Moss: Classification, Development and Growth and Functional Role in Ecosystems
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Book Description:

Terrestrial moss communities are widely distributed among the Earth's major biomes, including equatorial to polar latitudes. Because of their high primary productivity, relatively dense vegetative structure, and alteration of the substratum through deposition of organic matter, moss communities often support rich and diversified microbial communities. This book examines microbial communities in terrestrial moss in further detail. It also discusses terrestrial mosses as trace element bioindicators; moss bioreactors; the ecological diversity and application for agricultural microbiology; small scale area investigation for heavy metals air pollution; biomonitoring of atmospheric pollution using mosses; the impact of forest decline on fine-scale vertical distribution of epiphytic bryophytes; and the use of mosses in criminal investigations. (Imprint: Nova)

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ABSTRACT Application of several moss species for monitoring of the anthropogenic impact on heavy metals air pollution in a small scale area was studied. Mosses were reviewed for their potential to reflect metal air pollution. The attention was focused on their quantification ability, underlying the metal accumulation in the moss plant tissue. Potential "hot spots" were selected in areas of lead and zinc mines (case study at Zletovo mine and Sasa mine), copper mine (Bučim mine), ferronickel smelter plant (FENI industry) and the abandoned As-Sb-Tl mine at the Allchar area, as the main metal pollution sources in the Republic of Macedonia in the period between 2010-2012. There is continuous distribution of dust from ore, flotation tailings and slag surface. This results in air-introduction and deposition of higher contents of certain metals. Several moss species (Hypnum cupressiforme, Campothecium lutescens, Scleropodium purum and Homolothecium sericium) were used as plant sampling media. Determination of chemical elements was conducted by using both instrumental techniques: atomic emission spectrometry with inductively coupled plasma (ICP-AES) and mass spectrometry with inductively coupled plasma (ICP-MS). Combination of multivariate techniques (PCA, FA and CA) was applied for data processing and identification of elements associated with lithogenic or anthropogenic origin. Spatial distribution maps were created for determination and localization of narrower areas with higher contents of certain anthropogenic elements. In this way, influences of selected human activities in local (small scale) air pollution cases can be determined. Summarized data reveal real quantification of elements distribution not only in order to determine the hazardous elements distribution, but also present complete characterization of elements deposition in mines/smelter plant environs.