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EFFECTS OF PLASTIC POLLUTION ON HUMAN

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ABSTRACT

Plastic pollution, accumulation in the environment of synthetic plastic products to the point where they create problems for wildlife and their habitats as well as for human populations. In 1907 the invention of Bakelite brought about a revolution in materials by introducing truly synthetic plastic resins into world commerce. By the end of the 20th century, however, plastics were found to be persistent polluters of many environmental niches, from Mount Everest to the bottom of the sea. Whether being mistaken for food by animals, flooding low-lying areas by clogging drainage systems, or simply causing significant aesthetic blight, plastics have attracted increasing attention as a large-scale pollutant. There are different types of ways that plastic is dangerous for humans. Direct toxicity from plastics comes from lead, cadmium, and mercury. These toxins have also been found in many fish in the ocean, which is very dangerous for humans. Diethylhexyl phthalate (DEHP) contained in some plastics, is a toxic carcinogen. Other toxins in plastics are directly linked to cancers, birth defects, immune system problems, and childhood developmental issues. To learn more on effects of plastics on humans visit the Ecology Center

Other types of toxic plastics are BPA or health-bisphenol-A, along with phthalates (mentioned above). Both of these are of great concern to human health. BPA is used in many things including plastic bottles and food packaging materials. Over time the polymer chains of BPA break down, and can enter the human body in many ways from drinking contaminated water to eating a fish that is exposed to the broken down toxins. Specifically, BPA is a known chemical that interferes with human hormonal function.

Rolf Halden, associate professor in the School of Sustainable Engineering and Arizona State University has studied plastics adverse effects on humans and has thus far concluded that and exact outline of health effects of plastics on humans is almost impossible to determine. This is due to the fact that the problem of plastic contamination in humans is globally spread; there are almost no unexposed subjects. That being said, it is evident that the chemicals are not healthy for humans.

INTRODUCTION

Over a few decades, humans have managed to dump tons upon tons of garbage into the ocean. Of the most devastating elements of this pollution is that plastics takes thousands of years to decay. As a result, fish and wildlife are becoming intoxicated. Consequently the toxins from the plastics have entered the food chain, threatening human health. In the most polluted places in the ocean, the mass of plastic exceeds the amount of plankton six times over. This is a large piece of evidence that leaves the problem of polluted oceans undeniable. It is upsetting that more of cleanup effort is not taking place.

The Great Pacific Garbage Patch, also known as the Pacific Trash Vortex or gyre, is located in the central North Pacific Ocean and is larger than the state of Texas. There are also garbage patches in the Indian and Atlantic Ocean. The patches are defined as containing a

higher amount of plastic as compared to surrounding oceans. To date, five patches in total have been discovered.

Plastics are transported and converge in the ocean where currents meet. This means that huge plastic islands are made as a result. SES (Sea Education Society) scientists studied plastics in the Atlantic and calculated there are 580,000 pieces of plastic per square kilometer.(1)

DISCUSSION

As far as plastic entering the ocean, about 20% of the trash comes from ships and platforms that are offshore. The rest sources from litter being blown into the sea, picked up by tides on the beach, or intentional garbage dumping. The worst part is, these plastics don't biodegrade, so they break up into tiny pieces that are consumed by fish and sea mammals. Plastic is killing more than 100,000 sea turtles and birds a year from ingestion and entanglement.

As far as protecting yourself from contamination, it is probably best not to have a diet that consists mainly of fish, since most is probably contaminated. However, one of the most effective things we could all do as members of this fragile ecosystem is to be responsible for our trash. When we have the opportunity, we should try to avoid buying products packaged in plastic. We should always recycle plastic when we do use it. At the store, request a paper bag instead of plastic, or bring your own. Use a reusable water bottle, and of course don't litter.

"Marine debris – trash in our oceans – is a symptom of our throw-away society and our approach to how we use our natural resources."

Our tendency as humans to be irresponsible about cleaning up after ourselves is about to get us in trouble. We risk losing many species in the ocean as well as negatively affecting ourselves. The average person produces half a pound of plastic waste every day. No wonder the oceans are filling up with waste!(2)

RESULTS

Scientific studies indicate that an emerging threat faces our freshwater and marine ecosystems: plastic pollution.[i] Since plastics are cheap, versatile and strong,[ii] and deliver significant societal benefits (e.g., energy savings, consumer protection, healthcare innovations),[iii] it comes as no surprise that plastic production has increased exponentially since the 1960's.[iv] If current practices continue as usual, by 2025 there could be 1 ton of plastic for every 3 tons of fish in the ocean.[v] With the ability to persist for up to 4 centuries,[vi] plastic products are harming freshwater and marine ecosystems.

Plastics pose a significant threat to ocean and freshwater ecosystems and the benefits humans receive from them. The amount of plastic debris discarded by the commercial fishing industry has doubled over the last 50 years (from 340,000 tons in 1975[xii] to 640,000 tons annually)(3)

First, plastics threaten the survival of many species of wildlife, negatively impacting nearly 700 species worldwide.

- Larger items, such as fishing nets, entangle and kill wildlife.
- Smaller items ingested by wildlife lower fitness by decreasing fertility.
- As plastic breaks down, it becomes less buoyant and sinks to the ocean floor. This can lead to hypoxia (oxygen deficiency), dead zones, and a shift in sediment properties necessary for sex- determination in animal eggs.

- Plastics transport invasive species. As a medium for long distance dispersion, plastics carry species to uninhabited areas where they compete with native species. For example, a study in the Western Atlantic showed insect eggs on 24% of the plastic pellets sampled.

Second, plastic products serve as a conduit for the release and travel of toxins into and through freshwater and marine food chains, posing a threat to wildlife, public health, and the fishing industry.

• Plastic, mistaken as food, is ingested at all levels of the food web and travels through the food web via a process known as bioaccumulation (i.e., the accumulation of a substance in an organism's tissue due to a greater intake rate than excretion or metabolic rate).
• Plastics cause two chemical impacts: the release of additives (e.g., BPA), and the attraction and subsequent release of toxins (e.g., DDT, PCBs).
• Plastic fragments can transport contaminants, increase their environmental persistence, and concentrate organic pollutants up to 106 times that of surrounding seawater. The chemicals present in plastic pollution, such as PCBs, lead to reproductive disorders or death, increase the risk of diseases and alter hormone levels. (4)
Third, plastic pollution is costly.
• Beach cleanups cost coastal communities millions of dollars each year. For example, Texas spends approximately $14 million a year cleaning beaches; and San Francisco spends approximately $6 million per year picking up cigarette butts.
• Plastics on beaches lower aesthetic value and therefore revenue for coastal communities and the tourism industry.
• Losses to the fishing industry occur through vessel damage, decreased fertility and ghost fishing (i.e., the continued trapping and killing of marine life by discarded fishing net). In the U.S., an estimated $250 million worth of lobster is lost to ghost fishing annually and four to ten million blue crabs are trapped in ghost fishing gear each year in Louisiana.
• Plastic litter fouls propellers and clogs the water intake of vessels. This reduces fishing opportunities, and increases accidental death. In the U.S. alone, cleanup and boat repairs due to marine debris costs over $1 billion a year.(5,6)

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