

ANNOUNCEMENT OF PhD POSITION IN THE DEPARTMENT OF HORTICULTURE AND FOOD SECURITY AT JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY (JKUAT)

Topic

Food loss prevention by utilization of insect larvae as AFB₁-decontamination agents and safe feed source for aquaculture fish feeding

Background

Maize is a staple food for 50% of Kenya's population and it accounts for 65% of the staple food calorie intake. Maize is highly affected by aflatoxin contamination with Kenya being a world's hotspots for aflatoxin contaminations. Aflatoxins therefore constitute a major challenge to food and nutrition security in Kenya. To contribute to the solution of aflatoxin in maize, a project by Jomo Kenyatta University of Agriculture and Technology (JKUAT) in collaboration with the Kenya Agricultural Research and Livestock Organization (KALRO) and various German institutions including Max Rubner Institute (MRI). The project shall involve infecting maize with aflatoxin-producing fungi to obtain grains with high mycotoxin levels. These grains, also containing a variety of fungal secondary metabolites additional to AFB₁, will be used to study their effects on the growth and performance of Black Soldier Fly (BSF) larvae its transfer rates as well as alterations of the nutritional value of BSF larvae in fish meal compared to BSF reared on i) regular control diet and ii) market waste. Fish feed will be produced at a private company after a defatting. The fish feeding trial will be done in an aquaponic system. For a comparative trial in Germany feed from a private company will be shipped to MRI. The fish will be analysed for toxin levels in edible tissues, along with monitoring their quality parameters and growth rates.

PhD Position

The project is seeking a suitable candidate to undertake the research as part of his/her PhD studies in the Department of Horticulture and Food Security at Jomo Kenyatta University of Agriculture and Technology (JKUAT) for a period of three years. The project shall cover tuition fee, research cost and provide a modest stipend to cover living expenses for the successful candidate. Within the project it is also planned that the PhD candidate will go to Germany for a few month to do some analytical work and learn additional techniques.

Tasks for PhD student

The following are indicative tasks to be undertaken by the PhD student:

1. **Production of mycotoxin-contaminated maize** by inoculating maize with an *Aspergillus flavus* strain.
2. **Perform feeding trials of the BSF larvae** using different substrates (manure, pure maize, mixtures of manure + maize and market waste group fruit/vegetable waste).
3. **Undertake partial defatting and milling** of the BSF larvae. The defatted, protein-rich BSF flour, as well as the BSF oil, will be obtained separately and used for the production of fish feed at an external company.
4. Assistance with **production of Fish feed** private company.
5. Assist with **feeding trial of African catfish** in an aquaponic system
6. **Undertake chemical characterisation of the BSF feed and frass** throughout the lifecycle (during BSF rearing period, and before and after defatting). Parameters to be assessed include total fat, total nitrogen, dry matter content and fatty acid profile.
7. The PhD will **work in close collaboration with a German PhD candidate, exchange samples and results**. Complementary research work will be done by both PhD candidates forming a research-tandem

Requirements

- Minimum of B.Sc Second Honours Upper Class from a reputed institution of higher learning
- M.Sc in an area related to the project
- Good scientific skills demonstrated by publication
- Experience with some aspects of the project
- Strong motivation demonstrated by application letter and concept note provided

Application procedure

Submit application via email consisting of a letter indicating their motivation to work in the project and how they meet the requirements indicated above, and a concept note for PhD proposal. The application should include academic certificate, a research concept note aligned to the project and any other supporting documents. The application should be submitted as single document in pdf format via email to: info.projects2024@gmail.com to be received not later than September 17th 2024 at 5.00pm.