

Sexually deceptive spider orchids fool wasps

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Credit: University of Western Australia

Scientists at The University of Western Australia, in collaboration with researchers from The Australian National University, have uncovered the chemical compounds used by a species of spider orchid (*Caladenia*) to sexually seduce male wasp pollinators.

Pollination by sexual deception is an extremely specialised pollination strategy used by many Australian orchids. These orchids mimic the sex [pheromone](#) of a female wasp in order to lure the male to pollinate the flower by the false promise of sex.

Dr Bjorn Bohman from UWA's School of Molecular Sciences said the researchers were able to demonstrate for the first time the makeup of sulfur-containing chemicals the [spider](#) orchid uses to attract wasps for

pollination.

"We demonstrated the spider orchid, attracts its pollinator with a unique system of chemicals never seen before in science," Dr Bohman said.

"The same chemicals mimic the [sex pheromone](#) of the wasp, and also represent the first occurrence of sulfur containing sex pheromones in the hymenoptera, the group of insects containing [wasps](#), bees and ants."

"It is important for understanding the survival of plants to determine how they achieve pollination. So far there have been very few studies which pinpoint the chemicals involved in the communication between the flower and pollinator."

Spider orchids are a diverse collection of Australian orchids, comprising over 360 species. They use multiple pollination strategies including food-reward, food-deception and most bizarrely, sexual deception.

Until now the identity of the chemicals involved in sexual deception have remained elusive for any spider orchid species.

"Studies of the chemistry of this group, beyond revealing new natural chemicals, also offer a unique opportunity to understand the role of floral odors in the evolution of sexual deception as a pollination strategy," Dr Bohman said.

The power of these sex pheromones can be seen in remarkable footage where a male wasp abandons his female partner in preference for copulation with the flower.

These unprecedented observations confirm the extreme sexual attractiveness of the spider orchid to the pollinators, via mimicry of the sex pheromones.

"We had to use methods that normally aren't used for pollination chemistry. Instead we had to bring together a team of biologists, analytical chemists and organic chemists, to identify the active chemicals."

"We hope that new collaborations between organic chemists and biologists will move the field of [pollination](#) chemistry forward."

"The [chemical](#) web of a spider [orchid](#) - Sulfurous semiochemicals seduce male wasp pollinator" has been published by *Angewandte Chemie*.

More information: Björn Bohman et al. The chemical web of a spider orchid - Sulfurous semiochemicals seduce male wasp pollinator, *Angewandte Chemie International Edition* (2017). [DOI: 10.1002/anie.201702864](#)

Provided by University of Western Australia

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