# The range of Braunia alopecura revised

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**Abstract:** The range of Braunia alopecura has been revised. It comprises only China, Nepal and Bhutan, the southern Alps and the Cap Verde Islands. All other indications are erroneous.

Braunia alopecura (Brid.) Limpr. has been described by Bridel from the southern Alps in Switzerland. Subsequently, the species was also found in other parts of the southern Alps in Italy and Switzerland as well by De Notaris near Gevova, a record which has often been overlooked (Frahm 1976). For long time, the species was supposed to be an European endemic, although Herzog (1926) called it a mediterranean element ("mediterrane Einspregung am Südfuß der Alpen"), however, the species does not occur else in the Mediterranean.

In 1943, Potier de la Varde published mosses collected by Auguste Chevalier in 1934 on the Cape Verde Islands. In this paper he published Hedwigidium imberbe. Later, Bizot (1969) revised this identification to Braunia alopecura. Both genera are easily to separate by immersed (Braunia) and exserted (Hedwigidium) capsules, but are difficult to distinguish in sterile condition. According to Frahm (1976) Hedwigidium imberbe differs from Braunia alopecura by recurved leaf margins, leaves gradually narrowed into the apex and papillose but translucent laminal cells. In contrast, Braunia alopecura has plane leaf margins, leaves with short apiculus (like a dolphin nose) and opaque laminas because of dense papillae..

Braunia alopecura was collected in several localities on Santo Antâo by Anja Lindlar (Frahm et al. 1996).

He & De Luna (2004) reported the species as new for China, where it has been confused with B. delavayi Besch..

The authors indicate the range with "China, Cape Verde Is., France, Germany, India, Iran, Italy, Kuwait and Switzerland". However, this list includes several mistakes.

The specimen cited from Germany (Weber s.n., 1885, JE) is from Switzerland. According to H.J. Zündorf, the curator of the herbarium Jena, the specimen is labelled "Braunia sciuroides Br. eur.", "Flora der Schweiz", "Ponte Brolla, auf Granitfelsen, Juli F. Weber 1885, however the information is on a printed label "C. Warnstorf, Deutsche Laubmoose" and was therefore erroneously attributed to Germany.

A record from Kuwait is not included in the Bryophyte Flora of the Arabian Peninsula (Kürschner 2000) and very unlikely, since the genus (with B. secunda) occurs in Saudi Arabia and Socotra only in mountains above 1200 m (Kürschner, pers. comm.). No specimen is cited for this reference.

Similarly there are no references cited for India and Iran and the origin of these records are dubious. Neither Gangulee (1969-72) nor Dandotiya et al. (2011) mention Braunia alopecura from India.

Fig. 1: Braunia alopecura (surroundings of Meran, Italy).

A record from Saudi Arabia belongs to B. secunda (Hook.) Bruch & Schimp. (cf. Kürschner & Frey 2011).
At least, Dalton et al. (2013) added Nepal and Bhutan to the range of Braunia alopecura and Braunia obtusicuspes to the synonymy, which was regarded as synonymous with Hedwigidium integrifolium by He & De Luna (2004).
Finally only records from the Sino-Himalayan region, the southern Alps and the Cape Verde Islands remained, but an explanation of such a range is difficult.
Species occurring in the southern Alps are likely declared as relics from the Tertiary, although the present habitats were glaciated during the Pleistocene. “True” relics such as Radula visianica are, however, found in the unglaciated parts of the foothills of the Alps and it cannot be excluded that Braunia alopecura is a also a relic which survived not in situ but elsewhere in the surroundings.
Disjunctions between the Alps and China (Himalayas) are not unusual and must be taken into account, however, the occurrence on neovolcanic islands such as the Cape Verde Islands is difficult to explain and can be based on misidentifications. especially because “there are 8 more species of Braunia described from tropical Africa, a revision of these species could reveal the identity of one or more of these species with Braunia alopecura” (from the Cape Verde Islands) (Frahm et al. 1996). In addition, there are 68 species of Braunia worldwide (www.tropicos.org), and the checklist of the mosses of sub-Saharan Africa (O´Shea 1995) lists 7 species of Braunia from mainland Africa, which could have dispersed to the Cape Verde Islands much easier than from the Alps or the Himalayas.

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Therefore a revision of the Cape Verde material seemed desirable. However, the collections made by Anja Lindlar (Frahm et al. 1996) were missing in the herbarium of the author. Therefore it was a valuable chance that Thierry Mahevas (Strasbourg) spent his holidays in spring 2013 in the Cape Verde Islands, where he was able to collect specimens even in previously not known localities.

