

**PERFORMANCE OF EDIBLE GRASSHOPPER *RUSPOLIA DIFFERENS*
(ORTHOPTERA: TETTIGONIDAE) FED ON LOCALLY AVAILABLE
ARTIFICIAL DIETS IN UGANDA**

BY

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ABSTRACT

This study investigated the suitability of locally available artificial diets in Uganda for rearing the edible long-horned grasshopper, *Ruspolia differens*, whose supply from wild populations is insufficient and unreliable. Newly hatched nymphs were reared individually on diets from eight categories, including cereal grains, cereal by-products, germinated cereals, brewery spent grains, oil-seed cakes, fruit and tuber wastes, and composite feed formulations. Growth and reproductive performance were assessed through survival, development time, adult weight, pre-oviposition period, fecundity, and egg hatchability, while relationships between the performances with nutritional composition and secondary metabolites were also examined.

Cereal-based diets, particularly germinated finger millet (GFM), finger millet seedhead, sorghum seedhead, and fresh maize cob at the silking stage, produced the highest survival rates, fastest development, and greatest adult weights. Females fed GFM exhibited more than twice the lifetime fecundity of those on other diets. Among 11 agricultural by-product diets tested, only dry maize cob, local brew waste, and soybean hull meal supported development to adulthood, with composite diets containing GFM and 50 – 75% dry maize cob performing best. Males matured faster but attained lower adult weights than females across all diets.

Growth performance was influenced mainly by crude fibre and fat content. Higher crude fibre levels reduced survival and delayed development, while dietary fat showed a weak positive relationship with adult weight. Secondary metabolite concentrations were not associated with growth performance.

The findings demonstrate that inexpensive and locally available diets, such as germinated finger millet, finger millet seedhead, sorghum seedhead, fresh maize cob, soybean hull meal, dry maize cob, and local brew waste, can effectively support the survival, growth, and reproduction of *R. differens* in captivity. In particular, GFM supplemented with 50 – 75% dry maize cob offers a promising low-cost feeding option that could reduce production costs and reliance on feed resources that compete with human and livestock consumption. These results provide a basis for developing sustainable mass-rearing systems for *R. differens* and the need for policies that promote the use of agricultural by-products within a circular economy framework.