



Sunscreens: a major cause of coral bleaching

New research highlights the harmful effects of sunscreens on coral reefs. The ultra-violet (UV) filters, used to protect skin from the harmful effects of sun exposure, caused bleaching of coral reefs even at very low levels. In areas exposed to high levels of human activity, sunscreens may now be posing a significant risk to marine life.

Coral reefs are among the most biologically productive and diverse ecosystems in the world. These ecosystems directly sustain half a billion people, but around 60 per cent are currently threatened. Over the past 20 years, coral bleaching has increased dramatically. This has been blamed on a range of causes including temperature change, excess UV radiation, pollution and bacterial pathogens. Italian researchers have now added sunscreens to this list of damaging agents¹.

Chemical compounds in sunscreen and personal care products are found in detectable levels in sea and freshwater. Already, sunscreens are banned in many sensitive areas such as a marine eco-park in Mexico. Research shows that chemicals in sunscreens can accumulate in aquatic animals, have an oestrogen-like effect and biodegrade into toxic by-products.

The researchers investigated the effects on coral of adding controlled amounts of three brands of sunscreen to the surrounding seawater. The research was carried out at locations in Mexico, Indonesia, Thailand and Egypt, representing a range of ecosystems. Even when sunscreen was added in low quantities, large amounts of coral mucous, composed of algae and coral particles, was released within 18-48 hours. Within 96 hours, complete bleaching of corals had occurred.

Bleaching was faster at higher temperatures and microscope analysis showed a loss of photosynthetic pigments and membrane integrity in the algae. Virus levels in seawater surrounding coral branches increased significantly, reaching 15 times the level found in control samples. The researchers believe the viruses were released from the corals or algae, suggesting that sunscreens might stimulate latent viral infections. This suggests that inducing algae or coral to release latent viruses is an important factor contributing to coral bleaching. Pesticides, hydrocarbons and other contaminants have been found to have a similar effect, and these compounds could act synergistically with sunscreen products, increasing the extent of coral bleaching.

According to the UN World Trade Organisation, around 10 per cent of tourism takes place in tropical areas with 78 million tourists visiting coral reefs each year. An estimated 4,000 and 6,000 tonnes of sunscreen are released in reef areas each year with 25 per cent of the sunscreen ingredients on skin released into water over the course of a 20 minute submersion. The authors estimate that up to 10 per cent of the world's coral reefs are at risk of sunscreen-induced coral bleaching.

Sunscreens are made of around 20 compounds acting as UV filters and preservatives. Seven were tested including parabens, cinnamates, benzophenones and camphor derivatives. This research suggests that action is needed to find UV filters that do not threaten the survival of these endangered ecosystems.

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