HOME BREW HEROES

MICHAEL WHITEHEAD EXPLORES THE PLACE WHERE FLORAL BIOLOGY MEETS BREWING

Wild yeasts are everywhere. Some of them will even make beer for you.

I spend a lot of time thinking about flowers and beer. Thinking about flowers is a big part of my job as a research botanist, and beer – that's my current obsession. I recently found myself dwelling upon what they have in common: that most marvellous microbe, yeast.

Yeast is the critical fungus that converts sugar solutions into beer and wine. While we have harnessed a collection of domesticated strains for beverage production, a startling diversity of untamed wild yeasts exists everywhere. They are in the air, in the soil, on plants and animals, on your skin, in your hair. Wild yeasts are particularly abundant in flowers, because most flowers provide a source of freely available sugar by way of nectar. Given this obvious overlap, a natural and irresistible work-hobby collaboration sprang to mind. Could I capture wild yeast from the flowers of the plants I study, and convince it to make beer?

Now I am not the first to try this. Wild yeasts and other microbes have a long history of use in creating beer. Belgian brewers have perhaps the most celebrated traditions in this area – their Lambic beers are created by leaving fresh, unfermented beer (wort) to be inoculated by whatever yeast and bacteria the atmosphere may gift them.

Wild fermentation is a growing global trend, with numerous craft breweries in Australia (such as La Sirene, Wildflower, Van Dieman), and overseas (Jester King, Jolly Pumpkin, Trinity) creating artisanal ales fermented with the help of indigenous and wild microbes.

While the diversity of wild yeasts might be wide, not all are useful for producing beer. Many yeasts die in the presence of moderate alcohol, many cannot ferment all but the simplest of sugars, many produce unpalatable byproducts during fermentation. So where are we most likely to find the best, most useful wild yeasts for beer production? This is where floral biology meets brewing.

'SMELLS LIKE FLOWERS, TASTES LIKE A FRUIT SALAD'

Nectars are produced by flowers as rewards for the service of pollinating animals. Because some flowers specialise in being pollinated by particular kinds of animals, they evolve specific traits that cater to the biology of those animals. For example, moth-pollinated flowers are white so that they are visible in low light, bee-pollinated flowers evolve UV-reflective runway markers to guide accurate landing and foraging, flowers pollinated by carrion-fly smell like rotting flesh. In the same fashion, nectar is shaped by evolution to cater to the specific creatures most likely to consume it.

One way nectar becomes tailored to its consumer is by its sugar concentration. At the concentrated end, nectar is very viscous and sticky and difficult to suck up through long or thin mouth parts. These nectars cater to insects with short tongues like bees, flies, wasps and beetles. On the other end you have dilute nectars, perfect for birds to suck out of tubular flowers. By a happy and useful coincidence, the sugar concentrations of bird-adapted nectars are in the same range as unfermented wort.

Recognising this was what led me to try hunting for yeasts in the flowers of one of my study species – the bird-pollinated monkey mint-bush (*Prostanthera walteri*). The monkey mint-bush (pictured bottom left) is a rare shrub that grows on a few remote, misty granite peaks in East Gippsland, Victoria. I have been getting to know the plant for a couple of years in a study to understand how bird pollination might differ from insect pollination. And so on a field trip to collect data, I collected some fresh flowers and take back home for bioprospecting. I made up a test wort: a low concentration malt-extract solution to mimic the conditions of beer, then syringed out the nectar from several flowers and spiked the test jars with whatever might be living in the nectar.

And it worked. Most of the test jars began fermentation, and sniffing the results revealed various aromas of bright apple juice, white wine, earth and smoke. After months of re-culturing these initial samples, and whittling down the field as some sputtered out along the way, I now have a yeast culture that ferments with the performance of a domestic brewer's yeast, and volunteers its own fascinating and unique blend of aroma and flavour.

So how does it taste? I recently took a pilot batch to a meeting of the Merri Mashers homebrew club, and the responses were overwhelmingly positive. The beer was a simple pale, gently hopped for neutral and supporting bitterness – a blank canvas for the yeast to play upon. On the nose, esters and phenols contributed a largely floral aroma, with some notes of classic Belgian bubblegum and banana, while the palate is fruity, faintly tart and finishes clean and dry. My uncle sent his review via text: "Smells like flowers, tastes like a fruit salad."

This Australian indigenous yeast, after dwelling in remote forests for who knows how many thousands of years, had just created its first beer: a lively and refreshing table Saison.

Read more about Michael's adventures at michaelwhitehead.net