

Helminth Parasitic Load in Soil of Northern Lahore

Baig, A. S. A.*, Rana, M. S., Zaki, M. T. and Khan, K.

Centre for Integrated Mountain Research (CIMR), Quaid-I-Azam Campus, University of the Punjab, Lahore, Pakistan

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ABSTRACT: Environment conservation is the common concern at all levels from local to global. Most of the recent environment problems and ill effects stem from ecological misappropriation and neglect to recognize the limits of ecosystem, its. Rapid population growth, low income, lowest health facilities, poor sanitation, lack of education. Personal and community hygiene poverty has enhanced the incidence percentage of parasite infections. This situation is further worsened due to ignorance about the hazard of parasite infection. In order to minimize the risk factors, Municipal Corporation has taken some bold steps. In order to develop an integrated system for solid waste management, the Municipal Corporation has divided the Lahore city (Pakistan) into six towns. For each of these a decisional model is applied so as to define the composition and amount of solid waste flows to be collected and diverted to the dumping sites.

Key words: Municipal, Waste, Soil, Helminth, Organic, Lahore

*Corresponding author: Email- sikandarstar@yahoo.com

INTRODUCTION

Waste is never consistent. It varies widely in composition and depending on use of available material by different areas. It may be hazardous material or non hazardous material (Richard and Bernard, 2000). Improper and insufficient disposal of urban solid waste is polluting water and soil in several ways.

Similarly application of different types of organic wastes may have a marked effect on soil biomass and its activity and hence increasing the environmental hazards (Jedidi, *et al.*, 2004).

Quantitative and qualitative changes in the composition of solid waste not only contaminated soil, water and air but also causes serious health hazards (Lis, *et al.*, 2004).

The food processing and production industries are increasing the organic solid waste. It is also increasing the population of scavenger, vectors (i.e. flies, mosquitoes) which are responsible for spreading respiratory, gastrointestinal and skin diseases, cholera, diarrhea, tuberculosis, typhoid, mums, hepatitis and malaria (Russ and Meyer-Pittrof, 2004). The major protozoan species that

effect human are *Entamoeba histolytica*, *Giardia intestinalis*, *Cryptosporidium*, *Toxoplasma*, *Cyclospora* and *Isospora* species. These parasites exist in environment as oocysts or spores which are transmissible stages in many environmental conditions i.e. water, soil and food (Sinski, 2003).

Philippe (1997) and Traub, *et al.*, (2002) reported that by gardening or walking bare-foot outside, human had potentially been exposed to soil contaminated with canine faeces. Surveys of contaminated areas in many countries have almost invariably shown the presence of viable eggs of *Toxocara canis* (*T.canis*) in around 10% of soil samples (Smith, *et al.*, 2001). Trichiuriasis was the most common helminthic infection associated with significantly lower serum vit A. The prevalence of the trichiuriasis was greater in pre-school children because of poor sanitary facilities (Rim, *et al.*, 2003). *A.lumbricoides* has been assumed to be the most world wide prevalent (Gharavi, *et al.*, 2003). This condition occurs most commonly in children who have close contact with their pets or who live in areas such as public parks

where contamination of the ground by the dog faeces is abundantly available (Mafiana, et al., 2000). Rockiene (1995) reported that soil samples analysis showed that they were infected with helminths ova and this revealed a close correlation between soil contamination and human ascariasis. Infestation with *A.lumbricoides* causes intestinal complications, massive gastrointestinal bleeding especially in temperate and tropical countries (Sangkhathat, et al., 2003). Atukorala and Lanerolle (1999) recorded the prevalence of soil transmitted helminthic infection, living conditions and personal hygiene in school girls aged 14 -18 years old in both urban and rural areas in Sri Lanka. In developing countries with high population growth rate, low income, lowest health facilities, poor nutrition, joint family systems (particularly in rural areas) with maximum chances of contact provide ideal condition for intestinal helminthic infections (Doligalska, et al., 2003). In addition lack of education, personal and community hygiene and poverty has further enhanced the incidence percentage of parasitic infections. This situation is further worsened due to ignorance about the hazards of parasitic infections.

