



Tropentag, September 17-19, 2018, Ghent

“Global food security and food safety:
The role of universities”

Molecular Analysis of Gut Contents to Establish Host Range of Edible Grasshoppers in East Africa

ALFONCE LEONARD¹, FATHIYA KHAMIS¹, SAMUEL KYAMANYWA², SUNDAY EKESI¹, KOMI FIABOE¹, JAMES P EGONYU², SUBRAMANIAN SEVGAN¹

¹International Centre of Insect Physiology and Ecology (ICIPE), Plant Health, Kenya

²Makerere University, Crop Science, Uganda

Abstract

African grasshoppers (*Acanthacris ruficornis*) and long horned grasshoppers (*Ruspolia nitidula*) are important cultural food among communities in Kenya and Uganda. They are a good source of protein, fats, vital minerals and vitamins. Grasshoppers multiply during rainy season when there is enough moisture for eggs hatching and when grasses are available for them to feed. Despite their traditional importance as food, mass-rearing protocols for the species has not been developed. To optimise mass-rearing protocol, information on the preferred host crop of the grasshopper is critical. In this regard, we undertook molecular analysis of gut contents of *Acanthacris* and *Ruspolia* to identify their wild host plants. Adult insects were collected at different locations in Murang'a, Kenya and Mbarara, Kabale and Hoima, Uganda; preserved in absolute ethanol until further analysis. Grasshopper's guts i.e. fore-, mid- and hind gut were dissected from each specimen. Extraction of Plant DNA from the gut was done using the ISOLATE Plant DNA Kit from BIOLINE Company as per manufacturer's instructions. Forward and reverse primers, Mat K-1 RKIM-f and Mat K-3 FKIM-r respectively were used in PCR analysis. PCR products were purified and sequenced using Applied Biosystems 3730XL sequencer. Consensus sequences were generated using BioEdit software and the identity of plants established using basic local alignment search tool (BLAST) in the Genbank. Identified host plants of *Acanthacris ruficornis* were *Achyroopsis leptostachya*, *Heliocarpus pallidus*, *Centella virgata*, *Erigeron atticus*, *Galinsoga quadriradiata*, *Bougainvillea glabra* and *Digitaria exilis*. *Digitaria exilis* was the only identified host plant of *Ruspolia nitidula*. Most of the identified host plants were broad leaved species except *Digitaria exilis* which is a grass species. The identified wild host plants of these insects are available everywhere in the country hence they can be adopted for mass rearing of grasshoppers. Further studies should focus on assessment of preference to and growth of *Acanthacris* and *Ruspolia* on the identified host plants.

Keywords: *Acanthacris ruficornis*, gut contents, host plants, *Ruspolia nitidula*