Diamondback moth host-parasite interaction unraveled

September 9 2011

The diamondback moth, *Plutella xylostella*, is one of the world's most destructive crop pests. It has developed resistance to many chemical and biological pesticides, and the estimated global cost of controlling this insect is approximately US$1billion annually.

In a new article published in the open access journal BMC Genomics, researchers from Australia have identified the genes expressed when the diamondback moth is attacked by a parasitic wasp, which could have significant implications for controlling this notorious pest. Asgari and colleagues, from the University of Queensland, use transcriptome profiling to provide the first-ever comprehensive analysis of the impact of a parasitoid wasp on its host. The transcriptomic profiling datasets obtained in this study – a powerful approach with which to study parasitization – provide a basis for further research in this underexplored host-parasitoid interaction.

Diadegma semiclausum, the parasitic wasp, attacks *P. xylostella* by injecting its eggs into the moth larvae. The wasps then manipulate the hosts' physiology in favour of their developing larvae by introducing secretions that contain symbiotic viruses, such as polydnavirus (PDV), into the host. PDVs suppress the hosts' immune system and stall metabolism and development. Research so far has concentrated mainly on individual genes of PDV, in order to explore their function following parasitization, but never before has so comprehensive a profiling study been conducted.

Asgari and his team used an RNA deep sequencing technique called Illumina to identify the symbiotic PDV *D. semiclausum* ichnovirus (DsIV) genes expressed in the host and compared their sequences with other reported PDVs. Their novel study provides detailed information on the differential expression of *P. xylostella* larval genes following parasitization, as well as on the DsIV genes expressed in the host. The genes identified here may be targets that allow for the control and manipulation of host-parasite interactions.

Dr Asgari said, "This emphasizes the necessity for the continued development of innovative alternative control measures and resistance management strategies. Parasitoid regulatory molecules can be used to improve pest control strategies in sustainable agriculture."

Provided by BioMed Central

Citation: Diamondback moth host-parasite interaction unraveled (2011, September 9) retrieved 19 April 2024 from https://phys.org/news/2011-09-diamondback-moth-host-parasite-interaction-unraveled.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.