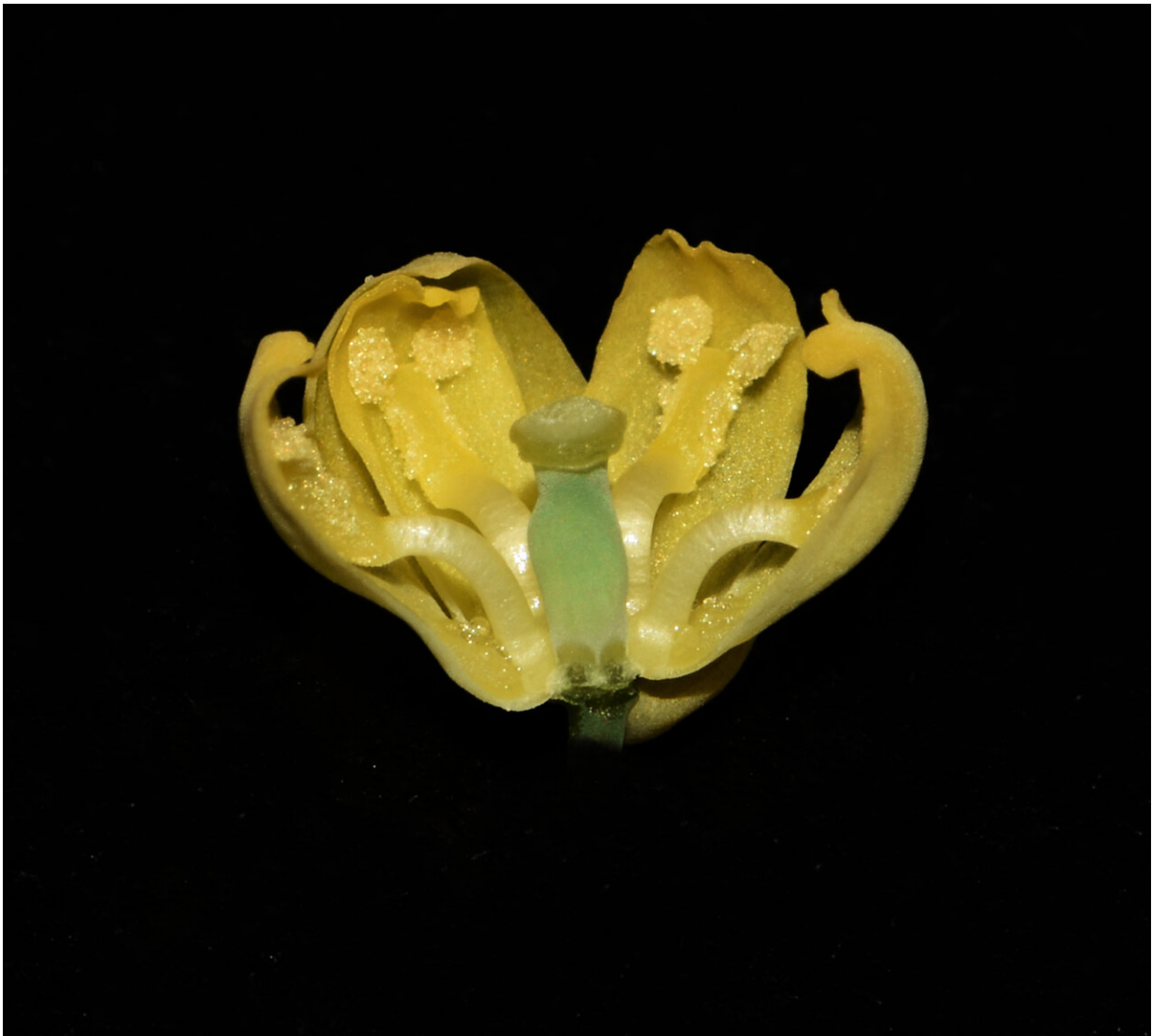


Insect-slapping flower stamens help maximize pollination

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An open flower of *Mahonia bealei* with a mobile stamen visible. Credit: Deng-Fei Li

Using a mobile stamen to slap away insect visitors maximizes pollination and minimizes costs to flowers, a study published today in *eLife* shows.

For centuries, scientists have observed that when a visiting insect's tongue touches the nectar-producing parts of certain [flowers](#), the pollen-containing stamen snaps forward. The new study proves that this action helps increase the flower's reproductive success while reducing the costs of insects lingering too long and feeding on the flower's nectar, similar to in a restaurant, where table turnover is crucial to maximize profits.

"We tested three scenarios," says lead author Deng-Fei Li, a Ph.D. student at the Institute of Evolution and Ecology at the School of Life Sciences, Central China Normal University, Wuhan, China. "These included whether snapping stamens help flowers by controlling how much pollen each insect takes, filtering out less proficient [pollinators](#), or reducing the amount of nectar taken by each visitor."

Li and colleagues immobilized the stamens of the flowers of barberry bushes by dipping the floral pedicel in an alcohol bath for 35-45 minutes. They confirmed that the alcohol treatment, or the lingering smell from the alcohol, did not deter pollinators. They then compared the behavior of insects and the [pollination](#) success of flowers with mobile or immobilized stamens under glass containers in the laboratory and directly outdoors. They also stained the flowers' pollen to track how efficiently insects transported it to other nearby flowers.

Their work showed that insects visiting flowers with immobilized stamens stayed 3.6 times longer and removed more nectar than those visiting flowers with mobile stamens. However, the insects deposited two times fewer pollen grains per flower visit than insects visiting flowers with mobile stamens. Additionally, the team found that insect visitors

deposited pollen from flowers with mobile stamens on about three times more flowers, and on flowers further away, increasing the likelihood of reproductive success for the plant.

The team did not find evidence that the slapping stamens helped exclude less helpful pollinators. All five species of bees and flies that were tested on visiting the flowers stayed about four times longer on flowers with immobile stamens.

"Our study helps resolve the mystery of the purpose of insect-triggered movement of flower parts that has troubled botanists since Linnaeus first observed mobile stamen in 1755," explains senior author Shuang-Quan Huang, professor at the Institute of Evolution and Ecology at the School of Life Sciences, Central China Normal University. "We've shown that plants use rapidly moving stamens to enhance the turnover of bees and flies on their flowers, thereby reducing their nectar costs per successfully transported pollen grain."

More information: Deng-Fei Li et al, Touch-sensitive stamens enhance pollen dispersal by scaring away visitors, *eLife* (2022). [DOI: 10.7554/eLife.81449](https://doi.org/10.7554/eLife.81449)

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