

III. THE EASTERN AMERICAN REPRESENTATIVES OF ARNICA ALPINA.

(Plate 143.)

IN 1905 I published¹ a synopsis of the species of *Arnica* known in northeastern America and at that time predicted that "doubtless many other species will be found, especially on the mountains and cliffs of eastern Quebec." Although the prediction has not yet been wholly fulfilled, two very distinct new species have been discovered, one on the Long Range of western Newfoundland, the other in the Shickshock Mountains. In determining the exact relationships of one of these plants, discovered in 1923 on Mt. Logan and the neighboring Mt. Mattaouisse in Matane County, Quebec, it has seemed appropriate to present a new treatment of the eastern species with few and small cauline leaves and with white and merely barbellate pappus (*A. alpina* and its allies) and to publish Miss Brackett's drawings of these species. In order to show the contrast between these plants and the well known *A. mollis* Hook. of the Rocky Mountains and of the Gaspé Peninsula and of northern New England and northern New York, the latter species is also included in the key, although it seems unnecessary to discuss it in detail.

- a. Stem-leaves 1-4 pairs (sometimes scattered small bracts above), at least the upper entire or only sparingly toothed: pappus white or whitish; its bristles merely barbellate *b*.
- b. Achenes copiously hirsute from base to summit *c*.
- c. Lower leaves entire or with only remote irregular teeth *d*.
- d. Base of involucre and summit of peduncle villous-lanate *e*.
- e. Leaves nearly glabrous or only minutely glandular-hispid: involucre bracts 15-20, narrowly lanceolate, 2-3 mm. broad, only sparingly pubescent above the middle: ligules with blunt lobes only 1-2 mm. long.....1. *A. alpina*.
- e. Leaves loosely villous: involucre bracts 8-10, narrowly rhombic, 3-3.5 mm. broad, loosely villous to the tip: ligules with acutish lobes 3-5 mm. long.....2. *A. pulchella*.
- d. Base of involucre and summit of peduncle viscid-villous but hardly lanate *f*.
- f. Leaves glabrous or merely minutely pilose on nerves and margin, entire; the cauline lanceolate to oblong: stem glabrous or essentially so at base: involucre bracts oblanceolate, 1 cm. long, glandular-villous at base, only sparingly pilose or glabrate above: ligules with blunt lobes only 1-2 mm. long.....3. *A. plantaginea*.
- f. Leaves glandular-puberulent and viscid-villous, irregularly dentate; the cauline linear or linear-

¹ RHODORA, vii. 146-150 (1905).

lanceolate: stems viscid-villous at base: involu-
 cral bracts linear- to lance-attenuate, 1.2–1.5 cm.
 long, uniformly viscid-villous: ligules with acutish
 lobes 3–5 mm. long.....4. *A. Sornborgeri*.

c. Lower leaves regularly dentate *g*.

g. Disk-corollas 6–8 mm. long, with glabrous or only
 sparingly setose lobes; the densely pilose portion
 of the tube and throat 3.5–6 mm. long: mature
 pappus 5–8 mm. long, bright-white.....5. *A. chionopappa*.

g. Disk-corollas 9–10 mm. long, with copiously setose
 lobes; the densely pilose portion of the tube and
 throat 7–9 mm. long: mature pappus 9–10 mm.
 long, creamy-white.....6. *A. gaspensis*.

b. Achenes glabrous or nearly so below the middle.....7. *A. Griscomi*.

a. Stem-leaves 3–5 pairs, all evenly dentate: pappus yellowish-
 brown or olive-tinged; its bristles subplumose.....8. *A. mollis*.

1. *A. ALPINA* Olin & Ladau. FIG. 1. Stem 0.5–3 dm. high, *sparingly short-villous below*, densely so above, copiously villous-lanate at tip: *leaves nearly glabrous or minutely glandular hispid*; the basal linear-lanceolate, 3–9 cm. long, 0.4–1.6 cm. broad, entire or with few remote small teeth; cauline 1–3 pairs, entire, sessile, the lowest usually much longer than the reduced upper ones: heads solitary (rarely 2–4), 4–6 cm. broad: *involucre densely villous-lanate at base; its 15–20 narrowly lanceolate long-acuminate usually purplish bracts only sparingly pubescent above the middle*, 1.2–1.5 cm. long, 2–3 mm. broad: *ligules 10–15, with 3 blunt lobes 1–2 mm. long*: achenes hirsute: pappus cream-white; its bristles barbellate.—Diss. 11 (1799), acc. to Ind. Kew. *A. montana*, β *alpina* L. Sp. Pl. ii. 884 (1753). *A. angustifolia* Vahl, Fl. Dan. ix. t. 1524 (1818).—Arctic regions, south to rocky slopes of the Torngat Mts., Labrador, Mosquito Bay, Ungava Distr., northern Manitoba, and Alaska; arctic and alpine Eurasia. Fl. August.

