Title	**Effect of 30 years of road traffic abandonment on epiphytic moss diversity**
Author	Vítězslav Plášek, Arkadiusz Nowak, Marcin Nobis, Grzegorz Kusza, Katarzyna Kochanowska
Journal	Environ Monit Assess, Vol. 186
Abstract	Road traffic emits a cocktail of pollutants that can influence the vegetation and plant diversity in neighboring areas. However, the recovery potential of bryophytes after traffic abandonment is still little explored. In addition, the effects of the main pollutants of road verges, such as metals and salinity, on moss flora need to be investigated. In our study, we compared the moss richness and diversity in two closely related veteran tree allees of high conservation importance. The allees in Gryżów and Lubrza, Poland, were chosen because of their similarity in age, geographical location, type of surrounding areas, and tree species. The only difference was that the trees in Gryżów had not been exposed to direct road pollution for almost 30 years. The moss richness and diversity differed significantly between the sites. Altogether, 20 moss species were recorded on 229 trees, 17 species in Gryżów (abandoned road), and 13 in Lubrza (busy road). We found considerable differences between moss cover on the road-facing and opposite sides of tree trunks. In Lubrza, mosses on the road-facing side were very scarce. The moss cover in Gryżów was highly balanced between trunk sides as well as among trunk heights. Typical epiphytic species such as Bryum moravicum, Dicranoweisia cirrata, Leskea polycarpa, and Orthodicranum tauricum preferred the Gryżów tree stands, where they were present in numbers almost twice as high as that at Lubrza. The study shows that constructing a bypass road could be an effective conservation measure for veteran tree protection with their epiphytic moss flora.
Year	2014
Pages	8943–8959
keywords	Moss monitoring, Road salting, Tree conservation, Epiphytes, Tilia cordata, Orthotrichum, Poland

Title	**Drastic Turnover of Bryophyte Vegetation on Bog Microforms Initiated by Air Pollution in North-eastern Estonia and Bordering Russia**
Author	Kai Vellak, Jaan Liira, Edgar Karofeld, Olga Galanina, Maria Noskova, Jaanus Paal
Journal	Wetlands, Vol. 34

Abstract	Human influence on bogs, including air pollution, causes changes in vegetation leading to the degradation of an ombrotrophic bog ecosystem into a more uniform transitional mire-like system. We have hypothesized that intensive atmospheric alkaline pollution will cause an increase in water pH and convergence of bryophyte species composition among microforms. We also expected that bog-specific acidophilic species will be replaced by species indigenous to neutral pH habitats. Through GLM and DCA analyses, we found that although natural acidic bogs are more species poor than polluted bogs, the increase in pH can lead to a decrease in bog specific vegetation. In polluted bogs, the species composition in different bog microforms will become similar; in particular bog-specific Sphagnum mosses will be increasingly replaced by more tolerant brown mosses, particularly in lawns.
Year	2014
Pages	1097–1108
keywords	Alkaline input, Characteristic species, Micro topography, Raised bogs

Title	**Tissue S/N ratios and stable isotopes (d34S and d15N) of epilithic mosses (*Haplocladium microphyllum*) for showing air pollution in urban cities in Southern China**
Author	Hua-Yun Xiao, Cong-Guo Tang, Hong-Wei Xiao, Yan-Li Wang, Xue-Yan Liu, Cong-Qiang Liu
Journal	Environmental Pollution, Vol. 158(5)
Abstract	In urban cities in Southern China, the tissue S/N ratios of epilithic mosses (*Haplocladium microphyllum*), varied widely from 0.11 to 0.19, are strongly related to some atmospheric chemical parameters (e.g. rainwater SO42-/NH4+ ratios, each people SO2 emission). If tissue S/N ratios in the healthy moss species tend to maintain a constant ratio of 0.15 in unpolluted area, our study cities can be divided into two classes: class I (S/N > 0.15, S excess) and class II (S/N < 0.15, N excess), possibly indicative of stronger industrial activity and higher density of population, respectively. Mosses in all these cities obtained S and N from rainwater at a similar ratio. Sulphur and N isotope ratios in mosses are found significantly linearly correlated with local coal d34S and NH4+- N wet deposition, respectively, indicating that local coal and animal NH3 are the major atmospheric S and N sources.
Year	2010

Pages	1026- 1032
keywords	Epilithic mosses, Sulphur, N isotope ratios

Title	**Assessment of atmospheric sulfur with the epilithic moss *Haplocladium microphyllum*: Evidences from tissue sulfur and d34S analysis**
Author	Xue-Yan Liu, Hua-Yun Xiao, Cong-Qiang Liu, Hong-Wei Xiao, Yan-Li Wang
Journal	Environmental Pollution, Volume 157(7)
Abstract	The application of geochemical signals in mosses is more and more popular to investigate the deposition of atmospheric pollutants, but it is unclear whether records of atmospheric sulfur in mosses differ between their diverse habitats. This study aimed to investigate the influence of growing condition on tissue sulfur and d 34S of *Haplocladium microphyllum*. Epilithic and terricolous mosses in open fields, mosses under different canopy conditions were considered. We found that tissue sulfur and d34S of mosses under different habitats were not consistent and could not be compared for atmospheric sulfur research with each other even collected at the same site, moss sulfur and d34S records would be distorted by subsoil and upper canopies in different degrees, which possibly mislead the interpretation of atmospheric sulfur level and sources. Consequently, mosses on open rocks can be used reliably to assess atmospheric-derived sulfur in view of their identical sulfur and d34S evidences. Mosses on open rocky surfaces are reliable bioindicators of atmospheric sulfur deposition.
Year	2009
Pages	2066- 2071
keywords	Atmospheric pollutants, Bioindicators, sulfur