

IEM Committee

From: Barbara Barry <haikupointofview@icloud.com>
Sent: Monday, November 13, 2017 9:57 AM
To: IEM Committee
Subject: Oxybenzone and Octinoxate sunscreen use and sale ban in Maui County.

Aloha Chair Cochran and Committee Members,

Banning sunscreens with the chemicals Oxybenzone and Octinoxate in Maui Waters is not a new idea. This has been happening all over the world where the Science has proven that these 2 chemicals in sunscreens cause Death to Coral Reefs.

The Consumer Healthcare Products Association has made overturning bans on these two chemicals present in sunscreens a legislative priority for 2017. The Board of Directors for this organization has Johnson & Johnson, Proctor and Gamble and Colgate Palmolive Corporations.

Please do your homework on this organization. They are not here to help our Reefs stay healthy. They are here to protect their Corporate interests under the guise of 'Making sure the consumer has choices'. The consumer does have choices, they can chose not to come to Maui and kill our reefs with their chemical laden sunscreens or use a safe, mineral based sunscreen.

From CHPA Legislative Priorities list.

Sunscreen: CHPA supports providing consumers with access to a wide variety of safe and effective sunscreens to use as an important part of an overall safe sun program. Recently, oxybenzone, an active ingredient in many of the most widely-used sunscreens, has come under attack for its alleged role in the degradation of coral reefs. These attacks cite a study published in *Archives of Environmental Contamination and Toxicology* suggesting oxybenzone could be harmful

to coral, but the study failed to accurately reflect the complexity of the natural marine environment in which coral exists. There is no scientific evidence that under naturally-occurring conditions, sunscreen ingredients, which have been safely used around the world for decades, are contributing to this issue. According to the U.S. National Oceanic and Atmospheric Administration's (NOAA) Coral Reef Conservation Program, coral reefs are threatened by an increasing array of impacts – primarily from global climate change, unsustainable fishing and other factors. Sunscreen is a first line of defense for individuals seeking protection from the sun's cancer-causing UV rays. Oxybenzone has been an FDA-approved sunscreen ingredient since 1978 and is proven effective against both UVA and UVB radiation, which is why the American Academy of Dermatology recommends the use of sunscreens containing oxybenzone. There is no evidence that restricting the availability of oxybenzone will improve the health of coral reefs, but it will certainly reduce the selection of sunscreen products available to consumers.

While this Association may do important work in other areas, their opinion about banning these two toxic chemicals in Maui County is not relevant or caring for our fragile Reefs that are dying rapidly. I urge you to remember they are here to protect the Corporations who make these sunscreens and the Chemical Companies that produce these Chemicals.

We do not want a Corporate Consumers Group from Washington D.C. dictating the will and wisdom of the the People and Scientists like Craig A. Downs, PHD. He's the Executive Director of Haereticus Environmental Lab, or Joe DiNardo, retired Research Scientist and Toxicologist. These men have both shown why the Science is behind banning these two toxic chemicals. It's a fact, not a theory!

Please do what's pono for Maui County Reefs. Be the leader for the sacred islands and their precious Reefs and ocean life. That is what people come here for.

Let the big Chemical Corporations that create these sunscreens do better for the fragile Coral Reefs around the world. It's not always about profit when our environment is being destroyed.

Ban the USE and SALE of Oxybenzone and Octinoxate sunscreens now!

Below an article on the health issues with these two chemicals for humans from EWG. The reef is not the only one who suffers from these chemicals. Remember, these chemicals are showered off and go into our sewer treatment plants, cesspools or septic systems. They are absorbed into the skin and are excreted through urine and sweat. They don't belong in Maui County!

The Trouble With Ingredients in Sunscreens

Sunscreen is a unique body care product: consumers are directed to apply a thick coat over large areas of the body and reapply frequently. Thus, ingredients in sunscreen should not be irritating or cause skin allergies, and should be able to withstand powerful UV radiation without losing their effectiveness or forming potentially harmful breakdown products. People can potentially inhale ingredients in sunscreen sprays and ingest some of the ingredients they apply to their lips, so ingredients must not be harmful to lungs or internal organs. Further, sunscreens commonly include ingredients that act as "penetration enhancers" and help the product adhere to skin. As a result, many sunscreen chemicals are absorbed into the body and can be measured in blood, breast milk and urine samples.

