

## **Diversity and life-cycle requirements of keystone fly pollinators in the Succulent Karoo biodiversity hotspot**

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Our ability to assess global change driven pollinator declines in South Africa, and implement adequate conservation measures, is limited by the absence of data on diversity, distributions and abundances of pollinators. This limitation not only impacts on the pollinators, but also the plants which depend on them. The focus of concern globally has been on bees, yet the biodiverse SA flora is characterised by widespread specialisation on non-bee pollinators. In the Succulent Karoo biodiversity hotspot we have identified three lineages of Diptera that are keystone pollinators of a large assemblage of plants. These largely endemic flies are critical to the persistence of the globally unique mass flowering displays that underlie the tourism based biodiversity economy of the region. Surprisingly, foundational knowledge of these important pollinators is virtually non-existent. Very sparse existing collections limit knowledge of their diversity and distributions, and preliminary observations suggest our current understanding hugely underestimates (cryptic) fly diversity. While limited data on the flower resource use of adult flies exists, there is no data on the host requirements of parasitoid larval stages. We propose to use DNA barcoding to fill this knowledge gap. We will barcode our densely sampled existing collections of the three target fly groups to reveal their diversity. This together with mobilization of the locality, abundance and flower visitation data linked to these collections, into public data repositories, will provide the critical baseline information for future eco-evolutionary and taxonomic research, and conservation and monitoring efforts. The resulting reference barcode libraries of adult flies will then be used to identify larvae sampled from insect hosts. This will provide the first host use data for these fly groups in South Africa, providing insights into both their life-cycle requirements and the ecological role of their parasitic larval stages.