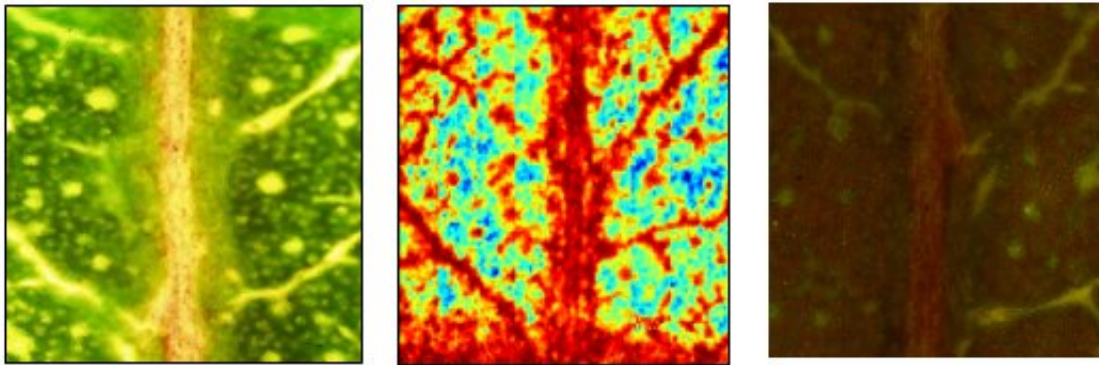


# Is that plant healthy? Using the waxy surface of leaves to monitor their health

January 14 2020

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Visible image of a eucalyptus leaf (left) infrared image (middle) and fluorescence image (right). Credit: *The Analyst*

We can't easily monitor the health of plants, by the time we see that they're sick it's usually too late to save that. That's an issue for your house plants, a field of wheat, orchards and plantations.

Karina Khambatta has developed a way to use the waxy surface of leaves to monitor their health.

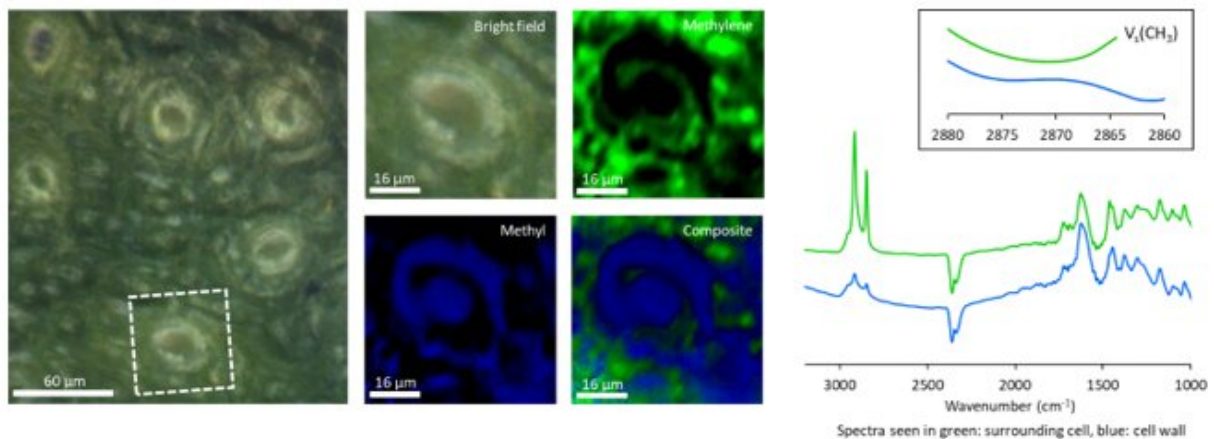
Currently the technique uses [infrared spectroscopy](#) to study changes seen throughout leaf senescence. Karina has had the opportunity to utilize the infrared microscopy lab located at the Australian Synchrotron to help correlate her infrared studies undertaken at Curtin University, but Karina believes it can be turned into a [handheld device](#) that could be used on-

farm, like reading a barcode.

"When you look at a leaf and hold it up towards the sun you can see a shiny surface this is the epicuticular wax we look at using infrared technology to look at [chemical changes](#) seen on the surface," she says.

Working at Curtin University under the supervision of Dr. Mark J. Hackett and Dr. Alan D. Payne, Karina developed a way of looking at the [chemical composition](#) on a micron scale as well as a macro scale to show us how changes in lipid composition are varied depending on the plants health.

Karina hopes to use this technology in order to help with early detection signs of plant stress to benefit the agriculture and mining departments.



Visible image of stomata (left), infrared stomata and overlay image (middle) and infrared spectra (right). Credit: *The Analyst*

**More information:** Jitraporn Vongsvivut et al. Synchrotron macro ATR-FTIR microspectroscopy for high-resolution chemical mapping of single cells, *The Analyst* (2019). [DOI: 10.1039/c8an01543k](https://doi.org/10.1039/c8an01543k)

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