

Orchid wears the scent of death

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Fly pollinating orchid. Photo by Dennis Hansen

Sex and violence, or at least death, are the key to reproduction for the orchid *Satyrion pumilum*. Research led by Timotheüs van der Niet at the University of KwaZulu-Natal shows that the orchid lures flies into its flowers by mimicking the smell of rotting flesh. A new study comparing the scent of the orchids with that of roadkill is to be published in the *Annals of Botany*.

The orchid *S. pumilum* is found in sandy, moist conditions near small streams across the Cape floral kingdom of South Africa. The flowers are a puzzle. They don't carry any nectar and even if they did, the spurs that would hold it are the wrong shape to feed any visitors. So how do they attract insects to pollinate their flowers?

Van der Niet said: "We know it's common for orchids to deceive insects

into pollinating them. We also know that some plant species can mimic carrion to attract flies. What we didn't know was how successful this was. Mimicry is often a very poor way to pollinate a plant. So we set out to observe the plants in the wild and see if we could work out how they were attracting flies."

The team staked out a region of farmland with many of the orchids on it. They then went about finding carrion for a comparison.

Van der Niet said: "We didn't kill creatures to entice the flies. Instead we used dassies (rock hyraxes). They're small animals and they look a little like a guinea pig. You can find them almost anywhere in South Africa, and that means you can also find them as roadkill. So we examined the flies visiting the dead dassies, and compared them to the flies visiting the orchids.

"Because of the high density of orchids we didn't see many flies visiting the flowers, but on the nearby dassie carcass we caught a lot of flies carrying orchid pollen, providing ample 'smoking gun' evidence of how common this interaction was. However, we found that not every species of carrion fly at the dassie carcass had orchid pollen on it. The ones that were carrying the pollen were flesh-flies, mostly females."

Further experiments on the flowers showed that the orchids were mimicking the smell of small amounts of carrion. Studies on flies have shown that flesh-flies are better at finding these food sources than other flies.

Van der Niet said: "The flowers of the orchids are incredibly specialised. Not only do they have to entice flies in, but they have to get flies of the right size into the right position to pick up the pollen. We've found that scent plays a hugely important role in pulling in the flies, and even inside the flower different scents attract the flies into the right location to pick

up the pollen. The combination of smell and sight is irresistible to some flies. The level of carrion mimicry is amazing; we even saw a female fly leave larvae in a flower because it thought it was carrion.

"What we've done is show for the first time that carrion mimicking [flowers](#) are highly sophisticated tools for orchids. It's not just any fly that the [orchid](#) is after. For *Satyrium pumilum* we can now see exactly how successful mimicry is for pollination. It also disproves a cliché, you don't always catch more [flies](#) with honey."

More information: The study 'Carrion mimicry in a South African orchid: flowers attract a narrow subset of the fly assemblage on animal carcasses' can be freely accessed at the *Annals of Botany* [DOI: 10.1093/aob/mcr048](#) from March 14.

Provided by Oxford University

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