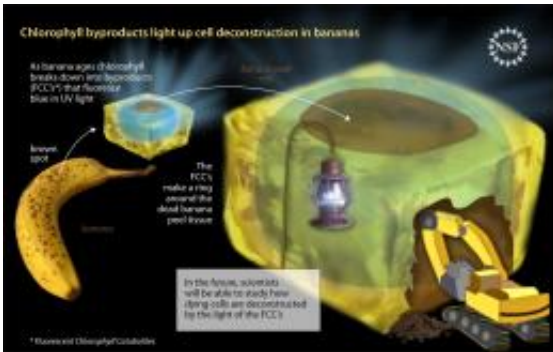


Bananas Gone Bad Glow Blue in UV-Light

September 9 2009



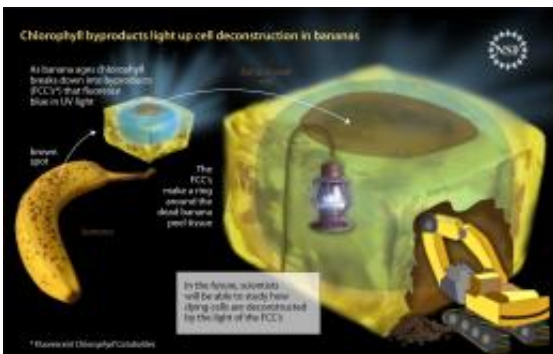
As bananas age, the chlorophyll in their peels breaks down into particles called FCCs (fluorescent chlorophyll catabolites). Since these glowing particles occur in close proximity to dying tissue, they hold promise of lighting the way in studying programmed cell death. Credit: Zina Deretsky, National Science Foundation

(PhysOrg.com) -- Nicholas Turro of Columbia University, Bernhard Krautler of the University of Innsbruck, Austria and their colleagues have found that, as chlorophyll ages and begins to disintegrate in banana peels it does not change color in the spectrum of visible light we see. Instead, it glows blue when observed under ultraviolet light.

While the light show adds a level of exoticism to the fruit in our eyes, and serves to attract a host of potential consumers in the eyes of insects and other animals who can appreciate the UV, the display is equally exciting to chemists. Because the glowing molecules occur in close proximity to dying tissue, they promise to be a literal beacon for the

further study of the way organisms cleanse themselves of dying cells, or programmed cell death. A well known and poorly understood condition in which programmed cell death malfunctions is cancer.

Turro and his colleagues describe how ordinary brown spots that form on bananas as they transition from ripe to rotten, each show a glowing blue halo in UV, caused by the congregation of chlorophyll breakdown byproducts. Their research appears in the *Proceedings of the National Academies of Science*.



Ripening bananas glow blue in UV light, developing halos around the dying tissue of the dark spots. On the right is a photograph of a banana using "white" daylight. On the right is a photo showing the banana in "black" light. Credit: Simone Moser, University of Innsbruck, Austria, et al.

Chlorophyll is the molecule that makes much of the life on earth possible. It is the integral ingredient that allows plants to take in a mixture of carbon dioxide, water and sunlight and convert it to oxygen, sugars and starches. These are the same sugars and starches we eat every time we fix a salad, and the same oxygen that we breathe.

Chlorophylls are ubiquitous on earth and their life processes are clearly visible even from outer space. As chlorophylls age and break down they

can do so in spectacular displays. The most familiar of these is the red and yellow of fall foliage. However, not every chlorophyll molecule that breaks down results in red or yellow.

"This work brings to fruition some of the remarkable principles of fundamental organic photochemistry harvested from more than four decades of Professor Turro's research at Columbia" says George Kenyon, program officer in the National Science Foundation's Chemistry Division.

Provided by NSF

Citation: Bananas Gone Bad Glow Blue in UV-Light (2009, September 9) retrieved 24 April 2024 from <https://phys.org/news/2009-09-bananas-bad-blue-uv-light.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.