

Missouri grapes hold key to improving world grape production

December 6 2010

In a few years, a sip of Cabernet Sauvignon, Merlot or Pinot Noir may include a taste of the "Show-Me" State. The state grape of Missouri – the Norton variety grown at many vineyards around the state – is resistant to powdery mildew, a fungal pathogen that affects winemaking grapes around the world. Now, researchers at the University of Missouri are working to identify valuable genes from the Norton grape for eventual transfer into other grapes to make them less susceptible to mildew, decrease fungicide use and increase world-wide grape production.

Walter Gassmann, a researcher in the Bond Life Sciences Center and associate professor of plant sciences in the College of Agriculture, Food and Natural Resources.

"The hot, humid environment of Missouri is perfect for the growth of fungal pathogens, such as mildew, yet Norton resists the fungus," said Walter Gassmann, a researcher in the Bond Life Sciences Center and associate professor of plant sciences in the College of Agriculture, Food and Natural Resources. "Understanding what makes Norton resistant to fungus, and European varieties, such as Cabernet Sauvignon, susceptible to fungus, can help us improve [grape](#) production around the world."

Researchers say the difference between the Norton grape and other varieties is that the Norton grape builds more of a certain protein that is essential to fight fungal pathogens than other grape varieties, which build too little of the protein too late to successfully battle the fungus. Earlier research has discovered the gene that contains the blueprint for this

protein present in both Norton grapes and other varieties that cannot resist the mildew. Gassmann is conducting research on the fast-growing Arabidopsis plant, which features a gene similar to the targeted grape gene. His team added the grapevine gene to an Arabidopsis plant that was lacking its own gene. Adding the grapevine gene led to plants that resisted the mildew, confirming that the grapevine gene is responsible for orchestrating plant defenses against mildew. The next step in this research is to figure out what in the genetic instructions is different in Norton and other grapevine varieties that leads to ! the observed difference in protein levels in resistant Norton and susceptible grapevines.

Most wineries must use sulfur to combat the fungus, and Gassmann says that it will be years until fungus-resistant grape varieties can be put into commercial production. He says that research is being conducted, including sequencing the Norton genome, but it will still be technically difficult to make a transgenic grape plant and even more difficult to find consumers accepting of the idea of consuming genetically modified grapes, although he hopes that these attitudes will eventually change.

"Until then, there really is no way to eliminate fungicide use, for economic reasons or to make organic wine, unless you breed the mildew resistant trait into other varieties," Gassmann said. "Many people forget that before Prohibition Missouri was the second largest wine-producing state in the country after New York. We see this work as eventually providing an economic impact through the high-value agriculture and tourism that wineries can provide."

Provided by University of Missouri-Columbia

Citation: Missouri grapes hold key to improving world grape production (2010, December 6) retrieved 25 April 2024 from

<https://phys.org/news/2010-12-missouri-grapes-key-world-grape.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.