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Transcriptome divergence between different species of the *Bemisia tabaci* species complex

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Invasive species are ideal model systems for examining the evolutionary processes associated with their specific characteristics by comparison with closely related species. We sequenced the transcriptome of three whitefly species, MEAM1, MED and Asia II 3, of the *Bemisia tabaci* complex and compared their genetic divergences. Protein family comparisons revealed obvious diversification among the transcriptomes of these species suggesting species-specific adaptations during whitefly evolution. On the contrary, substantial conservation of the whitefly transcriptomes was also evident, despite their differences in many aspects of biology. The overall divergence of coding sequences between the orthologous gene pairs of Asia II 3 and MEAM1, Asia II 3 and MED, MEAM1 and MED transcriptomes is 1.73%, 1.84% and 0.83%, respectively. This is consistent with the previous phylogenetic analyses and crossing experiments. We also identified hundreds of highly diverged genes and found the most divergent gene classes are Cytochrome P450, Glutathione metabolism and Oxidative phosphorylation. Based on the ratio of nonsynonymous and synonymous substitutions, we identified a number of sequences that have evolved in response to positive selection. Many of those genes are predicted to be involved in metabolism and insecticide resistance. These results strongly suggest that the divergence of genes involved metabolism and insecticide resistance might be the driving force of MEAM1, MED and Asia II 3 differentiation. The extensive comparisons of Asia II 3, MEAM1 and MED transcriptomes will serve as an invaluable resource for revealing the genetic basis of whitefly invasion and the molecular mechanisms underlying their biological differences.

Biography

Xiao-Wei Wang has completed his Ph.D. from National University of Singapore and postdoctoral studies from Harvard University. Currently, he is a Principal Investigator at Institute of Insect Science, Zhejiang University. He has published more than 25 papers in reputed journals.