Cross-disciplinary student projects:

Disease vectors, citizen science and DNA-methods

Background: The recent emergence in Europe of invasive mosquito species and mosquito-borne diseases has prompted intensified mosquito vector research in most European countries. Large efforts are being allocated to monitoring and surveillance activities in order to assess the current species occurrence and distribution in order to permit the early detection of invasives and the spread of disease vectors. However, entomological monitoring by traditional trapping methods can be expensive and very time- and labour-intensive. Therefore, there is increasing focus internationally on the potential of citizen science-based approaches in mosquito ecological research to expand the reach of current surveillance programs.

The project: In Denmark, we recently launched the citizen science project "Insektmobilen" (www.insektmobilen.dk), which will collect insects, here among biting mosquitoes capable of transmitting a wide range of pathogens, such as parasites, bacteria and viruses. The next round of collections will commence summer 2018. We are currently seeking master students for the fieldwork season summer 2018 and/or summer of 2019, but we are also interested in hearing from you if you are planning your BSc or PUK project.

Overall aim of student projects would be to assess the use of citizen science-based vehicle mosquito-trapping to enhance or supplement existing surveillance operations. The work will include fieldwork to collect mosquitoes with "Insektmobilen", sample sorting and molecular approaches to mosquito bulk identification and mosquito pathogen detection. After morphological identification, the bulk samples will be metabarcoded. This method involves extracting DNA, and potentially RNA, and amplifying the extracted material with universal primers and PCR. The amplified products will then be sequenced by high-throughput sequencing. Fieldwork will include evening and night sampling of insects at ~20 locations across Denmark, so driver's license would be an advantage. Knowledge of the mentioned molecular techniques is preferable but not a prerequisite.

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