

**Grimmia elatior Bruch ex Balsamo-Crivelli & De Notaris - Mem. R. Acc.
Sc. Torino 40: 340. 1838.**

Type: Austria, Heiligenblut, lectotype, designated by Cao & Vitt (1986), GZU.

Synonyms: *Dryptodon incurvus* (Hoppe & Hornsch.) Brid., *Grimmia funalis* var. *robusta* De Not., *G. cognata* Card. & Thér., *G. grandis* Kindb., *G. madagassa* Ren. & Card., *G. papillosa* (Warnst.) Kindb., *G. pseudo-funalis* Limpr. *G. elatior* var. *pseudo-funalis* Limpr. (*G. elatior* var. *asperula* (Geheeb) Limpr.), *G. papillo-sa* Kindb.).

Distribution: Afr.1,3. Am.1. As.1,2,5. Eur.

Description

Grimmia elatior forms robust, loose, hoary, readily disintegrating tufts; leaves loosely appressed to slightly twisted when dry, erectopatent when moist, broadly-lanceolate, tapering to acute apex, keeled above, costa weak below, channeled above, projecting on dorsal side; hair-points short to long, usually terete and weakly denticulate, margins broadly recurved on one side. The distal areolation is bistratose, mid-leaf cells are \pm quadrate with more or less sinuose and incrassate walls, the apex areolation very opaque with rounded-incrassate, \pm papillose cells, basal marginal cells rectangular, transverse walls not thickened, basal juxtacostal cells long-rectangular with incrassate straight to slightly sinuose walls. Sexuality dioicous, capsules on arcuate seate occasionally present, they are emergent to exerted, obloid, striate with rostrate operculum, the peristome teeth are smooth in the basal part, finely papillose in the splitted apex.

Discussion

G. elatior was described by Hoppe and Hornschuch in 1819 from boulders near Heiligenblut (Carinthia, Austria) under the name *Trichostomum incurvum*. It is an easily recognizable species by its robust habit, usually growing in dark-green extended patches on various types of acidic rock, like gneiss, granite, sandstone and serpentine. There is resemblance to *G. decipiens* and both species are of the same size, however *G. decipiens* has two recurved leaf margins, and strongly denticulate hair-points, which are flattened at the base, while in *G. elatior* there is only one recurved leaf margin, and the hair-points are shorter, rounded and weakly denticulate. The length of the hair-point in *G. elatior* is very variable, depending on sexuality. Male plants, growing in separate cushions, are dark green, the leaves are much smaller with very short hair-points, sometimes with muticous leaves, female plants are larger with longer hair-points. When male and female plants

grow close together, sporophytes are frequently present. Under the microscope the leaf apex is very typical, extremely obscure, ± irregularly denticulate and slightly papillose. There is also some resemblance to *G. pilifera* P. Beauv., a widely spread Asiatic and North American species, that thus far not has been recorded for Europe. However, this species has immersed capsules, smooth cells and the basal marginal cells are quadrate. An interesting taxon is *G. elatior* var. *pseudofunalis* Limpr. (*G. elatior* var. *asperula* (Geheeb) Limpr., *G. papillo-sa* Kindb.). Loeske reports it from Norway, Sudeten and Tatra (however it is not in Pilous & Duda, 1960). I have studied various samples of this variety, from Norway (Nordland, Fauske; Dovre, Kongsvold), and Sweden (Lappmark, Abisko nature reserve). The stiff, blackish leaves are qua leaf form and areolation intermediate between *G. elatior* and *G. funalis*, however with rounded papillae on mid-leaf cells and nerve in the bi- to tristratose part the leaf, and hair-points are absent or very short and dentate. It occurs on boulders in streams in the upper forest zone and has never been found with sporophytes. Occasionally filiform, short-leaved, innovations are abundantly produced, the muticous leaves resembling those of *G. elongata*, cause for misidentification. In one of the convolutes, filled with such innovations, I found a note from Loeske with the message that these plants in his opinion were a remarkable modification of *Grimmia elongate*. *G. elatior* is characterspecies of the *Grimmietum elatioris* Gams 1927, a montane to alpine association with a preference for north facing, silicious rocks.

