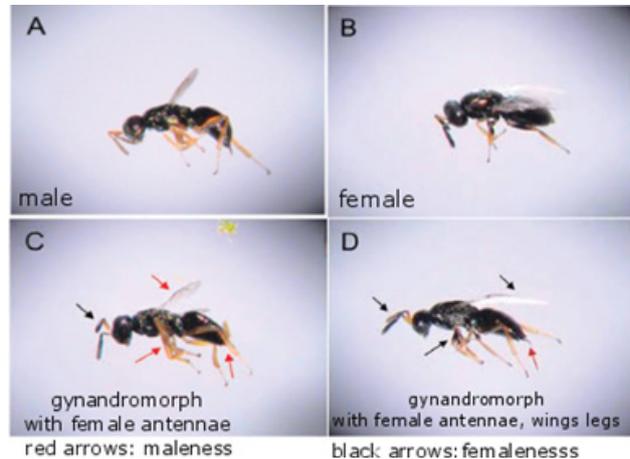


The genetic basis of gynandromorph production in the parasitic wasp *Nasonia vitripennis*

Supervision by: Yuan Zou

Contact: y.zou@rug.nl, room 5172.0664; language: English

The parasitic wasp *Nasonia vitripennis* has haplodiploid sex determination. Males are haploid and develop from unfertilized eggs, whereas females are diploid and develop from fertilized eggs. Adult males and females can be distinguished on the basis of their morphological differences. Sometimes, so called 'gynandromorphs' that display both male and female characteristics develop from unfertilized eggs. The occurrence and extent of gynandromorphy is temperature dependent and sometimes complete haploid females develop. Previous studies have revealed that both nuclear and cytoplasmic (likely mitochondrial, small RNA) components are involved in gynandromorphism. Genetic analysis revealed a major effect locus, termed "*gyn*" on chromosome IV close to the sex-determining doublesex (*dsx*) gene. We performed whole genome Illumina sequencing on a *N. vitripennis* strain artificially selected for a high incidence of gynandromorphism (HiCD12). We also established two introgression lines, 1) we introgressed the HiCD12 genome into a non-gynandromorphic (AsymCX) background for several generations, while selecting only gynandromorph producing females to generate the next generation. Conversely, 2) we introgressed the AsymCX genome into the HiCD12 genome, while continuously selecting for absence of gynandromorphy. We expect that these two lines will show the largest genetic differences around the *gyn* locus. In this project, we will do comparative analysis of the HiCD12 and Asymcx genomes to develop insertion-deletion polymorphisms (Indel) markers on chromosome IV. Indel genotyping experiments will then be performed on the two introgression lines to characterize the candidate *gyn* region. If successful, candidate gene expression in this region will be analysed and functional analysis will be performed by RNA interference (RNAi).



Methods & keywords: gynandromorph; sex determination genes; genome data analysis; transcriptome; genotyping; RNA interference

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