#### **RRES Press Release 17 April 2024 Protecting West Africa’s chocolate, one flyover at a time**

*Drone based spore sampling could help identify fungal diseases threatening Ghana’s cocoa farmers*

Scientists have carried out a drone-based aerial fungal spore survey in Ghana for the first time. The DNA sequenced results suggest that there is a fairly diverse and uniform spore distribution across  the country, and that rapid identification of the fungal pests that plague important commercial crops may be possible.

10 spore samples were collected onto Vaseline-coated acrylic rods mounted on drones (UAVs) flown at heights of between 15 and 50 metres above ground for 10-15 minutes at three sites in Ghana. Purified DNA was extracted from the air samples, followed by [MinION](https://nanoporetech.com/products/sequence/minion) sequencing and analysis.

The survey found no clear difference between fungal air communities based at the various geographic locations (east vs. central Ghana), nor any noticeable differences relating to underlying vegetation type (cocoa plantation vs. non-cocoa) or height above ground level.

*"If a fungal disease hits, it can be devastating for individual growers. If we can use aerial drone surveys to maintain a high level of surveillance, the chances of dealing with disease outbreaks quickly will minimise damage and costs to growers.”*

However, the team did identify that many fungal genera containing potential plant pathogen species were present. These include the globally common crop pest Fusarium, and Lasiodiplodia, which can cause leaf blight, stem canker, and pod rot in cocoa trees.

“Cocoa growing is almost unique among tropical cash crops in being mainly being undertaken by smallholder farmers,” said Dr Kevin King who led the study. “That means that if a fungal disease hits, it can be devastating for individual growers. If we can use aerial drone surveys to maintain a high level of surveillance, the chances of dealing with disease outbreaks quickly will minimise damage and costs to growers.”

Given this context, the team developed a novel [LAMP](https://en.wikipedia.org/wiki/Reverse_Transcription_Loop-mediated_Isothermal_Amplification) assay, for rapid, sensitive and specific detection of the fungal genus Lasiodiplodia, which can be easily deployed locally in Ghana.

“The goal ultimately is to support the development of state-of-the art fungal spore surveillance in West Africa,” said Dr King. “Working closely with our local partners we see huge potential to help growers monitor disease threats in real time, leading to more environmentally sensitive and better targeted crop protection.”

Publication

King, K.M.; Canning, G.G.M.; West, J.S. MinION Sequencing of Fungi in Sub-Saharan African Air and a Novel LAMP Assay for Rapid Detection of the Tropical Phytopathogenic Genus *Lasiodiplodia*. Pathogens **2024**, 13, 330. https://doi.org/10.3390/pathogens13040330