ASSESSMENT OF MUNICIPAL SOLID WASTE FOR NUTRIENT ELEMENTS AND HEAVY TOXIC METALS

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ABSTRACT

Pollution has become a major threat to the very existence of mankind on this planet. Of the many sources, municipal solid waste (MSW) is one of the serious causes of pollution. To minimize pollution, MSW must be managed in a way that it becomes an asset rather than a liability. For this purpose, a survey was carried out to assess the quantity and quality of MSW in terms of plant food nutrients and toxic metals produced in Peshawar during May 2002-April 2003. Waste samples were collected from houses in different locations (such as IDS colony, Police colony, Cantt area, Yakatooth, and Hayatabad Town), hotels, juice shops and city garbage. After weighing and necessary processing, waste samples were analyzed for major nutrients (N, P, K), some micro-nutrients (Zn, Cu, Fe, Mn) and some heavy toxic metals (Ni, Cd, Pb, Cr). Information on the current utilization status of such wastes were also collected from concerned quarters. The results showed that the amount of MSW produced varied greatly from location to location and from house to house within the same locality. Our data revealed that on average about 0.43 kg of MSW is produced per person per day in Peshawar which is equivalent to about 868 tons per day for Peshawar. Our results showed that the MSW contain variable amounts of elements (total) such as N 0.23-4.02%, P 0.04-0.22%, K 0.05-2.38%, Zn 5-149 μg g^{-1}, Cu <1-104 μg, Fe 190-1958 μg, Mn 29-204 μg, Ni <1-259 μg, Cd <1-14, Pb <1-164μg, and Cr <1-187 μg. Currently most of the MSW is used for land filling and which used to be a good source of organic fertilizer in the past. The farmers interest in its use declined because of presence of plastic bags, glasses and hospital wastes. These results suggested that huge amount of MSW is produced in Peshawar but it is not being used for any meaningful purpose despite the fact that it has large reserves of essential elements.

Key Words: Municipal solid waste, Macronutrient, Micronutrient, Heavy metals