Role of transposable elements in a parasitoid wasp ongoing speciation

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Abstract

Endoparasitoid wasps lay their eggs and develop at larval stages inside a specific host. Recent studies have shown that parasitoid wasp species often constitute a complex of sister species, each one resulting from the adaptation to a specific host. The project aims to understand the involvement of transposable elements (TEs) in the ongoing speciation of two populations of the wasp *Cotesia congregata* (CcC and MsT) specialized on different hosts. The CcC population parasitizes the caterpillar *Ceratomia catalpa* which lives on the catalpa tree, and MsT population parasitizes the caterpillar *Manduca sexta* which lives on the tobacco plant. Differences in reproductive behavior and genetic differentiation (microsatellites and COI) indicate these two populations are indeed at the beginning of a speciation process. A reproductive defect is observed which could contribute to reinforcing barriers between the two populations. The cross between CcC female and MsT male gives a fertile offspring while the reciprocal cross (MsT female X CcC male) gives a nearly sterile offspring showing ovaries atrophy. We hypothesize that this phenotype corresponds to hybrid dysgenesis previously described in *Drosophila*, which would be induced by a transposable element present in CcC and not in MsT wasps or more global deregulation of TE control. Here, we present results identifying TE candidates potentially involved in dysgenesis by TE comparison from CcC and MsT and the study of the piRNA repression system in somatic and germinal tissues targeting these TEs in both populations using bioinformatic analyses. Among TE candidates are those showing piRNA repression in CcC and not in MsT.

Keywords: hybrid dysgenesis, piRNA, parasitoid wasp, bioinformatics

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