



## Past and present activities and future strategy of bryophyte conservation

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### Abstract

A review of past and present progresses in bryophyte conservation worldwide is attempted. The strategy and action program in bryophyte conservation in the future are also presented.

**Key words:** Red list, endemism, hot spots, *ex situ*, awareness, measures

### Introduction

Why is bryophyte conservation needed?

The interest in conservation of bryophytes has increased significantly in the last two decades (Hylander & Jonsson 2007). Today we recognize that bryophytes provide important ecosystem services and we enjoy the existence of high bryodiversity for ethical and aesthetical reasons (Pócs 1980; Longton 1992). We follow the precautionary principle, which states, that lack of certainty regarding the threat of environmental harm should not be used as an excuse for not taking action to avert the threat (IUCN 2007). This reason alone justifies the motive and goal to protect and preserve the natural flora of bryophytes.

Some bryophytes species do have a direct economical value, e.g., peat mosses (*Sphagnum*) which cover large areas of northern hemisphere, including northern Europe, Canada and Russia (Joosten & Clarke 2002). Several species are valuable due to their medicinal properties. Some have chemical compounds that are active against certain cancer cell lines. Others have anti-bacterial, anti-microbial, and anti-fungal activities (e.g., Raymundo *et al.* 1989; Asakawa 1995; Asakawa *et al.* 2003; Nagashima *et al.* 2002).

Bryophytes play an important role in natural ecosystem and are also essential for the sustainability of human civilization and society. The most obvious are the contribution of bryophytes to water recycling, biomass production and carbon fixing (Hallingbäck & Hodgetts 2000) as well as Carbon and Nitrogen cycling (Turetsky 2003). They are also important food items for animals. In cold environments where seed plants do not grow in abundance, bryophytes are the main staple food for reindeers, geese, ducks, sheep, musk oxes, lemmings and other rodents (Longton 1992).

However, bryophyte flora is continually being impoverished in many countries today. A positive development, though, is that bryophyte species are redlisted also in many countries. The already published national red lists show that the rate of confirmed extinction of bryophytes, in most cases, ranges from 2–4%, and that a substantial proportion of the bryoflora worldwide is threatened in the short term (Vanderpoorten & Hallingbäck 2008). This prognosis is alarming—however, not hopeless.