

Title	Assessment of environmental quality in Harwan area of Srinagar district (j&k), using lichens as bio-indicators
Author	<i>Asma Hussan, G. A. Bhat, Mukhtar Ahmad Sheikh</i>
Journal	International Journal of Current Research and Review
Abstract	<p>The present study deals with the monitoring of lichens in a sub-urban area, Harwan, free from any direct polluting source was done with the aim that how air quality of area can be assessed using lichens as indicator and establishing the fact that how cleaner environment supports better diversity and density of lichens. The variety and variability data on Lichen species was collected and correlated with the air analysis data that was obtained using High volume Air Sampler. Analysis of air quality in the air was based on determining fraction of SPM (Suspended Particulate Matter), RSPM (Respirable Suspended Particulate Matter), NRSPM (Non-Respirable Suspended Particulate Matter), SO₂ (Sulphur dioxide) and NO₂ (Nitrogen dioxide) on seasonal basis i.e spring, summer and winter season on six (6) hourly basis. Quadrats of 25cm x 25 cm size, three on each tree, were laid from base to chest height for recording the data on frequency, density and abundance of lichens growing on the selected trees. Chlorophyll analysis, pH of host trees and water holding capacity was determined. The study revealed the occurrence of 14 species of lichens belonging to 11 genera and 5 families. The air quality parameters were generally found within permissible limits with slight variation in different seasons. The data on the quantitative parameters i.e frequency, density and abundance of lichen species showed good values. Analysis of data further revealed that chlorophyll content of species is quite good in the area. The present communication thus serves as baseline record regarding the level of various pollutants including particulate matter and the number of lichen species for conducting biomonitoring studies in future.</p>
Year	2014
Pages	01-06
keywords	Lichens, Biomonitoring, Environmental Quality, Harwan, Kashmir

Title	Sulfur isotopic signatures of water-soluble sulfate in needles of <i>Pinus Massoniana</i> Lamb in two Chinese areas
Author	Hui Guan, Hua-Yun Xiao, Cong-Qiang Liu

Journal	Environmental Earth Science
Abstract	This study analyzed the water-soluble sulphate (S_{SO_4}) and total sulfur (ST) concentrations and their isotopic signatures ($\delta^{34}S_{SO_4}$ and $\delta^{34}S_T$) in needles of <i>Pinus massoniana</i> Lamb collected from Guiyang (seriously affected by acid rain) and Yunnan areas (acid rain did not occur), China SW. The results indicated that the S_{SO_4} concentrations in needles of <i>Pinus massoniana</i> Lamb collected from several Chinese areas were found to be significantly correlated to ambient sulfur dioxide ($R^2 = 0.9176$, $p = 0.01$), showing that S_{SO_4} concentrations in needles were more reliable to indicate atmospheric sulfur. The average $\delta^{34}S_{SO_4}$ (-7.2 %) and $d34STS$ (-5.1 %) in needles in Guiyang areas were significantly lower than those in Yunnan areas (+3.9 and +5.7 %, respectively), which were in accordance with the lower $\delta^{34}S$ of coals in Guiyang areas than in Yunnan areas. The $\delta^{34}S_{SO_4}$ and $\delta^{34}S_{TS}$ in needles became less positive with a distance from plant combusted ^{34}S -enriched coals while for another plant combusted ^{34}S -depleted coals, more positive was observed. These results indicated that $\delta^{34}S_{SO_4}$ in needles was also a good indicator of atmospheric sulfur sources. A very small difference between $\delta^{34}S_T$ and $\delta^{34}S_{SO_4}$ for most needle samples suggested that little isotopic fractionation accompanies sulfur assimilation processes.
Year	2014
Pages	----
keywords	<i>Pinus massoniana</i> Lamb, Needles, Watersoluble sulphate, Total sulfur, $\delta^{34}S$, Source discrimination

Title	Corticolous lichen diversity, a potential indicator for monitoring air pollution in tropics
Author	<i>ANPM Attanayaka, S Chandrani Wijeyaratne</i>
Journal	Journal of the National Science Foundation of Sri Lanka Vol. 41, No 2
Abstract	As information on lichen diversity and air quality in tropical ecosystems are limited, attempts were made in this study to correlate the distribution and diversity of corticolous (tree bark colonizing) lichens in the Western Province of Sri Lanka. The major source of air pollution in the study area was vehicular emissions. Thirty one sites located on six transects diverging from the Colombo City were selected for this

	<p>purpose. Eight trees representing three species (<i>Cocos nucifera</i>, <i>Mangifera indica</i> and <i>Artocarpus heterophyllus</i>) within each site (1 km²) were chosen for the study. The coverage and frequency of corticolous lichens found on the selected trees were recorded by using 250 cm² grids. After studying their morphology, anatomy, reproductive structures and chemistry, the lichens were identified using taxonomic keys. In addition, land use pattern, traffic density, pH of the substrates and exposure levels of the bark of these trees to light were also recorded. Ambient SO₂ and NO₂ levels at each site were determined using passive samplers having filter pads coated with the absorbing reagents ethylene glycol and acetone for SO₂, and NaI, NaOH and ethylene glycol for NO₂. Data were analyzed statistically using the mean comparison, correlation coefficient and principal component analysis to investigate the relationship between the diversity of lichens and environmental parameters. Lichen diversity data collected on selected trees were used to formulate the index of atmospheric purity (IAP). A negative correlation was found to exist between the lichen diversity expressed as IAP and the concentrations of SO₂ and NO₂ levels in the study sites. These results revealed that corticolous lichens have the potential to be used as indicators of air quality monitoring in a tropical environment as well.</p>
Year	2013
Pages	131-140
keywords	Air pollution in tropics; corticolous lichens; index of atmospheric purity (IAP)