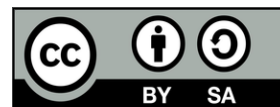




Research article



DEVELOPMENT OF INSECT-BASED TRADITIONAL CRACKERS: NUTRITIONAL PROFILE, PHYSICAL CHARACTERISTICS, AND SENSORY ACCEPTANCE

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ABSTRACT

Entomophagy, or the consumption of insects, has been an integral part of food culture in several regions of Indonesia, where crickets (Gryllidae) and grasshoppers (Acrididae) are typically fried and eaten as snacks or protein-rich side dishes. While these insects are usually served in simple fried forms incorporating them into widely recognized local foods could enhance consumer acceptance. *Kerupuk*, a culturally-familiar and widely-consumed popular Indonesian traditional cracker made from a starch-protein blend that is steamed, dried, and deep-fried to achieve its airy crunch, is traditionally prepared with shrimp, fish, or plant-based ingredients, but rarely with insects. This study presents a novel approach by incorporating insect flour into Indonesian *kerupuk* as a strategy to improve the nutritional value of the product while reducing potential consumer resistance toward visible insect-based foods. Traditional crackers were produced using cricket flour (CC) and grasshopper flour (GC) comparing them with conventional shrimp crackers (SC) in terms of nutritional profile, physical characteristics, and sensory acceptance. Proximate analysis showed that fried insect crackers contained higher protein (CC: 24.93%, GC: 23.72%) than SC (19.65%), despite showing a slightly lower protein and lipid digestibility. Color analysis indicated insect crackers were darker than SC, yet expansion ratios (~375-379%) and crispness metrics were higher compared to SC (~313%). Sensory evaluation with 186 untrained panelists found no significant differences ($p>0.05$) among CC, GC, and SC in overall liking, but a higher preference related to crispness and hardness towards CC and GC compared to SC. These findings demonstrate that Indonesian *kerupuk* can serve as a practical and culturally acceptable food vehicle for edible insect incorporation, producing a protein-enriched snack with desirable crispness and sensory acceptance while supporting protein diversification and sustainable entomophagy in modern diets.