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Mini Review

Threat of Skincare Products on Marine Life

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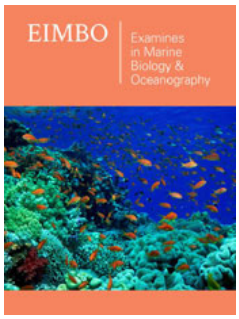

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Abstract

Today marine pollution is a very serious problem. Every type of pollutant is going into the ocean. Some pollutants are invisible like metal pollution and can't see by the naked eyes but some pollutants are visible like oil pollution and debris pollution etc., These visible and non-visible pollutants always entered into the ocean by human beings which is due to accidently or deliberately released in ocean. It is fact that pollution is something introducing into the environment that is dirty, unclean and has a harmful or negative effect on the environment and marine life and often impacts human health and wellbeing. Many of the pollutants are very harmful and not degraded by bacteria or not diluted. So, they become the permanent addition into the marine environment. One pollution which is not famous too much but very harmful for marine life, is skincare creams pollution. Most commonly the products of sunscreen cream or lotion people used for the protection of their skin from the harmful effect of ultraviolet radiations when they take bath in seawater. It is a serious threat for marine life especially for coral reefs. The purpose of the present article is that skincare creams or products have very harmful chemicals that eliminate the marine organisms especially coral reef. Upto 10% reef of the world are eliminated by these harmful chemicals. According to one estimate approximately 14,000 tons of sunscreen ends up in waters surrounding the coral reefs.

Keywords: Skincare products; Marine life; Ocean; Pollutants; Ultraviolet radiations; Harmful chemicals

Abbreviations: SDG: Sustainable Development Goals; FDA: Food and Drug Administration

Introduction

Coral reefs exist in a very wide range in the marine environment; provide an important ecosystem in under seawater. They are the one marine fauna that threatened by natural and anthropogenic impacts. Usually, coral reefs are beneficial for coastal areas, protect by reducing the power of strong waves that were going to hit the coast. They are also significant way of income for most of the coastal peoples but near coastal areas or human habitation it is potentially vulnerable of sunscreen pollution. Coral reefs are the colonies of hundreds to thousands of tiny marine invertebrate animals known as polyps. They have diverse life and thousands species of fauna and flora found that living on one coral reef.

Coral reefs are colourful and sessile, have hard exoskeleton which is made up of calcium carbonate. The good reef examples exist of classic, oceanic atolls (a ring shaped coral reef) in clear water and also of extensive fringing and patch reef which grow in condition of high stress environment with other benthic groups like marine attached plants (seaweeds). One chemical oxybenzone, which is found in skincare cream is very toxic and damage the coral DNA and induces severe and lethal deformities. Many findings show that when swimmers at the beach take bath they apply themselves with cream and when they went into the water, make the water oily. Then it makes sense that sunscreen is also one threat to our Oceans. One Scientist Craig Downs in the U.S. Virgin Island also told the importance of sunscreen cream or lotion about the declining of coral reefs in one his investigation [1]. He observed oily bright colourful layer on the surface of the seawater after the bathing of tourist. Its mean sunscreen washing off into the water that tourist used before swimming and sunscreen lotion that has many harmful ingredients and oxybenzone, most of them are absorbed in the skin of swimmers and washed off in water when they come in contact of water.

Importance of Coral Reefs

Coral reefs are important to the well-being of more than 500 million people around the world. People use them for food, jobs, and coastal protection. Coral reefs can act as barriers to wave energy, reducing the impact of waves on the reef. Coral reefs are very important due to many reasons, including providing food and habitat for marine life, filtering water, acting as a natural barrier to shoreline erosion, and providing tourist opportunities. They protect coastal areas from the destructive effects of waves and tropical cyclone. Protecting coral reefs is important because it provides habitats and shelter for many different creatures. Corals are the source of nitrogen and other essential nutrients in marine food chains and is found in many different places in the ocean promote carbon and nitrogen fixation. Corals are animals that form close symbiotic associations with marine plants or algae [2]. The algae live inside the coral's cells and use the coral's tissue to create their own food. Coral reefs are made up of a community of different species of marine life that live together in an intricate structure called a coral reef. This community of organisms provides the calcium carbonate framework that supports the growth of other marine life. The microbiome which are consists of beneficial and potentially harmful microorganisms very important for healthy holobiont functioning. Nitrogen is an important nutrient for both the coral and the symbiotic algae. Microbes of the cycle are very important in maintaining the stability of the symbiosis and the function of the holobiont. Most healthy microbiota live in symbiosis with their host, benefiting both parties. However, some microbes can cause disease, in smaller numbers. Coral reefs are an important part of the marine environment, reducing the power of waves hitting the coast and protect coastal areas from erosion. Many different species of flora and fauna live on one reef such as Great Barrier Reef have 400 coral species, 1,500 fish species, 4,000 molluscs species and six turtle species. Coral reefs contribution to the fishing and tourism industries and the coastal protection estimated, £6 trillion globally each year [3].