Active ingredients in sunscreens come in two forms, mineral and chemical filters. Each uses a different mechanism for protecting skin and maintaining stability in sunlight. The most common sunscreens on the market contain chemical filters. These products typically include a combination of two to six of the following active ingredients: oxybenzone, avobenzone, octisalate, octocrylene, homosalate and octinoxate. Mineral sunscreens use zinc oxide and/or titanium dioxide. A handful of products combine zinc oxide with chemical filters.

Laboratory studies indicate that some chemical UV filters may mimic hormones, and physicians report sunscreen-related skin allergies, which raises important questions about unintended human health consequences from frequent sunscreen application.

The Food and Drug Administration has not reviewed evidence of potential hazards of sunscreen filters – instead it grandfathered in ingredients used in the late 1970s when it began to consider sunscreen safety. The Danish EPA recently reviewed the safety of active ingredients in sunscreen and concluded that most ingredients lacked information to ensure their safety (Danish EPA 2015). Sixteen of the 19 ingredients studied had no information about their potential to cause cancer. And while the published studies suggest that several

chemical filters interact with human sex or thyroid hormones, none of the ingredients had sufficient information to determine the potential risks to humans from hormone disruption.

EWG has reviewed the existing data about human exposure and toxicity for the nine most commonly used sunscreen chemicals. The most worrisome is oxybenzone, added to nearly 65 percent of the non-mineral sunscreens in EWG's 2017 sunscreen database. Oxybenzone can cause allergic skin reactions (Rodriguez 2006). In laboratory studies it is a weak estrogen and has potent anti-androgenic effects (Krause 2012)

The Centers for Disease Control and Prevention has detected oxybenzone in more than 96 percent of the American population, based on a representative sampling of children and adults (Calafat 2008). Participants who reported using sunscreen have higher oxybenzone exposures (Zamoiski 2015). Investigators at University of California, Berkeley, recently reported a dramatic drop in teen girls' exposure to oxybenzone in cosmetics when they switched from their usual products to replacements that did not contain this chemical (Harley 2016)

In a recent evaluation of CDC-collected exposure data for American children, researchers found that adolescent boys with higher oxybenzone measurements had significantly lower total testosterone levels (Scinicariello 2016). The study did not find a similar effect in younger boys or females. The researchers cautioned that their results are a single day snapshot instead of a controlled study of the effect of multi-day exposures.

Intentional dosing studies in people are rare. In one study, human volunteers applied a lotion with oxybenzone and two other sunscreen ingredients. Researchers reported a minor but statistically significant decrease in testosterone in men, accompanied by a minor increase in inhibin B, another male sex hormone (Janjua 2004). The researchers concluded these differences were normal variations and not attributed to sunscreen exposure, but critics argue that the exposures were too short to be conclusive (Krause 2012).

Given the pervasiveness of oxybenzone exposures, further study is needed to evaluate the association between oxybenzone and hormone disruption in children and adults.

EWG recommends that consumers avoid sunscreens with oxybenzone. But sunscreen users are exposed to other active ingredients as well. Margaret Schlumpf of the University of Zurich detected oxybenzone and four other sunscreen filters in Swiss women's breast milk, indicating that the developing fetus and newborns may be exposed to these substances (Schlumpf 2008, Schlumpf 2010). She detected at least one sunscreen chemical in 85 percent of milk samples.

Some experts caution that the unintentional exposure to and toxicity of active ingredients erode the benefits of sunscreens (Krause 2012, Schlumpf 2010). But most experts conclude that more sensitive tests are needed to determine whether sunscreen chemical ingredients pose risks to frequent users (Draelos 2010, Gilbert 2013).

