

Effects of 6'-O-caffeoylarbutin on the activity and conformations of mushroom tyrosinase

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Abstract: Based on a well understanding of the strongly anti-melanin activity of 6'-O-Caffeoylarbutin (CA), high performance liquid chromatography (HPLC) was performed initially to determinate the inhibitory effects of CA against the oxidation of diphenolase substrate L-dihydroxyphenylalanine (L-DOPA) catalyzed by mushroom tyrosinase (mTyr), then the inhibition of CA on the mTyr were assayed. CA exhibited potently inhibitory effects both monophenolase activity with an IC₅₀ value of $1.114 \pm 0.035 \mu\text{M}$ and diphenolase activity with $95.198 \pm 1.117 \mu\text{M}$, respectively. Conformations changes of enzyme were further studied by ultraviolet-visible (UV-vis), fluorescence, and computational stimulation, results indicated that CA could be used as an inhibitor by inhibiting the release of the oxidation products and the access of L-DOPA. These results will be contributed to design and screen for mTyr inhibitors from the most abundant naturally occurring arbutin derivatives.

Keywords: 6'-O-Caffeoylarbutin, mushroom tyrosinase inhibition, diphenolase inhibitory effect, molecular docking