Strides in farming edible African bush cricket, *Ruspolia differens* (Serville) (Orthoptera: Tettigoniidae) in East Africa: a systematic review of rearing protocols

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Abstract

The edible African bush cricket, *Ruspolia differens* (Serville), is the most sought-after nutrient-dense edible insect in East Africa, with the potential to boost employment and income opportunities and ensure food and nutritional security. However, this potential is curtailed by the reliance on the limited and unstable harvests from its wild populations. Recently, significant effort has gone into developing protocols for domesticating this species, but this information is scattered in literature and limits the standardization of rearing techniques. This contribution reviews recent research on edible *R. differens* rearing protocols in East African region with a view to improving its rearing practices. We searched published articles from four databases including PubMed, Google Scholar, Scopus and Web of Science following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) method. Of the 99 records identified, 36 reviews

met inclusion criteria. We found that this species can be reared from egg to adult in a relatively short time on grass leaves, inflorescences and grains as well as on artificial diets, side-streams from industry and agricultural by-products, and at relatively high densities. More diversified diets lead to shorter development time, increased adult fresh weight, and enhanced female fecundity compared to single or less diversified diets. Increasing the protein levels in the diet by up to 17% enhances the growth, development and survival of *R. differens*. The suitable temperature for *R. differens* rearing is 28–30 °C. Suitable rearing density for young *R. differens* nymphs should not exceed 36 nymphs per liter, as higher densities significantly increase nymph mortality rapidly over time. A promising egg-laying medium for larger scale production is an artificial folded plastic cloth (one side covered with short fleece). We also identify knowledge gaps and challenges that need to be tackled before scaling up technologies for *R. differens* mass production in the East African region. Our review offers suggestions to entrepreneurs and investors who wish to finance *R. differens* farming endeavors.

Data availability

This research did not generate data but reused existing data.

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G.M.M, J.P.E, A.V and H.A conceptualized the study; G.M.M wrote the initial draft of the manuscript with the help of all contributors. P.N and MHA edited the manuscript. All authors have read and agreed to the published version of the manuscript.

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Ethics declarations

Research involving human participants and/or animals

This study did not involve use of human and/or vertebrate animals.

Conflict of interest

The authors declare that they have no relevant competing interests to declare.

Additional information

Publisher's Note

Appendix 1

Table 2.

Table 2 Diets used in feeding *Ruspolia differens*

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