

'Bee' thankful for the evolution of pollen

May 20 2020, by Eric Stann



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new flowers, according to the U.S. Forest Service. This process involves the transfer of pollen between plants by wind, water or insects called pollinators--including bumblebees. Credit: University of Missouri

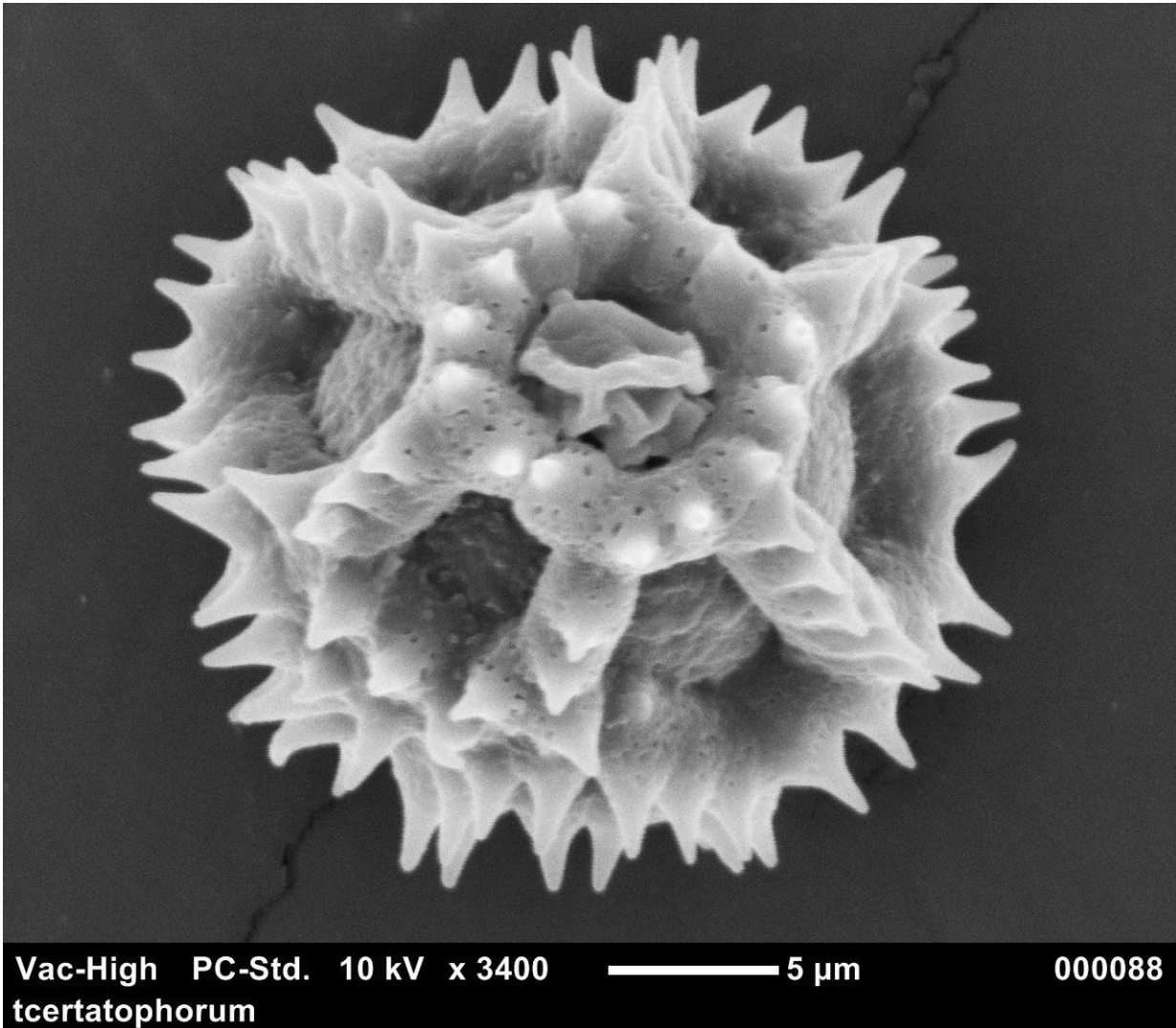
Have pollen. Must travel.

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In a new study, researchers at the University of Missouri discovered spiny pollen—from a native wild dandelion species in the southern Rocky Mountains—has evolved to attach to traveling bumblebees. Using a highly detailed electron scanning microscope, the research team could observe the microscopic surface of the spiny pollen, which otherwise looks like yellow dust to the naked eye.

"We observed this native pollen from the Rockies has optimally spaced spines that allow it to easily attach to a pollinator, such as a bumblebee," said Austin Lynn, a recent graduate with a doctorate in biology from the Division of Biological Sciences in the College of Arts and Science.

"When we compared that with the average lawn dandelion, which does not need pollen to reproduce, we saw that the pollen on the lawn dandelion has a shorter distance between these spines, making it harder to attach to traveling pollinators. Therefore, we show this wild dandelion pollen has evolved over many generations to create an optimal shape for attaching to pollinators."



A microscopic view of spiny pollen from a native wild dandelion species in the southern Rocky Mountains. Credit: University of Missouri

Previous studies have examined spiny pollen, but this is one of the first studies focusing on the pollen's spines. Lynn, the lead researcher on the study, said the researchers were also able to refute a competing idea that spiny pollen serves as a defensive mechanism to protect the pollen from being eaten.

"The spiny pollen actually acts like Velcro," Lynn said. "So, when bees are harvesting pollen for food, this pollen is sticking to their hair. It's a great example of mutualism where the plant needs the pollinator to reproduce and the pollinator needs the plant for its food."

The researchers plan to study how a bumblebee's hairs contribute to this process.

The study, "Sexual and natural selection of pollen morphology in *Taraxacum*," was published in the *American Journal of Botany*. Other authors on the study include Emelyn Piotter and Candace Galen at MU; and Ellie Harrison at Colorado State University. Funding was provided by the Mountain Area Land Trust and a Cherng Foundation Scholarship. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies.

More information: Austin Lynn et al, Sexual and natural selection on pollen morphology in *Taraxacum*, *American Journal of Botany* (2020). DOI: [10.1002/ajb2.1428](https://doi.org/10.1002/ajb2.1428)

Provided by University of Missouri

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