

***Pleurozium schreberi* (Musci, Hylocomiaceae) recorded for tropical Africa and a review of its world distribution**

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Abstract – The occurrence of the common Holarctic moss species *Pleurozium schreberi* (Brid.) Mitt. in tropical Africa is confirmed. The species was recorded twice in the Bale Mountains in central Ethiopia by Sabine and Georg Miehe in the upper montane *Philippia-Hagenia* forest at an elevation of 3 300–3 500 m. The global range of the species is discussed, with special reference to North America, and mapped. *Cuspidaria morenoi* Müll. Hal. from western Patagonia is briefly assessed and it is suggested that this species should be considered conspecific with *Acrocladium auriculatum* (Mont.) Mitt., not with *Pleurozium schreberi* (Brid.) Mitt.

Bryophyta / Musci / *Pleurozium* / bryogeography / global distribution / East Africa / Ethiopia / North America / *Cuspidaria morenoi*

INTRODUCTION

Pleurozium schreberi (Brid.) Mitt., the only member of the monotypic genus *Pleurozium* Mitt. in the family Hylocomiaceae, is one of the best known Northern Hemisphere moss species. Its glossy, pale green to yellowish carpets or coarse wefts are found on soil, humus and other substrata in a wide range of habitats, usually in dry and open but also, less often, in shaded and damp sites. It is a characteristic, common and abundant component of ground vegetation in coniferous and other acidophilous forests, moorlands, heathlands, sand-dunes and scree from the lowlands to the low-alpine belt in the mountains. *P. schreberi* is an indicator of acid substrata.

A REVIEW OF THE GLOBAL DISTRIBUTION OF *PLEUROZIUM SCHREBERI*

Pleurozium schreberi is common throughout the boreal zone and temperate zones in the Holarctic. In the north it extends into the Low Arctic in North America (Kuc, 1970), Eurasia (Afonina & Czernyadjeva, 1995) and Greenland

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where it extends to lat. *ca* 70°N only on the west coast of the island (Lewinsky & Mogensen, 1979). [It does not reach lat. *ca* 78°N as indicated on the map by Kuc (1997)]. Only occasionally does it penetrate deeply into the High Arctic on Ellesmere Island in the Canadian Arctic Archipelago (Kuc, 1997) and Svalbard (Kuc, 1973).

Pleurozium schreberi becomes rarer towards the south of the Holarctic where it occurs mostly in the mountains. In Eurasia its southern limit runs roughly from Japan and Taiwan through the Himalayas, the Caucasus, and the Mediterranean area [including Algeria in North Africa (Allorge, 1955-1956)] to the Azores. In North America it extends in the south to North Carolina, Arkansas, Colorado, Idaho and northwest Oregon as clearly indicated on the maps by Wynne (1945) and Vitt *et al.* (1988). Their distribution maps contradict the recent global distribution maps for *P. schreberi* published by Menzel and Schultze-Motel (1987) and Kuc (1997). According to these authors the continuous range of this species covers in the south almost the whole of the North American continent except for Florida and the western fringes of California and additionally extends to Costa Rica. In fact, the species has never been recorded from the southern states of the United States, for example from Georgia (Lampton, 1970), Texas (Whitehouse & McAllister, 1954), Arizona (Haring, 1961), New Mexico (Mahler, 1978), Nevada (Lawton, 1958) or California (Koch, 1950), so this part of the range appears to have been incorrectly mapped. A new map of the global distribution of *P. schreberi*, with corrections to its North American range is presented in figure 1.

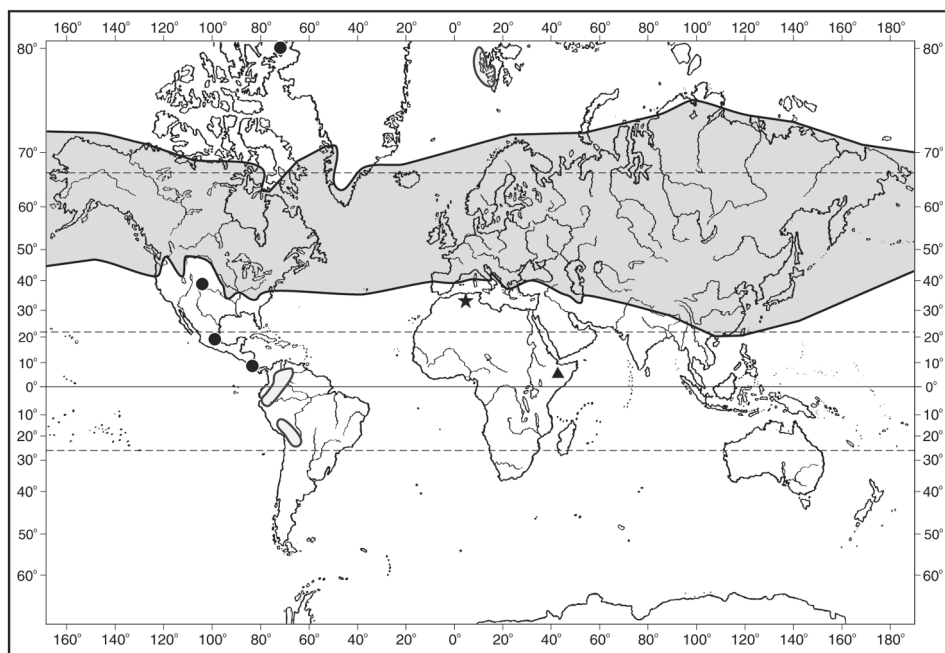


Fig. 1. Global distribution map for *Pleurozium schreberi* (Brid.) Mitt. The Ethiopian locality is marked by the triangle and a (not accurately located) station in Algeria by the star.

