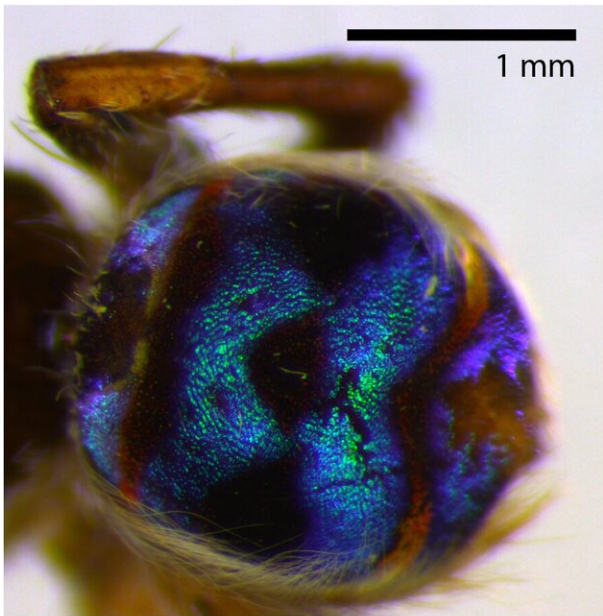


Bumps on peacock spider make dark spots super-dark

May 15 2019, by Bob Yirka



Maratus speciosus



Maratus karrie

image credits Mary K. Salcedo and Mara Laslo

Specimens. Credit: Mary K. Salcedo and Mara Laslo

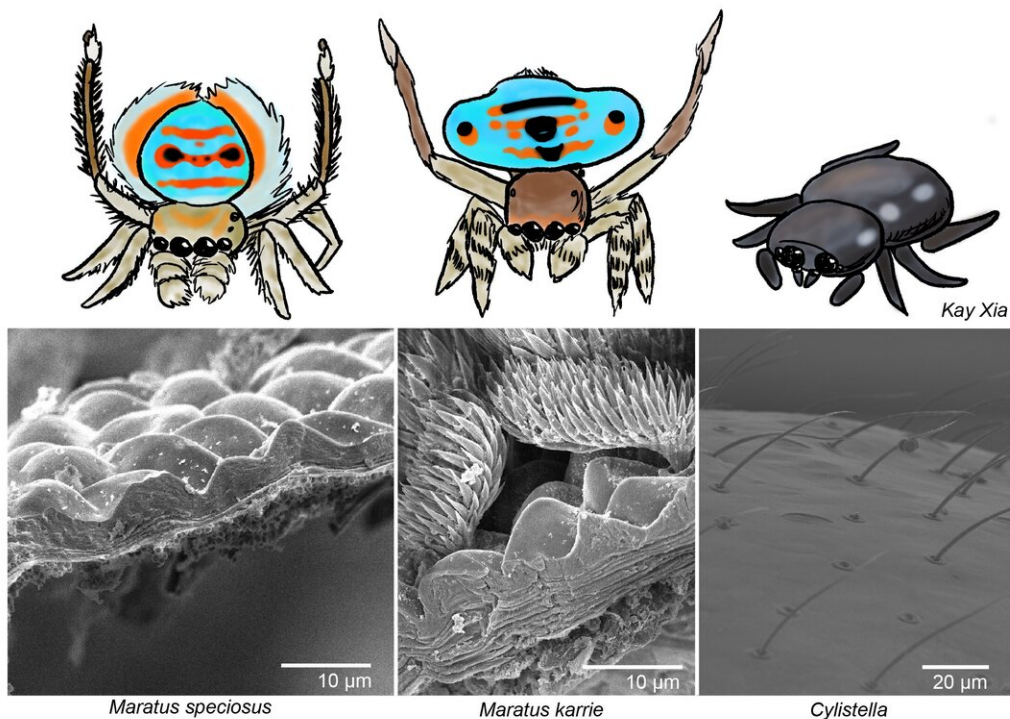
A team of researchers with members from Harvard University, the University of Bonn, the University of Denmark and Yale University has identified bumps on the abdomens of male peacock spiders that make their dark-colored patches look even darker. In their paper published in *Proceedings of the Royal Society B*, the group describes their study of the

bumps and what they learned about them.

The Maratus or peacock spider, native to Australia, is tiny (just 4 to 5 mm long) and is known for the brilliant coloring of the male [abdomen](#). The males use the colorful display as part of a dance they perform to woo females. The colorful abdomen attracted the attention of the researchers due to its intensity. Some descriptions say it appears to glow. Prior research had shown that the yellow and red hues were due to pigmentation, while the purples and blues were due to hair-like scales. To better understand how the tiny [spider](#) could create such a vibrant display, the researchers observed several specimens under an electron microscope.

The researchers report that part of the reason the colors were so striking on the abdomen was because the black, velvety parts next to them were incredibly black. When they took a very close look at the black parts, they observed bumps with a unique structure. When they reproduced the bumps in a simulation, they found that they manipulated light in two ways to reduce reflection. First, their curved surfaces made light bounce in random directions, directly reducing reflection. And second, they found that each of the bumps was a tiny microlens—each forced light that entered to take a longer path as it interacted and was ultimately absorbed by the black melanin pigment. Together, the features of the bumps reflected less than 0.5 percent of the light that struck them.

The researchers note that the spiders are not the only creatures that manipulate [light](#) to create exceptionally striking colors—prior research has shown that the rich colors displayed by birds of paradise, for example, are also due to tiny structures, this time in their feathers, making the black parts blacker.



Illustrations And SEMs. Credit: Kay Xia

More information: Dakota E. McCoy et al. Structurally assisted super black in colourful peacock spiders, *Proceedings of the Royal Society B: Biological Sciences* (2019). [DOI: 10.1098/rspb.2019.0589](https://doi.org/10.1098/rspb.2019.0589)

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