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PROXIMATE COMPOSITION, MINERALS CONTENT AND FUNCTIONAL PROPERTIES OF CRICKET (*ACHETA* spp.)

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Proximate composition, minerals content and functional properties of field cricket (*Acheta* spp) were analyzed using standard methods. The result of the proximate content (%) was as follows: crude protein (39.9±0.40), crude fibre (5.2±0.1), carbohydrate by difference (39.9± 0.1) and energy (46.7Kcal). The predominant mineral was potassium and zinc was the least. The functional properties (%) ranged as follows: Water absorption capacity (100), oil absorption capacity (205.6), oil emulsion capacity (75), foaming capacity (28), least gelation capacity (10). Foaming stability was low and collapsed after 240 min. Emulsion stability was high. The result suggests that cricket is a good food formulation medium.

Key words: Minerals, *Acheta* spp, Crude protein, Crude fibre, Foaming stability

Introduction

Crickets belong to the family Gryllidae and are commonly called field crickets. They are found throughout Africa, Southern Europe and parts of Asia. The adult cricket is either brownish or blackish in color with a body length of 2-3 cm. They are ominivorous. In the night they make horrible noise which gives endless hours of displeasure to those living at the surroundings like variegated grasshopper (Hill 1987).

There are no information about the proximate chemical composition or minerals contents and functional properties of cricket which could be used to assess its value in the food industries. Therefore, this paper reports the results of investigation on cricket (*Acheta* spp).

Materials and Methods

The cricket sample was collected at Federal College of Agriculture, Akure, Ondo State, Nigeria. It was washed in distilled water and dried in an oven at 60°C, dry milled and stored for prior analysis. The ash and moisture contents were determined using air oven and dry ashing methods of Pearson (1976). Minerals content was determined using Vogel's method (1962). The sample was analyzed for crude protein and crude fat according to the methods in AOAC (1995). The analysis of total energy was calculated according to methods reported by Manzi *et al* (2001). The functional properties were determined using the methods reported for African Yam Beans (AYB), (Oshodi *et al* 1997).

Results and Discussion

The data in Table 1 depicts the proximate and minerals compositions of the cricket sample. The moisture content (16%) was low. This means that the growth of micro-organism would be hindered and storage life of sample would be high. The crude protein was 39% and compared with those reported for grasshopper and raw termite (Olaofe *et al* 1998). The high crude protein is an indication that the sample is ideal in food formulations. The fat content was high (20%) this is also an indication of good source of oil. The energy value of 467.6 Kcal was not in agreement with results recorded for livestock dungs fed to pigs (Abulude *et al* 2002). This result suggests that cricket could be exploited in food formulations as an excellent source of energy. The minerals contents were reasonably high and may satisfy the nutritional needs of the conusmers (Oshodi 1992).

The results obtained for some functional properties are shown in Table 2. The results are as follows (%): Water absorption capacity (100), oil absorption capacity (205.60), oil emulsion capacity (75), foaming capacity (28) and least gelation

Table 1

Proximate (%) and minerals (mg / 100g) compositions of cricket sample

Proximate		Minerals	
Crude protein	39.00 ± 0.40	Calcium	52.00± 0.45
Crude fat	20.00 ± 0.20	Sodium	96.50± 0.02
Crude fibre	5.20 ± 0.10	Phosphorus	22.00± 0.10
Moisture	16.20 ± 0.10	Iron	5.50 ± 0.05
Ash	2.90 ± 0.10	Copper	10.20± 0.05
Carbohydrate (by difference)	39.90 ± 0.10	Potassium	100.50± 0.10
		Magnessium	10.80± 0.02
Energy (Kcal)	467.60 ± 0.02	Zinc	0.40± 0.30

capacity (10). These trends were also observed for *Adenopus breviflorus* benth flour (Oshodi 1992). These present observations probably suggest that cricket may be good for food formulations like baking, salad dressing and other related food processings.

Table 2
Some functional properties of cricket sample (% DM)

Functional properties	
Water absorption capacity	100.00 ± 0.2
Oil absorption capacity	205.60 ± 0.5
Oil emulsion capacity	75.00 ± 0.4
Foaming capacity	28.00 ± 0.4
Least gelation capacity	10.00 ± 0.1

Table 3
Foaming and emulsion stability (%) of cricket sample

Foaming stability Time (min)		Emulsion stability Time (h)	
0.00	30.62 ± 0.05	0	90.24 ± 0.05
25.00	30.62 ± 0.05	1	90.24 ± 0.05
50.00	25.57 ± 0.10	2	84.54 ± 0.05
60.00	25.57 ± 0.10	3	80.00 ± 0.05
110.00	20.25 ± 0.10	4	75.50 ± 0.10
120.00	20.25 ± 0.10	5	70.25 ± 0.10
180.00	20.25 ± 0.10	6	70.25 ± 0.10
240.00	10.15 ± 0.05	22	70.25 ± 0.10
300.00	0.00	24	70.25 ± 0.10
360.00	0.00		

The foaming and emulsion stabilities are shown in Table 3. The foaming stability (FS) was low and collapsed within 240 min, whereas, emulsion stability (ES) was high. These values were similar to that of African Yam Bean (Oshodi *et al* 1997). This suggests that there is binding of oil and water phase. Data on ES show that it would be useful in production of foods of stable emulsion.

Conclusion

The present results show that cricket samples have high protein value and fairly rich in minerals. It also has great potential for food formulations like mayonnaise salad dressings, soups, milks, baked products just to mention a few.

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