

“The Rose Sheet”

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Overreaching Microbeads Legislation Would Be Disservice – TerraVerdae

By Ryan Nelson / [Email the Author](#) Posted: **June 11 2015 3:15 PM**

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Executive Summary

It would be "truly unfortunate" if sustainable, biodegradable alternatives to conventional plastic microbeads were banned as a result of overreaching legislation, says TerraVerdae BioWorks, which recently launched a line of PHA microspheres for use in personal-care products. Restricting manufacturers' options to traditional natural exfoliants could be a consumer health risk in its own right, the firm's CEO suggests.

Proposed state legislation aimed at imposing a blanket ban on plastic microbeads would be a disservice to industry, severely limiting replacement options, and could even put consumers at risk, according to green materials firm and PHA microsphere supplier **TerraVerdae BioWorks**.

"While we applaud the activist community and their efforts to ban polyethylene microbeads, and while we agree completely with their efforts to ensure that the problem with microbeads does not continue by replacing polyethylene microbeads with 'green-washed' alternatives, it would be truly unfortunate if a truly sustainable substitute such as PHA is blocked by legislation that is overreaching," the company's founder and CEO William Bardosh said in a June 9 email to "The Rose Sheet."

Campaigns such as Beat the Microbead, supported by 69 NGOs from 33 countries, have helped drive legislation in the U.S., including at the federal level, aimed at phasing out use of plastic microbeads in personal-care products that can pose environmental risks when washed down consumers' drains ("[Industry Weighs In On Federal Microbead Bill At Committee Hearing](#)" — "*The Rose Sheet*," May 7, 2015).

For decades, industry has been formulating scrubs, toothpastes and other cosmetic products with microbeads primarily made of polyethylene, but also of polypropylene, polyethylene terephthalate, polymethyl methacrylate and nylon, according to Beat the Microbead.

A number of states already have passed bills to eliminate such ingredients – collectively characterized as "non-biodegradable, synthetic plastic microbeads" – from products on their store shelves and from the waterways where they end up.

But some environmental advocates are critical of what they perceive as a "biodegradable loophole" in those bills that would enable continued use of plastic microbeads that may degrade slightly in aquatic settings but still accumulate as microplastic debris harmful to wildlife.

California has responded to such concerns with a bill that would outlaw plastic microbeads of any form, which would limit manufacturers' replacement options and be a blow to suppliers of emerging bioplastic materials shown to degrade rapidly in marine water ("[Plastic Is Plastic' Under California's Pending Microbeads Bill](#)" — *"The Rose Sheet,"* Jun. 4, 2015).

It also could increase use of potentially sensitizing natural materials, according to Bardosh.

California Could Shift Risks From Environment To Public

Under the California bill, as well as laws already enacted around the U.S., personal-care manufacturers are free to reformulate microbead-containing products with natural abrasive materials in use before plastic microbeads became widely available, such as salt crystals, ground pumice, seeds or nut shells.

Traditional natural solutions from Milford, Conn.-based **Composition Materials Co., Inc.**, for example, include walnut, apricot and all-white palm nut grit for use in exfoliating cosmetic products.

Such options may seem like the surest bet for personal-care manufacturers given uncertainty in the current regulatory climate.

However, "forcing the market to adopt certain natural alternatives may end up causing a bigger problem in the mid [to] long term," Bardosh suggested.

"[What] lawmakers and the lobby community are not thinking through is the natural toxicity of certain natural alternatives, such as crushed nut shells, and the effects this may have on the consumer. The incidence of sensitivity to nuts is a significant health issue, and it may turn out that forcing natural alternatives [to plastic microbeads] may just shift the problem," he said.

New York reportedly is hung up on the microbead biodegradability issue as its legislative

session nears a June 17 close. Legislation that passed the state Assembly would ban plastic microbeads outright, but the bill reportedly has met with opposition in the Senate due to the potential implications of its broad language.

According to Bardosh, there is good reason for getting the scope of such legislation right, as limiting manufacturers' replacement options too severely could be bad for consumers as well as business.

"If they are going to ban a category of natural products (PHAs) that are biocompatible, and are actually produced inside living cells, but promote natural alternatives that may be linked to a rising public health issue (nut allergies), then the law will drive a public health issue from an environmental issue," he asserted.

Not All Alternatives Created Equal

TerraVerdae launched a line of microbeads derived from polyhydroxyalkanoates (PHAs) June 3.

The ingredients rapidly degrade in marine environments and, according to the firm, are as natural as walnut shells, representing a promising alternative for personal-care manufacturers working to reformulate away from synthetic plastic microbeads.

Bardosh said he appreciates concerns raised by the activist community, including the suggestion that biodegradable loopholes in legislation could enable manufacturers to blend polyethylene with "an additive that would cause the plastic to break down more quickly," if not to the extent sought by environmental advocates.

"While we are unaware of anybody who has taken this approach for microbead replacement, or any studies that examine what would happen to such a material in the marine environment, based on what is known about how these plastics degrade on land there is no question that this sort of product would not even come close to meeting standards such as ASTM D7081," the exec said.

The referenced ASTM standard, which addresses non-floating biodegradable plastics in the marine environment, has been withdrawn for review, but reportedly will be reissued soon, according to Bardosh.

He said polylactic acid is another material that the NGO community views as unacceptable for replacing polyethylene and related microbeads, and Bardosh agrees.

While PLA is derived from renewable sources, such as corn starch, and meets ASTM standards for biodegradability on land – particularly in specialized industrial composting facilities when subjected to extremely high temperatures – they do not degrade readily in marine water.

He noted that in a 2012 study conducted by California's Department of Toxic Substances Control and Department of Resources, Recycling and Recovery, PHA plastic broke down at a rate similar to cellulose in marine water, but PLA "barely show[ed] evidence of biodegradation under these sorts of conditions" ("[Biodegradable Debate Could Affect PHAs' Viability As Microbead Stand-Ins](#)" — *"The Rose Sheet,"* Jun. 11, 2015).

TerraVerdae Microspheres 'Disappear' In 2-4 Weeks

Bardosh maintained that TerraVerdae's PHA microspheres "are totally different from either of these so-called potential alternatives that the activist community rightly opposes."

The exec described PHA as "a completely natural material that is produced by many single-celled organisms, including a number of different organisms that are naturally found in oceans and lakes."

The process is akin to brewing beer, he said.

PHA requires no additives to make it biodegradable, "because in its natural state it biodegrades very, very quickly," he added.

In the California DTSC study, 38% and 45% of two PHA samples biodegraded into carbon dioxide after six months in marine water.

According to Bardosh, that timeline is longer than what would be expected for a PHA microsphere because the study used PHA films. PHA microspheres "have been shown to disappear within two to four weeks," he said, "and they break down into compounds that are completely non-toxic to fish and plants in the water."

He added that when compared with other natural ingredients, TerraVerdae's PHA microspheres pose significant advantages for product formulators.

"In contrast to some other natural options such as peach pits or walnut shells ... our microspheres are naturally produced in a spherical shape, which produces a silky texture and spreadability for creams and lotions," he noted.

The exec concluded: "The manufacturers of personal-care products that we have spoken to so far are very excited by the possibilities offered by TerraVerdae's microspheres."

TerraVerdae is headquartered in Canada, with operations in the U.S. and U.K.