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学 位 論 文 内 容 の 要 旨

博士の専攻分野の名称 博士 生命科学 氏 名 ブンジン パットウィラー

学 位 論 文 題 名

The characterization of a heat-activated retrotransposon *ONSEN* and the effect of zebularine in adzuki bean and soybean

「アズキとダイズにおける高温活性型レトロトランスポゾン *ONSEN* の特徴とゼブラリンの効果について」

The *Ty1/copia*-like retrotransposon *ONSEN* is conserved among *Brassica* species, as well as in beans, including adzuki bean (*Vigna angularis* (Willd.) Ohwi & Ohashi) and soybean (*Glycine max* (L.) Merr.), which are the economically important crops in Japan. *ONSEN* has acquired a heat-responsive element that is recognized by plant-derived heat stress defense factors, resulting in transcribing and producing the full-length extrachromosomal DNA under conditions with elevated temperatures. DNA methylation plays an important role in regulating the activation of transposons in plants. Therefore, chemical inhibition of DNA methyltransferases has been utilized to study the effect of DNA methylation on transposon activation. To understand the effect of DNA methylation on *ONSEN* activation, *Arabidopsis thaliana*, adzuki bean, and soybean plants were treated with zebularine, which is known to be an effective chemical demethylation agent. The results showed that *ONSEN* transcription levels were upregulated in zebularine-treated plants. Extrachromosomal DNA of *ONSEN* was also accumulated in the treated plants. However, it depends on many factors such as the concentration of zebularine, the cultivation area, or the kind of plant tissue. Another factor which might involve in *ONSEN* transcription and transposition was chromosomal location. In soybean, most of the *ONSEN* copies were located in pericentromeric regions which is chromatin repressive regions.