2. *A. PULCHELLA* Fernald. FIG. 2. Stem 1–1.8 dm. high, *villous*, especially above, *with white hairs 1–2 mm. long* mixed with minute stipitate glands: *leaves loosely villous* on both surfaces; the basal lanceolate or oblanceolate, 3–15 cm. long, 0.5–1.5 cm. broad, entire or remotely callous-dentate; cauline 1–2 pairs, entire: head solitary, 4.5 cm. broad: *involucre densely villous-lanate at base; its 8–10 narrowly rhombic long-attenuate bracts glandular and loosely villous to the tip*, 1.5 cm. long, 3–3.5 mm. broad: *ligules about 10, with 3–4 sharp lobes (the longest 3–5 mm. long)*: achenes hirsute: pappus white, barbellate.—RHODORA, xvii. 18 (1915).—Dry exposed limestone ledges and shingle, Table Mt., Port à Port Bay, Newfoundland. Fl. July.

3. *A. PLANTAGINEA* Pursh. FIG. 4. Stem 1.5–4.5 dm. high, *glabrous or only very sparingly villous-hispid below*, glandular-puberulent at summit: *leaves glabrous or minutely pilose on the nerves and margins*, entire; the basal oblong to oblanceolate, 0.6–1 dm. long, 1.2–2 cm. broad; cauline 3–4 pairs, sessile, the lower 7–13 cm. long, the upper much reduced: heads 1–3, 4–5 cm. broad: *involucre glandular-villous at*

base; its 10–12 oblanceolate bracts 1 cm. long, sparingly pilose or glabrate above the base: ligules 10–15, with 3 blunt lobes 1–2 mm. long: achenes hispid: pappus white, barbellate.—Fl. 527 (1814); Fernald, RHODORA, vii. 147 (1905). *A. angustifolia* Torr. & Gray, Fl. ii. 449 (1843), in part, not Vahl. *A. alpina* Gray, Syn. Fl. i. pt. 2: 382 (1886), in part, not Olin & Ladau. *A. alpina*, var. *Lessingii* Fernald & Sornborger, Ott. Nat. xiii. 106 (1899), in part, not Gray.—Banks of mountain-brooks, etc., Ramah to Nain, Labrador, west to Kooksoak River, Ungava District. Fl. August.

4. *A. SORNBORGERI* Fernald. FIG. 3. Stem 1.5–2 dm. high, viscid-villous throughout, densely so at summit: leaves glandular-puberulent and viscid-villous, irregularly dentate; the basal linear-lanceolate to narrowly oblong, 6–9 cm. long, 0.8–1.6 cm. broad; cauline 3 pairs, linear to lanceolate: head solitary, 4.5–6 cm. broad: involucre uniformly viscid-villous throughout; its 10–12 linear- to lance-attenuate bracts 1.2–1.5 cm. long: ligules 10–15, with acutish lobes 3–5 mm. long: achenes hirsute: pappus white, barbellate.—RHODORA, vii. 147 (1905).—Rocky banks of streams, Torngat Mts., Labrador. Fl. August, September.

5. *A. CHIONOPAPPA* Fernald. FIG. 5. Stem 0.7–4 dm. high, loosely or sparingly villous: leaves sparingly villous or glabrate; the basal lanceolate to narrowly ovate, regularly dentate, 0.3–1.8 dm. long, 0.5–3.3 cm. broad; cauline 2–4 pairs, the lower slender-petioled and resembling the basal, the upper sessile and much smaller: heads 1–4, 3–4 cm. broad: involucre villous throughout; the 10–15 linear- to lance-attenuate bracts 7–13 mm. long: ligules 10–15, with short bluntish lobes: disk-corollas 6–8 mm. long, with glabrous or only sparingly setulose lobes; the densely pilose portion of the tube and throat 3.5–6 mm. long: achenes densely short-setulose, 4–6 mm. long; the ascending white hairs about equaling one-half the diameter of the achene: pappus bright-white, in fruit 5–8 mm. long.—RHODORA, vii. 148 (1905).—Calcareous ledges, shingle, cliffs and river-gorges, Table Mt., Port à Port Bay, Newfoundland; Cap-Rosier, Gaspé Co., Quebec to the Tobique River, New Brunswick. Fl. late June–early August.

6. *A. GASPENSIS* Fernald. FIG. 6. Stem 3–4 dm. high, villous below, glandular-puberulent above: leaves sparingly pilose on both surfaces, lanceolate; the lower with sharp spreading teeth, 6–12 cm. long, 1.2–2.3 cm. broad; the 3 or 4 pairs of cauline sessile, the upper much reduced: heads 1–4, 4–5 cm. broad: involucre glandular puberulent and sparingly pilose; its 8–10 oblong bracts 1 cm. long, with triangular tips: ligules about 10, sharply lobed: disk-corollas slenderly funnelform, 9–10 mm. long, with copiously setose lobes; the densely pilose portion of the tube and throat 7–9 mm. long: achenes hirsute with short and long hairs, the latter nearly equaling the diameter of the achene: pappus cream-white, in fruit 9–10 mm. long.—RHODORA, vii. 148 (1905).—Calcareous ledges and cliffs, Cap Tourelle, Gaspé Co., Quebec. Fl. July.

