To Study Heavy Metals in Continates Soils, System and Human Health

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Abstract: The environment it the surrounding where humans plants, animals and microorganism live together. It has composed of the Earth's surface and water. The Earths system is defined by the four spheres. i.e. Living things, air, land, and water. Heavy metals are found naturally on the earth crust since the earth's permeation natural causes can also increase heavy metals pollution such as Volcano activity, metal corrosions metal evaporation from soil and water and sediment re suspensive soil erosion, geological weathering.

Manure is very cheap and reliable technique for the solid waste management for compost fertility of soil in organic and inorganic Ions farms under in the soil. If the compost have containing contaminants such as heavy metal then its harm to ecosystem effect of heavy metals are toxicant in nature for biotic and abiotic factors such as soil, plants, aquatic life and human health. The concentration of heavy metals effected on the plant physiological metabolism, decrease the microbial activity of soil microorganisms and roots are affected. The concentration of heavy metals under in the water and effected on aquatic animals on their morphological and physiological mechanism and change the water buffers value acarcinogenic metal and the detrimental effect in human health. Excessive ingestion of as can coagulates proteins, reduced ATP production and cause ant immune disorder, muscles weakness and nerve inflammation.

Keywords: Fertilizer, heavy metals, pesticides, human health & aquatic animals.

INTRODUCTION

Soil pollution with heavy metals draw a serious concern because of their detrimental effects on the living organism. Agricultural soils are receiving tremendous amount of pollutants from the various sources. Heavy metals contamination in agricultural soils may impart functional disorders of soils, retarded plant growth and even harm. The health of humans through contamination of food chain the heavy metals bio accumulate in the living system and their concentrations increase as the passed from organism of lower trophic level to higher trophic level, a phenomenon known as biological concentration. (Freedman et al. 1981), (CPCB, 1997) The consumption of heavy metal such as Cr, Pb, Fe, Zn, Cv, Ni, Cd etc. contaminated food chain can dangerous deplete some researcher. (Aldriano et al. 1986) (Chandra et al. 1997) have been reported to be of bio important nutrients in the body that are further responsible in the human and their daily medicinal and dietary allowances increasing immunological defenses, intra growth retardation, disabilities compost according to the sequences of metallic
nature of their ionic bond to malnutrition and high prevalence of gastro intestinal cancer rates.

METALS EFFECT ON SOIL:

Soil contamination by heavy metal is known to causes detrimental effect on microbes organisms on microbes organisms' growth (Spurgeon et al. 1996). The industrial metabolism at high concentration (Ashraf and Ali, 2007). The increasing production of livestock and poultry product has led to generation of large amount of waste into the soil from the industries. The large quantity of waste product must be treated properly keeping into consideration to the environmental measures involved in land treatment. The elevated heavy metals levels in the agricultural land and the rate of application by the supplier with its elemental concentration (Vries et al. 2015). This review focuses on sources of heavy metals in soil strategies (Srivastava et al. 2015), or the technologies involved in their removal from the contaminated soils and further the challenges involved in use of various amendments for remediation of soils. (USEPA, 2007).

METAL EFFECT ON WATER:

Lethal and sublethal concentration of the metals determined the sensitivity of individual organisms across aquatic species the complicated metal induced changes in the physiology and survival of aquatic fauna under metallic stress. Metal sulphide and the stability constant of metal ions with sulphate (=.72-0.81).

Such changes metal to metal from species to species from one experiment condition to another experiment condition. The exact causes of death due to heavy metal poisoning are multiple and depend on time concentration combination. The degree of PH of water also effected under the metallic nature of Ions concentration (Jeffrey et al. 1997) (Clayton 1989). Cytotoxicity of multiple parameters including measurement of cell death, viability, morphological, metabolism, cell attachment, cell membrane permeability, proliferation and growth kinetics (Barabasz et al.2002).

Heavy metals significant decreases in the percent of hemoglobin and different PH levels have shown increased the clotting time. (Van et al. 1981).

METAL EFFECT ON PLANT:

Some of these heavy metals i.e. As, Cd, Hg, Pb are not essential for plants growth. Others are Co, Cu, Fe, Mn, N1 and Zn essential elements required for normal growth for plant metabolism. When their concentration greater to the an optimal values the use of compost to improve cultivation yield carrying with possible negative effect might be a problem since the waste compost (Srivastava et al. 2005) applied to improve soils used to grow vegetables. The edible part of the plant most vegetables species, the risk of transference trace of metals from soil to humans should be a meal of concern. (Jewel et al. 2010) (Kumar et al. 2012). Metal concentrations in soil the median element composition of soil and the calculated means of the element content in land plants (=0.69-0.83).

METAL EFFECT ON HUMAN BODIES:

These heavy metals, a few have direct or indirect impact on the human body, such as Cu, Co, Fe, Ni, mg, Mb, Cr, Se, Mn and Zn have functional roles which are essential for various diverse physiological and biochemical activity in the body. High doses can be harmful to the body while other such as Cd, Hg, Ag, Pb. in minute quantities have delirious effect in the body causing acute and chronic toxicant in human (Tchounwou et al. 2005), (Patrick, 2002) Methyle Mercury is a neurotoxic compound which is destruction
Biochemical mechanism (Monisha et al. 2014) of heavy metal intoxicant which involves binding to proteins and enzymes, altering their activity and causing damage the mechanism by which heavy metals causes neurotoxicity generate free radicals which performances oxidative stress damaging lipids, proteins and DNA molecules and how these free radicals propagate carcinogenesis (Kim et al. 2015).