Active ingredient toxicity

This table outlines human exposure and toxicity information for nine FDA-approved sunscreen chemicals. We asked these questions:

- Will the chemical penetrate skin and reach living tissues?
- Will it disrupt the hormone system?
- Can it affect the reproductive and thyroid systems and, in the case of fetal or childhood exposure, permanently alter reproductive development or behavior?
- Can it cause a skin allergy?
- What if it is inhaled?
- Other toxicity concerns?

Chemical	EWG Hazard Score	Use in U.S. sunscreens	Skin Penetration	Hormone disruption	Skin Allergy	Other concerns	References
UV filters with higher toxicity concerns							
Oxybenzone	8	Widespread	Detected in nearly every American; found in mother's milk; 1% to 9% skin penetration in lab studies	Acts like estrogen in the body; alters sperm production in animals; associated with endometriosis in women	Relatively high rates of skin allergy	N/A	Janjua, Janjua, Sarveiy, Gonzalez 2006, Rodriguez 2006, Krause 2012
Octinoxate (Octylmethoxycinnamate)	6	Widespread	Found in mothers' milk; less than 1% skin penetration in human and laboratory studies	Hormone-like activity; reproductive system, thyroid and behavioral alterations in animal studies	Moderate rates of skin allergy	N/A	Krause, Sarveiy, Rodriguez 2006, Krause 2008
UV filters with moderate toxicity concerns							
Homosalate	4	Widespread	Found in mothers' milk; skin	Disrupts estrogen,	N/A	Toxic breakdown products	Krause, Sarveiy, SCCNF

			penetration less than 1% in human and laboratory studies	androgen and progesterone			
Octisalate	3	Widespread; stabilizes avobenzone	Skin penetration in lab studies	N/A	Rarely reported skin allergy	N/A	Walters Shaw 2014, Singh 2014
Octocrylene	3	Widespread	Found in mothers' milk; skin penetration in lab studies	N/A	Relatively high rates of skin allergy	N/A	Krause 2014, Bryden 2014, Hayden 2014

UV filters with lower toxicity concerns

Titanium Dioxide	2 (topical use), 6 (powder or spray)	Widespread	No finding of skin penetration	No evidence of hormone disruption	None	Inhalation concerns	Gamer 2014, Nohyne 2014, Wu 2014, Sadrieh 2014, Takeda 2014, Shimizu 2014, Park 2014, IARC 2014
Zinc Oxide	2 (topical use), 4 (powder or spray)	Widespread; excellent UVA protection	Less than 0.01% skin penetration in human volunteers	No evidence of hormone disruption	None	Inhalation concerns	Gulson 2014, Sayes 2014, Nohyne 2014, SCCS 2014
Avobenzone	2	Widespread; best UVA protection of chemical filters	Very limited skin penetration	No evidence of hormone disruption	Breakdown product causes relatively high rates of skin allergy	Unstable in sunshine, must be mixed with stabilizers	Klinubo 2014, Bryden 2014, Hayden 2014, Monter 2014, 2008, M 2014
Mexoryl SX	2	Uncommon; pending FDA approval; offers good, stable UVA protection	Less than 0.16% skin penetration in human volunteers	No evidence of hormone disruption	Skin allergy is rare	N/A	Benech 2003, Fourtar 2014

Six other ingredients approved in the U.S. are rarely used in sunscreens: benzophenone-4, benzophenone-8, menthyl anthranilate, PABA, Padimate O, and trolamine salicylate

Hormone disruption

Several common chemical filters appear to be endocrine disruptors. A large number of studies in animals and cells have shown that the chemicals affect reproduction and development by altering reproductive and thyroid hormones, although the evidence is

mixed for some studies (Krause 2012). Animal studies report lower sperm counts and sperm abnormalities after exposure to oxybenzone and octinoxate, delayed puberty after exposure to octinoxate and altered estrous cycling for female mice exposed to oxybenzone. Recently, Danish researchers reported that eight of 13 chemical sunscreen ingredients allowed in the U.S. affected calcium signaling of male sperm cells in laboratory tests, which the researchers suggest could reduce male fertility (Endocrine Society 2016).

