



Biodiversity and Microplastic consumption

Sai Prashanthi N and Naga Srinidhi V

Osmania University, Hyderabad.

E-mail: saiprashanthi.neelda@gmail.com

Abstract

Plastic is the major component of our world as we use plastic everywhere.

Biodiversity is considered as a variety of living organisms in the world. Nowadays, it is being affected by various anthropogenic activities. It is the major component in the world now, which is a great threat to the living organisms in many ways. Animals consuming plastic along with food is a biggest problem to the health of living organisms. It ultimately causes death of animals which is a reason for loss of biodiversity and the digestive system of animals is being affected by this. This study shows how domesticated animals are being affected by plastic and its preventive measures.

Keywords: biodiversity, plastic, animal health, consumption of plastic

Introduction

Biodiversity is the major part of earth by which earth is considered as a planet of living. Plastic is the major component in day to day life as it is being used everywhere. But it has adverse effects on the environment as well as human life. Biodiversity means the variety of living organisms in nature. It is also termed as biological diversity. Plastic contains hazardous compounds which affect animal health. Humans are part of the environment and are also affected by plastic. From the smallest animal to the biggest animal, every animal is affected by plastic. Recently in a study scientists have noticed that there is microplastic inside blood and it causes Cancer and other very dangerous chronic diseases. It also

affects every part of our environment. It will pollute soil and water and also trees, animals, insects, birds, human beings etc. Plastic has been absorbed everywhere from the very highest place everist to the very lowest place Mariana trench. This is all because we are using plastic very much we will buy everything covered by plastic we will also drink water in plastic bottles this is also a major cause were forming of microplastic inside our body because we drink water inside plastic bottle that water stored at least for 24 hours the water inside plastic bottle injects water with cells of microplastic in this way we are consuming plastic we are using plastic and throwing plastic everywhere and animals will consume that plastic

and they will be affected and throwing plastic waste in water will cause health issues to aquatic animals as we all know that plastic it is a non biodegradable material and it will affect the soil fertility crops will not be grown properly not only chemical fertilizers but also plastic effects soil fertility.

If we once manufacture the plastic we cannot destroy it in a way which is not at all harmful if we burn it causes air pollution if we throw it will cause soil pollution or water pollution. Now a days most of the animals not taken care of and

those animals will consume the plastic and they will affected with different types of diseases. Plastic is poisoning the environment along with every animal using plastic is low of cost so all are using plastic to covers we are getting everything covered with plastic and throwing those wrappers everywhere animals are consuming those plastic directly and falling ill will consume nano plastic particles directly. Most of the food which we consume daily contains plastic particles in it. We cannot recycle some types of plastics those will affect our life and biodiversity also.



Fig 1

Literature review

Microplastics are the small particles which are released by plastic, and are microscopic in structure. If animals consume food which is in plastic covers, these microplastic particles enter into the body and settle in body parts causing diseases (Md. Simul Bhuyan).

For example, edible fishes from rivers are discovered with microplastic particles which is the major reason for their mortality (Alfaro-Núñez et al., 2021).

These microplastic particles enter into the ecosystem by throwing plastic bags, covers into rivers, and it causes damage to biodiversity present there (Zhou et al., 2018). If it enters into the organs of living organisms, it causes damage by growth retardation, hormonal imbalance, oxidative stress, and immunological problems if they consume microplastics (Güven et al., 2017). Microplastics are accumulated in the digestive system and cause physiological disturbance (Ma et al. (2020).

Biodiversity is affected by various factors like environmental pollution and leads to loss of biodiversity. Recently scientists discovered the term plasticosis.

When a particular species is affected by microplastic particles where they are entered into the digestive tract of the animals. Plasticosis is the pathological condition where it leads to the death of various animals and birds. Lord Howe Island which is in Australia is the place where scientists discovered that the microplastic particles are entered into the digestive system of flesh footed Shearwater (Jennifer et al, 2021).

Plasticosis is the term which was coined by researchers recently because the plastic particles are causing fibrosis and this phenomenon is observed in sea birds(Charlton-Howard et al, 2023).

It causes damage in the tissue of various organs like the uterus, liver. Microplastic particles are observed in the tissue of these organs and cause scarring, inflammation in the tissue(Jennifer).

When these microplastic particles enter into the digestive system of the birds, it causes problems in the functioning of the stomach. It increases infections in the digestive system, so it causes loss of appetite such as absorption of nutrients, ultimately causing death of animals which affects biodiversity of that area. Scientists recently identified the death of sea birds due to plasticosis, where birds are consuming plastic more(Craig Mowat)(Charlton-Howard).



Fig 2. Plastic materials are consumed by various organisms, causing damage to their health.

Domestic animals

Compared to wild animals, domestic animals are more prone to consuming plastic as food, as plastic which is used by humans can be taken as their food.

