An Innovative Feed Formula and Suitable Environmental Factors for Efficient Farming of Giant Water Bugs (Lethocerus indicus)

Srisuk, Kasidet (School: The Demonstration School of Khon Kaen University (Modindaeng))
Khongsawat, Pruttachart (School: The Demonstration School of Khon Kaen University (Modindaeng))
Jaturon, Thunvarat (School: The Demonstration School of Khon Kaen University (Modindaeng))

A population decline of Giant water bug (Lethocerus indicus), an edible insect, due to environmental changes, pesticide usage, and habitat destruction, was observed. This study aims to determine optimal rearing conditions and feeding strategies for efficient farming to boost bug production. Field surveys revealed that L. indicus is the most found species in Thailand with a life cycle of 73–83 days. The optimal farming ratio was 1 female: 1 male, yet challenges included low survival rates, cannibalism, and an inconsistent sex ratio favoring females. AI-assisted morphological analysis was constructed to enhance sex differentiation, minimizing farming inefficiencies. Environmental factors influenced farming outcomes. The rainy season (30-35?C, 70-80% RH, 250-600 mm rainfall) promoted higher growth, egg-laying, and survival rates. Male offspring were more prevalent in the hot season. To address live feed limitations due to high cost and short life span of natural diets such as baby shrimp and tadpoles, a diet containing fish viscera residual was developed. We stuffed fish viscera inside the pork intestines and tied to a size around 3 cm to imitate the bug's natural prey and eating habit by sucking food through the elongated mouthpart. Essential amino acids and lipids beneficial for growth, and the key odorants compounds in males grown with developed diet in the controlled environment were higher than in market-sourced bugs. The feed formula was made into a gel-like form for a longer shelf-life and user-friendlier for farmers. These innovations could enhance commercial farming and encourage cultural food with high nutritional value

Awards Won: