Structure-activity relationships of five myricetin galloylglycosides from leaves of Acacia confusa

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Abstract

Five structure-related myricetin galloylglycosides isolated from leaves of Acacia confusa were previously reported (Lee et al., 2000, J. Nat. Prod., 63, 710-712). However, the structure-activity relationships were not reported. In this research, the 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity, and inhibitory activities against semicarbazide-sensitive amine oxidase (SSAO) and angiotensin converting enzyme (ACE) were compared among five compounds, namely, myricetin 3-O-(3"-O-galloyl)-α-rhamnopyranoside 7-methyl ether (compound 1, 630 Da), myricetin 3-O-(2"-O-galloyl)-α-rhamnopyranoside 7-methyl ether (compound 2, 630 Da), myricetin 3-O-(2"-O-galloyl)-α-rhamnopyranoside (compound 3, 616 Da), myricetin 3-O-(3"-O-galloyl)-α-rhamnopyranoside (compound 4, 616 Da), myricetin 3-O-(2", 3"-di-O-galloyl)-α-rhamnopyranoside (compound 5, 768 Da). For DPPH scavenging activity, the IC50 for five compounds was 591, 1522, 3210, 1389, and 867 μM, respectively. For SSAO inhibitory activity, the IC50 for five compounds was 36.16, 93.20, 119.50, 88.20, and 39.35 μM, respectively. The IC50 of positive control of semicarbazide was 34.21 μM. The five compounds have the same orders of compound 1> compound 5> compound 4> compound 2> compound 3 for DPPH scavenging activity and SSAO inhibitiony. It was found that gallic acid in the R3 position was the key role for both biological activities. For ACE inhibitory activity, compound 1, compound 2, and compound 5 showed dose-dependent inhibitory modes and the IC50 was 60.32, 151.90, and 19.82 μM, respectively