UPPSALA UNIVERSITET

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Evolutionary Biology Centre
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PhD position 'Evolutionary forces and genetic mechanisms underlying sexual dimorphism: insights from the fungal kingdom'

A 4-year PhD-student position is currently available at the Department of Evolutionary Biology, Uppsala University, Sweden.

Sexual dimorphism is the systematic distinction in phenotype between individuals of the two sexes in dioecious species. Males and females differ in numerous features, which is thought to be a result of natural and/or sexual selection for traits that influence the fitness of each sex. Nevertheless, we are still at the beginning of understanding the underlying genetic mechanisms and evolutionary forces driving sexual dimorphism. Emerging data from the fungal kingdom suggests that fungi present new opportunities to test hypotheses about the evolution of genetically different sexes and the related phenotypic divergence. Until now, sexual dimorphism has not been recognized in the fungal kingdom. Although male and female reproductive structures exist in fungi, phenotypic traits are generally exchangeable and reciprocal between strains of different mating types. As for most filamentous ascomycetes, the mating type in the model species Neurospora crassa is governed by two alternative alleles at a single mating-type locus. In contrast, in the congeneric species N. tetrasperma, a large (~7 Mbp, >1,500 genes) region of suppressed recombination surrounds and includes the mating-type locus. Phylogenetic analyses suggest that the suppressed recombination evolved less than 2 MYA but is associated with substantial DNA sequence divergence between the mating-type chromosomes. Recent data from our research group suggest that N. tetrasperma exhibit consequent mating-type linked transcriptional divergence. Furthermore, our data indicate that the phenotypes of strains of different mating types in N. tetrasperma are optimized for traits promoting development of male or female features. These findings illustrate a possible analogue to sexual dimorphism in the fungal kingdom.

This PhD-project aims at using large-scale genomic/transcriptomic data together with mating experiments of Neurospora to test hypotheses about the driving forces and genetic mechanisms of sexual dimorphism. The PhD student will be part of Dr. Hanna Johannesson's lab at the Evolutionary Biology Center, EBC. The Johannesson lab has a broad interest in eukaryote genome evolution. In particular, the research utilizes genomic and experimental data to infer the connection between reproductive behavior and genome evolution. The project is in collaboration with the group of Dr. Simone Immler, whose research focus lays on in particular sexual selection, the evolution of gametes and the consequences of bi-phasic eukaryotic life cycle. The project is announced in combination with a postdoc position on multilevel selection, thus here are ample opportunities to work closely with postdocs and other PhD students in the lab that focus on related projects. The research environment is international with English being the working language. See Johannesson and Immler lab web-pages for more information and recent publications (http://www.ebc.uu.se/Research/IEG/evbiol/research/Johannesson/ and http://www.ebc.uu.se/Research/IEG/evbiol/research/Immler/).

EBC constitutes an exciting arena for multidisciplinary research in evolutionary biology in a broad sense, with research programs including ecology, systematics, genetics, genomics, and developmental biology. Uppsala University is the oldest university in Scandinavia and the city of Uppsala is a vibrant student town with beautiful surroundings conveniently situated 40 minutes by train from Stockholm.

Qualifications: An MSc or possibly a BSc degree (or equivalent) in a relevant field is required. The ideal candidate is highly motivated with thorough education and strong interest in evolutionary genetics/genomics. Previous experience with large-scale genetic data analysis, bioinformatics, and microbiology techniques is advantageous. Candidates must be fluent in English.

Conditions: The PhD training comprises four years of full time research and studies. The successful candidate will receive a fellowship the first year and a PhD-student position year 2-4. The position can be combined with up to 20% of teaching assistantship, which will then prolong the position accordingly. Please contact Hanna Johannesson (Hanna.Johannesson@ebc.uu.se, +46 18 471 6662) for more information. Union representatives are Anders Grundström, Saco-rådet +46 18 471 5380 och Carin Söderhäll, TCO/ST +46 18 471 1996, Stefan Djurström, Seko +46 18 471 3315.

How to apply: The application should include 1) a letter of intent describing your research interests and motivation for PhD studies, 2) a short description of your education, 3) a CV, 4) an authorized copy of your BSc/MSc degree, 5) the names and contact information (address, email address, and phone number) of at least two reference persons, 6) relevant publications (including BSc/MSc thesis). The application must be written in English.

You are welcome to submit your application no later than February 28th 2013.
Use the link below to access the application form:
http://www.uu.se/jobb/phd-students/annonsvisning?tarContentId=228812