As most of the hazard data is generated from animal studies, it is difficult to determine the human health implications of exposure to a mixture of hormone-disrupting ingredients in sunscreen.

In addition to the relationship between oxybenzone and testosterone levels in adolescents, preliminary investigations by a team of researchers at the NIH and SUNY Albany suggest a link between higher concentrations of benzophenones and poorer reproductive success in men seeking assistance at a fertility clinic. Men with greater exposures to benzophenone-2 and/or 4-hydroxyoxybenzone had poorer sperm quality (Louis 2015), and reported that it took longer for their partner to conceive (Buck-Louis 2014). Female exposures to oxybenzone and related chemicals have been linked to increased risk of endometriosis (Kunisue 2012)

Mineral sunscreens

Mineral sunscreens are made with zinc oxide and titanium dioxide, usually in the form of nanoparticles.

Mineral sunscreens are made with zinc oxide and titanium dioxide, usually in the form of nanoparticles. There is good evidence that little if any zinc or titanium particles penetrate the skin to reach living tissues. Thus, mineral sunscreens tend to rate better than chemical sunscreens in the EWG sunscreen database. However, it is important that manufacturers use forms of minerals that are coated with inert chemicals to reduce photoactivity. If they don't, users could suffer skin damage. To date, no such problems have been reported.

The FDA should set guidelines and place restrictions on zinc and titanium in sunscreens to minimize the risks to sunscreen users and maximize these products' sun protection. Our detailed analysis of nanoparticles in sunscreens is available [here](#).

Inactive ingredients

The FDA must also take a close look at the so-called inactive ingredients in sunscreens. These typically make up 50 to 70 percent of a sunscreen product

One ingredient in particular is a cause for concern: methylisothiazolinone, a preservative. This year, EWG has found methylisothiazolinone is listed on the labels of 94 sunscreens including six marketed to children. Methylisothiazolinone is used alone or in mixtures with a related chemical preservative called methylchloroisothiazolinone

The American Contact Dermatitis Society named methylisothiazolinone its “allergen of the year” in 2013.

Laboratory studies indicate that methylisothiazolinone is a skin sensitizer or allergen. Over the past several years, physicians have reported serious cases of serious skin allergies, most notably in children exposed to methylisothiazolinone, from baby wipes and other products meant to be left on the skin (Chang 2014). In a study published in 2014, researchers at Baylor University surveyed the ingredients in 152 children’s body care products labeled “hypoallergenic” and found methylisothiazolinone in 30 of them (Schlichte 2014).

In 2015, researchers from 15 clinics in the U.S. and Canada reported an increase in MI allergy in patients. The researchers concluded that they had documented “the beginning of the epidemic of sensitivity to methylisothiazolinones in North America” (Warshaw 2015).

That MI has become relatively common in sunscreen is a matter of concern because sunscreen users are likely to be exposed to significant concentrations of this chemical. The products that contain MI are intended to be applied to large portions of the body and to be reapplied often.

In March 2015, the European Scientific Committee on Consumer Safety concluded that no concentration of MI could be considered safe in leave-on cosmetic products (EU SCCS 2014).

MI is allowed in U.S. products. Last September, the Cosmetics Ingredient Review expert panel – an independent, cosmetics-industry-funded body the American cosmetics industry pays to advise it on the safety of cosmetics ingredients – told the industry that MI was safe for use in body care products as long as manufacturers come up with formulations that wouldn’t cause allergic reactions (CIR 2014). Since FDA has little legal power to regulate cosmetics ingredient safety, it has authorized the cosmetics industry to police itself through this CIR panel. The body’s recommendations are not legally binding on any company. In several decades, it has declared only 11 ingredients or chemical groups to be unsafe (CIR 2012).

EWG recommends that the FDA launch a more thorough investigation of the safety of all ingredients currently in sunscreens to ensure that none of them damage skin or cause other toxic effects in consumers.

Mahalo nui loa for protecting our precious Reefs and life in Maui County!

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