

**Grimmia anomala Hampe in W.P. Schimper - Syn. Musc. Europ.  
ed. 2: 270. 1876.**

**Type:** Switzerland, Wallis, Zermatt, Aug. 1873, leg. Bertram, holotype, BM!

**Synonyms:** *Dryptodon anomalus* (Hampe) Loeske, *Grimmia anodon* var. *anomala* Bartr., *G. hartmanii* ssp. *anomala* (Hampe) Loeske, *G. hartmanii* var. *alpinoborealis* Loeske, *G. hartmanii* var. *anomala* (Hampe) Mönk., *G. pachyneurula* C. Müll. & Kindb., *G. phyllantha* Broth., *G. philibertiana* Britt.

**Distribution:** Am.1. As.1,2. Eur.

### **Description**

*Grimmia anomala* grows in green flat patches with abundant globular, multicellular, yellowish-green to orange gemmae present on leaf tips, the leaves are irregularly imbricated when dry, erect when moist, oblong-lanceolate, keeled above with eroded hyaline apex, the costa is projecting on dorsal side, hair-points are absent or very short, the margins are recurved on one or both sides. The distal areolation is unistratose, at places bistratose, the cell walls have longitudinal ridges, resembling papillae in cross-section. The mid-leaf cells are rounded-quadrangle, the walls slightly sinuose, the basal marginal cells are rectangular with smooth walls, the basal juxtacostal cells are short-rectangular with thickened transverse walls. The sexuality is dioicous, the seta is straight to slightly arcuate when moist, capsules are sporadically present, they are exserted, oblong-ovoid, with a rostrate operculum.

### **Discussion**

*Grimmia anomala* usually grows on rocks in alpine woodlands, and has been treated as a variety of *G. hartmanii* (Jones 1933). However, the ecological and morphological differences with this latter species are constant and so distinct, as pointed out by Vitikainen (1969), that it, without any doubt, can be treated at specific level. As a result of the always abundantly present gemmae on the deformed leaf apices, *G. anomala* can only be confused with *G. hartmanii*. However, *G. hartmanii* is more a lowland species, usually growing on boulders in forests with spreading secund upper leaves which taper to long sharply keeled apices. Capsules of *G. anomala* are extremely rare and only known from Norway (Nordland, Hordaland) and N. America (Rocky Mountains).

### **Specimens examined**

**Switzerland.** Canton of Uri, Klausenpass, alt. 2010 m, leg. H.C. Greven nrs. 3581 - 3589, 20-08-1996; Canton of Valais, Lötschental, Fafleralp, shaded boulder in

Larix forest, alt. 1787 m, Greven nrs. 2810, 2811, 20- 07- 2008; Canton of Berner Oberland, Grindelwald, slope of Lauberhorn, alt. 1900 m, leg. H.C. Greven nr. 3588, 29-08-1996; Canton of Uri, Klausenpass, alt. 2000 m, leg. H.C. Greven nr. 3125, 07-09-1994; **France.** Cantal, St. Paul de Salers, Col de Redondet, alt. 1640 m, leg. Ph. de Zuttere, nr. 20401; Savoie, Massiv du Mont Cenis, leg. E. Wallace; **Corsica.** Mte. Cinto, alt. 1590 m, leg. H.C. Greven, nr. 2907; Savoie, Massiv du Mont Cenis, leg. E. Wallace, 26-07-1965; Pyrenees, entrance tunnel de Bielsa, alt. 1650 m, leg. H.C. Greven nr. 3143, 03-05-1995; Pyrenees, Ariège, Salau, Cirque d' Anglade, alt. 1536 m, leg. H.C. Greven nr. 1933; Pyrenees, Ariège, Salau, track to Port de Salau, alt. 1220 m, leg. H.C. Greven nr. 1934, 03-07-1997; Pyrenees, entrance tunnel de Bielsa, alt. 1650 m, leg. H.C. Greven nr. 2782, 06-06-2003; Auvergne, Cantal, Plomb du Cantal, alt. 1795 m, leg. H.C. Greven nr. 3576, 30-07-1998; **Spain.** León, Cantabrian mountains, Pto. de San Isidro, prope Isoba, alt. 1610 m, leg. H.C. Greven nrs. 3577-3580; 02-08-1995; **Germany.** Algäuer Alps, Oberstdorf, alt. 1900 m, leg. F. and K. Koppe; Algau, Bärigünde, über Hinterstein, alt. 1305 m, leg. F. Koppe; Bavaria, Algau alps, Oberstdorf, Limlappolt block, summit, alt. 1900 m, leg. F. & K. Koppe, 15-08-1935; Bavaria, Algau alps, Bärigünde, Hinterstein, im Tal unter der Point Hütte, alt. 1305 m, leg. F. Koppe & R. Düll, 26-08-1959; **Norway.** Nedenes, Satersdalen, Kosterno, alt. 600 m, leg. N. Bryhn, 01-08-1896; **Sweden:** Pite Lappmark, Arjepluog, Vuoggatjalmejaur, leg. H. Möller. **Corsica.** Mte Cinto, alt. 1590 m, leg. H.C. Greven nr. 2907, 09-06-1994; **Iceland.** Siglifjörður, rock close to river, leg. W. Labeij, 06-06-1990. **Norway:** Nedenes, Satersdalen, alt. 500 m, leg. N. Bryhn; Nedenes, Byhle, leg. N. Bryhn; Nedenes, Breive, alt. 850 m, leg. N. Bryhn, Seljestad, Odde, leg. Nicholson & H.N. Dixon; **U.S.A.** Colorado, Routt Co., Routt Nat. Forest, 1-2 miles above Slavonia, east of Clark, alt. 2700 m, leg. Weber & Nelson, 27-06-1975; Montana, Flathead Co., Glacier Nat. Park, trail to Josephine Lake, leg. Ireland nr. 9945, 20-08-1965, MICH; Michigan, Keweenaw, conglomerate outcrop on north shore of Lake Manganese, leg. F.J. Hermann, 26-06-1980;

## References

- Greven, H.C. 1995. *Grimmia* Hedw. in Europe. Backhuys Publishers, Leiden, The Netherlands.
- Jones, G.N. 1933. In: A.J. Grout (ed.), Moss Flora of North America Vol. II, Part I: 1-66. Newfane, Vermont.
- Vitikainen, O. 1969. On the taxonomy and distribution of *Grimmia anomala* and *G. hartmanii* Schimper. Ann. Bot. Fenn. 6: 236-242.

