is, still, another and even more interesting type, hitherto undescribed, which we found in the herbarium of the Canadian Geological Survey, which had been collected on Mansfield Island, north of Hudson Bay by Dr. Robert Bell. In this species the flowering glume is distinctly awned, not simply mucronate, a fact that excludes the plant absolutely from *Colpodium*, while it may be well understood as an *Arctophila*, and placed next to *A. mucronata*. It constitutes a species distinct from this not only by the presence of a true awn, but also by the larger number of flowers in the spikelet, the slender culm, much narrower leaves and by an altogether more graceful habit; we have designated the name *A. trichopoda* to this species, and a full description and illustration will be published at an early date in a work upon the Hudson Bay Flora.

The discovery of this well marked species induced the writer to study some more material of the genus as represented in North America, and our investigation has resulted in the separation of three other species, which appear to us as very distinct from those previously described; they had been identified as *A. fulva* and *A. pendulina*.

These new species are:

ARCTOPHILA GRACILIS (Figs. 3 and 4.)

Rhizome wanting: culm glaucous, slender, glabrous, the internodes longer than the leaf-sheaths: leaves glaucous, glabrous, the sheaths split to about the middle: ligule lacerate; leaf-blade flat, very narrow, much longer than the internode, erect: panicle relatively long and narrow, the almost capillary rays semiverticillate: the basal and several of the upper ones deflexed, giving the plant somewhat the aspect of *Poa sylvestris* Gr.: spikelets glaucous, quite numerous near the end of the branches with capillary pedicels, two to four-flowered: empty glumes very unequal, obsoletely three-nerved, acute: flowering glume relatively narrow, the apex obtuse and erose, three-nerved, longer than the bidentate, glabrous palea: rhacheola hairy at the joints: stamens and pistil as in *A. fulva*.

Very characteristic by its narrow panicle, the narrow leaves and glaucous hue.

Collected by Dr. R. Bell in bogs and swamps north of Lake Superior; in flower July 1883.

ARCTOPHILA BRIZOIDES. (Fig. 8.)

Rhizome robust, stoloniferous: culm glabrous, about 60 cm. in height, the upper internodes longer than the leaf-sheaths the basal shorter: leaves glabrous, the sheaths split to about the middle; ligule large, almost entire. leaf-blade flat, quite broad, much longer than the internode, erect: panicle nodding, very short, but broad, the rays semiverticillate, two or three together, drooping, very slender: spikelets pale green with a slight tinge of purple, mostly four-flowered, quite numerous in proportion to the small panicle, broadly ovate, on very slender pedicels: empty glumes subequal, the lower one-nerved, the upper three-nerved: flowering glume rather broad, obtuse, erose, nerveless, longer than the palea: rhacheola, stamens and pistil as above.

Recorded as *A. fulva*, but very distinct from this and the others by the short and broad inflorescence with its drooping, broadly ovate spikelets, rendering the plant the aspect of a *Briza*.

Collected by James M. Macoun on St. Paul Island, Behring sea; in flower August 1892.

## ARCTOPHILA CHRYSANTHA. (Figs. 6 and 7.)

Rhizome stoloniferous, somewhat robust: culm glabrous, about 30 cm. in height, the upper internodes very little longer than the leaf-sheaths, the basal shorter: leaves glabrous, deep green, the sheaths closed from above the middle: ligule almost entire: leaf-blade flat, relatively narrow in the upper leaves, much longer than the internodes, erect: panicle rich-flowered, nodding, somewhat contracted, the slender rays three to five in the basal verticils: spikelets numerous, small, yellowish-brown, shining, short-peduncled to nearly sessile, two- to three-flowered: empty glumes variable in length, both five-nerved in fully developed spikelets, broad and slightly acute: flowering glume relatively broad with the acute apex entire or minutely erose: rhacheola, stamens and pistil as in the other species.

Identified as *Colpodium fulvum*, from which it, however, is very distinct by the characters mentioned above. Collected by J. B. Flett in swamps near sea-shore, 16 miles west of Nome City, Alaska; in flower Aug., 1900.

These species of *Arctophila* may naturally be classified in two sections:

I. *Macrostachyæ*.

Spikelets, when fully developed, five- to seven-flowered, the base acute during anthesis.

*A. fulva*, *A. remotiflora*, and *A. pendulina*.

II. *Brachystachyæ*.

Spikelets two- to four-flowered, the base obtuse during anthesis.

*A. brizoides*, *A. chrysantha*, *A. deflexa*, *A. gracilis*, *A. latiflora*, *A. mucronata*, *A. pæcilantha*, *A. scleroclada*, *A. similis* and *A. trichopoda*.

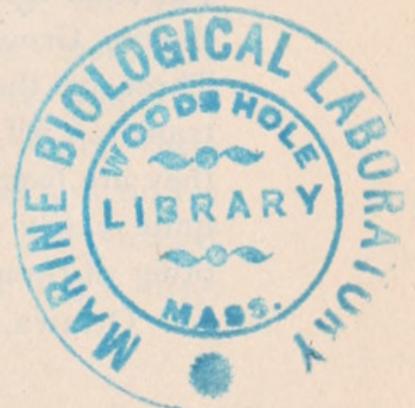
Brookland, D.C., April, 1902.

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## EXPLANATION OF PLATE NO. 1.

- Fig. 1—Spikelet of *Arctophila pendulina*.  
 „ 2— „ „ *A. fulva*.  
 Figs. 3 and 4—Spikelets of *A. gracilis*.  
 Fig. 5—Spikelet of *A. effusa*.  
 Figs. 6 and 7—Spikelets of *A. chrysantha*.  
 Fig. 8—Spikelet of *A. brizoides*.





*Sherrill. ad mat. del.*

To illustrate Dr. Holm's paper on Arctophila.



Holm, Theodor. 1902. "On the Genus *Arctophila*, Rupr." *The Ottawa naturalist* 16(3), 77-85.

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