Characterization of the Cyclin-Dependent Kinase 6 Gene in *Apis cerana cerana* in Response to Multiple Environmental Stresses

Lu Luo[a], Mingjiang Kang[b], Kai Liu[a], Xingqi Guo[a,*], and Baohua Xu[b,*]

[a] State Key Laboratory of Crop Biology, College of Life Sciences, Shandong Agricultural University, Taian, Shandong, 271018, P. R. China. Fax: +86 538 8226399. E-mail: xqguo@sdau.edu.cn

[b] College of Animal Science and Technology, Shandong Agricultural University, Taian, Shandong, 271018, P. R. China. Fax: +86 538 8241419. E-mail: bhxu@sdau.edu.cn

* Authors for correspondence and reprint requests

Z. Naturforsch. **67 c**, 342–352 (2012); received May 22, 2011/February 3, 2012

Cyclin-dependent kinases (CDKs) are serine/threonine kinases that play critical roles in the cell cycle regulation. Herein, we describe the identification of a CDK gene from *Apis cerana cerana*, named *AccCDK6*. The full-length cDNA is 1,778 bp long, including an ORF of 1,380 bp that encodes a polypeptide of 459 amino acid residues. Multiple sequence alignment analysis showed that the predicted AccCDK6 sequence shares a high similarity with CDK6 genes of other species, and this protein may share an evolutionary predecessor with *Drosophila* CDK4. The expression patterns of the gene were also analysed, and the transcript was detected throughout the larval, pupal, and adult developmental stages. Furthermore, the expression level of the mRNA of the gene in adult workers was influenced by H_2O_2, ultraviolet (UV) light, temperature (42 °C), $HgCl_2$, and pyriproxyfen. These results indicate that *AccCDK6* responds to multiple environmental stresses and may also participate in intracellular reactions of reactive oxygen species (ROS) and development processes in honey-bees.

Key words: Cyclin-Dependent Kinase 6, *Apis cerana cerana*, Cloning, Semi-Quantitative RT-PCR