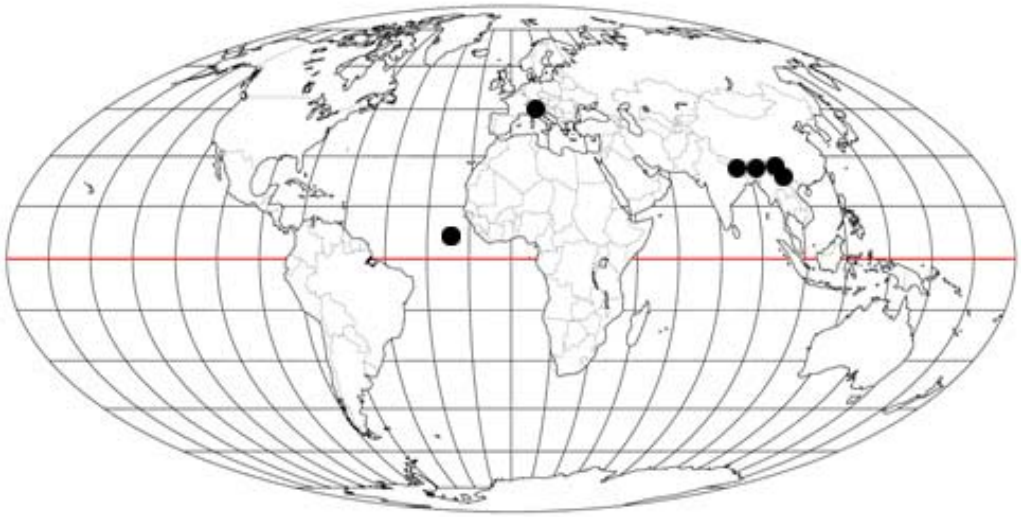

Fig.: 2: Presently known world distribution of Braunia alopecura.

A recent revision of Sino-Himalayan Hedwigiaceae (Dalton et al. 2013) included SEM pictures of the leaf surface of Braunia alopecura which show that the structure of the papillae resemble the specimens from the Cape Verde Islands (as well as from the southern Alps). Therefore the identity of the plants from the Cape Verde Islands with B. alopecura is apparently not questionable.

The range of Braunia alopecura can only be explained if a world wide revision of the genus has been undertaken but would else be speculation. In this stage of knowledge it is as we have only three pieces of a puzzle at hand but 10 pieces are required for the full image. A first attempt could be a molecular genetic analysis to see how the population are related.

**Literature**

BIZOT, M. 1969. Mousses des Iles du Cap Vert. Svensk Bot. Tidskr. 63 : 441-454.

DALTON, N.J., KUNGU, E.M., LONG, D.C. 2013. A taxonomic revision of Hedwigiaceae Schimp. from the Sino-Himalaya. J. Bryol. 35: 96-111.

DANDOTIYA, D., GOVINDAPYARI, H., SUMAN, S., UNIYAL. P.L. 2011. Checklist of the bryophytes of India. *Archive for Bryology* 88: 1-126.

FRAHM, J.-P. 1976. Ein Fund von *Hedwigidium integrifolium* (Dix.) P.d.B. in den Südalpen. Nova Hedwigia 27(3-4): 773-780.

FRAHM, J.-P., LINDLAR, A., SOLLMAN, P., FISCHER, E. 1996. Bryophytes from the Cape Verde Islands. Tropical Bryology 12: 123-154.

GANGULEE, H. C. 1969-1972. Mosses of Eastern India and Adjacent Regions, 3 vols. Calcutta.

HE, S., DE LUNA, E. 2004. The genus Braunia (Bryopsida, Hedwigiaceae) in China. The Bryologist 107 : 373-376.

HERZOG, TH. 1926. Geographie der Moose. Jena.

KÜRSCHNER, H. 2000. Bryophyte Flora of the Arabian Peninsula and Socotra. Bryophytorum Bibliotheca Bd. 55.

KÜRSCHNER, H., FREY, W. 2011.. Liverworts, Mosses and Hornworts of Southwest Asia (Marchantiophyta, Bryophyta, Anthocerotophyta): A Systematic Treatise on Liverworts, Mosses and Hornworts with Keys to Genera and Species Occuring in Afghanistan, Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sinai Peninsula, Syria, Turkey, United Arab Emirates and Yemen (incl. Socotra Island); with 1 Table. Cramer in der Gebr.-Borntraeger-Verlag-Buchh.

O´SHEA, B.J. 1995. Checklist of the mosses of sub-Saharan Africa. Tropical Bryology 10: 91-198. 1 map.

POTIER DE LA VARDE, R. 1943. Mousses récoltées aux Iles du Car Vert par M. Aug. Chevalier en 1934. Bull. Mus. Hist. Nat. Paris 2 : 239-243.

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