© 2019 The Authors. The *Bulletin of the Ecological Society of America*, published by Wiley Periodicals, Inc., on behalf of the Ecological Society of America. This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

THRIPS PARTIALLY CONTRIBUTE TO POLLINATION OF AN ORCHID WITH GRANULAR POLLINIA

Kenji Suetsugu, Shintaro Tetsu, Masayoshi K. Hiraiwa, and Tadaaki Tsutsumi

Study Description

The tremendous floral diversity of Orchidaceae has been attributed to the intimate relationships between orchids and pollinators. However, despite the long history of orchid pollination studies, the identity of most orchid pollinators remains inadequately explored. Although Darwin hypothesized thrips could pollinate certain orchid species, the pollinator status of thrips has never been investigated in any orchid. Since thrips feed on pollen and plant tissue contents using piercing–sucking mouthparts, they are usually considered antagonists. Here, we reveal that thrips deliver some pollen grains to stigmas of the nectariferous orchid *Epipactis thunbergii,* thereby contributing to fruit set. Additional studies are needed to determine whether the relationship between thrips and *E. thunbergii* is mutualistic.

Suetsugu, K., Tetsu, S., Hiraiwa, M.K., and Tsutsumi, T. 2019. Thrips Partially Contribute to Pollination of an Orchid with Granular Pollinia. Bull Ecol Soc Am 100(1):e01477. https://doi.org/10.1002/bes2.1477



Photo 1. Natural population of the nectariferous orchid *Epipactis thunbergii* with several individuals bagged to exclude all the pollinators using paper bags or exclude all the pollinators except thrips using polyethylene netting. Photo credit: Shintaro Tetsu.



Photo 2. Flowers of the nectariferous orchid *Epipactis thunbergii*. The thrips, *Frankliniella intonsa*, can be observed within a flower that is situated in the middle of inflorescence. Photo credit: Kenji Suetsugu.



Photo 3. Hoverfly, *Sphaerophoria macrogaster*, carrying *Epipactis thunbergii* pollinia. Photo credit: Kenji Suetsugu.



Photo 4. Unidentified thrips transferring pollen grains to an *Epipactis thunbergii* stigma. The remaining pollinia lose their cohesiveness and are less likely to attach to the hoverflies than do intact pollinia. Therefore, even if thrips deposit some pollen grains on the stigma, this may be at the cost of the remaining pollen grains. Photo credit: Kenji Suetsugu.

These photographs illustrate the article "Thrips as a supplementary pollinator in an orchid with granular pollinia: is this mutualism?" by Kenji Suetsugu, Shintaro Tetsu, Masayoshi K. Hiraiwa, and Tadaaki Tsutsumi published in *Ecology*. https://doi.org/10.1002/ecy.2535