

Mysterious genes that make citrus fruit sour could lead to sweeter lemons, limes and oranges

Lemons are known for their face-puckering sour taste. Now scientists have uncovered the mysterious genes behind this acidity, new findings that could help farmers breed sweeter oranges, lemons, limes, grapefruit and other citrus fruit.

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The sour taste of a fruit depends on compartments within plant cells known as vacuoles....In most plant species, these vacuoles are only mildly acidic compared to the rest of the cell's innards. It was long a mystery how citrus vacuoles became extremely acidic.

The new discovery regarding citrus began with distant relatives of citrus plants, the petunias. Husband-and-wife team Ronald Koes and Francesca Quattrocchio, molecular geneticists at the University of Amsterdam....found mutant versions of genes known as PH1 and PH5 could alter the color of the flowers by hyperacidifying their petals....

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The researchers investigated CitPH1 and CitPH5, the citrus versions of these petunia genes. They found these genes were highly active in sour lemons, oranges, pomelos and rangpur limes, but much less active in sweet-tasting "acidless" varieties of citrus, such as Lima oranges and Millsweet limettas, due to a variety of hindering mutations.

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By analyzing the DNA of young saplings, breeders may one day predict the sweetness or sourness of their fruit "many years before the trees set fruit that one could examine for acidity or taste in the conventional way," Koes explained.

Read full, original article: [The Genetic Reasons Why Citrus Fruits Taste So Sour](#)