

## **Characterization of original and solvent-treated cricket (*Gryllus bimaculatus*) powder for future food**

**CATALANO DAMASCENO B. (1), NAKAJIMA M. (1), ITO J. (1), TAARJI N. (2), ANTONIO DAS NEVES M. (1)**

1 University of Tsukuba, Tsukuba, Japan

2 Mohammed 6 Polytechnic University (UM6P), Benguerir, Morocco

Edible insects are a new option of protein, fat, and minerals source, and are gaining attention all around the world. The use of insects has ecological and economic advantages when compared to other farming options, like the reduction of greenhouse gases emission and the reduction of water waste. The objective of this study is to evaluate the difference in nutrients, bioactive compounds, and powder properties after different treatments.

The treatment of cricket powder was performed using four different solvents: Milli Q water at pH5, ethanol 20%, ethanol 99.5%, and hexane. The powder was washed with the solvents individually for 2 h under stirring. After that the solution was centrifuged, the powder pre-dried overnight in the fume hood, and freeze-dried posteriorly. Proximate analyzes were determined through moisture, chitin, protein, ashes, and fat content. Osborne's classification of the proteins was analyzed using protein solubility. Phenolic content and antinutritional compounds were analyzed using Folin Ciocalteu method.

Significant differences were observed in the proximate analyzes after the solvent treatments, with a reduction of fat content from 33% in the original powder to 7% in the powder treated with ethanol 99.5%. At the same time, the amount of protein in the treated powders increased from 55.4% (in original powder) to 72% (ethanol 99.5% treated powder), which influence the nutritional value of the final product. The removal of fat also contributes to changes in the color of the powder, making it clearer. When analyzed, the antinutrients show a significant decrease in the powders treated with aqueous solvents. Due to the removal of fat, other compounds present in the powder tend to be more concentrated, this can be observed in the phenolic compounds present in the powder: after the treatment with ethanol 99.5% of this value has increased.

In conclusion, cricket powder is a good source of protein, fat, and phenolic compounds. The treatments applied improved the nutritional profile of the powder, increasing the protein content, reducing the fat, and increasing the phenolic compounds.

This work was supported by Government of Japan, Moonshot R&D Program for Agriculture, Forestry and Fisheries.