7. *A. Griscomi*, n. sp. (FIG. 7), rhizome gracile 0.4–1 dm. longo

horizontali vel oblique adscendente; caule solitario (rarissime 2-3) piloso supra sparse villosa-hirsuto 0.8-2.5 dm. alto; foliis rosulatis lanceolato-ellipticis 3-10 cm. longis 0.5-2 cm. latis subacuminatis basi angustis plus minusve petiolatis supra papillosis vel sparsissime villosis glabratisque ciliatis margine calloso-serratis, dentibus 3-7-jugis; foliis caulinis 1-2-jugis, inferioribus oblanceolatis vel oblongis vel lanceolato-ovatis remote serratis vel integris glabris vel papillosis, superioribus valde reductis apice calloso-subulatis; pedunculis 1-3 nudis vel bracteolatis, bracteolis linearibus apice subulati-filiformibus; capitulis 2.5-4 cm. diametro; involucri 1-1.5 cm. alto basi minute piloso supra glabro; bracteis 8-10 anguste rhomboideis 2-3 mm. latis acuminatis ciliatis dorso glabris, paginis interioribus apice villosis; ligulis 9-12 luteis, lamina 1-1.5 cm. longa 4-5 mm. lata 7-9-nervata apice 3-dentata, dentibus longioribus 0.5-1 mm. longis; corollis disci 6-7 mm. longis, tubo villosa 2.5-3.5 mm. longo; achaeniis 3-3.5 mm. longis glabris vel ad apicem sparse breviterque hirsutis; pappo 6-7 mm. longo albo, setis barbellulatis.—Matane County, QUEBEC: moist rock-walls and shelves of hornblende-schist at head (altitude about 1070 m.) of Big Chimney, Mt. Mattaouisse, July 8, 1923, *M. L. Fernald, Ludlow Griscom, K. K. Mackenzie, A. S. Pease & L. B. Smith*, no. 26,082; same station, August 20, 1923, *Fernald & Smith*, no. 26,085; dry schistose crests and talus of Razorback Ridge (altitude 850-1000 m.), Mt Logan, July 13, 1923, *Pease & Smith*, no. 26,083; cold chimneys in the schist at about 900-1000 m. altitude, south of Fernald Pass, Mt. Mattaouisse, August 20, 1923, *Fernald & Smith*, no. 26,084 (TYPE in Gray Herb.).

Named for Ludlow Griscom, professional ornithologist, keen amateur botanist, tireless explorer and choice companion, who first discovered the plant which subsequently proved to be somewhat generally distributed on the cold walls of Mts. Mattaouisse and Logan.

Arnica Griscomi belongs to the group of species nearly related to *A. alpina*. From all of them it is distinguished by its achenes being glabrous at base or often nearly throughout; *A. alpina*, *A. plantaginea*, *A. chionopappa*, *A. gaspensis* and *A. arnoglossa* Greene, the five species to which it is most nearly related, having the achenes densely hirsute with comparatively long trichomes. In *A. alpina*, furthermore, the entire basal leaves are very narrow, and the involucre is densely lanate at base and it has more numerous and narrower bracts. *A. chionopappa* has the more numerous linear- or lance-attenuate bracts villous throughout, the ligules more numerous, the villous portion of the disk-corolla longer, and the achenes longer; *A. plantaginea* has the stem glabrous or essentially so at base but distinctly glandular above and its leaves are entire; *A. gaspensis* (which is



A. E. Brackett del.

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known only at the type-station where it has thrice been collected) has the involucral bracts glandular as well as pilose, its disk-corollas slender and longer than in others of the group and with the villous tube more than twice as long as in *A. Griscomi*, its achenes nearly twice as long and its pappus creamy- or sordid-white instead of snow-white. *A. arnoglossa*, described from the Black Hills, is densely glandular-puberulent above and the very young achenes (the only ones seen) are definitely longer than the mature ones of *A. Griscomi*.

EXPLANATION OF PLATE 143.

FIG. 1, *Arnica alpina* $\times 1$; 1a, disk-flowered $\times 4$; 1b, tip of ligule $\times 4$. FIG. 2, *A. pulchella* $\times 1$; 2b, tip of ligule $\times 4$. FIG. 3, head of *A. Sornborgeri* $\times 1$. FIG. 4, *A. plantaginea* $\times 1$. FIG. 5, *A. chionopappa* $\times 1$; 5a, disk-flower $\times 4$. FIG. 6a, disk-flower of *A. gaspensis* $\times 4$. FIG. 7, *A. Griscomi* $\times 4$; 7a, disk-flower $\times 4$.

(To be continued)



Fernald, Merritt Lyndon. 1924. "The eastern American representatives of *Arnica alpina*." *Contributions from the Gray Herbarium of Harvard University* (72), 103–107. <https://doi.org/10.5962/p.336079>.

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