



Short communication

Comparison and estimation lead (Pb) in suspended particulate matter in spider webs at iron and steel re-rolling industrial areas and ruler area of Wagha Town, Lahore

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ABSTRACT

Air emission and contaminants residues in biota are reflective of environmental quality. Spider webs found in environmentally degraded areas as absorb air contaminants. In the present study heavy metals Pb concentrations were determined in spider webs were collected from industrial and ruler areas in to the level of suspended Pb metal in the indoor houses in Wagha Town, Lahore. Exposure level and accumulative mean concentration values of Pb incline ($P < 0.001$) in spider's webs at iron and steel re-rolling industrial areas compare to ruler areas. Effort should be intensified to monitor iron and steel re-rolling industry fuels and emission on a regular basis in order to ensure safe environment.

Keywords: Spider web, Lead (Pb), suspended particulate matter, Industrial emissions.

INTRODUCTION

Spiders belong to one of the largest and most diverse groups of insects Spider web contamination of house facades especially indoor wall surfaces area consider as selection of web weaving (Samu 2002). Monitoring of spider web now consider has provided a tool for environmental contamination estimating the degree of contamination, source and habitat of residential commercial and industrial areas (Rybak, 2012; Ayedun et al., 2013; Ayabe et al., 2014; Rybak et al., 2014). Xiaoli et al., (2006); Zmudzki and Laskowski, (2012); Ayedun et al., (2013) studied the biodiversity and structure of spider communities along a metal pollution gradient and concluded that spider's community may be affected by heavy metals indirect effect of pollutants. The level of heavy metals in spider webs can be used of or both quality control and also for determination of environmental contamination or pollution. Spider webs have been demonstrated as effective indicator of heavy metals attributed to particulate emission (Hose et al., 2002; Ayedun et al., 2013). The aim of the present study is to find out the Pb

lead quantity of air in industrial and ruler environment using spider webs as an indicator.

MATERIAL AND METHOD

Total three union councils selected in wagha town Lahore and sample collected from five indoor houses walls. Sampling area No.1 Shadipura 31°35'54.4"N 74°24'07.9"E area in union council.39, Iqbalpura 31°35'31.8"N 74°23'33.4"E area in union council.38 are area were human settlements and iron re-rolling industrial activities coexisting with the exception of few vehicular passage on the roads while Rot Garh village 31°39'00.6"N 74°24'57.5"E area in union council.49 ruler area with a few agricultural activities. Spider webs were collected from indoor house of industrial and these spider webs were collected during moderate dry season of April, 2013 and methodology related to (Xiaoli et al., 2006). 1 g of each spider web was taken and plate digested concentrated nitric acid and 2.0 ml of 30% hydrogen

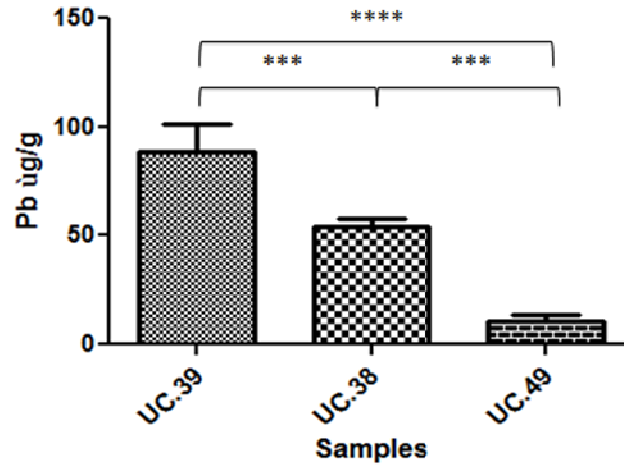


Figure 1. Distribution of average concentrations concentration of elements measured in spider webs collected from different industrial and ruler sites (N = 15).

