Wild yeasts from Patagonia could yield new flavors of lagers: Genetic mutations enhance alcohol production

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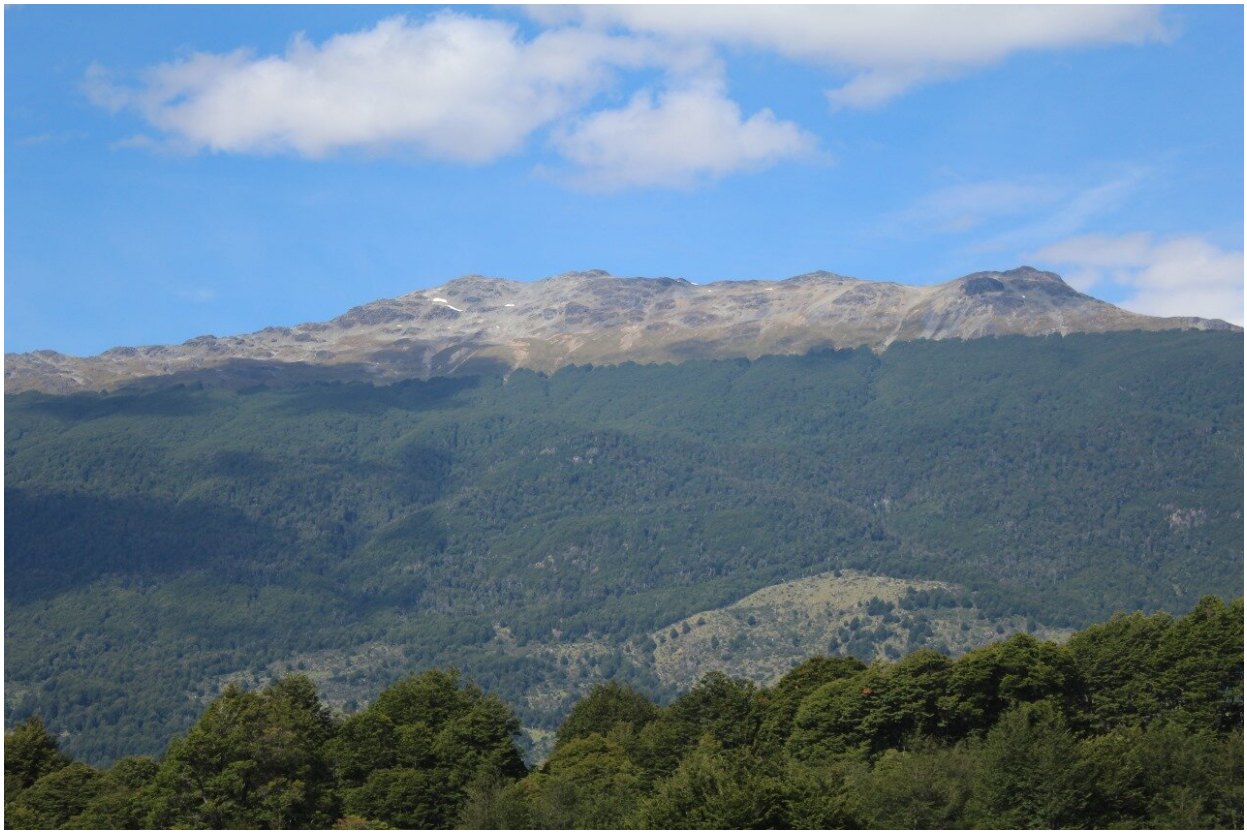

Yeast from the Patagonia Mountains. Credit: Francisco Cubillos, (CC-BY 4.0, creativecommons.org/licenses/by/4.0/)

New strains of yeast for brewing lager beers, created by hybridizing wild

strains of yeast from Patagonia with brewer's yeast, can yield novel flavors and aromas, reports a new study by Jennifer Molinet and Francisco Cubillos of the Universidad de Santiago de Chile, published June 20 in the journal *PLOS Genetics*.

Lager beers, which are brewed at low temperatures, dominate the global market, accounting for over 90% of commercial beer varieties. However, the flavors and aromas found in lagers are limited by a lack of genetic diversity in the yeast used to brew them. There are only two types of this yeast used worldwide. Both resulted from the hybridization of common brewer's yeast (Saccharomyces cerevisiae) and a wild, cold-tolerant strain (Saccharomyces eubayanus).

In the new study, researchers created new types of lager yeasts in the lab by hybridizing brewer's yeast with natural isolates of wild S. eubayanus from Patagonia at low temperatures. They grew the resulting hybrids in ways to encourage their fermentation qualities.

Further analysis showed that the strains had mutations in genes that enhanced their ability to metabolize certain types of sugars, which resulted in unique aroma profiles and high alcohol production.

The researchers said the success of the new strains could be traced back, in part, to the fact that they inherited their mitochondria—the organelle that powers the cell—from the cold-tolerant wild strains, not the brewer's yeast.

Overall, the new findings show that the genetic diversity found in wild yeast strains can be tapped to develop new lager yeasts that are suitable for industrial production. The study's authors encourage others to explore wild yeasts as a way to expand the range of currently available beer styles.

The authors add, "Our study takes advantage of the great genetic diversity of wild Patagonian yeast to create novel hybrid strains of lager beer with enhanced fermentation capacity and unique aroma profiles. Through interspecific hybridization, experimental evolution, and the identification of fermentation-associated genetic changes, we expand the repertoire of industrial yeast available for lager brewing."

More information: Wild Patagonian yeast improve the evolutionary potential of novel interspecific hybrid strains for lager brewing, *PLoS Genetics* (2024). DOI: 10.1371/journal.pgen.1011154

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