



## STUDIES OF THREE PLANT SPECIES-A REVIEW AND CASE STUDY

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**Abstract:** The family solanaceae viz Tobacco (*Nicotiana tabacum*), Brinza (*Solanum melanoxyton*) and Tomato (*Lycopersicon esculentum*) spectrophotometrically for Cd and Pb with special reference to rising pollution due to heavy industrialization of the Pamgarh Block District Janjgir champa (C.G)

**Keyword:** - Tobacco, Brinza, Tomato.

### Introduction:

Plants migrate all over the globe so every where they suffer change in the chemical contents. [1] many pathophysiological actions of  $Cd^{2+}$  with body stores of essential ions especially  $Ca^{2+}$ ,  $Zn^{2+}$  and  $Na^{+}$  for example  $Ca^{2+}$  supports the pulmonary artery response ( found in rabbit ) replacement of  $Ca^{2+}$  by  $Cd^{2+}$  may lead to contractile response of vasculature .  $Cd^{2+}$  replacing  $Zn^{2+}$  from the body pool cause hypertension, diabetes, bone marrow disorder

and heart problems. [2] [3] [4]. Heavy industrialization has been reported to raise the concentration Cd level. (mg / 100g. dry matter ) in potato [5] . Naif Gebologu *et al.* (2005) and de pieri (1997) [7] reported rise in Cd nad Pb conc. In vegetables Sait Erdogan *et al.* [8] Reported rise in fruiting body of some mushroom species for Cd (8.83 mg / kg ) , Zn 100 mg / kg . Pb was not detected. ( Pb toxicity shown in fig. No. 1)

### Fig.No-1: The Synthesis of Heme Modified by Haeger Aronsen(1960)

Enzymes	Intermediates/ By Product
1. = ALA synthetase	ALA =Delta aminolevulinic acid
2. = Pb-ALA dehydrase	PBG=Porphobilinogen
3. =PBG decaminase	CPGIII =CorproporphyrinogenIII
4. =Pb-CPG Oxidase	PP9 = Protoporphyrinogen 9
5. =Heme Synthetase- Pb	2HOOC-CH <sub>2</sub> .CH <sub>2</sub> -C-CH <sub>2</sub> -NH <sub>2</sub>

**Table No-1: Indian standards for industrial effluents discharged into inland surface waters is 2490-1981**

S.N.	Parameters	Limit	Unit
1.	Colour & odour	-	
2.	Suspended solids	100	
3.	Partical size suspended Solids micron sieve	To pass 850	
4.	Dissolved solid ( inorganic)	2100	
5.	pH Value	5.5 to 9.0	
6.	Temperature 0C (in any part of the stream within 15 minutes downsucam from the effluent outlet)		
	oil & greas		
7.	Total Residual chlorine	10	mg/l
8.	Ammonical Nitrogen (as N)	1	mg/l
9.	Max. Total Kjeldal nitrogen	50	mg/l
10.	Free Ammonia (as NH <sub>3</sub> )	100	mg/l
11.	Biochemical oxygen Demand (3 days at 27 <sup>0</sup> C)	5	mg/l
12.	Chemical oxygen Demand	30 max	mg/l
13.	Arsenic (as As)	30 max	mg/l
14.	Mercury (as Hg)	0.2	mg/l
15.	Lead (as Pb)	0.01	mg/l
16.	Cadmium (as Cd)	0.1	mg/l
17.	Hexavalent chromium (Cr <sup>6+</sup> )	2	mg/l
18.	Total Chromium (as Cr)	0.1	mg/l
19.	Copper (as Cu)	2	mg/l
20.	Zinc (as Zn)	3	mg/l
21.	Selenium (as Se)	5	mg/l
22.	Nickel (as Ni)	0.05	mg/l
23.	Boron (as B)	3	mg/l
24.	Persent Sodium	2	mg/l
25.	Residual sodium	-	mg/l
26.	Cyanide (as CN). mg/l	-	mg/l
27.	Chloride (as Cl)	0.2	mg/l
28.	Fluoride (as Cl), mg/l	1000	mg/l
29.	Dissolved phosphate (as P)	2	mg/l
30.	Sulphate (as SO <sub>4</sub> ). mg/l	5	mg/l
31.	Sulphide (as S), mg/l	1000	mg/l
32.	Pesticides	2	mg/l
33.	Phenolic compounds as C <sub>6</sub> H <sub>3</sub> OH	Absent	mg/l
34.	Radioactive material	1	mg/l
	1. Alpha emitters uc/ml, max 10-2		
35.	2. Beta emitters uc/ml, max 10-4		

**4. Materials and Methods:** - In the one set of plot experiments the three sets of plants species were grown. 10% fly ash has shown better results especially when plants grown were treated with plant hormones i.e. IAA and G.A. Fly ash treated soil raises soil metabolic species i.e. rise in protease activity, invertase activity, dehydrogenase activity etc [9] fig. 2,3 enclosed in the next page. Sample of the three plant species (leaves and fruits) were collected and dried. Grinded and samples were finely powdered dissolved in CH<sub>3</sub>OH.

Standard curve obtained in each case and concentration of Pb, Cd and Zn were determined spectrophotometrically by dithizone in 1.1.1 trichloroethane. Cd turns the color to blue violet, Pb<sup>2+</sup> to brick red and Zn to pink. Plants growth parameters were measured as leaf area, plants height, root length and chlorophyll content.

**Result and Discussions:** - Heavy industrialization and other anthropogenic activities have affected the soil, plant and water bodies.

Cd when replaces Zn from the body pool, it causes hypertension, cancer, diabetes and renal disorder. Cd in the blood is mainly located in the blood cells in the humans and animals. Recent informations suggest that high accumulation of Cd in the body is dangerous, and WHO limit of 400

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