MATERIALS & METHODS

To record the rate of generation of solid waste (SW) and its physical composition, samples were collected near the transfer station of Ravi Town (northern Lahore; Pakistan), i.e. Scheme No. 2 and Shad Bagh. To record the prevalence of various parasites including helminths, a total of 75 soil samples collected from colonies of Ravi

Town i.e. *Khokar Road, Saddiqia Colony and Scheme No 2* situated near the open dumping stations in November and December 2003 to January 2004. For the collection and recovery of helminthes eggs and larvae the marshy areas are preferred and Sodium hypochlorite technique (WHO, 1991) was used.

RESULTS & DISSUCTION

Figure 1 shows physical composition of SW samples. It was observed that organic waste (domestic waste) was in high quantity consisting of vegetables and fruit residues (Tables 1 & 2). As the SW is transferred to the open dumping station i.e. Mehmood Bottie, the scavengers (dogs, cats, cattle and rodents) were observed wandering in the area of waste dumping. Similarly the children of the age 4-10 years belonging to the poor families and nomads were also observed playing in vicinity of dumping stations with dogs, glass marbles and kites. Permanent depressions with stagnant water were the breeding sites for vectors (mosquitoes and flies), hence increasing the intensity of malaria, diarrhea, typhoid, hepatitis, dysentery, gastrointestinal infections and whooping cough etc. The soil samples examination showed various helminths eggs and larvaes flourishing in the soil. The soil had been contaminated with eggs, larvae and parasites of dogs, rodents, cattle and horses. The polluted soil was being ingested by children playing in vicinity of dumping sites. The soil contamination was the result of excreta shed by the wild and domestic animals. The most abundant parasites in the area of study include:

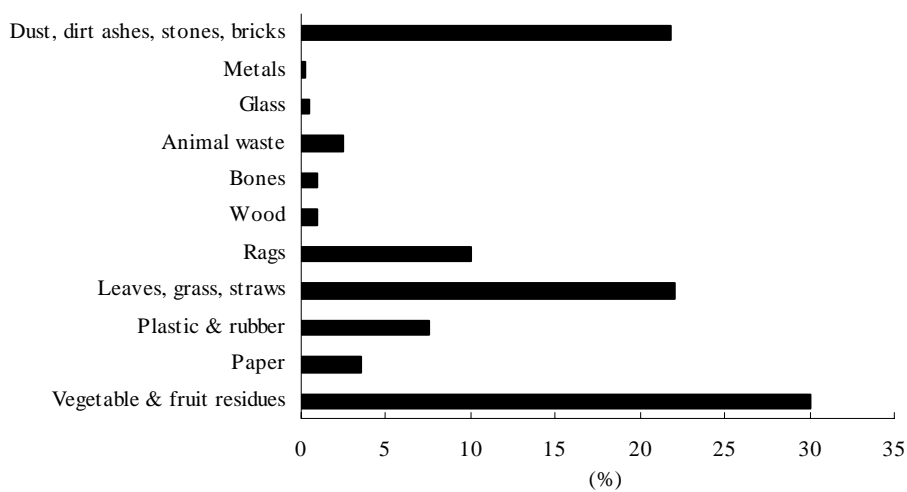


Fig.1. Average composition of municipal wastes in lahore

Table 1: Solid waste generated in Pakistan and Indians major cities

Cities	Solid Waste Generated (tones/Day)
Lahore	3960
Karachi	6000
Mumbai	6050
Dehli	4000
Calcutta	3500
Banglore	2000
Chennai	2000 (USW); 500 (debris)
Lukcnov	1500
Hyderabad and Secunderabad	1300
Ahmedabad	1280
Surat	1000

