

many developing nations has spurred the need to examine the health implications of such dumps to the surrounding residents. For instance, Yongsu et. al. (2008) conducted a cross-sectional epidemiological study to examine the health risks of different waste disposal system in Cameroun. The study found a 14% diarrheic prevalence among the respondents and a strong statistical association was found between household refuse management methods and incidence of diarrhea among the respondents. Salam Abul (2010) examined the health impact of solid waste management among residents around the Mangwaneni Dumpsite in Swaziland. The study is unique in that the respondents were stratified by the distance of their homes to the dumpsite.

The first group are those having their homes within 200 metres radius, while the second group live from 200 metres and beyond from the Manzini Dumpsite in Swaziland. Damaturu city does not have a sanitary and landfill (Moffat and Linder, 1996). As a matter of fact, waste materials are sited in certain open dump sites in some areas in Damaturu and allowed to compile until they are taken away or incinerated. Improper disposal of untreated municipal solid waste is not only harmful to human health but also a threat to the environment (Yaliang, 1996). Pathogenic microorganisms and harmful chemicals in solid waste can be introduced into the environment when the waste is not properly managed (Wai-Ogosu, 2004). Waste can contaminate surface water, groundwater, soil and air which pose more problems for humans, other species, and ecosystems (Obire et al. 2002). Thus, the objective of the study was to identify the microorganisms associated with some waste dump sites around Damaturu metropolis. At present there is a particular interest in the relation between biodiversity, simply defined as the number of species present in the system and function in the soil. There is now a growing body of experimental evidence that most mediated by microbes.

Indeed, bacteria are highly versatile, they can carry out almost all known biological reactions. To provide a comprehensive view of the complex relations between microbial diversity and soil functionality consider:

- The complexity of soil as a biological system.
- The problems in measuring microbial diversity and microbial functions in soil and meaning of these measurements.
- Current ideas concerning the link between microbial diversity and soil functions.

- Instance when measurements of microbial diversity are unnecessary for a better understanding of soil functionality; and
- The research needed for a better evaluation and manipulating of microbial diversity and soil functionality.

Bacteria

Bacteria are single called microbes. The cell structure is simpler than that of other organisms as there is no nucleus or membrane bound instead their control center containing the genetic information is stained in a single loop of DNA. Some bacteria have an extra circle of genetic material called a plasmid. The plasmid often contains genes that give bacterium some advantage over other bacteria. For example, it may contain a gene that makes the bacterium resistant's to a certain antibiotic. Bacteria are classified into 5 five groups according to their basic shapes: spherical (cocci), rod (bacilli), spiral (spirilla), comma (vibrious) or corkserew (spirochaetes). They can exits as single cells, in pair's chains or: lusters. Some bacteria live in the soil or on dead plant matter where they play an important role in the cycling of nutrients. Some types cause food spoilage and crop damage but others are incredibly useful in the production of fermented food such as yoghurt and soy source. Relatively few bacteria are parasites or pathogens that cause disease in animals and plants.

Important of Bacteria in the Soil

Bacteria perform important function in the soil, decomposing organic residues from enzymes secreted in the soil. There are basically four functional soil bacteria groups:

1. Decomposers, which are bacteria that consume simple sugars and simple carbon compounds, such as root exudates and fresh plant litter.
2. Bacteria mutualisms form partnerships with plants including the nitrogen fixing bacteria (Rhizobia)
3. Bacteria can also become pathogens to plants
4. Lithotrophs or chemoautotrophs bacteria obtain energy from compounds of nitrogen, sulfur, iron or hydrogen instead of for carbon compounds. Some of these species are important to nitrogen cycling and degradation of pollutants. (Archulate, R. 2009).

There is growing concern over the spread of disease around the refuse dumpsite. This paper try to find out the organism responsible for the disease transmission around the waste dumpsite in Damaturu metropolitan with the following objective.

1. To determine the bacterial load in the dump site soil.
2. To determine the pathogenic bacteria in soil of refuse dump site.
3. To isolate and identify the types of bacteria,

Materials and Method

Study area

The study was carried out in Babbar Tsangaya ward within Damaturu metropolitan, Damaturu is the Yobe State capital situated in Northeast region in Nigeria. Damaturu like other towns in the less developed countries faces the same problem of improper sanitation. As result a large number of refuse dump site are found within the town.

Sample collection

The sample collected randomly from ten (10) different location within the Babban Tsangaya refuse dump site in Damaturu metropolitan in a specimen bottle using stapler. The location was represented with letters A – J.

Sample Treatment

From each sample one (1mg) was dispersed into 9ml of distilled water which serve as stock solution. And each sample were serially diluted as carried out as follow 1/10, 1/100, 1/1000 and 1/10,000 respectively.

Inoculation method

Two methods of inoculation was adopted, pour plate and streaking plate method.

Pour plate method

The prepared nutrient agar, mono Conkey agar and cled agar was melted in a water bath and allowed to cooled from each of serial dilution 1ml of sample was poured into the petric dish and the corresponding agar was poured on the sample

and its was allowed to solidified and incubated at 37°C for 24 hours and 48 hours respectively.

Streaking method

The nutrient agar, mocConkey agar and cled agar was also melted in the water bath and allowed to cooled. The media was poured in various Petridish and allowed to solidify. The wire loop was dipped into serial diluted sample and streaked on media and incubated at 37°C for 24 hours and 48 hours respectively.

Enumeration of viable organism

Using the colony counter, the number of colony was enumerated.

Biochemical test

Catalase test and oxidase test were carried out.

Results and Discussions

Table shows the total Heterotrophic bacteria count (cfu/g) of soil.

Sample site	Total Heterotrophic Bacterial Count(cfu/g)
T ₁	142x10 ⁷
T ₂	2.80x 10 ⁸
T ₃	2.91 x 10 ⁸
T ₄	3.00x10 ⁷

Table 1 shows the viable bacterial count on four different sample collection centres. The areas were represented with T₁, T₂, T₃ and T₄. The T₁ shows 142x10⁷, T₂ shows 2.8x10⁸, T₃ shows 2.91x10⁸ and T₄ with 3.00x10⁷ respectively.

Table 2 shows the gram reaction and biochemical test of the isolate

S/N	Isolate	Gram reaction	Catalase	Coagulas	Indole
1	Bacillus,	-ve	N/A	N/A	NA
2	Escherichia coil	-ve	-	-	+
3	Klebsiella	-ve	-	-	-

4	Proteus	-ve	-	-	+
5	Pseudomonas	-ve	N/A	NA	N/A
6	Staphylococcus	+VE	+	-	-
7	Streptococcus	+VE	-	-	-

Table 2 shows the gram reactions and other biochemical test. The result shows gram positive and gram negative organisms with the staphylococcus catalase positive.

Conclusion

Base on the research carried out it was concluded that a soil around the refuse dump site along Babbar Tsangaya 1 and 2 was highly contaminated with pathogenic bacteria; it was also shows the present of other microorganism and the parasitic worms.

5.3 Recommendation

The soil around the dump site are contaminated base on the result obtain from the study. Therefore the following recommendation was suggested; The dump site should be disinfected so that the population of the organism around the area would be reduce to avoid health implication. The sanitation agency should be evacuating the dump waste regularly. Proper disposal of waste should be monitored, Public awareness on the important of good sanitation of the disposal of refuse should be done and public awareness on the implication of the microorganism on their health in other to reduce infection.

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