

Transferrin in a Beetle (*Apriona germari*): Molecular Cloning, Characterization, and Up-regulation on Temperature Stress

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In a search to identify gene involved in the beetle self-defense responses, we cloned a novel transferrin gene, AgTf, from the mulberry longicorn beetle, *Apriona germari*, which is firstly characterized in coleopteran insect. This gene encodes a 722 amino acid polypeptide with a predicted molecular mass of 79780Da and pI of 8.09. Like known cockroach and termite transferrins, AgTf appears to have residues comprising iron-binding sites in both N- and C-terminal lobes. Northern blot analysis revealed that the AgTf mRNA expression was detected in both fat body and epidermis, although the AgTf expression in the epidermis was relatively less than in the fat body, and no expression was found in the midgut. Expression of AgTf mRNA in both fat body and epidermis of *A. germari* larva was up-regulated by either iron overload or bacterial challenge with intrahemocelic injection. Interestingly, the expression level of AgTf mRNA in both fat body and epidermis was up-regulated when *A. germari* larvae was exposed at low (4°C) and high (37°C) temperatures, suggesting that the AgTf seems to play a self-defense role against temperature shock.