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The Effects of Harvesting Conditions and Processing on the Nutritional Profile of *Ruspolia differens*

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Abstract

Wild seasonal edible insects such as *Ruspolia differens* continue to significantly contribute to the food, nutrition and economic security of many people in Uganda and Africa at large. This research aimed at investigating the effect of season, sourcing geographical area and processing method on the nutrient profile of *R. differens*. On a dry matter basis, proteins (34.2–45.8 %), lipids (42.4–54.3 %) and chitin (8.26–10.79 %) were the most abundant macronutrients while potassium (242.0–673.3 mg/100 g), phosphorus (316.1–626.6 mg/100 g), calcium (34.9–128.0 mg/100 g), magnesium (38.5–69.0 mg/100 g) and iron (33.2–69.0 mg/100 g) were the most abundant micronutrients. Vitamin B12 ranged from 0.22–1.35 μg/100 g. The full amino acid profile was determined, showing a high biological value. The variability in amino acid composition across the different samples (areas, seasons) was low. Oleic acid (C18:1 cis-9) was the most abundant (38.9–42.7 %) fatty acid, followed by palmitic acid (C16:0) (26.6–28.5) and linoleic acid (C18:1 cis-6) (17.6–23.0 %), implying that the *R. differens* fat is highly unsaturated (56.5–65.7 %), similar to chicken and pork but higher than beef. *R. differens* samples from the April season had a significantly higher protein and mineral content than samples from the December season, probably due to the younger growth stage of the grasshoppers. Geographical area also significantly influenced the nutrient content of *R. differens* but not consistently. Boiling and roasting significantly resulted in the loss of lipids, minerals and vitamin B12. Correspondingly, protein content increased. Understanding the nutrient profile of *R. differens* will greatly contribute to defining its key quality attributes and inform development of shelf stable products fit for the formal regulated market. Despite *R. differens*' potential to contribute to combatting the micro and macro nutrient deficiencies especially for protein and iron, the bio-availability of these nutrients need to be investigated. Efforts to rear *R. differens* should be harnessed to ensure its sustainable contribution to food, nutrition and income security.

Keywords: Geographical area, nutrient profile, processing, *Ruspolia differens*, season

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