Two Homologous Parasitism-specific Proteins Encoded in *Cotesia plutellae* Bracovirus (CpBV) and Their Expression Profile in *Plutella xylostella*

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A wasp, *Cotesia plutellae*, parasitizes diamondback moth, *Plutella xylostella*, and alter host physiology for wasp survival and development. To identify parasitism- specific factors is required for understanding host-parasitoid relationship. This study found ≈15 kDa protein specific to the plasma of parasitized *P. xylostella*. Degenerate primers were designed after the N-terminal amino acid sequence of the parasitism- specific protein (PSP15) and used to clone the corresponding gene from the parasitized *P. xylostella* by a nested reverse transcriptase-polymerase chain reaction (RT-PCR). The cDNA of PSP15α was cloned as 607 bp, of which open reading frame (ORF) encoded 158 amino acid residues with a signal peptide (21 N-terminal residues). During cloning PSP15α, another high homologous gene was cloned as PSP15β, which exhibited the same size of open reding frame and identical N and C terminal sequences with PSP15α.

Both genes were located in segment "M" of *C. plutellae* bracovirus genome. Real time quantitative RT-PCR (qRT-PCR) indicated lateexpression of both PSP15 genes after parasitization, where a common major peak was at 7-8 days after parasitization. Both PSP15α and β were expressed in bacterial expression system and purified as ≈20 kDa recombinant proteins, which were used for raising polyclonal antibody. An immunoassay supports the qRT-PCR data of the PSP15 expression. The recombinant PSP15α and β proteins could enter hemocytes of non-parasitized *P. xylostella*.

Amino acid sequences of PSP15α and PSP15β were homologous to malaria circumsporozoite protein, known to inhibit host protein synthesis. They also shared sequence homologies with eukaryotic translation initiation factors, eIF4F and eIF5. We put PSP15α ORF into *Autographa californica* multi-nucleocapsid nuclear polyhedrovirus (AcMNPV), and a resulting recombinant exhibited more potent pathogenicity than control AcMNPV.

Key words: Parasitism, *Cotesia plutellae*, *Plutella xylostella*, Polydnavirus, parasitism-specific proteins, Circumsporozoite protein, Eukaryotic translate initiation factors