



Opinion

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# False Whale Poo to Improve Oceanic Production

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## Opinion

I don't remember having so much fun reading a book of popular science as with Merde. Excursions in Scientific, Cultural and Socio-Historical Coprology [1], I've made a kind recension of this booklet in an article from 1999 in a Catalan newspaper, "Profane Eschatology", later published anew in one of my books [2]. I recommend it to the interested reader for the agile and entertaining way in which this marine biologist, specialist in the genetics of single celled algae, dealt with the ecological aspects related to animal and human droppings. Lewin had already discussed in his book, among other topics, the important contribution of organic matter that marine organisms on the surface of the oceans and the water column, especially the copepod crustaceans, produce in the form of their droppings to fertilize the deep ocean waters. This organic matter is broken down into the basic nutrients that form it, and is used by all kinds of organisms, so that it makes a very important contribution to the metabolic dynamics of the oceans.

It is estimated that cetacean hunting, which lasted for almost four centuries until its partial ban in the mid-20<sup>th</sup> century, wiped out a huge fraction of the populations of whales, sperm whales, dolphins and porpoises, to which other marine animals, such as seals, turtles and penguins must be added. These were hunted for their fat, which was used as fuel before oil, gas, and electricity lit our homes; but also for meat, the very fine oil of spermaceti, the baleen of whales, and other resources needed a couple of centuries ago, but of which today our society can pass without. Many millions of tons of feces from these animals, especially large cetaceans, which have seen their populations reduced by more than 90% and are recovering very slowly, have ceased to enter the waters of the oceans. Cetaceans defecate huge amounts of shit

mostly in shallow water: on their deep dives, it is difficult for them to evacuate due to the high pressure they are subjected to, and they poo on the surface when they go up to breathe. This means that, due to the decline of its populations, an immense amount of organic matter cannot fertilize the water column. Therefore, there is much less nutrients for phytoplankton, and consequently less food for zooplankton and the next oceanic trophic levels, which usually end up in the fish and other organisms we fish or harvest.

Various international research centers are currently preparing a so-called Marine Biomass Regeneration Project, which will manufacture artificial cetacean feces, based on rice husks and organic matter, and sink it into the surface waters of the Indian Ocean, to see what effect this has on promoting primary production by phytoplankton [3,4].

I find it very strange that research institutions want to invest in this project. It is true that there has been a huge reduction in marine mammal populations over the last few centuries (and also in many fish populations we have overfished, and which also excrete and fertilize marine waters [5]). However, it is also true that the human population and that of the animals of our livestock have increased greatly, that the inflows of feces (in the form of wastewater from agricultural, livestock and urban runoff) are much larger, despite their partial purification, that when the cetaceans were not hunted and could evacuate safely. Many coastal areas where large rivers drain after crossing agricultural land fed by natural or artificial fertilizers, or where the sewers of coastal cities discharge, take advantage of the nutrients from our organic waste and are home to important primary production. Nevertheless, in some cases, the consumption of large amounts of this organic matter input produces dead zones: large areas of the

seabed deprived of oxygen and inadequate for most organisms, invertebrates and fish.

In addition, maritime traffic is constantly injecting human (and animal, in the case of livestock transport) feces in every ocean in the world, and many thousands of passengers in merchant ships, cruise ships or military vessels continuously cross the world oceans. I find it hard to believe that these fecal entries (and kitchen scraps, not to mention accidental losses and sinking of organically loaded ships) are not equivalent to those of the whales of yesteryear. As I've suggested more than once (unsuccessfully, I'm afraid, [6,7], perhaps instead of making fake cetacean droppings, the sea could be fertilized with the excess manure that our livestock generate and that we do not know how to get rid of, and which pollute fields and waters the world over, and mainly in my country, Catalonia. Surely, the economic cost of the studies needed to assess this possibility would be much lower than that devoted to the Marine Biomass Regeneration Project. Overall, it is a filthy affair.

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