Best wine-making yeast has clever trick to ensure survival

August 22 2014

Wine-making yeast produces nice smells to attract the highest number of fruit flies which in turn helps it disperse over the widest area of a vineyard, according to research from the University of Auckland.

Fruit flies are attracted to, and lay their eggs on, fermenting fruit where yeast develops. A new study by evolutionary ecologist and School of Biological Sciences senior lecturer Mat Goddard shows yeasts are actively producing smells to lure the greatest number of flies.

"Yeasts can't move by themselves, so they have evolved to attract and then hitch a ride on insects," Dr Goddard says. "This dispersal contributes to genetic diversity and reproductive ability and in turn is beneficial for flies because it provides a very fertile environment in which to lay eggs."

Yeast plays a vital role in wine-making with the best-smelling yeast – according to human noses – tending to produce the best wine. But until now, scientists puzzled over why yeasts produced attractive smells – or chemical "lures" – because to do so costs the organism energy.

"This study shows the key to success for the yeast is to have the most attractive smell to lure fruit flies so that yeast dispersal and egg fertility are both enhanced, leading to reproductive success for both partners," Dr Goddard says.

Laboratory tests showed fruit flies preferred the same yeast we do: S.

cerevisiae, used in winemaking, baking and brewing since ancient times. Flies were released into a glass tube "maze" where they could choose between different types of yeast. Tests showed more attractive-smelling yeast attracted the greatest number of flies.

That result was replicated in the field where tests on grapevines showed more attractive yeasts were also the most widely-dispersed, attracting the largest number of flies – demonstrating that yeast's trick works in the real world.

"The proportion of flies carrying S. cerevisiae was approximately one hundred times greater than expected if flies randomly recruited members of the fungal community," Dr Goddard says. "So yeasts producing more attractive olfactory cues are more likely to be associated with flies and thus be moved around."

The research has implications for understanding how organisms interact with one another for mutual benefit and could further our understanding of how agricultural and horticultural processes are affected by interaction between organisms.

"If you think about the kiwifruit disease PSA, research to improve our understanding of how microbes are moved around in agricultural settings is vital," Dr Goddard says.

Provided by University of Auckland

Citation: Best wine-making yeast has clever trick to ensure survival (2014, August 22) retrieved 17 July 2024 from https://phys.org/news/2014-08-wine-making-yeast-clever-survival.html