

## DRACULA ORCHID FLOWERS MIMIC MUSHROOMS TO ATTRACT FLIES



A real *Dracula* orchid (left) among 3D copies containing parts of real flowers

In the cloud forests of Central and South America live masters of disguise. Some species of orchid have evolved an unusual solution to pollination in forests with few bees: part of their flowers look and smell like mushrooms.

The flowers of some *Dracula* orchids have a lower petal – known as a labellum – that closely resembles the mushrooms that live in their forest habitat. The flowers also emit chemicals identical to those given off by some fungi.

Scientists had long speculated that this mimicry attracts fungus gnat flies, which lay their eggs on mushrooms and act as pollinators. However, the exact importance of appearance and scent to the orchids' disguise had not been studied before.

To study what it is that attracts forest flies, a team led by Tobias Policha, a biologist at the University of Oregon in Eugene, created 3D-printed replicas of the flowers of one species of *Dracula* orchid (*Dracula lafleurii*).

The researchers swabbed some of these replicas with a scent extract from the real orchid, and left others unscented. They then tested the printed flowers in the orchid's natural habitat – the forests of the Ecuadorian Andes – to see what the flies made of the impostors.

They found that the orchids are playing an even more subtle game than we thought.

Sure enough, the scented replica flowers attracted three times as many flies as unscented ones. This suggests that their scent, in addition to their looks, attracts unwitting insect pollinators looking to lay their eggs on mushrooms.

### Spotting patterns

But the team found that the *Dracula* flowers also attracted flies in another, less obvious way.

Aside from its mushroom-mimicking labellum, the sepals of *D. lafleurii* have a characteristic spotted pattern. By painting the replica sepals, the researchers showed that flies were more attracted to those with a spotted pattern than those that were striped or did not have a pattern.

The reason for this is not clear, but it could be that the insects confuse the spots for other flies, and land on the flowers in the hope of finding a mate.

Although various species of *Dracula* orchid have been proposed as fungi mimics, this is the first time that scientists have managed to separately study their visual and olfactory tactics, says Policha.

“Few organisms scream evolution like orchids – they have developed some absolutely wild adaptations,” says David Grimaldi, an entomologist at the American Museum of Natural History in New York. “This study reveals just how deceptively sophisticated orchids can be in luring pollinators.”

At least four other plant genera are believed to mimic fungi. However, this is not a well-studied phenomenon in plants, so may be more widespread than we know, says co-author Bryn Dentinger. ■

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