

Bonanza Creek, Dawson, June 12, 1914, *Eastwood*, no. 204; Dawson Slide, Dawson, June 12, 1914, *Eastwood*, no. 207. MONTANA: Bald Mt., alt. 3050 m., July 22, 1880, *S. Watson*, no. 54; plains near Cutbank Creek, August 5, 1883, *Canby*, no. 45. WYOMING: high mountains, Yellowstone Park, August 13, 1893, *J. N. Rose*, no. 483. NEVADA: East Humboldt Mts., alt. 3050 m., August, 1868, *Watson*, no. 173. OREGON: on cliffs at 2440 m., Eagle Creek Mts., 1881, *Cusick*, no. 969. WASHINGTON: rocky ridges near snow, at 2440 or 2740 m., Mt. Paddo, September 15, 1883, *Suksdorf*, no. 175.

V. THE SPECIFIC IDENTITY OF *ARENARIA GROENLANDICA* AND *A. GLABRA*.

It has been customary to treat the boreal *Arenaria groenlandica* (Retz.) Spreng. and the more southern *A. glabra* Michx. as distinct species, the former extending from Greenland to the higher granitic mountains of New England and New York and locally southward along the Alleghenies to the mountains of North Carolina, the latter confined to the mountains of North Carolina, Tennessee and Georgia. The characters as stated by those who maintain the two as species are as follows:¹

A. GROENLANDICA. Stems 2–8 in. long, 1–5-flowered (*Robinson*); 3–20 cm. tall, sparingly forked (*Small*): leaves linear, $1\frac{1}{2}$ –7 lines long, the basal in a dense cluster (*Robinson*); leaf-blades filiform to subulate, 0.3–1.5 cm. long, the basal in a dense cluster (*Small*): pedicels 0.5–1.5 cm. long (*Small*): sepals broadly ovate, $1\frac{1}{2}$ –2 lines long (*Robinson*); sepals oblong or oblong-lanceolate, 3–4 mm. long (*Small*): petals obovate (*Robinson*, *Small*): capsule subglobose to oblong (*Robinson*); capsule ovoid, or rarely subglobose or nearly oblong, 5–6 mm. long (*Small*).

A. GLABRA. Stems 6–12 in. high (*Robinson*); stems 0.5–3 dm. tall, often bushy (*Small*): leaves narrowly linear, equaling or exceeding the internodes (*Robinson*); leaf-blades narrowly linear or nearly filiform, 1–2.5 cm. long (*Small*): pedicels elongated (*Robinson*); pedicels 1–4 cm. long (*Small*): sepals ovate-oblong, $1\frac{1}{2}$ lines long (*Robinson*); sepals oblong or ovate-oblong, 2.5–3 mm. long (*Small*): petals spatulate (*Small*): capsule ovoid (*Robinson*); capsule ovoid, 3 mm. long (*Small*).

That the specific lines between the two are not satisfactory has long been evident from the fact that plants referred by one author to *A.*

¹ These characters are taken from the treatments by Robinson in Gray, *Synop. Fl. i.* 243 (1897) and by Small, *Fl. S. E. U. S. ed. 2*, 420 (1913).

glabra have been referred by others to *A. groenlandica*; and examination of herbarium-material shows at once that the characters depended upon are far from constant. Thus material of most typical *A. groenlandica* from Greenland and Labrador and the highest New England mountains shows sepals varying from 3–5 mm. in length, while plants of good *A. glabra* from the South (for example, *Biltmore Herb.* no. 664 from North Carolina; *Curtiss*, no. 304 from Nashville, Tennessee; and sheets from Lookout Mountain, near the line between Tennessee and Georgia), with pedicels up to 4.5 cm. long and with cauline leaves up to 3 cm. long, have sepals 3–5 mm. long, i. e. with the same variation in length as those of *A. groenlandica*. Similarly with the capsules: the material from Lookout Mountain, with long leaves and pedicels, has capsules up to 5.5 cm. long, while fully ripe material from Table-Top Mt., Gaspé, has the capsules less than 4 mm. long. The stems of the boreal plant may be as freely forking as the austral, having 1–30 flowers, while characteristic southern plants with long leaves and pedicels may have the stems subsimple or with only few flowers. The Lookout Mt. material collected by Judge Churchill has the petals as long and as broad as much of the northern material; and the seeds of the northern and southern specimens are quite alike.

