This PhD program is for **Self-Funded PhD Students Only**
International tuition fees for 2025-26 entry – 4.800 € per annum

Title: **Biological potential of mycelium and fruiting body of edible/medicinal mushrooms – submerged fermentation vs. solid state cultivation**

Are you passionate about researching the biologically active components contained in the mycelium and fruiting body of edible/medicinal mushrooms. Are you interested in the advantages and disadvantages of submerged liquid fermentation and growing mushrooms on a solid substrate?

The aim of this PhD project should be the production and determination of the biological potential of the mycelium and fruiting body of a selected edible/medicinal mushroom. It is known that many species of mushrooms possess biologically active components that can be isolated by an appropriate type of extraction and then tested with a series of adequate responses. The extraction method itself is of crucial importance because it directly affects the composition of the extract, favoring the separation of the appropriate components of interest. Considering the danger of the presence of pathogens as well as microbial species that cause food spoilage, the potential antimicrobial effect of mushrooms in the food industry is very promising. In modern food and beverage production, biofilms of individual species or consortia of several types of microorganisms are a common problem. Therefore, one of the important goals of this research would be the anti-adhesion/anti-biofilm potential of mushroom fruiting bodies and their mycelium. As part of this research, the PhD student should also examine the antioxidant capacity of the fruiting body/mycelium in question as an added value of the food product, i.e. a characteristic that significantly contributes to the health aspect of mushroom consumption.
The PhD candidate would be tasked with growing his/her own mycelium in submerged culture and fruiting bodies on solid substrates, as well as assessing the advantages and disadvantages of both methods of cultivation in a given case. In general, mushroom cultivation on solid substrates is time- and space-consuming, and the quality of the product depends on the cultivation conditions, which cannot always be the same. On the other hand, the production of mycelium in submerged culture can be standardized, requires less space, and takes less time. However, given that there are significant differences in the composition of the products obtained using these two cultivation methods, the PhD candidate should independently draw conclusions about the justification for using one or the other.

This research offers a unique opportunity for a PhD student to contribute to the development of methods for growing mycelium/fruiting bodies of mushrooms and defining the most potent extracts in terms of antimicrobial and antioxidant capacity, which makes it a challenging PhD project for candidates studying in the field of food science, mycology and microbiology. The PhD project would potentially provide possible proposals for stakeholders from the food industry and medicine level.

Supervisors:
Supervisor 1: prof. Dr Anita Klaus: e-mail: aklaus@agrif.bg.ac.rs
Supervisor 2: prof. Dr Maja Kozarski: e-mail: maja@agrif.bg.ac.rs

Entry requirements: educational background (both bachelor's and master's degree) in food science, food technology, biotechnology, microbiology, mycology, biochemistry, agronomy or similar. Applicants must meet the minimum English language requirements.

All potential applicants should send a CV highlighting educational background. In parallel, applicants may send a short research proposal (up to 3,000 words including references) to both supervisors. Upon selection of potential candidates, they will be contacted by the supervisors for an online interview, prior to selecting one PhD candidate.