

Host Translation Inhibitory Factor in Polydnavirus of A Parasititic Wasp, *Campoletis sonorensis*

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The wasp, *Campoletis sonorensis*, parasitizes the larvae of *Heliothis virescens* and inhibits the synthesis of host proteins related with host growth and immunity. It has been strongly suggested that the inhibition of the host gene expression during the wasp parasitization is at a posttranscriptional level. This study is to verify the identity of host translation inhibitory factor (HTIF) caused by the wasp parasitization. To identify HTIF, the proteins in the parasitized host were fractionated using different protein purification methods, and each fraction was bioassayed in its HTIF activity. In the course of protein purification steps, HTIF activity was highly correlated with the fractions containing VHv1.4 protein, which is a cysteine-motif protein encoded in the wasp polydnavirus, *C. sonorensis* Ichnovirus (CsIV). Purified VHv1.4 protein using immunoaffinity column had a significant HTIF activity, while the heat-inactivated VHv1.4 lost the activity. Both recombinant VHv1.4 protein and another CsIV cys-motif protein, VHv1.1 protein, were synthesized and purified in Sf9 cells through recombinant baculovirus vectors, and showed significant HTIF activities in nanomolar range, where VHv1.4 protein showed about four times higher HTIF activity than did VHv1.1 protein. The HTIF effect of two cys-motif proteins was proved to be caused by their direct action on the translation machinery based on the rabbit reticulocyte assay showing that both VHv1.4 and VHv1.1 proteins significantly inhibited *in vitro* translation of the fat body RNA extracts from the fifth instar larvae of *H. virescens*. HTIF activities of both cys-motif proteins varied among RNA sources from different culture cells and tissues. In addition, both cys-motif proteins could also specifically inhibit the translation of arylphorin, one of the HTIF target genes. These results indicate that both cys-motif proteins of VHv1.4 and VHv1.1 play a role as HTIF in *C. sonorensis* parasitization.