How worms could help solve plastic pollution

These remarkable worms are accomplishing something we once believed to be impossible: they are breaking down non-degradable materials, digesting the non-digestible, and effectively consuming plastic.

Harnessing their extraordinary abilities could enable us to eliminate our plastic waste in a matter of weeks instead of centuries. This breakthrough could save countless animals, aid in environmental cleanliness, and eliminate the need for toxic plastic incineration. In 2017, Federica Bertokini, a molecular biologist, made a significant discovery when she noticed these worms while cleaning one of her beehives. She observed that they managed to eat their way out of a plastic bag, unlike the typically deceased invertebrates she found. Plastic, an enigmatic material, does not decompose but rather fragments into microplastics that persist in the environment for centuries.

More on plastics

The history of plastics is one of transformation. Plastics have revolutionized our world, making it safer, more hygienic, and more vibrant than ever before. Throughout most of human history, we constructed objects using natural resources such as wood, rocks, and metals. However, as society advanced, there arose a demand for properties possessed by scarce natural elements, like ivory, silk, or tortoiseshell. By the mid-19th century, the widespread use of ivory to make billiard balls raised concerns about the extinction of elephants.

In response, an inventor named John Wesley Hyatt sought to find an abundant substitute for ivory. After years of tinkering, he developed celluloid, the precursor to modern

plastics. Celluloid replaced materials like tortoiseshell, coral, and mother-of-pearl, while nylon replaced silk and bakelite replaced traditional raisins. The reason plastic persists in the environment for so long is that there are no natural mechanisms to break down its bonds.

Mealworms

Mealworms, which can be purchased online and observed as they transform into adorable beetles while feeding on Styrofoam, play a key role in the process. However, it is not the worms themselves but the bacteria inside them, likely producing enzymes, that break down the plastic. Dominic Ian, a professor of structural biology, emphasizes the excitement surrounding enzymes and the search for bacteria in the most unexpected places to find those capable of digesting plastic.

Bio-recycling

The goal of researchers is to identify new insects and bacteria capable of digesting plastic, isolate their enzymes, and optimize their production in bioreactors. While this technology cannot address the plastic already present in the environment, it has the potential to revolutionize our recycling systems. True recycling involves breaking down materials to their basic elements, allowing them to be reassembled into new products. However, due to the unbreakable nature of plastic bonds, it can only be recycled once or twice before becoming unusable. This is where the worms can be a game-changer.

Conclusion

In conclusion, while worms and their enzymes offer a promising solution to our plastic problem, the root issue lies in the design of plastics themselves. Our dependence on fossil fuels to create unnecessary and trivial products is a significant concern. We entered into a toxic relationship with plastic

when we invented it to repel bugs, and now we are relying on bugs to eliminate it. However, living without plastic entirely may not be desirable or feasible. Instead, we should strive to adapt and find sustainable ways to coexist with this material, much like the mealworms have done.