# How environmental changes interact to shape non-vascular and vascular plant allelochemical interactions in terrestrial ecosystems ?

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## Abstract

The study of structural and functional characteristics of plant secondary metabolites (PSMs) is a particularly valuable scientific research in relation to recent environmental changes, including those with changing climate. The response of plants to ecological changes influences higher plant resource allocation and also PSMs. The accumulation of PSMs in vascular plant tissues is then considered as a common adaptive response of plant to adverse environmental conditions [1]. However, although diverse and complex secondary metabolites produced in the plant kingdom are found in vascular plants, our knowledge of secondary metabolites in ancient terrestrial non-vascular plants is extremely limited. Among them, the Bryophytes or mosses represent an important branch of the plant kingdom with more than 16 000 species playing a fundamental ecological role in many terrestrial ecosystems.

Here we proposed to give 1) a synthesis of current knowledge of bryophyte PSMs under environmental changes and 2) to focus on a case study of living *Sphagnum* secondary metabolites involved in a peatland plant–soil feedback under environmental changes. In particularly, we hypothesize that changing climate strongly influences aboveground-belowground interactions by modifying chemical interactions that alter ecosystem attributes and functions [2,3,4]. Our data support the hypothesis that *Sphagnum* phenolics varied along an ecological and seasonal gradient and interact with fungal symbiosis of *Andromeda polifolia*.

Understanding how environmental changes interact to shape non-vascular and vascular plant secondary metabolisms and consequently their potential allelochemical interactions remains an important challenge for chemical ecologists, especially where bryophytes are dominant community members.

Key words : Allelopathy; *Andromeda;* Bryophytes; Climate changes; ericoid mycorrhizae; Plant Secondary Metabolites; Polyphenols; *Sphagnum*

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