Anti-Amyloid β Aggregation Effects of Gobaishi (*Galla Chinensis*) and Its Active Constituents

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Abstract

The beta-amyloid (Aβ) aggregation, along with oxidative stress-inducing neurocellular apoptosis in the brain, has been considered one of the primary causes of Alzheimer's disease (AD), characterized by memory loss and changes in mental and behavioral functions in elderly individuals. Gobaishi (*Galla Chinensis*), a traditional herbal medicine has garnered considerable attention for its constituents and their potent therapeutic properties, especially for strong inhibitory activity against Aβ fibril formation. In this study, we investigated the anti-Aβ aggregation effects of Gobaishi and its active constituents. We isolated two compounds by employing Thioflavin T (ThT) assay guided fractionation, which were identified through various spectroscopic methods as 1,2,3,4,6-penta-O-galloyl-β-D-glucose (PGG) and methyl gallate (MG). The evaluatoion of anti-Aβ aggregation effects of them revealed that PGG and MG contributes only 1.5% and 0.7% of the activity of Gobaishi, respectively. In addtion, PGG demonstrated significant stronger DPPH radical scavenging activity (EC_{50}=13.6 μM) compared to MG (EC_{50}=173 μM). Based on these findings, both Gobaishi and its active compound PGG are proposed as promising candidates for further exploration as potent anti-amyloidogenic agent in AD management. Consequently, we plan to continue our investigation to identify additional active compounds within Gobaishi to further substantiate its therapeutic potential in the management of AD.

Keywords

1,2,3,4,6-penta-O-galloyl-β-D-glucose, Alzheimer's disease, beta-amyloid (Aβ) protein, methyl gallate, antioxidant.