

# Unique project focuses on plant-pollinator interactions

The global decline in pollinators has left researchers with the question of how plant communities and their interacting animals will respond when an important pollinator is taken out of the system.



Researchers at the Faculty of Science at Stellenbosch University (SU) have therefore erected six netted cages or exclosures of 400m<sup>2</sup> each in the Jonkershoek Nature Reserve outside Stellenbosch, known for its rare endemic plant and animal species.

"Many theoretical studies predict that the loss of an important pollinator species will trigger a cascade of linked extinctions throughout the community," says Prof Anton Pauw, an evolutionary ecologist at SU who specialises in plant-pollinator interactions. "Others argue that pollination is of little ecological importance because, in the absence of their primary pollinator, many plant species can compensate by self-pollinating or switching to other pollinators.

"All in all, real evidence for community-level impacts is lacking. We hope that this community-level study will help to provide the insight needed to conserve and restore plant-pollinator interactions," he says.

## Bird-pollinated plants

The focus of the experiment is on the interaction between South African nectar-feeding birds, the iconic sugarbirds and sunbirds, and bird-pollinated plants, particularly proteas, in a community context. Although there are only four species of birds that only rely on nectar for food, they pollinate about 350 plant species.

One of Prof Pauw's MSc students, Pieter Botha, has been studying the effect of bird exclusion on the pollination network since last year when the first three exclosures were erected. He is also comparing the seed production of plants inside the cages to that of plants visited by bird pollinators in the control sites (which are not covered by nets).

"We have already observed that the pincushions inside the cages have more nectar than those in the control sites outside

where birds are actively feeding. In some cases we have also observed more ants visiting these pincushions," Botha says.

Other possible changes in the community they are investigating include the potential local explosion of plant-eating insects, as well as spiders. Apart from feeding on nectar, birds are also predators that consume hundreds of insects every day. These enclosures will allow the researchers to determine how important birds are in controlling the numbers of plant-eating insects.

## **Prediction is difficult**

Prof Pauw explains that the effect of more insects on plants is not easy to predict. "It is also not at all clear to what extent plants rely on their own defenses, such as tannins, to protect themselves against leaf-eating insects, and to what extent they depend on predators, like birds, to act as their bodyguards."

After three years of excluding birds the veld will be burned, as natural fires are the trigger for germination in most fynbos plants.

"If the lack of birds caused a meaningful reduction in seed production, we expect to see that the new veld will lack bird-pollinated plants, and will instead be dominated by insect and wind-pollinated plants, including aliens. All in all, we hope to be able to give a definitive answer to the question, from an ecological perspective, of whether birds really matter," he concludes.

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