**Echinodium setigerum** (Mitt.) Jur.

Status: **Vulnerable (VU D1)**

**Class:** Bryopsida  
**Order:** Leucodontales  
**Family:** Echinodiaceae

**Description and Biology:** A medium-sized, branched, light to dark green pleurocarp moss. It is up to 6 cm long; primary and lower secondary stem wiry, dark brown to black, with leaves mostly eroded or broken; branch leaves erect-spreading, somewhat falcate when dry, subulate from a broadly ovate to oval base; nerve obscure, disappearing into the acumen, the excurrent part ca. 3 times longer than the lamina; capsule inclined, cylindrical. Dioecious.

Recent data indicates an evolutionary old age and a wider distribution of the genus *Echinodium* in the Tertiary which is supported by the predominant occurrence of this extant *Echinodium* species in evolutionarily old forest types as the laurel forest, a presumed remnant of the Tertiary flora (Stech *et al.* 2008).

**Distribution and Habitat:** Only found on Madeira (Portugal). Confined to less than 10 localities (using a grid net of 1 X 1 km) after 1950 in NW Madeira (Sérgio *et al.* 1992). However, the population size at each locality is quite small (<100 individuals). It is the rarest species of the genus in Madeira (Hedenäs 1992). Sporophytes are very rare and observed only once and not seen since 1989. It is largely confined to shady and humid narrow valleys of well-conserved laurel forest. The species is found on shaded soil, rocks, tree roots and tree bases, often close to streams, where there is little direct sunlight, at altitudes of 200-900m.

Vascular plants in the surrounding area are *Dactylorhiza foliosa*, *Heberdenia excelsa*, *Laurus novocanariensis*, *Musschia wollstonii*, *Ocotea foetens*, *Persea indica*, *Picconia excelsa*, *Polystichum falcinellum* and *Woodwardia radicans*. It is found in association with bryophyte species like *Drepanolejeunea hamatifolia*, *Frullania microphylla*, *Lejeunea eckloniana*, *Microlejeunea ulicina*, *Plagiochila exigua*, *Plagiochila stricta*, *Porella inaequalis*, *Radula holtii*, *Daltonia splachnoides*, *Homalia webbiana* and *Echinodium spinosum*.

**History and Outlook:**

Today, Madeira Laurel forest is under regional, national and international protection. It is considered a Place of the Natura 2000 Network and in 1999 was declared a World Natural Heritage of UNESCO. Presently the habitats where this species is present are confined to narrow and very humid valleys in well preserved areas of the laurel forest, difficult to access and distant from main roads. *E. setigerum* grows frequently close to headwater streams, however due to the implementation of the Water Framework Directive and consequent regulation concerning the water effluents we admit that water contamination is not a limiting factor. However, environmental alterations due to anthropogenic activity like increase of rubbish and water nitrification by the tourism action as well as destruction of habitats when opening new pathway and the construction of funiculars. Furthermore the maintenance of permanent open systems with water supplies is necessary in order to keep this species vital.

A climatic change may cause alteration in the forest water balance will probably have a negative influence in the ecological requirements of this relict species. Also landslides due to torrential rain can be a disaster for this taxon.

At its localities the taxon is occurring within only a few square meters at most making it highly vulnerable to both natural and human caused environmental changes. The future prospect of this species is that, despite there is no evidence for a continuing decline, the very small population size in itself indicates that it is not safe and thus meets the criteria for VU D1.
References:


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