Cellular organs and components of the cell have been reported to be affected by heavy metals, such as the nitrochandria Nuclei, Lysosomas. Cell membrane and enzyme. It has emerged that metal Ions Intract withDNA and Nuclear protein this causing DNA Damaged to the cell cycle modulation, apoptosis or carcinogenic.

**MICROBIAL EFFECT ON HEAVY METALS** :

Various microbial biomass has different bioserptive abilities which also varis cansi direct Y with each group. The biosorbent should be cheap effective and easy to grow and harvest. The organism should also lend itself to alternative of the bioreactor configuration as well as physical and depends upon chemical condition to enhance bioserption and their sorption, capacity is due to their high surface to volume reaction and their humorous potential achieve chemisorption sites on the acid well of cell. (Maitra 2016, (Kamran et al. 2017), Lukina et al. 2016).

### Table 1: Metal Toxicity effect

<table>
<thead>
<tr>
<th>Metal</th>
<th>Toxicity</th>
<th>Animal</th>
<th>Plant</th>
<th>Microorganism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>Copper Polishing mining, paint plating, printing operations</td>
<td>Abdominal pain anemia, diarrhea headache liver, lungs, Kidney damaged metabolic disorder</td>
<td>Chlorosis oxidative stress retard growth</td>
<td>Disrupt cellular function inhibit enzyme activities</td>
</tr>
<tr>
<td>Arsenic</td>
<td>Atmospheric deposition, mining, pesticides rate sedimentation smelting</td>
<td>Brain damage cardiovascular and Respiratory disorder conjunctivitis skin cancer</td>
<td>Decreased synthesis of plant growth inhibit chlorophyll synthesis</td>
<td>Inhibit enzyme activities reduce of growth rate</td>
</tr>
<tr>
<td>Cadmium</td>
<td>fertilizer mining pesticides, plastic</td>
<td>Bone diseases cough of headache , hypertension lung, kidney damaged</td>
<td>Nutrient growth inhibition reduced</td>
<td>Deactivation of enzymes, damaged</td>
</tr>
<tr>
<td>Chromium</td>
<td></td>
<td></td>
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<td>----------</td>
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<td></td>
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<tr>
<td>Dyeing electro planting paints production, steel, fabrication tanning, textile</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Hypochromic anemia vomiting</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Branch pneumonia chronic bronchitis irritation of skin lung cancer liver kidney damaged hyperactivity neurons</td>
<td></td>
<td></td>
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<tr>
<td>Chlorosis delayed senescence biochemical lesions reduced biosynthesis germination shrunken growth</td>
<td></td>
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<td></td>
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<tr>
<td>Elongation of log face growth inhibition of oxygen uptake</td>
<td></td>
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</tr>
</tbody>
</table>

**Table No. 2: Toxicity effect on Microorganism**

<table>
<thead>
<tr>
<th>Microbial Biosorbent</th>
<th>Metal</th>
<th>pH</th>
<th>Temperature</th>
<th>Time</th>
<th>Metal Ion concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacillus cereus</td>
<td>Hg</td>
<td>7</td>
<td>30°C</td>
<td>72 hrs</td>
<td>10</td>
</tr>
<tr>
<td>Bacillus laterosporus</td>
<td>cd Cr. (vi)</td>
<td>7</td>
<td>25°C</td>
<td>2 hrs</td>
<td>1000</td>
</tr>
<tr>
<td>Desulfovibrio desulfuricans</td>
<td>Cu Ni Cr(vi)</td>
<td>7.8</td>
<td>37°C</td>
<td>168 hrs</td>
<td>100</td>
</tr>
<tr>
<td>Sulphate reducing bacteria</td>
<td>As (III) As (V)</td>
<td>6.9</td>
<td>2.4</td>
<td>1 hrs</td>
<td>0.07 0.11</td>
</tr>
</tbody>
</table>

**Table No. 3: Toxicity effect on water**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>During Winter Season October to February</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7 to 7.8</td>
</tr>
<tr>
<td>DO</td>
<td>7 to 7.5 mg/l</td>
</tr>
<tr>
<td>BOD</td>
<td>2.722 to 3.71 mg/l</td>
</tr>
<tr>
<td>Hardness</td>
<td>210 to 215 mg/l</td>
</tr>
</tbody>
</table>
Chloride content  |  35 to 38 mg/l  
Alkalinity    |  67 to 69 mg/l  
Free CO₂       |  19.17 to 62.70 mg/l  

**CONCLUSION:**

Heavy metals containing compost may change the physical chemical and biological properties of soil. These metals uptake by plants from the soil reduce the crop productivity by inhibiting physiological metabolism (Sinha et al. 2012). Heavy metals uptake by plants and successive accumulation in human tissues and bio magnifications through the food chain causes both human health and environment concerns. Heavy metals containing agricultural runoff enter in aquatic environment, and harm to aquatic plants and animals therefore if the compost has to be applied in agriculture it should be free from pathogens and heavy metals.

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**REFERENCES**