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Nutritional Opportunities of Edible Insects in Madagascar, Case of *Borocera cajani* and *Bombyx mori* Chrysalis

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Abstract

In Madagascar, food consumption is marked by the predominance of cereals (rice and corn) and roots and tubers (cassava) and the low diversity of the diet. Food population intake is nutrient-poor. Several recent literatures show that insect consumption is common in rural areas. The lack of data on the nutritional composition of insects minimises the attention that nutrition stakeholders may pay to insects and constitutes a brake on the development of its consumption. In the present study, the nutritional potential of the chrysalis of two edible insects, *Borocera cajani* and *Bombyx mori*: the most locally used as food was determined and evaluated for the first time. *B. cajani* and *B. mori* contain 63.98 and 54.37 % crude protein, 29.84 and 35.78 % fat, 4.10 and 5.67 % ash, and 2.06 and 4.36 % carbohydrate, respectively. The essential amino acid (EAA) content shows that the amino acid scores of both insects exceeded the recommendation given by FAO/WHO/UNU (score >100). Amino acid profile shows that polyunsaturated fatty acid (PUFA) was the most predominant fatty acid found in both insects, followed by saturated fatty acid (SFA) and monounsaturated fatty acid (MUFA). Mineral content was generally higher than that of conventional meat types. Both species fulfiled the recommended daily allowance (> 100 %) for Zn and Cu. The energy content based on 100 g of insect flour of *B. cajani* and *B. mori* were 532.78 and 557.05 kcal. Knowledge of the nutritional quality of those edible insects allows to be better integrate them into the diet. We suggest that the two insects could be considered as good alternative sources of protein and fat in addition to traditional meats. The use of edible insects products as food diversification and food fortification of starchy based diet is recommended to enhance nutrition of vulnerable groups in Madagascar.

Keywords: Entomophagy, fatty acids, Madagascar, nutrition, protein quality

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