

Heavy Metal Pollution In Environment And Their Toxicological Effect On Plants And Living Organisms

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Abstract:-

Heavy metals normally occur in nature and are essential to life but can become toxic through accumulation in plants and living organisms. Arsenic, cadmium, chromium, copper, lead, nickel, and mercury are the most common heavy metals which can pollute the our environment. Most of the heavy metals causes environmental and atmospheric pollution, and may be lethal to plant. Heavy metal's can become strongly toxic by mixing with different environmental elements, such as water, soil, and air plants and other living organisms can be uptake to them through the food chain.

Key words:- Environmental, lethal, heavy metals toxic, accumulation, arsenic, cadmium.

Introduction:-

The plants and living organisms often face different environmental stress which in caused by biotic and abiotic environmental factor. Finally affects their growth and development (xu etal.2016). biotic stress is caused by living organism such as insects, nematodes, bacteria and fungi etc. (Gimenez et al.2017) other hand abiotic stress is temperature, light , draw and heavy metals. Heavy metal's are main abiotic stress which is affect the growth and development of plants and living organism. The heavy metal's are natural components of the Earth's crust. They can not be degraded or destroyed.

The heavy metals are the group of metal's and metalloid with atomic density is greater than 4 gm/cm³ or 5 times more greater then water density. Including mercury (Hg), cadmium (Cd), nickel (Ni), chromium(Cr), arsenic (As) and lead (Pb) etc. the environmental matter related to heavy metal's contamination are becoming significant problem in developing countries due to rise in geologic and anthropogenic venture. The heavy metals present naturally in our environment but The concentration of heavy metals increased to amount that are harmful to plants and other living organism is due to anthropogenic activities(Chibuike and Obiora2014) main causes of heavy metal concentration is increase in environment is due to rapid urbanization and industrialization. These increases concentration of heavy metal is fatal for plant and living organism.

Heavy metal toxicity in the environment:-

The heavy metals are naturally found in the environment and are essential for plants and living organism survival, but they may become dangerous when they accumulate in plants body as well as living organism. A few of the most frequent heavy metals that contaminated the environment include mercury (Hg), Cadmium (Cd), Arsenic (As), Chromium (Cr), Nickel (Ni), Copper (Cu) and lead (Pb) (Hazarat et al. 2019).The accumulation of cadmium in the soil through the usage of fertilizers can be affect the plants and ultimately living organism like animal and humans. Cadmium does not have any property that are helpful for plant growth and metabolism process (Hayat.et.al.,2018) Its unknown accumulation in the food chain has

the potential for causing chronic diseases of the renal, pulmonary, cardiovascular and musculoskeletal systems in animal and humans.

Mercury occurs naturally in the earth's crust, but anthropogenic activities, such as mining and fossil fuel combustion, have led to wide spread global mercury pollution. The mercury is accumulated in water laid sediments where it converts into toxic methylmercury and enters the food chain. Mercury has toxic effects on plants, even at low concentrations and leads to growth retardation and many other adverse effects in human cases it affects the nervous; digestive and immune system and lungs, kidneys, skin and eyes.

Arsenic may enter the environment during the mining and smelting of the areas of metals. Small amount of arsenic also may be released in to the atmosphere from coal-fired power plants and incinerators because coal and waste products after contain some arsenic. Once arsenic comes in environment they can not be destroyed. The arsenic availability can disturb normal functioning of plant metabolism, consequently leading to stunted growth and low crop productivity. In other hand incase of human the arsenic toxicity in causes vomiting, abdominal pain and diarrhoea.

The lead is important sources of environmental contamination on come form mining, smelting, manufacturing and recycling activities and use in a wide rang of products. Now days major used of lead in piston-engine aircraft operating on leaded aviation gasoline. Other stationary sources include waste incinerators, utilities, and lead acid battery manufacturers. In plants lead toxicity causes inhibition of seed germination, root elongation, seed development. Over all affect the plant development. In case of other living organism lead toxicity is causes many disease like high blood pressure, brain, kidney and reproductive health issues. (Lohetal.,2016) lead poisoning, also called plumbism.

Nickel is a naturally occurring element and has wide industrial uses. It is comes in environment from both natural and anthropogenic activity. It has many adverse effects on plants. High nickel concentrations is retards the seed germination of plants and causes the death of plants. Nickel effects on humans causes the allergies, nasal and lung cancer. Kidney and cardiovascular diseases. (Genchi et.al.,2020).

Although zinc is naturally occurs in environment. But their concentration is increases in environment through many anthropogenic activities like mining, smelting metals; steel production, as well as burning coal and certain wastes. Zinc toxicity-associated symptoms in plants include reduced yield and stunted growth, reduced the photosynthesis and causes the chlorosis in plant leaves. (Li et.al.,2013). In other hand the zinc toxicity causes nausea, vomiting, epigastric pain, lethargy and fatigue in human body.



Fig.1. Diagrammatic explanation about heavy metals in the environment.**Conclusion:-**

The heavy metals, viz, arsenic, nickel, chromium, cadmium, lead, mercury are most toxic to all plants, human beings, animals, and environment. The high concentration of heavy metals create severe toxicity through some heavy metals are essential for plants, animals, and other several living organisms. Due to anthropogenic activities all heavy metals enter in to environment and their concentration increases gradually. These heavy metals through biogeochemical cycle enter in the plants and animals. Leading to toxicity in plants, including living organism.

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