

# Bird pollinated plant mixes it up when it comes to sex

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An image of a sunbird feeding at one of the flowers in the study.

Across the western Cape of South Africa can be found small plants in the Iris family called *Babiana*. Flitting between them are sunbirds, small colourful birds like the African version of hummingbirds, that drink the nectar of flowers and in doing so pollinate them. New research to be published early next year in a special edition on plant mating in the *Annals of Botany* by De Waal, Anderson and Barrett shows that while birds are important for plant reproduction, when it comes to sex *Babiana* don't put all their eggs in one basket.

*Babiana* interest [biologists](#) because they seem to have a very specialised adaptation. Spencer Barrett of the University of Toronto said: "Sunbirds fill a similar evolutionary niche to [hummingbirds](#), but there's a key difference. Hummingbirds feed on the wing by hovering. In contrast, sunbirds prefer to perch when they feed. What makes *Babiana* special is that some species have evolved a specialised bird perch, so what we did was set out to investigate how this functions."

The research consisted of fieldwork across the western Cape, examining *Babiana* and making observations of the sunbirds that pollinate them. Barrett said: "What we found is when sunbirds visit *Babiana ringens*, they always land on this perch and then turn upside down to feed on nectar from the the ground-level flowers. In contrast *Babiana carminea* doesn't have a perch, and here we found that sunbirds land on the ground and probe flowers to feed on [nectar](#). Ground level flowers are highly unusual in bird-pollinated plants because of the likely predation risk and to find two contrasting feeding strategies among related species is remarkable"

"*Babiana avicularis* has a perch, but these plants are only visited by the southern double collared sunbird. This is a smaller sunbird, and it looks like *Babiana avicularis* may have evolved a specialised relationship with it. Larger malachite sunbirds don't visit this plant but are the exclusive pollinators of *Babiana ringens* which has larger flowers. No one had seen birds pollinate this plant before and it's now one of the smallest bird-pollinated plants known."

Another important discovery was the finding that in "*Babiana ringens* perch size and flower size were of different sizes depending on the geographical location of populations. We found that the bigger the perch, the more birds visited the plant. If that's the case, then why do some *Babiana ringens* plants have small perches?"

To find out what happened if no birds visited, the team experimented with self-pollination. "If you're a plant that's adapted for cross-pollination we might not expect self-pollination to be very successful: it's better for a species if genes are spread around, whereas self-pollination can lead to severe inbreeding. Indeed one of the *Babiana* species that were investigated *B. hirsta* was largely self-sterile but the remaining species that were investigated could set seed from self-pollination.

"What we also found with *Babiana ringens* is that the perch length was smaller in the east of our survey area. This is the region where we saw fewest sunbird visits to [plants](#). So with fewer [pollinators](#) around there's less natural selection to maintain large perches, and it also makes sense to have self-pollination as a back-up when the alternative may be no pollination at all".

Barrett is pleased that the work provides insight into the most specialized bird perch in the plant kingdom, but warns that there is still much that we do not know about how the perch evolved in the first place: "Our research shows a clear functional basis between perches and bird pollination, but that's not all it shows. At the same time we're also seeing self-pollination and it's clear *Babiana* can adopt different mating strategies in different locations depending on the availability of sunbirds."

**More information:** 'The natural history of pollination and mating in bird-pollinated *Babiana* (Iridaceae)' by Caroli de Waal, Bruce Anderson and Spencer C. H. Barrett, *Annals of Botany* [doi:10.1093/aob/mcr172](https://doi.org/10.1093/aob/mcr172)

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