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EFFECT LEAD ON LIVING ORGANISMS (A REVIEW)

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Abstract:

Lead (Pb^{+2}) atomic number 82. It is a bluish-gray metal that is shiny, soft, flexible, and dense, so that it has the ability to resist corrosion. Lead is one of the most toxic elements cases that it causes annually in the world, whether to humans or wild or marine animals. The doses that were exposed to are large, as this leads to nervous spasms that may end in death. Among the most important symptoms of poisoning with this element that appear on plants are dark discoloration of green leaves, wilting of old leaves, stunted leaf growth, short brown roots.

Keywords: Heavy metals, lead, poisoning.

INTRODUCTION. Heavy metals are one of the main pollutants in the supply. It may be considered the most important problem for our environment (Das *et al.*,2013; Radwan and Salama, 2006). It is defined as naturally occurring element that have a high atomic weight and a density (11.3 cm^3/g) greater than water (at least 5 times), and is characterized by being stable and non-dissolving, and has a long biological half-life and can be biologically accumulated through biological chains: soil-plant-food, water The sea - marine organisms - food leading to undesirable side effects (Kwon *et al.*, 2017; Majhi and Biswal, 2016). As the presence of large amounts of heavy metals in the environment represent a potential threat to human health and the environment due to their extreme toxicity. Although some heavy metals such as Zn (Zinc), Mn (Manganese) , Ni(Nickel) and Cu(copper) act as micronutrients in low concentrations, but become toxic in higher concentrations (Bansal and Asthana, 2018). Lead is one of the heavy metals occurring elements in the earth's crust concentration rate of about 16 ppm in soil (Al-Omar,2000). Lead reaches soil and surface water in the forms of pb^{+2}, hydroxides and oxides of lead, and anionic lead-oxy-lead complexes. The pb^{+2} form is the most active form for the formation of mono- and polynuclear oxides and hydroxides. Industrial development and throwing pollutants containing this element without treatment has increased its concentration in various environmental circles (soil, water and air) and thus this element is transmitted to living organisms (human, animal and plants) and affects them (Abbood *et al.*,2015).

The physical and chemical properties of lead (Miquel ,2001).

chemical symbol	Pb
Volumetric mass	11.35 g/cm3
atomic mass	270
melting temperature	°327
boiling temperature	° 1.740

1.**The effect of Lead on humans.** Lead is one of the heaviest metals encountered in both urban and rural agricultural environments, and children are often more susceptible to these symptoms than adults due to their high ability to absorb lead due to rapid growth. The absorption of lead transmitted through food occurs in the digestive system and in the duodenum in particular, however, age and nutritional status can greatly affect the rate of absorption, for example, only 10% of lead is absorbed when ingested with food, while 96% is absorbed by another method (Gulson, 2008; Wright *et al.*,2003). Rho and Boison, (2022); Boskabady *et al.*, (2022) their study showed that lead inhibits calcium-dependent events related to neuronal signaling and signal transmission within living cells. As it leads to a disturbance of the calcium cycle inside the cells, such as changing the ability of organelles to store or secrete (Sampson *et al.*,2022). Shih *et al.*,2014) confirmed that exposure to lead can to stress. Oxidative stress, especially since it is present in high concentrations in the blood and brain of children, and the main area for lead accumulation in the brain is the hippocampus, and it can also accumulate in many other brain regions. Exposure to lead in children can lead to reduced intellectual ability and can also cause deficits in the following (all hallmarks of autism spectrum disorders): memory, attention, speech and motor skills, deficits in emotion, visual and response skills. Ingestion of lead acetate Pb $(CH_3COO)_2$ by mouth or skin leads to kidney cancer and brain cancer (Steenland

and Boffetta,2000). Also causes renal failure and liver damage (Luckey,1977). Lead inhibits many enzymes necessary for the formation of hemoglobin, as lead poisoning also leads to effects in the blood, and the latter results in a decrease in the number of red blood cells and anemia (Pichard, 2002).

2.The effect of Lead on animals. Discarded lead-acid batteries are the most common sourceof lead poisoning in ruminants; the lead and lead salts inbatteries are readily eaten by livestock. There are manypotential sources including contaminated feed or soil, leadpaint, plumbing solder, lead shot, grease, discarded asphaltand crankcase oil. Lead from these sources can be easily absorbed by animals, particularly when finely ground or exposed to acidic conditions, including silage. Urban soil, due to historical exposure to lead-based paint and industrial processes, may have higher lead levels than rural soil Cattle and poultry are most at risk of lead poisoning because they are inquisitive and commonly taste new finds. The risk of lead toxicity can also increase during drought. Lead shot may be a source of poisoning of domestic poultry and wild birds. It is most often seen in water fowl, such as ducks and geese, which swallow lead shot and fisherman's sinkers from the bottom of lakes and ponds(Siddiqui and Gayatri,2008).

Osweiler *et al*., (1985) confirmed may animals that die from acute lead poisoning They have few noticeable gross lesions. Oil or chips paint or battery may be evident in the GI tract. The caustic action of lead salts causes gastroenteritis. In the nervous system, edema, congestion cerebral cortex, flattening cortical gyrus present. Endothelial tissue, swelling, lamellar May be cortical necrosis, white matter edema be clear. Necrosis and tubular degeneration Rapid insertion bodies of nucleic acids can be seen in the kidneys. Osteoporosis has been described in lambs. Placental inflammation and lead accumulation fetus may lead to miscarriage.

3.The effect of Lead on plants. Perhaps the most common environmental health risks are those associated with heavy metal contamination of soil, water and vegetation. Heavy metals are among the most dangerous substances that enter the soil, and their danger is concentrated in their survival in the soil for a long time without decomposition and they do not undergo chemical changes as a result of their presence in the agricultural soil, as it not only affects plant growth, but also pollutes fruits and grains that people eat (Shtiwi, 2005). The toxicity of lead depends on the concentration in the environment and its types, as it is well known that lead has harmful effects on plants, so that lead ions Pb^{+2} strongly inhibit germination at low concentrations (Mishra *et al*., 1998). The toxicity of lead depends on the concentration in the environment and its types. As it is known, lead has harmful effects on plants, so that lead ions strongly inhibit germination at low concentrations. According Wiezbick *et al*., (1989) to high doses of lead works to inhibit the germination of some plant species, and reduces the growth of biomass (Xiong *et al*., 1997). Lead affects and mineral nutrition by interfering with the absorption and transport of nutrients by the plant such as Ca, Fa, Mg, Mn Zn by preventing entry or binding with it, making them unavailable to the plant(Xiong *et al* .,1997). Seregin et Ivanov, (2001) confirmed that lead affects nitrogen metabolism by reducing nitrate uptake. Exposure to lead in plants causes a strong inhibition of photosynthesis and the rate of CO_2 uptake is very sensitive, and the yield of photosynthesis can be reduced by more than 50% (Pourrut, 2008).

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