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Molecular characterization of the gene checkpoint homolog 1 in *Daphnia carinata* during different reproductive phases

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ABSTRACT. Full-length cDNA of the gene checkpoint homolog 1 (*Chk1*) was cloned from *Daphnia carinata* and designated *DcarChk1*. *DcarChk1* cDNA was 1817 bp in length and encoded a 497-amino acid polypeptide. Phylogenetic analyses revealed that *DcarChk1* was most closely related to *Chk1* of *Daphnia pulex*, followed by homologous genes of insects. Expression of *DcarChk1* was higher in adult *Daphnia* than in larvae, and significantly higher in males than females, as determined by real-time polymerase chain reaction analysis. Using whole-mount *in situ* hybridization techniques, *DcarChk1* in parthenogenetic females was found to be expressed mainly on the head surface, capillus, and carapace valve edge. In contrast, in sexual females, *DcarChk1* was expressed mainly in the joint of the second antenna, and in the thoracic limbs and capillus. These results suggest that *DcarChk1* plays a significant role in both the growth and development, as well as in regulating reproductive plasticity, in *D. carinata*.

Key words: *Daphnia carinata*; Cloning; Expression; Whole-mount *in situ* hybridization; Checkpoint homolog 1

