

Cloning and Characterization of a cDNA Encoding Type 1 Diacylglycerol Acyltransferase from Sunflower (*Helianthus annuus* L.)

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Z. Naturforsch. **66c**, 63–72 (2011); received April 9/August 15, 2010

A full-length cDNA encoding a putative diacylglycerol acyltransferase (DGAT; EC 2.3.1.20) was obtained from sunflower (*Helianthus annuus* L.) seeds. The 1524-bp open reading frame of this cDNA, designated as *HaDGAT1*, encodes a protein of 507 amino acids with a molecular mass of 58.5 kDa showing high homology to DGAT1 enzymes of other plants. The protein characters, such as a predicted structure with a long *N*-terminal hydrophilic domain followed by 9 transmembrane domains, acyl-CoA-binding signature, diacylglycerol (DAG)-binding and putative endoplasmic reticulum retrieval motifs (ER-DIR), also indicated that *HaDGAT* belongs to the DGAT1 family. *HaDGAT1* is expressed in all plant tissues especially in developing seeds. Expression of recombinant *HaDGAT1* in yeast showed an 1.76-fold increase of total fatty acids, especially unsaturated fatty acids such as palmitoleic acid (enhanced by 86.6%) and oleic acid (enhanced by 81.6%).

Key words: *Helianthus annuus* L., Diacylglycerol Acyltransferase, Overexpression