Specimens examined

Austria. Hohe Tauern, Heiligenblut, Kl. Fleischtal, Alter Pocher, alt. 1807 m, leg. H.C. Greven; nr. 3021, 3023; Carinthia, Kreutzeckgruppe, Radlberg, alt. 110 m, leg. H.C. Greven, nr. 3022; Oetztal, Mühlau, alt. 1121 m, leg. H.C. Greven, nr. 2099; Oetztal, Tumpen, alt. 938 m, leg. H.C. Greven, nr. 2096; **Cyprus.** Troodos, Pano Platres, alt. 1100 m, leg. H.C. Greven, nr. 2138; **France.** The Vosges, Col de la Schlucht, alt. 1130 m, leg. H.C. Greven, nr. 2767; Hautes Alpes, La Béarde, alt. 1700 m, leg. H.C. Greven, nr. 2656; Pyrenees, Bigorre, Gavarnie, alt. 1380 m, leg. H.C. Greven, nr. 2102, 2104, 2098; **Italy.** Prov. Bozen, 9332/4D, Runggöglhofes above Ober-Lana, alt. 450 m, leg. R. Düll; Val di Fassa, Campitello, alt. 1696, leg. H.C. Greven, nr. 2094; Val di Fassa, Moena, alt. 980 m, leg. H.C. Greven, nr. 2095; **Scotland.** Glen Clova, leg. J. Ferguson; **Spain.** Prov. Lerida, Bohi, Rio de S. Nicolau, alt. 1500 m, leg. G.M. Dirkse; **Sweden.** Värmland, Karlstad, leg. H.E. Johansson; Värmland, Hammerö, leg. H.E. Johansson; Värmland, Segerstad, alt. 900 m, leg. Aberg; Värmland, Sunne, alt. 500 m, leg. Aberg; Värmland, Arvika, leg. N.C. Kindberg; Lule Lappmark, Jokkmokk, Akkatsforsen, leg. H. Möller;

Switzerland. Wallis, Evolène, Ban de Lana, alt. 1560 m, leg. H.C. Greven, nr. 2097; Wallis, Thyon, Mt. Rouge, alt. 2103, 2290 m, leg. H.C. Greven, nr. 2100; Wallis, Les Haudères, alt. 1470 m, leg. H.C. Greven, nr. 2101; **Turkey.** Prov. Rize, Hemsin, Ortakoy, alt. 1700 m, leg. Davis Dodds, nr. 21307; Prov. Adana, Bahce, Dumanli Dag Haruniyi, alt. 1200 m, leg. Davis & Hedge; Prov. Corula, Ardanuc, Kordevan dag, alt. 2800 m, leg. Davis & Hedge;
Canada: Alberta, Rocky Mts., Banff Nat. Park, Lake Louise, Ten Peaks, alt. 2050 m, leg. H.C. Greven nr. 3013, 3014, 3015, 02-07-2998;

var. *pseudo-funalis* Limpr.

Norway. Nordlands amt. Salten, alt. 350 m, leg. I. Hagen; Sör-Trøndelag, Opdal, Knutshö, inter Kongsvoll et Sprenbekken, leg. P. Olsson; Dovre, Kongsvold, alt. 1200 m, leg. N.C. Kindberg; **Sweden.** Torne Lappmark, Abiskoajokks canyon, leg. E. Jäderholm; Torne Lappmark, Abisko, Marmorbrottet, leg. W.R. Ugglå; Torne Lappmark, Karesuando, Nirjijokk, leg. H. Möller;

References

- Cao, T. & D.H. Vitt. 1986. A taxonomic revision and phylogenetic analysis of *Grimmia* and *Schistidium* in China. Journ. Hattori Bot. Lab. No. 61: 123-247.
- Greven, H.C. 1995. *Grimmia* Hedw. in Europe. Backhuys Publishers, Leiden, The Netherlands.