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Moss (*Barbula* sp.) as a bioindicator to monitor heavy metal air pollution: Comparison of native moss and moss bag technique

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Biomonitoring techniques using moss (*Barbula* sp.) as a bioindicator have been used to examine heavy metal deposition in local areas and around point sources. We sought to determine the efficacy of moss bag technique and native moss method against bulk deposition to determine heavy metal air pollution. Atmospheric heavy metal deposition was determined around the industrial area of Sapugaskanda which includes an oil refinery, an industrial zone and three power plants; Sedawatte which has the influence of Kalanitissa power plant and Dalugama University premises which close to the A1 road. Heavy metals (Pb, Ni, Cu, Cd and Cr) were determined by Atomic Absorption Spectroscopy (AAS) during six months of period from October 2007 to March 2008.

Heavy metal concentrations measured in three sampling sites during six months of period is given in µg/g dry weight of moss sample in native moss and moss bag technique. Concentration of heavy metals in bulk collector is expressed in µg/cm^2 area of the funnel. Dry weight of moss in unit area was used to bring these results into a common unit. A hypothesis was developed according to the equality of population variance of results in two methods and the corresponding significant levels (α value-probability of making a decision to reject the null hypothesis when the null hypothesis is actually true) were obtained from the F distribution table to compare native moss method and moss bag technique with bulk deposition method. The results indicate that the moss bag technique is most suitable to monitor heavy metal air pollution than the native moss method when compared with the bulk deposition method.

Metal	Comparison between two methods	α value
Pb	Native moss (*Barbula* sp.2) -Bulk deposition	0.0004
	Moss bag (*Barbula* sp.2) - Bulk deposition	0.0003
Ni	Native moss (*Barbula* sp.2) -Bulk deposition	0.3663
	Moss bag (*Barbula* sp.2) - Bulk deposition	0.1435
Cu	Native moss (*Barbula* sp.2) -Bulk deposition	0.1679
	Moss bag (*Barbula* sp.2) - Bulk deposition	0.0267
Cr	Native moss (*Barbula* sp.1) -Bulk deposition	0.2379
	Moss bag (*Barbula* sp.1) - Bulk deposition	0.1629
Cd	Native moss (*Barbula* sp.1) -Bulk deposition	0.0978
	Moss bag (*Barbula* sp.1) - Bulk deposition	0.0257

Table1 Statistical results for two methods compared with bulk deposition

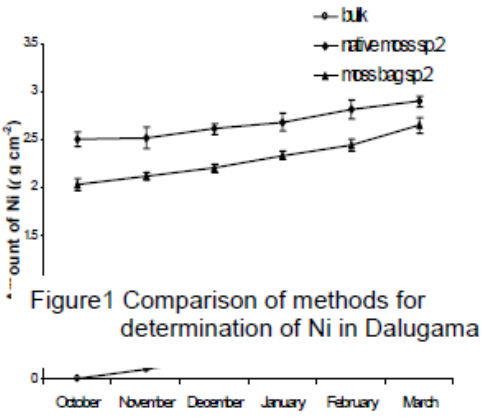

Figure1 Comparison of methods for determination of Ni in Dalugama

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