Sunscreen Product Chemical Composition

Sunscreen cream or products have two type of agents physical and chemicals. Physical agents such as titanium oxide and zinc oxide block the penetration of UV (A-B) radiations into the skin. Whereas chemical agents absorbing these harmful UV radiation. Currently Food and Drug Administration (FDA) approved sixteen sun filtering ingredients. Mostly twelve ingredients names oxybenzone, Benzophenone-1, Benzophenone-8, 3-Benzylidene camphor, 4-Methylbenylidene, avobenzone, homosalate, octisalate, octocrylene, octinoxate, zinc oxide, titanium dioxide commonly found in sunscreen lotion. The most common ultraviolet blocking chemical Oxybenzone is found in sunscreen lotion detected in urine within thirty minutes of application and entered in Ocean as sewer and municipal wastes. This oxybenzone beside coral bleaching create hormonal disruption in the growth, fertility, and defect in offspring of marine fauna and flora and coral reefs. Sometime corals encasing themselves in their own skeleton, unable to reproduce and finally they die. Most of the species fauna and flora affected more that are found at the bottom of the food chain (plants). The researchers predict that oxybenzone not only one the toxic ingredient of sunscreen cream, the same toxicity is present in the others ingredients of sunscreen, due to similar chemical structure they form similar phototoxic metabolites.

Today every organic thing understood perfect. Some skincare creams are in market with the name of "organic sunscreen". From the name of organic sunscreen people stands that it is not harmful for environment. Technically sunscreen products consist of carbon compounds and their polymer, like oxybenzone, avobenzone and octinoxate reduce the effect of ultraviolet radiation. The difference between organic sunscreen and inorganic sunscreen is that organic sunscreen contains chemicals that absorb or filter UV radiation whereas inorganic sunscreen contains metal oxide that absorb UV radiation. Some plant-based organic (Eucalytus globulus (eucalyptus) and Azadirachta indica (neem) oil) have toxic effects that are harmful to invertebrates that are live in the coral reef such as arthropods. Another ingredient beeswax has toxicity due to industrial insecticides and fungicides threat the environment. Marine algae or seaweeds (green, brown and red) growth and photosynthesis processes damage due to sunscreen products chemicals. In dolphins sunscreen chemicals accumulate in tissues and transfer to young ones. In fish growth, fertility and reproduction also decreases.

Conclusion and Recommendation

Sunscreen cream pollution is a global problem. Its threat to marine life is not great but endangers marine ecosystem. Like all types of pollution sunscreen cream marine pollution can also be controlled by arranging data-driven strategies that based on technology, laws and policy which target priority pollution sources. For the prevention of sunscreen cream pollution necessary all sunscreen products should prepared by harmless ingredients. One option is to arrange seminar for convincing the people to reduce the use of sunscreen creams and lotion. The safest sunscreen products should made from minerals instead of chemicals that biodegrade easily. Beside this avoiding the timing of sun when its rays strongest like during the period 10am to 4pm. One more way to cure body skin from sun rays wear protective dress with full sleeved and sun hat. Experienced committee will check all products of sunscreen before come in market. Prevention of any type of pollution give many benefits. It boosts the economy of the country, help restore fisheries, increase tourism and improvement of well-being. It is remember that these benefits are last for centuries. It advances the global goals or Sustainable Development Goals (SDG). Many laws formulated for the protection of marine environment. The aim of these laws was to make better provision for preventing and dealing with marine pollution. The implication of these laws is possible when government take action and right regulation and enforcement by the government.

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