**The Right Chemistry: Silly lawsuits leave a sour taste**

Boosters of 'natural' ingredients have some odd ideas about toxicity and synthetically produced equivalents.

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Talk about a frivolous lawsuit! A legal firm in Chicago recently launched a class action suit against the Natural Beverage Corporation, producer of the popular LaCroix brand of “naturally flavoured” sparkling waters. Curiously, the company wants the name pronounced as “LaCroy” to “rhyme with ‘enjoy.’” The suit alleges that promoting the beverage as “all natural” is misleading because it contains synthetic ingredients. Specifically mentioned are limonene, linalyl propionate and linalool. The suit makes a point of the fact that linalool is used as a cockroach insecticide, with the inference that it is therefore unfit for human consumption.

There are several layers of nonsense here. First, the tired old tome that if a substance is used in some non-food application, then it isn’t fit to be eaten. Are we to avoid chicken soup because the collagen extracted from bones can be made into glue? Avoid milk because the lactic acid it contains can be converted into biodegradable polyester? Shun vinegar because it can be used as a weed-killer? Of course not! True, linalool may kill cockroaches, but you can be assured that if you douse them with a LaCroix beverage, they will continue to frolic. Dosage matters!

What about attacking the beverages because they contain synthetic ingredients? I’m getting tired of repeating this ad nauseam, but whether a substance is natural or not has no bearing on its toxicity. The most toxic substance know is botulin, a protein produced by the very natural Clostridium botulinum bacterium. Linalool occurs naturally in numerous plants, including basil, coriander and mint. It can be extracted from these sources and used in food or beverages as a flavour component. According to information gleaned from the LaCroix website, this is just how the company sources its ingredients.

However, linalool can also be synthesized in the lab through various routes. For example, camphene, a compound that occurs in pine trees, can be converted into linalool via a sequence of chemical reactions. This is why linalool can be found on the U.S. Food and Drug Administration’s list of “synthetic flavourings.” But whether extracted from a plant or made in the lab, linalool is linalool. Same molecular structure, same properties. Nevertheless, the FDA has decreed that if a compound is produced synthetically, it has to be categorized as such, essentially catering to the whims of people who believe that “synthetic” is synonymous with “risky.”

Recently, the FDA went further down the rabbit hole by outright banning seven artificial flavours, namely pyridine, styrene, benzophenone, ethyl acrylate, pulegone, myrcene and methyl eugenol. Ostensibly, this was done for safety reasons based upon studies that had suggested some degree of risk associated with these chemicals. Those studies, though, either used large doses fed to animals, or referred to occupational exposure in workers exposed to amounts far in excess of what can be consumed in food either as a natural component or as an additive. Furthermore, each of these compounds occurs naturally! Pyridine is found in fried chicken, styrene in coffee, benzophenone in muscat grapes, ethyl acrylate in pineapples, pulegone in catnip, myrcene in hops and methyl eugenol in mangoes. Producers are free to use these compounds if extracted from the plant sources, but cannot use the synthetic version even though there is no chemical difference between the two. Why then make this distinction? Makes no sense.

While I think the lawsuit against LaCroix is ill-conceived, the company is deserving of some criticism for jumping on the “natural” bandwagon with the implication that “natural” means healthier. That may be somewhat mischievous advertising, but the lawsuit alleging that the public has been misled by the inappropriate use of the term “natural” is pure bunk.

There have been other lawsuits that are also worthy of disdain. In 2012 a class action suit against “Jamba Juice” in California claimed the “all natural” label on its smoothie kit was deceitful because the product contained citric acid. Whoaaa! Isn’t citric acid found in citrus fruits? So, isn’t it natural? Here’s the thing. Extracting citric acid from fruit is not economical. That, though, was the only way to obtain it until around 1920 when James Currie, an American chemist, discovered that certain strains of the mould Aspergillus niger were efficient citric acid producers. When fed sucrose or glucose, they dutifully cranked out citric acid. This technology was commercialized by the pharmaceutical giant Pfizer and has been used since to produce citric acid in an economical fashion.

According to the lawsuit, this method of citric acid production is not natural. That argument is hard to follow since moulds are certainly natural. In any case, the suit holds no water since there is no difference between citric acid produced by a mould, or by a lemon, or indeed by chemical synthesis. By whatever method it is obtained, citric acid leaves a sour taste in the mouth, just like these frivolous lawsuits.

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