Taste Perversion with Artichokes and Miracle Berries

Our taste buds are chemical detectors full of receptor cells waiting for the right chemical to come along and trigger them, like locks waiting for the right key to open them. But what if something were able to pick those locks?

Taste perversion occurs when a compound temporarily changes the way your tongue tastes other foods. Artichokes, for example, have two compounds, cynarin and chlorogenic acid, that cause foods eaten shortly afterward to taste slightly sweeter. Try steaming a fresh artichoke and eating the leaves without sauce, and then sipping some water; you should notice the water tasting mildly sweet. (This is also why pairing wine with artichoke is difficult!)

There's another compound in food, miraculin, that's an even better example of taste perversion. Miraculin binds to sweet receptors and activates them when acidic compounds wander along (the effect starts in solutions with a pH of 6.5 and increases down to a pH of 4.8), thus causing foods that would normally taste sour (due to the acidic pH) to taste sweet.

The miracle fruit plant produces a small red berry, aptly named the miracle berry, that contains a large concentration of miraculin. Chewing the berry flesh for a few minutes exposes you to enough miraculin that subsequently chomping down on a lemon will yield the taste of lemonade.

The phenomenon was first observed in 1725 in Western Africa, where locals were using it to "sweeten" their experience of sour beer. In 1852, the "miraculous" berry made its first appearance in the medical journals; more modern work has focused on potential use for diabetics. The last few decades have seen several attempts to use miraculin as a food additive, but food additives fall under different regulatory requirements (see page 376) than "plain old fruits" and miraculin has yet to clear those hurdles.

Fortunately, you can order the berries online; unfortunately, they're perishable. Dried tablets derived from the berry are also available and easier to experiment with. (For sources, see http://cookingforgeeks.com/book/miraculin/.) Once you have the berries or tablets in hand, invite a bunch of your friends over, munch on the miraculin, and serve up some sour foods. Plain yogurt works well, as do slices of grapefruit, lemon, and lime.

This "flavor tripping" experience isn't limited to sour foods. I've had one friend swear that the roast beef sandwich he was eating was made with a honey-glazed variety, while other friends tried Worcestershire sauce and compared it to sashimi. Try foods such as salsas, tomatoes, apple cider vinegar, radishes, parsley, stout beers, hot sauces, and cheeses. Keep in mind that miraculin makes sour foods *taste* sweet but doesn't actually alter their pH, so don't pig out on lemons, lest you give yourself a bad case of heartburn.

Miraculin, while fun to experience, ends up not being practical as a broad sugar substitute in its usual form: it'll stick around on your tongue for up to an hour, meaning other foods eaten after it will also be affected. There is some work being done to try to add proteins similar to miraculin into grain crops—imagine cereal grains that taste sweet but don't have extra sugar (see US Patent #5,326,580—*mmm, noncarbohydrate sweeteners*), but who knows where that'll go and if consumers will accept it.