P21: STRUCTURE-ACTIVITY RELATIONSHIPS OF *TRANS*-CINNAMIC ACID DERIVATIVES ON α-GLUCOSIDASE INHIBITION

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ABSTRACT

Trans-Cinnamic acid and its derivatives were investigated for the α-glucosidase inhibitiory activity. 4-Methoxy-*trans*-cinnamic acid and 4-methoxy-*trans*-cinnamic acid ethyl ester exerted the highest potent inhibitory activity among those of *trans*-cinnamic acid derivatives (IC_{50} = 0.04 ± 0.01 mM, 0.05 ± 0.03, respectively). The presence of hydroxy or methoxy group at 4-position on *trans*-cinnamic acid moiety is necessary to enhance α-glucosidase inhibitory activity. However, compounds having larger alkoxy substituent were found to have little effect on α-glucosidase inhibition (IC_{50} > 5 mM). The mode of inhibition of 4-methoxy-*trans*-cinnamic acid on α-glucosidase activity was non-competitive with K_i value of 0.06 ± 0.01 mM. In contrast, 4-methoxy-*trans*-cinnamic acid ethyl ester was a competitive inhibitor with K_i value of 0.02 ± 0.01 mM. Furthermore, 4-methoxy-*trans*-cinnamic acid also inhibit sucrase and maltase, α-glucosidase enzymes derived from rat intestine, with IC_{50} of 10.9 ± 0.75 mM and 8.75 ± 0.80 mM, respectively. These results indicated that *trans*-cinnamic acid derivatives should be further evaluated as a new group of potent α-glucosidase inhibitors for the treatment of various diseases, including diabetes, anti-viral infection, and AIDS.

Key words: cinnamic acid, α-glucosidase inhibition, structure-activity relationships