Faisal Eraiqat

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Mr. Mangan

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Bioaccumulation and Biomagnificaton Essay

Bioaccumulation is the build up of toxins within an organism as time increases. Biomagnification is the increase concentration of toxins in an organism as it moves along each trophic level. Higher the trophic level, more concentrated the toxins are. Both bioaccumulation and biomagnification have dangerous affects on the ecosystem. The bioaccumulation levels impact the biomagnification as if an organism is building up more and more toxins over time, the organism that consumes it will be more harmed through biomagnification and it keeps moving along each trophic level. The ecological impacts from bioaccumulation and biomagnification are its increase of death rates, harming fertility rates, and the increase of radiation.

To begin, bioaccumulation and biomagnification both increase the death rates of some species and have sever consequences on the ecosystem. With one species losing population, the other species that are interdependent with it are affected as well, and their predators. The dangerous chemicals that are being spread around hurts the host, and poisons the body until it dies. DDT is an organic insecticide that was first used to eliminate mosquitoes that carried diseases such as malaria, as it was such as health issue and the population of humans infected increased. DDT controlled the population of mosquitos, so it was a good short term decision. However, later on it had disastrous effects on the ecosystem. The population of many other species like birds began to decrease. After being sprayed and released in the air, DDT’s spread to other places via rain and weather as it could enter plants and water. DDT can cause cancer in humans, and it is something that is very difficult to remove. In Malaysia, the DDT spraying caused the death of many wasps that fed on moth pests. These moths lived on roofs of houses so with the wasps gone, the houses were destroyed and the moth population kept rising. Also, DDT caused the death of many high trophic level birds such as the bald eagle as the DDT caused their egg shells to thin, allowing them to be easily broken. The population for these species began to drop. The solution to DDT is a ban, such as what the USA did in 1972, to prevent any more damage. The death that bioaccumulation and biomagnification is only one impact of them.

Moving on, another impact on the ecosystem is on fertility and reproduction. The chemicals go into the systems of organism and can modify or change how everything works. If pregnant, the fetus may have a chance of dying as a baby still developing inside its mother is much more prone and weaker to any form of toxins. Children are the ones who are mostly impacted as their immune system is still weak and their bodies are developing, so toxins can quickly inflict damage on them. Mercury is a large contributor to this. Mercury is found in different fish such as tuna, and is both bio accumulated and biomagnified. Mercury can naturally occur from the volcanoes and rocks in the ocean that later goes into the fish surrounding them. Yet, humans have played a large role in increasing the mercury in fish to more alarming levels. Coal burning is the most common source of mercury, as it goes up in the air and is condensed, with water, to be rain. It then comes back down in liquid form and enters bodies of water such as oceans and lakes. Mercury is a very toxic chemical and targets the children and fetuses. As time goes by, the fish’s mercury levels increases and the consumers will be left harmed. It damages their nervous system and may kill the fetus. The mercury in mothers can cause miscarriages and damage chances for them to have a chance to have babies. Surrounding animals have reproductive issues as well as growth problems. This makes the species weak, and unable to compete with other groups. The main solution is to monitor consumption of these intoxicated fish, and reduce intake. Also, to limit mercury producing activities like coal burning around bodies of water. This is another harmful impact of bioaccumulation and biomagnification.

Finally, bioaccumulation and biomagnification increases radiation levels. Radiation is a very harmful energy that causes burns, deformation, death and other dangers. Contamination levels in an organism increases over time thus making them more dangerous. Radiation can also make areas unlivable as if a contaminated organism is being consumed, the radiation increase onto the next trophic level and so on. After the Fukushima power plant exploded, radiation spread all around the city and the waters. The city and nearby areas are unlivable as the radiation is lethal, and can change the genetic make up of some organisms. The animals that were exposed to the radiation and survived gave birth to even more radiated offspring that went around and spread across the area. They were deformed and had abnormal characteristics. The fish was the most contaminated. As they consumed other organisms, their radiation levels increased and they were consumed, spreading the radiation across to other habitats and countries. Alaska has been impacted by this as the contaminated fish and any organism that consumed the contaminated organism would then, through biomagnification, be more contaminated with the radiation. This causes some of the coastal areas to be uninhabited and reduce chances of life. The radiation also causes cancer to any people around the area and other diseases such as Leukemia. The animals are dying from the radiation and the food sources cannot be consumed. The solutions are to clean up the radiation waste that can be cleaned and stay away from radiated areas. Other than that, it is too dangerous to be dealt with so they must wait for the radiation to clear.

In conclusion, bioaccumulation and biomagnification causes populations to drop, hurt birth rates, and spreads dangerous toxins like radiation. Contaminated organisms be more dangerous as time goes on (bioaccumulation) but the organisms that are harmed more are the ones that consume those organisms and the concentration of the toxins increase with each trophic level (biomagnification). The death rates increase from these two events as the toxins are spread around and spread diseases that causes organisms to die. Some organisms are having fertility issues that effect the reproduction of some populations. Radiation from a small area could easily spread around through biomagnification as it increases the severity of the radiations effects.

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