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## Inactivation of $\alpha$ -Amylases from *Thermoactinomyces vulgaris* R-47, TVA I and TVA II, by $\omega$ -Epoxyalkyl $\alpha$ -D-Glucopyranoside

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We found here that  $\omega$ -epoxyalkyl  $\alpha$ -D-glucopyranosides consisting of three, four and five alkyl carbons ( $\alpha$ -E3G,  $\alpha$ -E4G and  $\alpha$ -E5G, respectively), which are known to be affinity-labeling reagents of  $\beta$ -amylase, had the effect of inactivating two pullulan-hydrolyzing  $\alpha$ -amylases from *Thermoactinomyces vulgaris* R-47, TVA I and TVA II, at high concentration (*ca.* 0.1-1.5 M). The inactivation exhibited saturation kinetics of a two-step mechanism, and an inactivation rate constant,  $k$ , and equilibrium dissociation constant,  $K_R$ , of  $\alpha$ -E5G were calculated. The  $k/K_R$  values of  $\alpha$ -E5G for TVA I and TVA II were  $13.1 \times 10^{-4}$  and  $6.41 \times 10^{-4} \text{ M}^{-1} \cdot \text{S}^{-1}$  respectively. In terms of the power of inactivation, the orders for TVA I and TVA II were  $\alpha$ -E5G >  $\alpha$ -E3G  $\approx$   $\alpha$ -E4G, and  $\alpha$ -E5G >  $\alpha$ -E3G >  $\alpha$ -E4G, respectively. The findings indicated that the relation between the lengths of the alkyl carbons and the inactivation of TVA I and TVA II differs from that for  $\beta$ -amylase and isomaltodextranase.

**Key words:**  $\alpha$ -amylase,  $\omega$ -epoxyalkyl  $\alpha$ -D-glucopyranoside, affinity labeling, *Thermoactinomyces vulgaris*

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