Nevertheless in spite of the absence of good specific characters in the seeds (which usually display the best of specific differences in *Arenaria*), in the capsules, petals and sepals, there is a "look" about the two extremes which indicates that they are not strictly identical. The boreal *A. groenlandica* is more tufted and lower, usually with more developed basal leafy shoots; its cauline leaves are shorter; its pedicels become less elongate, and its petals are inclined to be longer. This typical *A. groenlandica* is confined in New England and New York to the very highest mountains, descending along brooks in the White Mountains only to 885 m. and occurring on the summit of Mt. Monadnock, New Hampshire, above 915 m.; in Vermont it is only on the summits of Mansfield and Camel's Hump; in New York only on the summit of Whiteface.

On the siliceous or granitic rocks of the Kittatinny Mts. in New Jersey, the Shawangunk and Catskill Mts. in New York, and exposed granitic ledges of Connecticut and southwestern Rhode Island occurs a plant which has always been referred to *A. groenlandica*. The writer had never had a field-acquaintance with this plant of southern

New England, southern New York and northern New Jersey, until the past June, when at the invitation of Mrs. Orra Parker Phelps, he visited with her an extensive area in Charlestown, Rhode Island, where she had found the *Arenaria* abundant in the dry *Cladonia* carpet on exposed granite ledges. At Charlestown the plant was passing out of flower and with much mature fruit. It had taller, more forking and more brittle stems than in the familiar alpine *A. groenlandica*, no tufted basal foliage, but the flowers and fruits were quite like those of *A. groenlandica*. The habitats at Charlestown, either exposed sunny ledges in the pastures where the plant mingled with *Krigia virginica*, *Hypericum gentianoides*, *Juncus secundus*, and other Carolinian plants, or crevices of ledges in the dry oak woods, were so far from boreal stations that it seemed highly improbable that this Rhode Island plant could be identical with the arctic-alpine *A. groenlandica*. Abundant material was collected and it proves to be identical with the plant from Middletown and North Guilford, Connecticut, and the specimens from the Catskills which have always passed as *A. groenlandica* and it is probable that the plants from the Shawangunk and Kittatinny Mts. (as well as from the mountains of Pennsylvania), which the writer has not seen, are the same; and in no point does this material from southern New England and southern New York differ from true *A. glabra* from North Carolina and Tennessee.

Furthermore, perfectly typical *A. glabra* occurs northward into New Hampshire and Maine; in New Hampshire found on the lower granite mountains with *Paronychia argyrocoma*, var. *albimontana* and other plants of austral affinity or occasionally on ledges in oak woods. It is on Welch Mt., a dry warm granitic mass south of the Franconia Range, and when Professor A. S. Pease found it in oak woods of Carroll Co., he was so impressed with the fact that this was not the proper habitat for *A. groenlandica* that he specially commented on "*A. groenlandica* (Retz.) Spreng., which is not uncommon on the mountains of the Montalban Range, but which is perhaps seldom found in so incongruous a situation as here, growing under the shade of red oak trees!"¹ In Maine *A. glabra* is found on the lesser granitic mountains (Streaked Mt., Oxford Co., Alamoosook, Hancock Co., Peaked Mt., Penobscot Co., etc.), and on ledges near the mouth of

¹ Pease, RHODORA, xvii, 233 (1915).

the Kennebec. Eastward, on Mt. Desert Island as well as at Halifax, Nova Scotia, the plant in stature and habit is perplexingly transitional to the boreal *A. groenlandica*, being usually more tufted and lower than in *A. glabra* but with the very bushy habit of the latter and with pedicels intermediate in length, and petals shorter than in most arctic-alpine plants. Similarly, on some of the secondary mountains of Maine and New Hampshire (White Cap, Rumford, Maine, Mt. Hope, Coös Co., New Hampshire, etc.) the plant is so transitional between the arctic-alpine and the Alleghenian plant that specimens might pass for either; while the plant from the summit of Roan Mt., North Carolina, has the habit of *A. groenlandica* but the longer leaves and slightly shorter petals of *A. glabra*.

In brief, there seem to be no absolute lines by which *A. groenlandica* and *A. glabra* can be distinguished, although the plants of arctic-alpine and those of Alleghenian range have certain tendencies of habit and foliage which in extreme colonies are well marked, though in transitional areas these tendencies break down. At best, then, *A. glabra* is a geographic variety of *A. groenlandica*. The characters and ranges of the two varieties are stated below.

