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The Differential Effects of Rel Proteins from the Silkworm, *Bombyx mori* and the Beetle, *Allomyrina dichotoma* on the Activation of Antibacterial Peptide Genes

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Rel/NFkappaB family proteins are known as transcriptional factors that bind to the kappaB like motif and activate immune genes in *Drosophila*. A kappaB like motif is also located in the 5'-upstream regions of *Bombyx mori* antibacterial peptide genes, suggesting an important role in gene activation. Electrophoresis mobility shift assay revealed that factors which bind to the kappaB like motif of *B. mori* antibacterial peptide gene exist in the nuclear extract of fat bodies excised from *B. mori* larvae injected with lipopolisaccharide. Two full length cDNAs, BmRelA and BmRelB, which encode Rel homology domain were cloned as candidates of binding factors. BmRelB cDNA had the same nucleotide sequence as BmRelA except for a 239bp nucleotides deletion, which included an estimated translation start codon of BmRelA. The BmRelB protein has a shorter N-terminal region than the BmRelA protein. Interestingly, both BmRelA and BmRelB had a leucine zipper motif, which is not present in the C-terminal region of *Drosophila* Rel family proteins. Transient luciferase assay indicated that the attacin gene is strongly activated by BmRelB, but very weakly by BmRelA. On the other hand, lebocin 4 gene is activated more strongly by BmRelA than BmRelB. Immune gene activation by these factors was kappaB like motif dependent. The results suggest that BmRels differentially activate antibacterial peptide genes through a kappaB like motif. Interestingly, other insect, *Allomyrina dichotoma*, was also found to possess two Rel proteins, whose N terminal region is different. Only one of these proteins showed to enhance coreoptericin A gene expression. These results suggest that the differential transcriptional activation mechanism by Rel proteins is common feature in insects.