

# HEAVY METALS CONCENTRATION IN DUST ACCUMULATED ON LEAVES OF CERTAIN PLANT SPECIES GROWN ALONGSIDE NATIONAL HIGHWAY- 22, INDIA

Navjot Singh Kaler\*<sup>1</sup>, S.K. Bhardwaj<sup>1</sup> and Prabhat Tiwari<sup>1</sup>

<sup>1</sup>Dr Y.S. Parmar UHF Nauni, Solan- 173230 (H.P.), India  
Email: [kalernavjot8888@gmail.com](mailto:kalernavjot8888@gmail.com)

Received-04.02.2017, Revised-16.02.2017

**Abstract:** Heavy metals contamination in plants due to air pollution is one of the major issues to be faced throughout the world and requires attention because heavy metals above their normal ranges are extremely threatened to both plant and animal life. Now a day's increase in vehicular traffic on highways is a major threat to air quality as the pollution released from vehicles consisting high concentrations of heavy metals which seriously affects the nearby vegetation. As biomonitoring with plants is low-cost and valuable method for knowing the effect of different air and environment pollutants so the present study was carried to estimate levels of heavy metals in dust accumulated on leaves of selected plant species from Parwanoo to Solan on National Highway-22 falling in Solan district of Himachal Pradesh. The four species namely *Grewia optiva*, *Toona ciliata*, *Melia azedarach* and *Woodfordia floribunda* of uniform size, age, spread and common in occurrence on both sides of the highway were selected for the study. Concentrations of heavy metals (As, Cd, Cr, Cu, Mn, Ni, Pb and Zn) were estimate in dust accumulated on leaves of selected plants and compare them with their normal permissible limit prescribed for soil. The dust accumulated on leaves had heavy metals, Cu (29.15 mg kg<sup>-1</sup>) and Zn (1219.92 mg kg<sup>-1</sup>) above permissible limit of the soil. The study provided a reliable method for screening heavy metals concentration in dust deposited on leaves of plants nearby roads where the air-shed is contaminated by a variety of pollutants due to vehicular emissions.

**Keywords:** National highway-22, Leaf dust, Heavy Metals, Solan

## REFERENCES

- Allaway, B. J. (1990). Heavy metals in soils. Blackie and Son Ltd., Glasgow, London. pp. 177-196.
- Al-Khashman, O. A. (2004). Heavy metal distribution in dust, street dust and soils from the work place in Karak Industrial Estate, Jordan. *Atmos. Environ.*, 38: 6803-6812.
- Angold, P. G. (1997). The impact of a road upon adjacent health land vegetation effects on plant species composition. *J. App. Ecolo.*, 34: 409-417.
- Beckett, K. P., Free-Smith, P.G. and Taylor, G. (1998). Urban woodlands: their role in reducing the effect of particulate pollution. *Environ. Pollut.*, 99(3): 347-360.
- Dwivedi, A.K., and Tripathi, B.D. (2007). Pollution tolerance and distribution pattern of plants in surrounding area of coal-fired industries. *J. Environ. Biol.*, 28(2): 257-263.
- Gaikwad, U.S., Ranade, C.D. and Gadgil, J.M. (2004). Plants as Bio-indicators of Automobile Exhaust Pollution - A Case Study of Sangli City. *IE(I) Journal-EN*, pp. 26-28.
- Heumann, H.G. (2002). Ultrastructural localization of zinc in zinc-tolerant *Armeria maritime* spp. halleri by autometallography. *J. Plant Physio.*, 159(2): 191-203.
- Lin, D.A. (1976). Air Pollution Threat and Responses. Addison Wesley Publishing Company, London.
- Morrison, G.M.P., Revitt, D.M. and Ellis, J.B. (1990). Metal speciation in separate storm water systems. *Water Scie. and Techno.*, 22(10-11): 53-60.
- Nriagu, J. and Pacyna, J. (1988). Quantitative assessment of worldwide contamination of air, water and soils by trace metals. *Nature*, 333: 134-139.
- Oliva, S.R., Castrillon, B.V., Dolores, M. and Alvarez, M. (2007). *Nerium oleander* as a means to monitor and minimize the effects of pollution. *Bocconea*, 21: 379-384.
- Pacyna, J. (1988). Long-range transport of heavy metals— modelling and measurements. In H. Van Dop (Ed.), *Air Pollution Modelling and Its Application*, New York (USA): Plenum Press. pp. 367-380.
- Pendias, A.K. and Pendias, H. (1992). Trace elements in soils and plants In: Lead. 2<sup>nd</sup> edn, Boca Raton Arbor, London. pp. 187-198.
- Saison, C., Schwartz, C. and Morel, J.L. (2004). Hyper accumulation of metals by *Thlaspi caerulescens* as affected by root development and Cd-Zn/Ca-Mg interactions. *Inter. J. Phytoreme.*, 6(1): 49-61.
- Sharma, S.C., Sharga, A.N. and Roy, R.K. (1994). Abatement of Industrial pollution by landscaping. *Ind. J. Environ. Prote.*, 14(2): 95-97.
- Sunita, M., and Rao, K.V.M. (1997). Air pollution tolerance capacities of selected plant species. *J. Ind. Botan. Soci.*, 76: 95-98.
- Tripathi, A.K. and Gautam, M. (2007). Biochemical parameters of plants as indicators of air pollution. *J. Environ. Biol.*, 28(1): 127-32.
- Velikova, V., Yordanov, I. and Edreva, A. (2000). Oxidative stress and some antioxidant systems in acid rain treated bean plants. *Plant Scien.*, 151(1): 59-66.

\*Corresponding Author