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<b>Autor:</b>	Maier, Eva
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## Elevational distribution

Species growing at altitudes of between 2300 and 5700 m, are considered as high alpine taxa. Based on their elevations *G. abyssinica*, *G. bicolor*, *G. fuscolutea*, *G. handelii*, *G. macrotheca*, *G. nepalensis*, and *G. percarinata* can be considered as such.

The largest elevational range is found in *G. donniana* that grows from sea level to 5230 m. *Grimmia alpestris*, *G. anodon*, *G. consobrina*, *G. elatior*, *G. elongata*, *G. ovalis*, *G. sessitana*, *G. tergestina*, and *G. unicolor*, are found growing from the foothills to the high alpine zone, thus they inhabit a range of about 4500 m.

*Grimmia sessitana*, by its broad distribution across both hemispheres, its presence in Antarctica, and its vertical distribution range of 350 to 4750 m, may be regarded as the most widely distributed *Grimmia* species.

*Grimmia asperitricha*, *G. decipiens*, *G. dissimulata*, *G. humilis*, *G. kidderi*, *G. lisae*, *G. meridionalis*, *G. nutans*, *G. orbicularis*, *G. pilifera*, *G. plagiopodia*, *G. pulvinata*, and *G. trichophylla* probably do not extend above 2000 m.

## Reflections on taxonomic arrangements

The diagnostic characters elaborated for each taxon treated in this study, namely the cell morphology in the leaf base, costal architecture and sporophyte morphology, unite fifty-one accepted species in *Grimmia*. The genus is defined by the primary diagnostic characters of haplolepidous peristomes [Aplolepideen] with sixteen teeth separated down to the insertion and costae with ventral guide cells, as previously defined by LIMPRICHT (1889: 694, 722).

The taxa form groups within *Grimmia* although these groups depend on the choice of the defining characters used. They do not have the status of a rank, reflecting instead natural groupings of the species based on morphological and anatomical characters.

*Grimmia* includes the taxa with:

- **smooth capsules on elongate straight setae** – *G. alpestris*, *G. anomala*, *G. asperitricha*, *G. atrata*, *G. bicolor*, *G. caespiticia*, *G. donniana*, *G. elongata*, *G. hartmanii*, *G. incurva*, *G. khasiana*, *G. laevigata*, *G. longirostris*, *G. montana*, *G. nivalis*, *G. ovalis*, *G. tortuosa* and *G. unicolor*;
- **smooth capsules on elongate inclined setae** – *G. elongata*, *G. macrotheca*, *G. mammosa*, *G. percarinata* and *G. sessitana*;
- **smooth capsules on short straight setae** – *G. kidderi*, *G. tergestina* and *G. pilifera*;
- **smooth capsules on short inclined seta** – *G. crinita*;
- **smooth capsules on short setae in S-form** – *G. anodon*, *G. plagiopodia* and *G. tergestina*.