PhD scholarship in Applied Population Genomics

DTU Aqua

Friday 30 Aug 19

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A PhD Scholarship in applied population genomics in European flat oyster (*Ostrea edulis*) is available at the National Institute of Aquatic Resources (DTU Aqua), Denmark, with starting date November 2019. The scholarship is part of a larger Nordic collaborative project, MarGen_II, financed by the EU Interreg Öresund-Kattegat-Skagerrak Programme, the Danish Rod and Net License Funds and the National Institute of Aquatic Resources. The project will primarily be carried out at the Section for Marine Living Resources population genetics group situated in Silkeborg, Denmark. DTU Aqua is an institute at the Technical University of Denmark.

The population genetics group applies molecular methods with the aim to gain knowledge on how to preserve and manage biodiversity sustainably, in relation to recreational and commercial fisheries, biodiversity conservation and aquaculture. Knowledge is achieved through research into the evolutionary processes responsible for generating and maintaining genetic diversity within and among populations of marine and freshwater fish and shellfish.

Responsibilities and tasks

Sustainable management, harvest and production of marine fish and shellfish

resources require fundamental knowledge about the demography, distribution and connectivity of natural populations. The native European flat oyster (*Ostrea edulis*) is a sought-after food source commonly considered a luxury good. European flat oyster has received increased biodiversity conservation attention because native populations have declined due to overfishing and disease outbreaks. At the same time, the species is regarded as commercially valuable within its native range in northern Europe and has therefore attracted increased focus on development in aquaculture.

In this project, we focus on Scandinavian oyster populations that have so far received relatively limited attention. These populations are found within important environmental gradients and are close to the distributional margins of the species, which makes them interesting targets for analyses of population and, ultimately, aquaculture genomics. We have two overarching aims in the project:

1. Increase our understanding of the distribution of natural genetic diversity. We will investigate when and how European flat oyster colonized Scandinavian coastal regions as well as the relationship and connectivity between populations.
   Our approach here will be to use genome data (reduced representation or genome sequencing) from wild populations to model demographic history and investigate genetic structure, signatures of selection and connectivity among populations. We aim to link analyses to demographic and oceanographic data as well as habitat modelling.
2. Develop genetics as a practical tool for European flat oyster aquaculture and restoration programmes, for example to monitor genetic diversity in aquaculture populations, identify brood-stocks and source populations for use in restoration programmes and breeding aimed at increasing disease resistance.
   In (2) our approach will be to use a combination of population genomics data from (1) to identify source populations and new data for parentage analyses of aquaculture populations. Literature will be mined for disease resistance genes/genomic regions that can be assayed in wild/aquaculture populations.

Qualifications

Candidates should have a two-year master's degree (120 ECTS points) or a similar degree with an academic level equivalent to a two-year master's degree. A background in population genetics is preferred and experience with bioinformatic analyses of large genetic/genomic data sets is an asset.

In addition, we are looking for candidates who have:

- Master of Science (M.Sc.) degree in Biology, Computer Science or Engineering
- Strong analytical skills/interest
- Keen interest in research and the field of marine and aquatic sciences
- Good collaborative skills
- Proficiency in written and spoken English

Approval and Enrolment

The scholarship for the PhD degree is subject to academic approval, and the candidate will be enrolled in one of the general degree programmes at DTU. For information about our enrolment requirements and the general planning of the PhD study programme, please see the DTU PhD Guide.

Assessment

The assessment of the applicants will be made by Senior Researchers Jakob Hemmer-Hansen, Dorte Bekkevold and Camille Saurel, DTU Aqua.

We offer

DTU is a leading technical university globally recognized for the excellence of its research, education, innovation and scientific advice. We offer a rewarding and challenging job in an international environment. We strive for academic excellence in an environment characterized by collegial respect and academic freedom tempered by responsibility.

Salary and appointment terms

The appointment will be based on the collective agreement with the Danish Confederation of Professional Associations. The allowance will be agreed upon with the relevant union. The period of employment is 3 years.

The PhD student will be based at DTU Aqua in Silkeborg, Denmark, and will be integrated within the MarGen_II project and the population genetics group at DTU Aqua. Exchange visits to MarGen_II partners at the University of Gothenburg, Tjärnö, Sweden, and the University of Agder, Norway, are expected as well as visits for field work at the Danish Shellfish Centre, DTU Aqua, Mors, Denmark.

You can read more about career paths at DTU here.

Further information

Further information may be obtained from Senior Researcher Jakob Hemmer-Hansen, tel.: +45 93511088, email jhh@aqua.dtu.dk.

You can read more about the institute at www.aqua.dtu.dk/english.

Application

Please submit your online application no later than **1 October 2019 (local time)**. Applications must be submitted as **one PDF file** containing all materials to be given consideration. To apply, please open the link "Apply online", fill out the online application form, and attach **all your materials in English in one PDF file**. The file must include:

- A letter motivating the application (cover letter)
- Curriculum vitae
- Grade transcripts and BSc/MSc diploma
- Excel sheet with translation of grades to the Danish grading system (see guidelines and Excel spreadsheet here)

Candidates may apply prior to obtaining their master's degree but cannot begin before having received it.

Applications and enclosures received after the deadline will not be considered.

All interested candidates irrespective of age, gender, race, disability, religion or ethnic

background are encouraged to apply.

The purpose of DTU Aqua is to provide research, advice and education at the highest international level within the sustainable exploitation of living marine and freshwater resources, the biology of aquatic organisms and the dynamics of ecosystems as well as their integration in ecosystem-based management. DTU Aqua has 290 employees of whom 120 are scientific staff. The other employees are assistant biologists, laboratory technicians, IT employees, administrative staff, ship's crew, student assistants etc. The institute is organized into eight scientific sections, which carry out the research, educational and advisory activities. In addition, the institute has a number of scientific and administrative support functions, including the research vessel DANA. DTU Aqua has employees in Lyngby, Silkeborg, Nykøbing Mors and Hirtshals as well as on Dana. You can read more about DTU Aqua on www.aqua.dtu.dk.

DTU is a technical university providing internationally leading research, education, innovation and scientific advice. Our staff of 6,000 advance science and technology to create innovative solutions that meet the demands of society, and our 11,200 students are being educated to address the technological challenges of the future. DTU is an independent university collaborating globally with business, industry, government and public agencies.

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