When the plastic is consumed by animals, it gets accumulated in the digestive system, leading to starvation as it causes loss of hunger. Starvation is the main reason for the death of animals in the ecosystem that disturbs the ecological cycle.

Cattle and birds are more affected by this pollution caused by plastic (Joana C. Prata et al, 2023). Even these plastic particles are determined in the milk, meat of the farm animals which is due to consumption of plastic in the food by animals, and it causes health problems in humans(Damian Carrington). According to reports, 1 million Marine animals and birds are dying due to plastic pollution (Natalia Zolotova, et al). It is very tough to estimate the number of various species dying due to plastic pollution.



Fig 3

Methodology

Observation is done in the rural areas of Adilabad district, Telangana state.

Mainly focused on domesticated animals and birds.

During the last decade, consumption of microplastic particles by animals and birds has increased.

If we observe our surroundings daily, we can notice it.

It is a great threat to biodiversity though it looks like a simple issue.

According to research conducted by various organizations, plastic particles which are consumed by animals and birds, if they find food in plastic bags, lead to the death of them because it causes loss of hunger. It leads to starvation and finally causes death.

It may not be the single reason for biodiversity loss but it may be one of the reasons for biodiversity loss during last decades.

Consumption of plastic is more prevalent in urban areas and some parts of the villages. It leads to the death of various domestic animals and birds.

It causes loss of biodiversity and creates disturbance in the ecological cycle.

Results and discussion

Research shows that plastic pollution is the reason for loss of biodiversity in various regions.

In the village region, a reduced number of domestic animals and birds are observed and consumption of plastic becomes more.

It may lead to severe health problems in animals.

Discussion

Prevention:

It is advisable to stop consuming plastic, which is non degradable, Because it causes damage to the earth.

It is also advised to keep plastic materials away from animals and birds.

To stop animals consuming food materials in plastic bags, plastic containers etc to stop microplastic particles entering into the bodies of organisms. It is advised to humans also to stop taking food materials in plastic containers and covers as it affects human health also..

Future scope

There is a lot of scope, what are the effects of plastic in the digestive system of farm animals and domestic animals.

Acknowledgements: the authors acknowledge Department of Microbiology, Osmania University, Hyderabad.

Conflict of interests: There is no conflict of interests with others.

References

Charlton-Howard, H. S., Bond, A. L., Rivers-Auty, J., & Lavers, J. L. (2023). 'Plasticosis': Characterising macro- and microplastic-associated fibrosis in seabird tissues. *Journal of Hazardous Materials*, 450, 131090.

<https://doi.org/10.1016/j.jhazmat.2023.131090>

Cole, M. T., Lindeque, P., Halsband, C., & Galloway, T. S. (2011). Microplastics as contaminants in the marine environment: A review. *Marine Pollution Bulletin*, 62(12), 2588–2597.

<https://doi.org/10.1016/j.marpolbul.2011.09.025>

Browne, M. a. O., Crump, P., Niven, S. J., Teuten, E. L., Tonkin, A., Galloway, T. S., & Thompson, R. F. (2011b). Accumulation of Microplastic on Shorelines Worldwide: Sources and Sinks. *Environmental Science & Technology*, 45(21), 9175–9179.

<https://doi.org/10.1021/es201811s>

Charlton-Howard, H. S., Bond, A. L., Rivers-Auty, J., & Lavers, J. L. (2023b). 'Plasticosis': Characterising macro- and microplastic-associated fibrosis in seabird tissues. *Journal of Hazardous Materials*, 450, 131090.

<https://doi.org/10.1016/j.jhazmat.2023.131090>

Thompson, R. F., Moore, C. E., Saal, F. S. V., & Swan, S. H. (2009). Plastics, the environment and human health: current consensus and future trends. *Philosophical Transactions of the Royal Society B*, 364(1526), 2153–2166.

<https://doi.org/10.1098/rstb.2009.0053>

Wright, S. L., Thompson, R. F., & Galloway, T. S. (2013). The physical impacts of microplastics on marine organisms: A review. *Environmental Pollution*, 178, 483–492.

<https://doi.org/10.1016/j.envpol.2013.02.031>

Cole, M. T., Lindeque, P., Fileman, E. S., Halsband, C., Goodhead, R. M., Moger, J., & Galloway, T. S. (2013). Microplastic Ingestion by Zooplankton. *Environmental Science & Technology*, 47(12), 6646–6655. <https://doi.org/10.1021/es400663f>

Access this Article in Online



Website:
www.ijarbs.com

Subject:
Environmental
Pollution

Quick Response Code

DOI: [10.22192/ijarbs.2024.11.02.002](https://doi.org/10.22192/ijarbs.2024.11.02.002)

How to cite this article:

Sai Prashanthi N and Naga Srinidhi V. (2024). Biodiversity and microplastic consumption. *Int. J. Adv. Res. Biol. Sci.* 11(2): 12-16.

DOI: <http://dx.doi.org/10.22192/ijarbs.2024.11.02.002>