

Master thesis project:



## Avipoxviruses in Norwegian ecosystems – blood sucking insects as vectors

### Background:

*Avipoxvirus* is a genus in the *Poxviridae* family of viruses, infecting birds. It can produce proliferative nodules on the beak and legs of birds, and give loss of feathers and be fatal, especially during winter. We have previously diagnosed avipoxvirus infections in some birds in Norway (Figure 1 A and B). Transmission of virus between birds may be through direct and indirect contact, but also with mosquitos as biological vectors (Figure 1 C). In spite of the fact that clinical cases are reported every year, nothing is known about the presence or prevalence of avipoxviruses in Norwegian ecosystems. These infections in birds, and the presence of avipoxviruses in Norwegian ecosystems, have been actualized recently, since avipoxviruses now are used as live recombinant vectors in vaccines for many animal species and against a variety of diseases. In Norway, such vaccines are licensed for use in horses against influenza virus. What will happen if live avipoxvirus from vaccines meet wildlife – birds and potential vectors? Will they infect birds? Can they be spread by mosquitos? The first step towards answers is to check the presence and prevalence of avipoxviruses in the ecosystems.

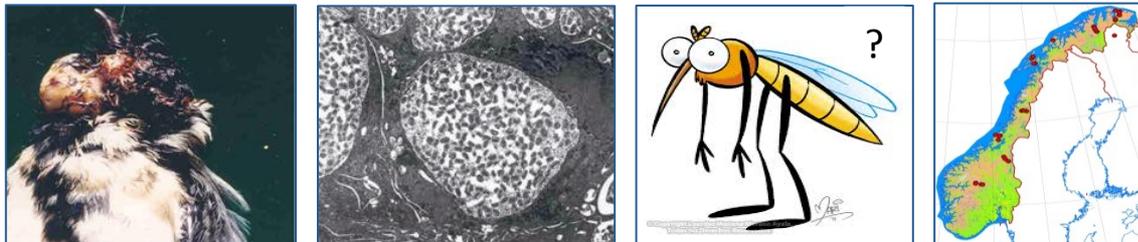


Figure 1: A: Great tit (Norw.: kjøttmeis) with avipoxvirus infection on the beak. B: Avipoxvirus particles in inclusion bodies in cells of a bird (electron microscopy). C: Potential vector! D: Collection of blood sucking insects (2013-15).

### How do we get mosquitos?

As part of our ongoing project on climate and reindeer diseases, CARD ([http://uit.no/prosjekter/prosjekt?p\\_document\\_id=367208](http://uit.no/prosjekter/prosjekt?p_document_id=367208)) we are collecting blood sucking insects, mainly mosquitos and midges, from eight reindeer pastures from Tana in Finnmark to Valdres in Oppland (Figure 1 D). The species of the collected insects (2013-2015) will be determined by an entomologist before investigation.

### What will you be doing?

As a master student, you will be in charge of the screening of insects for avipoxviruses. In the laboratory, you will extract DNA and RNA, and design a PCR with primers that can detect avipoxviruses in general. PCR amplicons will be sequenced, and you will compare viral DNA sequences with previously published avipoxvirus sequences (GenBank). You will also do phylogeny and search for epidemiological patterns, indicating which variants of the virus are circulating in which vector species and geographical region. In addition to relevant courses, you will write your master thesis, and the results will later be published in a scientific journal. You will have a supervisor team of 2-3 scientists.

### What do I do to get started?

Contact main supervisor for the project: Morten Tryland ([morten.tryland@uit.no](mailto:morten.tryland@uit.no)).