A. GROENLANDICA (Retz.) Spreng. Syst. ii. 402 (1825). *Stellaria groenlandica* Retz. Fl. Scand. ed. 2, 107 (1795). *Alsine groenlandica* Gray, Man. ed. 2, 58 (1856). *Alsinopsis groenlandica* Small, Fl. S. E. U. S. 420, 1330 (1903).—Tufted, forming dense mats of short leafy basal shoots 1–13 cm. broad: stems few to very numerous, filiform, depressed, decumbent or suberect, simple to freely forking 2–10 (rarely 15) cm. high, 1–30-flowered: leaves linear, obtuse, soft, often flaccid, or the basal narrowly oblanceolate; the basal 3–15 mm. long; the uppermost cauline (below the first forking) 2–9 mm. long: pedicels erect or spreading becoming 0.6–2.3 cm. long: calyx 3–5 mm. long, campanulate; the ascending essentially nerveless oblong to oval scarious-margined sepals obtuse: petals broadly to narrowly obovate, usually retuse, white, 6–10 mm. long (sometimes smaller or wanting): capsule globose-ovoid to slender-conical, slightly exserted: seeds reddish-brown, 0.7–0.8 mm. long.—Greenland and Labrador, south to Table-top Mt., Gaspé Co., Quebec, the higher mountains of Maine, New Hampshire, Vermont and New York, and in uncharacteristic form to the coast of southern Nova Scotia and eastern Maine.

Var. **glabra** (Michx.), n. comb. *A. glabra* Michx. Fl. Bor.-Am. i. 274 (1803). *Alsine glabra* Gray, Man. ed. 2, 58 (1856). *Alsinopsis glabra* Small, Fl. S. E. U. S. 420, 1330 (1903).—Similar: less tufted, usually with few if any short leafy basal shoots: stems solitary-few,

erect or strongly ascending, simple to freely forking, 0.7–2.7 dm. high, 1–50-flowered; the uppermost cauline leaves (below the first forking) 0.8–3 cm. long: pedicels becoming 1.2–4.5 cm. long: calyx 3–5 mm. long: petals 4–8 mm. long.—Mountains of Georgia, Tennessee and North Carolina, locally north on exposed siliceous rocks to the Catskill Mts., New York, central Connecticut, southwestern Rhode Island, central New Hampshire, and central Maine.

VI. AMERICAN VARIATIONS OF *ARENARIA VERNA*.

In 1906¹ it was felt by the present writer that the variations of *Arenaria verna* with petals shorter than or barely equaling the calyx could be separated as three varieties: var. *propinqua* (Richardson) Fernald, a glandular-pubescent plant with the rather tall flowering branches (up to 1.5 dm.) 2–5-flowered, and with the fruiting calyx 2.5–3.5 mm. long; var. *hirta* (Wormskj.) Watson, similar but with fruiting calyx 4–5 mm. long; and var. *rubella* (Wahlenb.) Watson, glabrous or nearly so, with branches 1 (rarely 2)-flowered and with calyx 3–4 mm. long. Since that time the writer has collected the plants extensively in Labrador, Newfoundland and Quebec and material from other regions has been sent him for study. As a result of reconsidering his former attitude it may now be stated that these variations are so freely confluent as to be practically unrecognizable.² They should be merged as one North American variety which is also in boreal Eurasia, and the earliest varietal designation seems to have been that of Chamisso & Schlechtendal, in 1826, when they distinguished *Arenaria hirta* *a. glabra* (the same as *A. verna*, var. *propinqua*, forma *epilis* Fernald) and *β. pubescens* (which covers vars. *hirta* and *propinqua* of later authors). This variety should, then, be known as

ARENARIA VERNA L., var. *pubescens* (Cham. & Schl.), n. comb. *Ar. Gieseckii* Hornem: Fl. Dan. ix. t. 1518 (1816). *Ar. hirta* Wormskj. Fl. Dan. x. t. 1646 (1819) excl. syn. *Ar. propinqua* Richardson in Frankl. Journ. 738 — reprint 10 (1823). *Ar. hirta β. pubescens* Cham. & Schlecht. Linnaea i. 56 (1826). *Alsine hirta* (Wormskj.) Hartm. Handb. Skand. Fl. ed. 3, 104 (1838). *Als. verna*, *η. hirta*

¹ RHODORA, viii. 32 (1906).

² Fenzl well understood the situation when he spoke of *A. verna* with "varietatum limitibus difficillime coërcenda, synonymia taediosa ac inextricabili fere modo confusa, botanicorum omnis aevi cruciamentum."—Fenzl in Ledeb. Fl. Ross. i. 348 (1842).



Fernald, Merritt Lyndon. 1919. "The specific identity of *Arenaria groenlandica* and *A. glabra*." *Contributions from the Gray Herbarium of Harvard University* (57), 17–21. <https://doi.org/10.5962/p.336029>.

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