

## **A survey of viruses of selected lepidopterans in South Africa**

Lepidoptera is among the most diverse insect orders and contains some of the most economically important insects. These lepidopterans are infected by viruses, but virus discovery studies have been conducted to a limited extent in South Africa, despite the important roles viruses play as mutualists and pathogens of insects. We therefore propose to conduct a virus discovery study in eight economically important lepidopterans using a metagenomics approach in order to determine virus diversity in these insects. Dead and live larvae will be collected from different host plants in various provinces. Total RNA will be extracted and next generation sequencing (NGS) carried out. Barcode analysis of the larvae will be conducted to positively identify the species and haplotype. Bioinformatics analysis of the NGS data will be performed to identify sequences of previously reported insect viruses and putative novel ones, especially entomopathogenic viruses and potential mutualists. Comparisons will be made between virus diversity in larvae of each species recovered from different host plants to determine the effect of host plant on virus diversity. The effect of insect haplotype on virus diversity will also be established. The insect viruses collected in this study will initiate an insect virus collection at the Agricultural Research Council-Plant Health and Protection to stimulate research on insect-virus interactions and use of insect viruses for biological control and as expression vectors for protein production.