Ancylostoma duodenale(A. duodenale.)
Trichuris trichiura(T. trichiura.)
Strongyloides stercoralis(S. stercoralis.)
Enterobius vermicularis(E. vermicularis)
Ascaris lumbricoides(A. lumbricoides)
Diphylidium caninum(D. caninum)
Diphyllobothrium latum(D. latum)
Toxocara canis(T. canis)
Apophallus donicus (A. donicus)
Capillaria hepatica (C. hepatica)

Similarly a boiler was found where carcasses of horses and cows were present. The employee of age 10-22 were boiling dead animals bodies in open boilers to get their bones, teeth and horns. As they were burning and boiling the dead, a crossive smell was reaching about 3km away in the air along with the cloud of smoke, thus increasing the air, soil and water pollution, also generating health hazards.

CONCLUSION

The findings of the present study indicate that improper and unscientific dispose of SW, may pollute air, water and soil in several ways. It also indicate the infected stages of the parasites shed from the rodent's excreta, that may be ingested by man via water, air or adulterated food. These are strong evidences suggesting parasitic infections cause not only acute or serious debilitations but can subvert health, growth and physical capabilities of the infected person (Kassi, 2002). As man is the potential host of wide variety of parasitic infections (Robert and Janovy, 2000). Very important sources of zoonoses (diseases or infections transmit from vertebrate animals to man via food stuff or soil) in human comes from food stuff of animal origin and can be directly tranmssed from environment (Zamo *et al.*, 2003).

Table 2: Waste form Oakistanis, India and North European cities-a comparison

Item	Pakistan	India	N. Europe
Paper	2.70%	4%	27%
Vegetable/putrescible matter	30.72%	75%	30%
Dust etc. under 10 mm	27.83%	12%	16%
Metals	0.32%	0.4%	7%
Glass	20.02%	0.4%	11%
Textiles	7.45%	3%	3%
Plastics	5.63%	0.7%	3%
Other, stores, ceramics, wood etc.	1.45%	7%	3%
Weight/person/day	0.55 kg/capita/day	414 g	845 g
Weight/dweling/day		2.5 kg (6 person)	2.5 kg (3)
Density kg/m ³	478	570	132
Anima waste	2.35%		

The numbers of parasites have been increased with increase in population and solid waste. Environmental contamination with helmintheic infective stages needs regular indication for recognition of parasite species under molecular data and improvement of effective measures to prevent human zoonotic diseases (Doligaska and Donskow, 2003). Infections involving helminths or parasite worms affect more than 25 % of population worldwide (Protol, 2003).

Intestinal Ascariasis can be the cause of massive gastrointestinal bleeding, especially in temprate and tropical countries (Sangkhat *et al.*, 2003). Infection with *A. lumbricoides* constitute one of the most common helminth disease in the world especially in the tropical and sub tropical regions. Transmission of this disease involves environmental contamination with eggs and therefore is classified as a soil transmitted disease. Therefore the option of integrated control programmes based on chemotherapy in combination with sanitation and health education, together with strong community involvement, must be considered in order to ensure the positive long-term effect of such programs. Nationwide parasite control project is necessary to reduce possible morbidity due to parasite diseases in the country. Hence it is necessary to adopt sanitary land filling techniques to avoid such problems.

The inhabitants are so used to the existing conditions that their children play in vicinity of these open damping sites. In June when storms come, the dust along with various eggs, spores etc and

particulate matter from the dumps spread in the neighboring areas and not only adulterate the water sources, spread the infectious parasitic agents, yet also increase the intensities of diseases, already prevailing in the areas i.e. respiratory and skin diseases. Most cases of tuberculosis have been identified from *Siddiqia Colony and Khokar Road* as it is seen contagious set of diseases. Thus, more and more inhabitants including children are becoming victim of such diseases due to malnutrition, poor sanitation conditions polluted water and lack of education.

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