

Finding the white wine difference

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CSIRO Plant Industry's Dr Mandy Walker.

A CSIRO research team has pinpointed the genetic difference between red (or black) and white grapes – a discovery which could lead to the production of new varieties of grapes and ultimately new wines.

While white wine has ancient origins – residue of white wine was found in the tomb of the Egyptian king, Tutankhamun – researchers know that the ancestors of modern grapes were all red.

What they did not know was how the change from red to white berries came about.

CSIRO researchers, working in the Cooperative Research Centre for Viticulture, have found the genetic mutations that occurred thousands of years ago to give us white grapes.

"Researchers in Japan have shown that one particular gene, which controls production of anthocyanin, the red pigment in grape skins, was mutated in white varieties," says team leader Dr Mandy Walker from CSIRO Plant Industry's Adelaide laboratory.

"By closely studying part of a red grapevine chromosome carrying the genes for red colour and comparing it to a white variety chromosome, we found a second similar gene involved in the grape colour pathway that was also different in white varieties.

"Our research suggests that extremely rare and independent mutations in two genes produced a single white grapevine that was the parent of almost all of the world's white grape varieties. If only one gene had been mutated, most grapes would still be red and we would not have the more than 3000 white grape cultivars available today."

A complete understanding of the two genes that control grape colour will also be useful in a practical sense.

"We have been able to produce a marker that can be used in future vine breeding to predict berry colour in seedlings, without waiting two to three years for them to grow into mature vines and produce fruit. The marker gives us a highly accurate way of selecting for berry colour traits when breeding grapevines," Dr Walker says.

"The discovery also has great potential for producing interesting and exciting new varieties with novel colours in the future, through genetic modification. One of the areas of future study is to determine if these two genes control the amount of red pigment made, so the colour of grapes can be improved."

Source: CSIRO

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