Effects of Bioaccumulation

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Citation: Pal N (2021) Effetcs of bioaccumulation. J Aquat Pollut Toxicol. Vol. 5 No. 2: 7.

Bioaccumulation refers to the steady accumulation of substances, such as chemicals and other pesticides, in an organism. It occurs when organism uptakes a substance at a higher rate than that at which the substance is removed from body through catabolism and excretion. So that, the longer the biological half-life of a toxin, the greater the chance of chronic poisoning, even if the environmental toxin level [1] are not very high. Bioaccumulation refers to intake from all sources combined such as water, food, air, etc. And the bio-concentration refers to uptake and accumulation of a substance from water alone. It also defines as the accumulation and enhancement of contaminants in organisms, relative to that in the environment. Bioaccumulation is the total result of all intake and loss processes, such as respiratory and dietary intake, and losing by egestion, simple diffusion, metabolism, transfer to offspring and growth .It needs not be a worry if the accumulated compound is not harmful. Compounds those are harmful to health, such as mercury, however, can accumulate in living tissues.

Chemical pollutants that are bio accumulated such as Pesticides are an example of a contaminant that bio accumulates in organisms. Rain water can wash freshly sprayed pesticides into creeks, where they will eventually make their way to rivers, estuaries, and the ocean. And some other major source of toxic contaminants is the presence of compounds from industrial smokestacks and automobile emissions that return to the ground in rainfall. Regular discharge of compounds into water is also a source of chemical pollutants. Once these toxic pollutants enter in the water or soil, it can easily pass into the food chain. In water, pollutants absorbed by the small particles, including a tiny living organism called phytoplankton. That's why there is so little pollutant stuck to each phytoplankton, and these pollutants does not cause much damage at this level of the food web. However, a small animal like a zooplankton [2] might then consume the particle. And a One zooplankton has eaten ten phytoplankton would have ten times the pollutant level as the phytoplankton. As the zooplankton it may be slow to metabolize or excrete the pollutant, the pollutant may build up or bio accumulate inside the organism and a small fish might then eat zooplankton. And the fish would have 100 times the level of toxic pollutant as compared to phytoplankton. This cycle would regular throughout the food web until the high levels of contaminants have biomagnified [3] in the top predator. While the amount of pollutant might have been small enough not a reason of any serious damage in the lowest levels of the food web, the biomagnified amount may be the reason of serious damage to organisms higher in the food web. This phenomenon is commonly known as bio magnification.

These bioaccumulation and bio magnification also affects the human healths.Because when humans eat organisms that are almost high in the food web, we can get high doses of some harmful chemicals. Such as, marine fish as swordfish, shark, and tuna contains high bio accumulated levels of mercury, and bluefish and striped bass also have high concentrations of polychlorinated biphenyls (PCBs).

References

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