As is the case with many Holarctic moss species, *Pleurozium schreberi* has been found at some isolated outposts at altimontane elevations in the Neotropics. It does not have a continuous range in the Central American isthmus as indicated by Menzel and Schultze-Motel (1987) and Kuc (1997), but it is known only from two isolated stations in the state of Vera Cruz in Mexico at an elevation of 2 700-3 100 m (Peterson, 1994), and from two stations in Costa Rica (Bartram, 1928). The species seems to be more frequent in South America where it occurs in the Andes from Venezuela to central Bolivia at an elevation 2 650-4 200 m (Delgadillo *et al.*, 1996; Churchill *et al.*, 2001).

Additionally, *Pleurozium schreberi* has been recorded once from southern South America (Wijk *et al.*, 1967; Greene, 1986). This record is based on Brotherus' (1925) assumption on the conspecificity of *Cuspidaria morenoi* Müll. Hal. and *P. schreberi*. This taxonomic conclusion was later confirmed by Wynne (1945). This species was described by Müller (1897) from a single collection made by F. P. Moreno in January 1880 at an unspecified locality in Patagonia at lat. 50-53°S and originating from the Kuntze herbarium. The type specimen of this species was apparently destroyed in 1943 in Berlin but Wynne (1945) cited the specimen of Moreno No. 593 from NY. Alas, despite special search by Dr. W.R. Buck it could not be located in this herbarium, either under *Cuspidaria* or *Pleurozium schreberi*. He only found a specimen of *Acrocladium auriculatum*, also originating from the herbarium of Otto Kuntze, but collected in 1882 by Moreno in this region and bearing the number 215. A close analysis of the original description of *C. morenoi*, especially its reference to broadly ovate, cochleariform and obtuse leaves clearly indicate that this taxon represents *Acrocladium auriculatum*, a species commonly occurring in western Patagonia (Ochyra & Matteri, 2001), not *Pleurozium schreberi*. This conclusion also concurs with the ideas of Dusén (1903) and Cardot (1908) who suggested the placement of this species in *Acrocladium*.

AFRICAN REPRESENTATION

Apart from the Neotropics *Pleurozium schreberi* has also recently been collected in sub-Saharan Africa. When examining a rich collection of mosses collected in the Bale Mountains, Ethiopia, made by Drs Sabine and Georg Miehe, Marburg, Germany, we found a good number of taxa new to the country and the whole of Africa. A provisional list of moss records from this area was published by Miehe and Miehe (1994a); many moss records were mentioned in other publications by these authors devoted to ecological studies on the vegetation of the Bale Mts. (Miehe & Miehe, 1993, 1994b). Some new continental or country moss records have been published in separate accounts, for example *Entodon concinnus* (De Not.) Paris (Ochyra & Bednarek-Ochyra, 2000), *Orthotrichum arborens* Thér. & Naveau (Ochyra & Bednarek-Ochyra, 2001), *Plagiothecium lucidum* (Hook. f. & Wilson) Paris (Ochyra *et al.*, 2000) and *Plagiomnium undulatum* (Hedw.) T. J. Kop. (Koponen, 1993). A detailed account on the Ethiopian liverworts collected by the Miehes was published by Pócs (1994). Because *P. schreberi* was mentioned by Ochyra (1992) and Miehe and Miehe (1994a) without more exact locality data and the information on the occurrence of this species in sub-Saharan Africa has subsequently been repeated by O'Shea (1999), and Kuc

(1997) has indicated the Ethiopian station on a distribution map, we think it is important to substantiate these reports by citation of the relevant specimens. These are as follows:

ETHIOPIA. BALE MOUNTAINS: (1) Hareenna escarpment and adjacent foothills and plain towards Mena, 6°49'N, 39°42'E, alt. 3 300 m, *Philippia keniensis* scrub forest near forest limit, rare ground moss, 23/24 December 1989, G. & S. Miehe 189 (KRAM). (2). Above Goba, 6°54'N, 39°56'E, alt. 3500 m, upper montane *Philippia-Hagenia* forest with uppermost *Juniperus procera* on 35° SE-facing slope, ground moss, rare admixture, 2 March 1990, G. & S. Miehe 3099 (KRAM).

According to the notes on the labels *Pleurozium schreberi* in the Bale Mts. is a very rare component of the ground vegetation of the upper montane forest dominated by *Philippia keniensis* and *Hagenia abyssinica*. The first specimen consists of only one very large shoot with the habit typical of this species, whereas the second specimen consists of only two small shoots, which also show all the typical features of the species. No associates have been found in the samples.

Frahm (1995) listed no less than 153 moss species which are common in Europe and tropical Africa. Many of them are known to occur only at altimontane elevations in East and Central Africa, but surprisingly Ethiopia appears to be a remarkable centre for the occurrence of Holarctic moss species on this continent. Species such as *Entodon concinnus*, *Plagiomnium undulatum* and *Pleurozium schreberi* have their only localities in tropical Africa here. However, Ethiopia is a very undercollected region bryologically, and therefore further interesting records are expected with progress in field study.

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