

**Grimmia orbicularis Bruch – J. E. Smith et al., Engl. Bot.**  
**4: plate 2888. 1844.**

suppl.

**Type:** U.K., Bristol, St. Vincent's Rocks, leg. F.K. Eagle, lectotype, designated by Muñoz & Pando (2000), BM!

**Synonyms:** *Grimmia campbelliae* C. Müll., *G. mammillaris* Poech, *G. microglobosa* C. Müll., *G. novae-zeelandiae* R. Brown ter., *G. pulvinatula* C. Müll., *G. sinaica* B.S.G., *G. orbicularis* var. *persica* Schiffn.

**Distribution:** Afr.1. Am.1,2,4,6. As.5. Austr. Eur.

**Description**

*Grimmia orbicularis* grows in dark green to greyish, hoary, usually hemispherical cushions, leaves are appressed and twisted when dry, erect when moist, broadly lanceolate, abruptly contracted into hair-point, keeled above, costa is weak below, projecting on dorsal side, hair-points are short to long, smooth to denticulate, margins are recurved in the middle of the leaf, on one or both sides. The distal areolation is unistratose, mid-leaf cells are subquadrate with incrassate and sinuose walls, basal marginal cells are rectangular with thickened transverse walls, basal juxtacostal cells are elongate with incrassate and nodulose walls. The sexuality is autoicous, and capsules are usually present, they are exserted, bent down into the cushions by the arcuate setae, ovoid and smooth, peristome teeth are orange, broad, cribose, irregularly cleft at apex, operculum is mammillate.

**Discussion:**

*G. orbicularis* is a thermophilous species with a preference for sunny basic substrates. The species is very similar to *G. pulvinata*, forming comparable hemispherical cushions, usually growing in the same habitat, however, differing markedly both in gametophytic and sporophytic characters. *G. pulvinata* has leaves with short-rectangular, thin-walled basal juxtacostal cells and bistratose margins, while *G. orbicularis* has leaves with elongate basal juxtacostal cells with incrassate and nodulose longitudinal walls, and unistratose margins. *G. pulvinata* has obloid capsules with narrow dark red, slightly cleft peristome teeth and rostrate operculum while *G. orbicularis* has globose capsules with broad, orange to reddish, cribose and cleft peristome teeth and mammillate operculum. Var. *persica* (= *G. sinaica*), a probably genetic adaptation to the arid habitat of the desert (Frey & Kürschner 1991, Vitt 1981), is characterized by second extremely long hair-pointed perichaetial leaves, and sporophytes on short weakly curved setae.

### **Specimens examined**

**Austria:** Hainburger Berge, Spitzerberg close to Hundesheim, leg. R. Düll; Carinthia, Weiszbriach, Weissensee, alt. 990 m, leg. H.C. Greven, nr. 3046 m; **Belgium:** Prov. de Luxemburg, Bomal, leg. H.C. Greven, nr. 2338; Durbuy, leg. H.C. Greven, nr. 2340; **Bulgaria:** Plowdiv, Rhodopen, Vallei of Cei near Assenograd, leg. R. Düll; **Cyprus:** Omodhos, alt 300 m, leg. H.C. Greven, nr. 2329; **France:** Aveyron, Causse du Larzac, Le Clapier, Plateau de Guilhaumar, leg. Bonnot; The Vosges, leg. Bruch et Schimper; Arles, Les Alpilles, leg. H.C. Greven, nr. 2660; Pyrenees, Gave de Larrau, leg. H.C. Greven, nr. 2330; Pyrenees, Ste Engrace, alt. 900 m, leg. H.C. Greven, nr. 2331; Pyrenees, Oloron Ste. Marie, leg. H.C. Greven, nr. 2336, 2346; Bergerac, leg. H.C. Greven, nr. 2342; **Corsica:** Ponte Leccia, alt. 400 m, leg. H.C. Greven, nr. 2952; Bocagnano, alt. 900 m, leg. H.C. Greven, nr. 2953; Ortra, alt. 720 m, leg. H.C. Greven, nr. 2954; **Crete:** Skafia, leg. H.C. Greven, nr. 2347; **England:** Caernarvonshire, Little Ormes Head, Creuddyn Caerns, leg. D.A. Ratcliffe; **Germany:** Schwäbische Alb, along road from Kolbingen to Mühlheim, leg. F. Koppe; Reinland-Pfaltz, Bad Dürkheim, Herxheim, alt. 200 m, leg R. Düll; **Ireland:** Kerry, Dingle peninsula, Conor pass, alt. 814 m, leg. H.C. Greven, nr. 2333; **Luxemburg:** Echternach, leg. H.C. Greven, nr. 2339; **Madeira:** Pico do Areira, leg. H.C. Greven, nr. 2341; **Mallorca:** Es Barracá, leg. H.C. Greven, nr. 2824; Mirador de Ricardo Roca, alt. 250 m, leg. H.C. Greven, nr. 2830; Road Palma to Soller, Alfabia House of Gardens, alt. 200 m, leg. H.C. Greven, nr. 2831; **Sardinia:** between Nurri and Esterzili, alt. 450 m, leg. H.C. Greven, nr. 2337; Ursulei, alt. 810 m, leg. H.C. Greven, nr. 2357; **Scotland:** Edinburgh, Arthurs seat, leg. W.Evans; Duddingston Loch, leg. J. Sadler; **Slovakia:** Pieniny Nat. Park, leg. H.C. Greven, nr. 2332; Biele Karpaty, Cerveny Kamen, alt. 400 m, leg. H.C. Greven, nr. 2334; **Spain:** Prov. Zaragossa, Caspe, leg. H.C. Greven, nr. 2335; **Switzerland:** Wallis, Sion, leg. H.C. Greven, nr. 2348; **The Netherlands:** Veluwe, Fransche Berg, leg. H.C. Greven, nr. 2352; Vaals, leg. H.C. Greven, nr. 2351; Leuvenumsche bos, leg. H.C. Greven, nr. 2350; Camerig, leg. H.C. Greven, nr. 2349; Utrecht, leg. H.C. Greven, nr. 2356, 2344, 2343; Honswijk, leg. H.C. Greven, nr. 2358, 2359; Haamstede, leg. H.C. Greven, nr. 2361; Schoonrewoerd, leg. H.C. Greven, nr. 2345; Muiderberg, leg. H.C. Greven, nr. 2353; De Biesbosch, leg. H.C. Greven, nr. 2362-2368; Goilberdingen, leg. H.C. Greven, nr. 2355; Sleenwijk, leg. H.C. Greven, nr. 2354; Heukelum, leg. H.C. Greven, nr. 2360; Doorn, leg. H.C. Greven, nr. 2810; **Turkey:** Prov. Adana, Saimbeyli, Himmetli, alt. 600 m, leg. Davis & Hedge.

**var. persica Schiffn.**

**Iran:** Prov. Khorasan, Bodjnurd, alt. 1000 m, leg. Frey & Kürschner; **Turkey:** Urfa, alt. 800 m, leg. Davis & Hedge; Prov. Malatya, Hekimhan, alt. 1300 m, leg. Stainton & Henderson, nr. 5415D.

**References:**

Frey, W. & H. Kürschner. 1991. Lebensstrategien von terrestrischen Bryophyten in der Judäischen Wüste. *Bot. Acta* 104: 172-182.

Vitt, D.H. 1981. Adaptive modes of the moss sporophyte. *Bryologist* 84: 166-186.