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# Removal of Environmental Pollutants Like Ni,Cu andZnWith The Help Of Green Cut Technology

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## ABSTRACT

To day heavy metal and other contamination are among the most technically are average ten fold time cheaper then conventional engineering based remediation method (MargusStal 2009),removal of toxic heavy metal like Ni, Cu, and Zn in contaminated soil by green plant species like B.Nigra were grown in soil .the soil is artificially contaminated with different amendments in different range of percentage. some metals also treated in soil (mg/kg) in the form of hydrate. after harvesting green plant were cut and dry then treated with di acid and prepare a distal water sample . the observed concentration of Cu (4.0-5.8 mg/gm),Ni(4.2-6.5 mg/gm),Zn(3.7-6.5 mg/gm) respectively in species of B.Nigra with compression reference range of Cu(),Ni(),Zn() [limit range in India]

## INTRODUCTION

The clean up of heavy metal contaminated soils is one of the worldwide issues for environmental engineering, because of the potential toxicity and high persistence of these contaminants in the soil.Phytoextraction is a remediation technology that removes metals from contaminated soil by plant absorption and translocation to harvestable plant parts and it has attracted for its low cost of implementation.

Soil pollution has recently been attracting considerable public attention since the magnitude of the problem in our soils cells for immediate action (Garbisu&Alkota 2003) metal pollution has become one of the most seriousenvironmental problems today. Due to their immutable nature, metals (Heavy metals) are a group of pollutants of much concern. At high concentration, metals can act in a deleterious manner by blacking essential functional groups, displacing other metal ions or modifying the active conformation of biological molecules(Collins &Stotzky 1989)metal toxicity for living organisms involves oxidative and geotaxis mechanisms(Briat& Lebrun 1999)

In India Rattan and co-workers(2001,2005) observed on increasing accumulation of heavy metals(Zn,Ni,andFe) in soil of different field, vegetable andand fruits crops like maize, mustard, rise etc. Through the food chain toxic metals get entry to the body of livestock as well as human being (like many trace elements)

The heavy metal and organic pollutant contamination already pose a severe threat to human and ecosystem health(WHO,2003)however large areas of soil and water contain high levels of heavy

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metals such as Cd,Cu,Co,Ni and Zn and other pollutants due to various human actions(Dissanayake et al,2002)

**MATIRIALS AND METHODS-**

For soil sampling, current year seeds are collected.FYM 36gm/pot, SSP 1.12 gm/pot,CaCo3 also added per pot. each pots were added with urea(for N) and KCl(for K) add per pots each combination were use for one sample pot in which 4kg soil were used.

**APPARATUS**

In this research many laboratory apparatus were use like Borosilicate glass ware, Borosilicate glass flask, AAS for analysis of all toxic heavy metals like (Ni, Zn and Cu),pots for samples cells, filter paper, conical flask for shake the mixture , mental heater, PH meter.

**SOIL PREPRATION-**

Soil were collected at a open aria from a agricultural land.soil were dry at room temp. anddifferent solid wastes were separate and pots fill with addition nutrients in different percentages.

**POT FILLING**

For each pots 4 kg dry and clean soil were taken mixed with fertilizer solution and poured with N,P,K nutrients.for each plants pots were artificially contaminated .(table .1)

| S.N. | TERTMENT COMPOSION | USING AMMENDMENT |
|---|---|---|
| 1 | Control | Soil +Cu +Zn +Ni |
| 2 | Cu | Soil+Cu |
| 3 | Cu +FYM | Soil +Cu +FYM |
| 4 | Cu+ ssp | Soil +Cu +ssp |
| 5 | Cu +CaCo3 | Soil +Cu +CaCo3 |
| 6 | Cu+CaCo3+FYM | soil+Cu+CaCo3+FYM |

**COLLECTION AND PROCESSING OF PLANTS SAMPLES**

Species of BresciaNigra was harvest in different combination amendments pots according to the physiological stage .after the full length plant growth ,its harvest and collection of biomass and it were

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dried in shade followed by drying in the oven at 70°c for loss of moisture dry weight of both biomass and make up a powder from.

Powder mixture were treated with di-acid (Wear & Evans 1968) and heavy metal was analyzed with AAS .

**RESULT AND DISCUSSION**

Properties of soil- top soil from the different sample sites, in the area under investigation had small differences in texture and $p^H$ value.

Physicochemical properties of experimental soil-soil have sand (64%), silt (14%), and clay (12%) than the texture of soil is sandy loam. the PHof naturally contaminated soil is 6.05.

Visual inspection showed that the soil was dark brown in colureindicating a low amount of humus. Slightly acidic (6.05).soil $p^H$value plays a major function control the solubility and hydrolysis of metal hydroxides ,carbonates and phosphates.

Heavy metal remade-

Accumulation of metals from soil samples by different amendments-(table 2)

| Type of soil | Species | Con. Of Zn(gm) | Reference range Zn(mg) | Con. Of Ni (gm) | Reference range Ni (mg) | Con. Of Cu (gm) | Reference range Cu (mg) |
|---|---|---|---|---|---|---|---|
| Control | Brassica Nigra | 4.5 | $8.10^3$-$10^{-1}$ | 4.2 | $1x10^3$ | 2.7 | $415x10^5$ |
| Cu | B. Nigra | 4.41 | $8x10^3$-$10^{-1}$ | 4.4 | $1x10^3$ | 4.0 | $415x10^5$ |
| Cu +FYM | B. Nigra | 5.3 | $8x10^3$-$10^{-1}$ | 5.76 | $1x10^3$ | 4.46 | $415x10^5$ |
| Cu +SSP | B. Nigra | 3.7 | $8x10^3$-$10^{-1}$ | 4.3 | $1x10^3$ | 5.8 | $415x10^5$ |
| Cu +$CaCo_3$ | B. Nigra | 4.9 | $8x10^3$-$10^{-1}$ | 6.5 | $1x10^3$ | 4.45 | $415x10^5$ |
| C+$CaCo_3$+FYM | B. Nigra | 6.5 | $8x10^3$-$10^{-1}$ | 5.2 | $1x10^3$ | 5.02 | $415x10^5$ |

Plant sample soil were mixed with different manner like Cu, Cu +FYM, Cu +SSp, Cu +$CaCo_3$, Cu+$CaCo_3$+FYM with compression control plant sample pot. In plant sample pots metal were mixed at the range of 0 and 20Zn+10Cu+2.5Ni(mg/kg) soil.

In different compression FYM ,SSp ,$CaCo_3$ , $CaCo_3$+FYM and Ni+$CaCo_3$+FYM heavy metal in plant the con. Of Cu(2.7 – 5.8 mg/gm) , Ni(3.52 – 6.4mg/gm), Zn(3.2 – 6.5mg/gm)for the sample mixture

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of B.Nigra with compressionreference range (safe limit in India)for Cu($415x10^5$mg), Ni($1x10^3$mg), Zn($8x10^3$-$10^{-1}$mg).

## CONCULUSION

Toxic heavy metal contamination of arable soil showed several problem including phototoxic effects of elements like Cd ,Pb ,Zn and Cu(susarla& medina 2002,chehregani &malayeri 2005).another serious problem is posed by theup take of potentially toxic us elements through food or for age plant species and their being transferred to the food chain and finally to humans(kloke 1980)

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