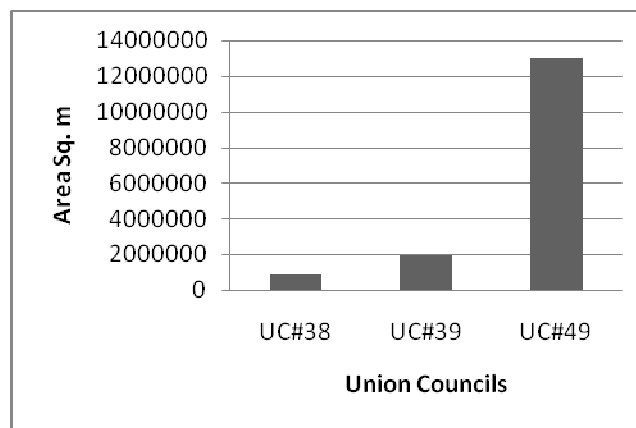


Figure 2. Area of studied Union Councils

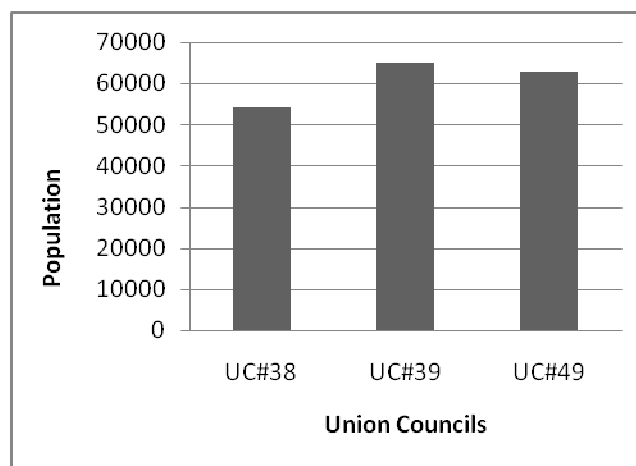


Figure 3. Population of studied Union Councils

peroxide until whole residue digestion was completed and filtered and methodology related to (Ayedun et al., 2013). Estimation of the lead metal was done by an Atomic Absorption Spectrophotometer (AAS) AA 7000 F, Shimadzu, Japan.

The data were analyzed using Graph Pad Prism statistical software version 5.00 for Windows, Graph Pad Software, San Diego California USA, and www.graphpad.com. Dunnett's posttest applied after a significant one-way analysis of variance (ANOVA), to determine which differences are significant. Union council.49 concentration considered as normal for comparison of time duration among groups. Results with <0.05 were considered to be statistically significant.

RESULTS AND DISCUSSION

Accumulation of metals significant concentrations of many traces metals especially Pb, by spiders in these locations is likely to occur and indicator of ecological toxicity level. Hendrickx et al., (2004), and Laskowski and Kammenga, (2000). In recent research found that mean accumulative concentration of Pb metals of 4.5 times raised and significantly high value in spider webs Xiaoli et al., (2006). Spider intoxicated and accumulates traces heavy metals as consequences exhibit strong physiological stresses. (Babczynska et al., 2006; Wilczek et al., 2003, 2004). In present study at three sites were significantly different ($P < 0.001$) concerning the concentration of Pb. Higher concentrations were generally observed in the 39. The obtained results show UC.49 relatively low level ($P < 0.0001$) of metals content in both sites. However compare the results of the study with the concentrations of Pb in village area of union council (49) in spider web collected showing that in the vicinity of union council 38 and 39 more than hundred iron and steel re rolling foundries working emitting a significant amount of Pb and agreeing with combustion processes are the basic source of pollution with lead and other harmful metal (Rybak, 2012; Ayedun, 2013).

CONCLUSION

In this study comparison and estimation lead (Pb) in suspended particulate matter in spider webs at iron and

steel re-rolling industrial areas and ruler area of Wagha Town, Lahore. The concentration of metals in spiderwebs from the study area majorly caused by industrial activities and contribution of burning of tyres as fuel at iron and steel re-rolling industrial. Environmental monitor tools should be intensified to checking of iron and steel re-rolling industry fuels and emission on a regular basis so as to certify safe and nontoxic environment air effluents.

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