PhD position in fungal evolution.

Project title: Evolution and coevolution in the *Tremellomycetes*. New approaches based on phylogenomics.

Reference: EVOTREM PID2023-146866NB-I00

Contact: Ana Millanes (ana.millanes@urjc.es)

Abstract: The *Tremellomycetes* (*Agaricomycotina*, *Basidiomycota*, *Fungi*) are interesting fungi in several ways: 1) they have a uniquely diverse range of nutritional habits (they include, among others, human pathogens, saprotrophic yeasts, and parasites on other fungi, including lichens), but little is still known about their evolution; 2) their biodiversity and modes of speciation are still not understood; 3) fungal-associated species represent a source of chemical compounds of therapeutic interest; 4) many species are host-specific and there are interesting coevolutionary patterns yet to be investigated, and 5) little is known about the factors that influence specificity. These questions, require sound phylogenetic hypothesis both at deep and shallow levels. We will use high throughput sequencing (target enrichment sequencing) to generate a much-needed comprehensive phylogenetic hypothesis of the *Tremellomycetes* as a whole. Using phylogenomics we will explore 1): whether there are evolutionary connections between the nutritional habit, the mating system, the taxon-specific CAZYmes and proteolytic enzymes, and the genes involved in regulating the transitions between yeast and filamentous forms; 2): if parasitism, including human parasitism, appeared secondarily in the evolutionary history of the group, and in which context; 3) whether yeast growth is a derived stage due to a loss of the ability to form hyphae; 4): whether speciation in lichen-associated species is promoted by adaptations to their hosts, and 5) what these adaptations consist of.

Job conditions: The call will be opened soon at Rey Juan Carlos University, and the job will start from January 2025. The duration of the contract is 4 years. The person hired will join an international group allowing to expand their training through research stays and to establish new collaborations. PhD supervisors: Ana Millanes (Rey Juan Carlos University), Raquel Pino Bodas (Rey Juan Carlos University) and Mats Wedin (Swedish Museum of Natural History).

Requirements:

- EU citizenship or otherwise owning a residence permit in Spain.
- BSc and MSc degrees related to the project (Biology, Biodiversity, Bioinformatics, Genomics, etc.)
- Motivation letter, CV and academic record.
- Contact of two references.

Valuable skills and experience:

- Experience and/or in aspects related to mycology including field work, identification, microscopy and cultures.
- Experience in molecular laboratory.
- Programming skills and experience in bioinformatics analysis, including genome assembly and annotation and phylogenetic reconstruction.
- Good English communication skills (written and oral).
- Potential interview (in person or online).

Contact: Send a motivation letter to ana.millanes@urjc.es, before October 18th. The letter will be preferably written in English, and you are asked to attach a CV, a copy of your academic record and contacts for two references, to the email.