

Are Paper Straws Friendly to the Marine Ecosystem?

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Abstract: The impact of marine plastic garbage pollution on people all around the world is enormous. When we consider the benefits of paper straws, we can see that they have fewer negative effects on the environment, which means that if a paper straw falls into the water, it is more likely to biodegrade, whereas plastic would exist for a longer time. Aside from the benefits we've discussed, paper straws aren't substantially more ecologically friendly than plastic straws. This study examines the detrimental effects of paper straws on the marine ecosystem, as well as the pollutants associated with their manufacture and whether they are biodegradable.

Keywords: Paper straws

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1. Introduction

“At first, we thought it was a worm,” says Christine Figgner, a sea turtle specialist at Texas A&M University in College Station who assisted the injured reptile off the coast of Costa Rica. After ten minutes, they found that the wrinkled, brownish thing turned out to be a four-inch (ten-centimeter) straw ^[1]. Millions of animals are crying for help to get rid of the torture of human-made plastic waste. As well, this phenomenon of marine plastic garbage pollution has a huge impact on the people of the world. There is no doubt that plastic in the ocean is a problem that needs to be tackled. It is a good view that more and more catering companies start to use paper straws. However, are paper straws ecofriendly as we thought? If we look at the advantages of paper straws, obviously paper-made straws bring less effects to the nature, which means that if a paper straw flows into the ocean, it is more likely to be biodegraded whereas the plastic will last in a longer period of time. Beyond the advantages that we have talked about the paper straws, they are not much more environmentally friendly than plastic straws. In other words, paper straws may lead to worse situations while we believe they are biodegradable. This research focuses on the negative consequences of paper straws having on the marine ecosystem, in terms of the pollution of producing paper straws, as well as whether paper straws are biodegradable or not.

2. Body

Do you know that in the United States, 500 million straws are used every day? In other words, 500 million straws would be enough to fill almost 127 school buses per day, or more than 46,400 school buses per year! ^[2]. It is reasonable to say that the global movement against the usage of plastic straws reached a fever pitch this year, with many businesses and individuals opting to replace plastic straws with paper ones ^[3,4]. By 2050, it is expected that 99 percent of all sea bird species would have consumed plastic. The mortality rate

might be “up to” 50%. Plastic has previously been found in sea salt, 94 percent of U.S. tap water, and shellfish, according to the investigation by Orb Media ^[5]. Seattle announced to ban plastic straws and using paper straws instead at the very beginning. “On January 1, 2019, a ban on plastic straws in restaurants and other service businesses began in Washington, D.C.,” written by Sarah Gibbens, a journalist of National Geographic. Followed by Starbucks, McDonald’s, Alaska Airlines, and other well-known companies also release the statement. It seems like we have already tried our best to prevent the usage of plastics, however, both the process of producing and recycling used paper straws harm the environment, even worse than the negative effects that plastics bring to the nature ^[6]. McDonald’s discovered this issue when they switched from plastic to paper straws and had to decide that the 1.8 million straws used in their restaurants per day throughout the UK could not be recycled and were thus being discarded ^[7]. Furthermore, Standard Testing, which has established long-term cooperative relationships with well-known enterprises such as Schneider, PetroChina, Haier, and so on, providing customers with one-stop service, considers paper straws to be standard. The biggest benefit of utilizing paper straws instead of plastic straws is that they are biodegradable ^[8]. This means it can be broken down organically and will not wind-up drifting in our oceans or being eaten by turtles. However, the solution is not as simple as substituting paper for plastic. Same as plastic straws, most of paper straws cannot be recycled by recycling facilities. Some use composite materials, such as paper with edging film, where the degradability will be combined. The synthesis of paper straws cannot be completely degraded, and the internal plastic coating cannot be recycled alone. It is hard to say that paper straws are the best option.

Replaced paper straws may not produce the expected protective effects. It typically takes more resources to produce paper straws. Although paper straws are a greener option than plastic straws, they are substantially disposable consumer items. Paper straws are made by cutting down trees, pulping them, and pressing them into tubes. By removing carbon dioxide from the atmosphere, trees act as a carbon sink, lowering atmospheric CO₂ levels and slowing climate change ^[9]. Paper straws may be considered an environmentally friendly product because they are made of trees, the renewable resource. Trees are, however, an extremely valuable source since they absorb the carbon dioxide emissions that humans make, 33% of the carbon dioxide that we produce to be exact ^[4]. That is precisely why they should not be chopped and be used for any other purposes. Being made to paper straw is not enough a good reason to chop trees, especially when there are other, much better, plastic-free alternatives available. What’s more, a paper straw uses around 10% more energy and four times the amount of water than a plastic straw ^[2]. Although recycled paper can be utilized, the recycling process consumes more energy and water than raw material, and the completed product is less durable ^[10].

The dilemma is that everything we use or make can be labeled as biodegradable. It could simply take a very long time ^[11]. Hence, putting the term “biodegradable” on food labels is not a sensible way for consumers carrying out greener purchasing decisions. As the result, the most straightforward strategy to lessen your environmental effect (in terms of straws) is to refuse all straws. Restaurants frequently provide straws with your drink, so it’s vital to refuse before you order. Substituting paper straws for plastic straws is analogous to replacing a McDonald’s diet with a KFC diet, both are terrible for your health, just as both plastic and paper straws are harmful to the environment ^[12]. The best way to improve such situation that throwaway trash brings to the environment is stopping using disposable products. As a customer, please refuse to use plastic straws and plastic stirring rods when you go to restaurants, cafes and snack stalls to consume.

3. Conclusion

To summarize, the environmental cost of producing paper straws is significant since it may require more wood, which is harmful to our ecosystem. Although paper straws can ultimately be degraded, the process

takes a significant number of natural resources. We use less paper straws, which means fewer trees are cut down and less pollution is generated. Pollution is also produced during the production of paper. Paper straws are not a viable substitute for plastic straws, regardless of the cost of manufacturing or the cost of recycling. Throughout the product's complete life cycle, we must analyze the product's environmental impacts in detail. If possible, request that your cold beverage be served without a disposable straw.

Disclosure statement

The author declares no conflict of interest.

Author contributions

Kunyue Zhang performed the essay and Dongran Zhai did the edition.

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