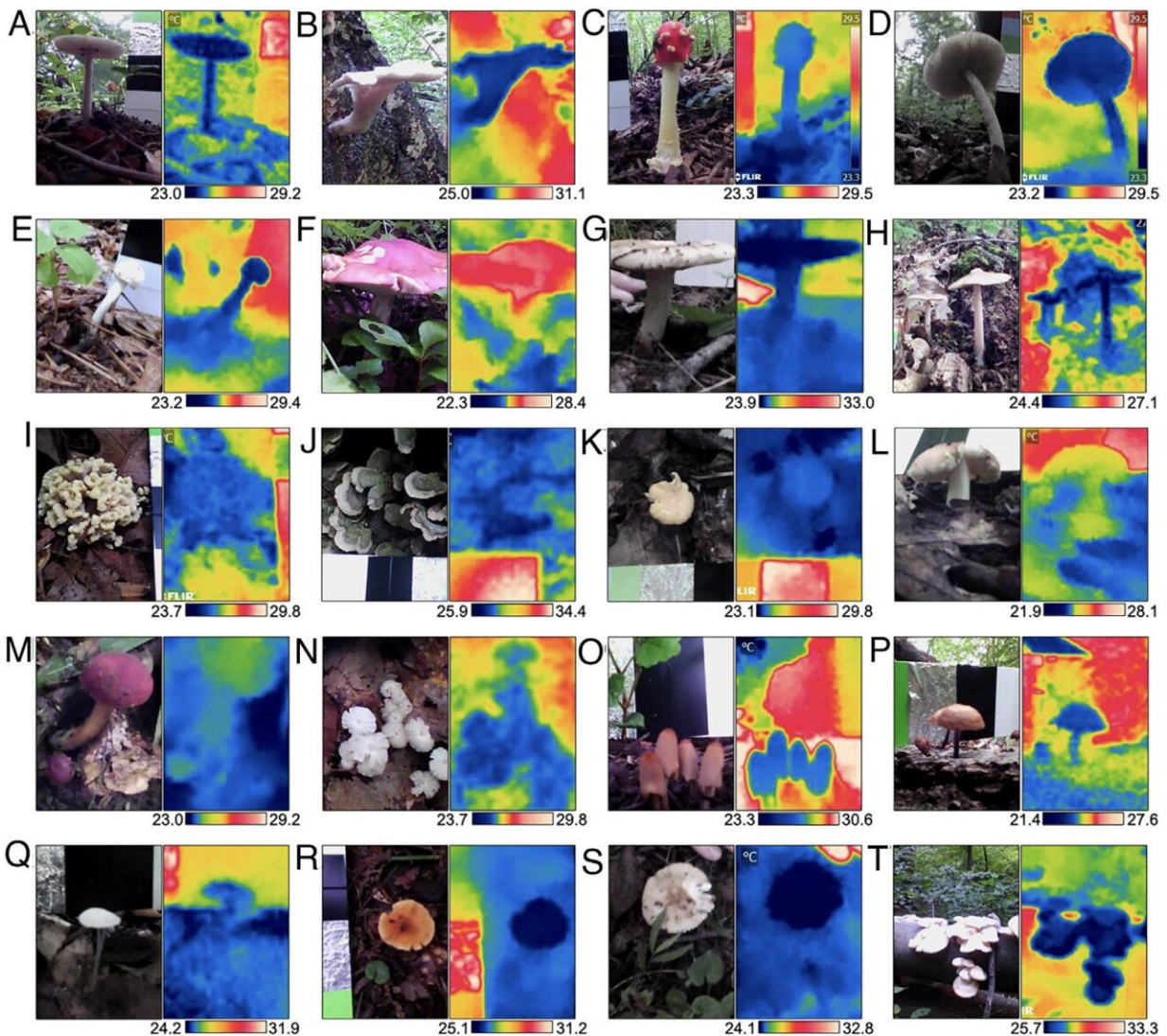


Mushrooms found to keep themselves cooler than their surroundings

May 8 2023, by Bob Yirka



Wild mushrooms are colder than the surrounding air. Visible images and infrared thermographs of 20 different wild mushrooms in their natural habitat while

attached to their natural substrate. Credit: *Proceedings of the National Academy of Sciences* (2023). DOI: 10.1073/pnas.2221996120

A team of molecular biologists at Johns Hopkins Bloomberg School of Public Health, working with a colleague from the University of Puerto Rico, has found that fungi keep themselves cooler than their surroundings. In their paper published in *Proceedings of the National Academy of Sciences*, the group describes how they discovered the cooling nature of fungi by accident and what they learned about them after testing.

Anecdotal evidence has suggested that mushrooms tend to be cooler than the environment around them. In this new effort, the researchers have found such reports to be accurate. In their paper, they describe how one of their team members was out testing a new thermal camera while isolating at home during the early days of the pandemic.

At some point, he ventured into the nearby woods and began capturing images of the plants growing there. As he did so, he noticed that the mushrooms growing on trees or among the vegetation, all showed up as images that were colder than their surroundings.

Intrigued by his finding, he and his colleagues decided to take a closer look. They imaged more mushrooms and tracked the temperature differences they found. In so doing, they found differences among the mushrooms ranging from 1.4 to 5.9°C colder than their surroundings—on average they were 2.9 ± 1.4 °C colder than the air surrounding them.

The group also found that it was not just mushrooms that were colder; they found it in all of the fungi they tested, such as Brewer's yeast. And

it persisted regardless of temperature—even just a few degrees above freezing.

In taking a closer look at several mushrooms, the researchers found that they cooled themselves using evaporation—they note their structure allowed for holding significant amounts of water and that their gill structure on the underside of their caps allowed for slow, even evaporation.

They were not able to ascertain why the [fungi](#) need to keep themselves cooler than their surroundings. They did however, find that it could be useful—they built themselves a cooler using Styrofoam and a small fan and after tossing in a handful of button [mushrooms](#), found it capable of keeping temperatures inside approximately 10°C cooler than [room temperature](#) for over half an hour.

More information: Radames J. B. Cordero et al, The hypothermic nature of fungi, *Proceedings of the National Academy of Sciences* (2023). [DOI: 10.1073/pnas.2221996120](https://doi.org/10.1073/pnas.2221996120)

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