



MOLECULAR ANALYSIS OF GUT CONTENTS TO ESTABLISH HOST RANGE OF EDIBLE GRASSHOPPERS IN EAST AFRICA

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INTRODUCTION

- African grasshopper (*Acanthacris ruficornis*) and long-horned grasshoppers (*Ruspolia differens*) are important cultural food among communities in Kenya and Uganda¹.
- These edible insects are a good source of protein, fats, vital minerals and vitamins.
- Unfortunately, communities rely on wild grasshoppers that only multiply during the rainy season.
- Despite their traditional importance as food, mass-rearing protocols for the species has been undeveloped².
- Need to develop mass rearing protocols for edible grasshoppers to enhance food security in East Africa exists.
- To optimise the mass-rearing protocol, information on the preferred host plants of the grasshopper is critical.

OBJECTIVE

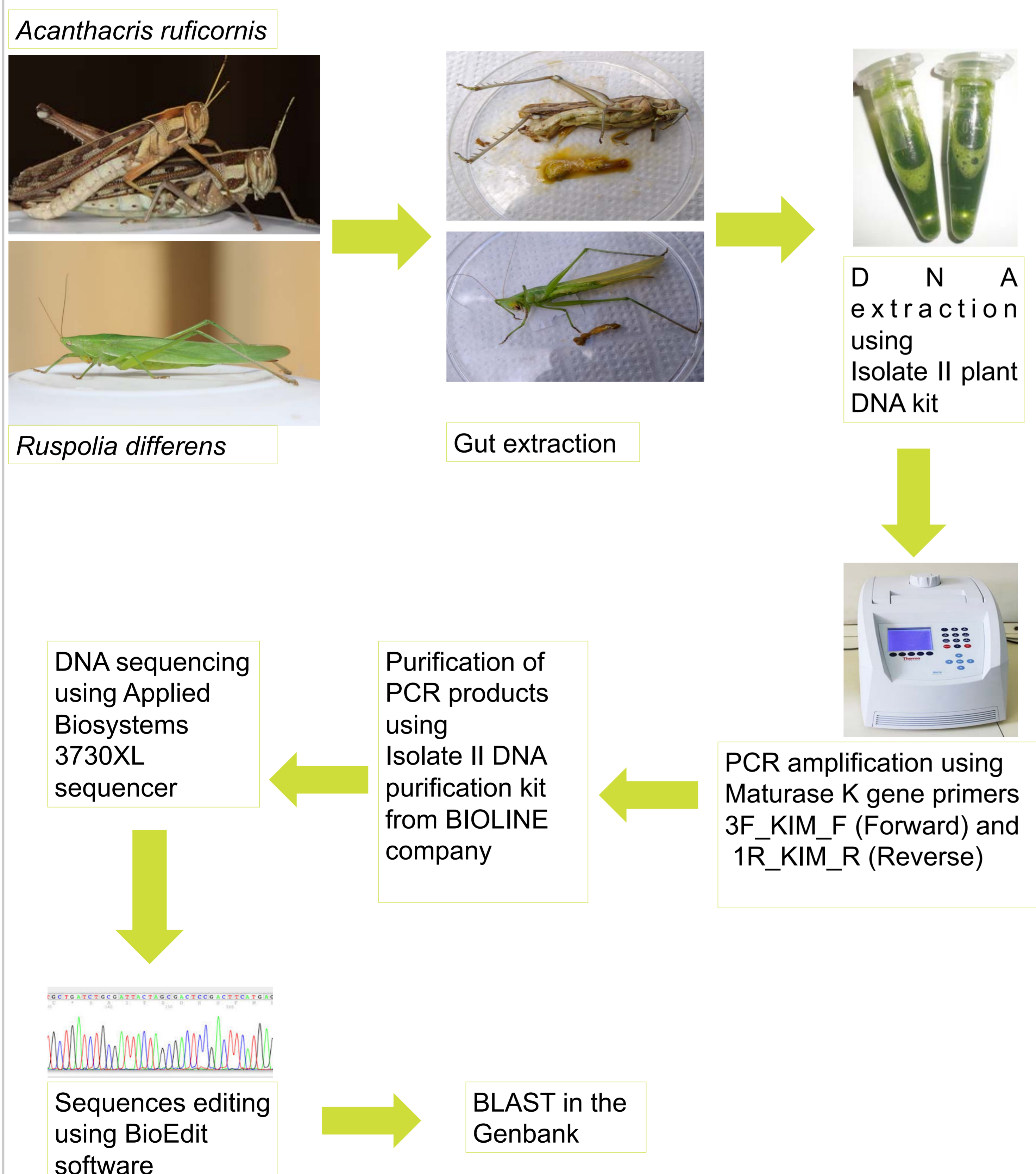
To determine host plants of *Ruspolia differens* in Uganda and *Acanthacris ruficornis* in Kenya through molecular analysis of gut contents.

METHODS

Sampling

Ruspolia differens were collected using light traps in Mbarara, Kabale and Hoima, Uganda. *Acanthacris ruficornis* were collected in Murang'a, Kenya using sweep nets. Samples were preserved in absolute ethanol until further analysis.

Molecular analysis of gut content³



RESULTS

Table 1: Outcome of the gut content analysis to identify host plants of *Ruspolia differens* and *Acanthacris ruficornis*

Site	Grasshopper	Host family	Host species	GenBank Accessions with Similarity (%)
Murang'a	<i>Acanthacris ruficornis</i>	Amaranthaceae	<i>Achyroopsis leptostachya</i>	AY998117.1 (99)
		Tiliaceae	<i>Heliocarpus pallidus</i>	KM219813.1 (97)
		Apiaceae	<i>Centella virgata</i>	KP110015.1 (99)
		Asteraceae	<i>Erigeron atticus</i>	KP175136.1 (87)
		Poaceae	<i>Digitaria exilis</i>	KJ513091.1 (99)
		Nyctaginaceae	<i>Bougainvillea glabra</i>	JQ844141.1 (100)
Mbarara	<i>Ruspolia differens</i>	Poaceae	<i>Digitaria exilis</i>	KJ513091.1 (99)
Hoima	<i>Ruspolia differens</i>	Poaceae	<i>Digitaria exilis</i>	KJ513091.1 (99)
Kabale	<i>Ruspolia differens</i>	Poaceae	<i>Digitaria exilis</i>	KJ513091.1 (99)

CONCLUSION

- Molecular analysis of gut contents has identified the host range of the two edible grasshoppers.
- *Digitaria exilis* was the only identified host plant of *Ruspolia differens*.
- Six plants were identified as hosts of *Acanthacris ruficornis*, all of which were broad-leaved species except *D. exilis* which is a grass species.
- The identified wild host plants of these insects are available in most parts of East Africa; hence, they can be adopted for mass rearing of the two edible grasshoppers.

IMPACT

The identified host plants of *Ruspolia differens* and *Acanthacris ruficornis* will lead to more efficient and sustainable mass-rearing of these grasshoppers.

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