香楠成份及其相關活性之探討

The constituents and their related activities from Machilus zuihoensis

中文摘要

香楠（Machilus zuihoensis Hayata）爲樟科（Lauraceae）楠屬（Machilus）之常綠中喬木，是臺灣特有種植物，廣泛地分佈於全島低中海拔山區。於初篩試驗中，香楠葉的乙醇萃取物顯示具有顯著清除 DPPH 自由基能力（IC50 = 7.9 μg/mL），因此本實驗的目的是希望從香楠葉中分離出具有相關活性的成分。目前從香楠葉中分離一個新的化合物，屬於 biflavonol glycoside 結構的 quercetin-3-O-β-D-glucopyranoside-(4''→ O-3"'')-quercetin-3-O-β-D-glucopyranoside (9)，以及八個已知化合物分別爲屬於 flavonols 結構的化合物 quercetin (1)、hyperoside (2)、quercitrin (3)和 afzelin (4)；屬於 phenyl derivative 結構的化合物 4-hydroxybenzaldehyde (5)；和屬於 caffeoyl derivatives 結構的化合物 ethyl caffeate (6)、ethyl 3-O-caffeoylquinate (7)和 clorogenic acid methyl ester (8)。在抗氧化活性分析中，和正對照組 [(+)-catechin, IC50 = 41.6 μM] 相較下，我們發現 quercetin-3-O-β-D-glucopyranoside-(4''→ O-3"'')-quercetin-3-O-β-D-glucopyranoside (9) 顯示清除 superoxide anion radical (O2-˙)的效果爲最佳，其 IC50 爲 30.4 μM。在抗發炎活性分析中，以 quercetin 及 ethyl caffeate 顯示對於 RAW264.7 巨噬細胞具有明顯的抑制 nitric oxide 產生，IC50 分別爲 27.6 及 42.9 μM。針對 ethyl caffeate，其可能透過抑制 NF-?辣的訊息傳遞路徑，進而降低 iNOS、IL-1β 及 IL-10 的 mRNA 表現。而在針對六種不同的腫瘤細胞株 NCI-H838、MCF-7、HCT-116、MES-SA、MKN-45 及 HL-60 的毒性分析中，以 quercetin 對於 NCI-H838 細胞毒性效果爲佳，IC50 爲 83 μM；另外 ethyl caffeate 對於 NCI-H838、MCF-7、HCT-116、MES-SA 腫瘤細胞毒殺性效果爲佳，IC50 分別爲 79、90、81 及 76 μM。

英文摘要

Machilus zuihoensis Hayata (Lauraceae) is an endemic species in Taiwan. It was found widely throughout the island and from the low lands up to an altitude of 1500 m. In our screening test, the 95% EtOH extract of the leaves of M. zuihoensis shows the free-radical scavenging activity against DPPH radical (IC50 = 7.9 μg/mL). Therefore, the related bioactive constituents from the leaves of M. zuihoensis were isolated in the present study. A new biflavonol glycoside, quercetin-3-O-β-D-glucopyranoside- (4''→ O-3"'')-quercetin-3-O-β-D-glucopyranoside (9), together with 8 known compounds including four flavonols, quercetin (1), hyperoside (2), quercitrin (3), and afzelin (4); one phenyl derivative, 4-hydroxybenzaldehyde (5); as well as three caffeoyl derivatives, ethyl caffeate (6), ethyl 3-O-caffeoylquinate (7), and clorogenic acid methyl ester (8) were isolated from the leaves of M. zuihoensis. In superoxide anion radical scavenging activity, compared with positive control

[(+)-catechin, IC50 = 41.6 μM], we found the isolated new compound 9 showed the significant scavenging activity (IC50 = 30.4 μM). In anti-inflammatory activity, quercetin and ethyl caffeate were found to markedly suppress the lipopolysaccharide (LPS)-induced nitric oxide (NO) production (IC50 = 27.6, and 42.9 μM) in RAW264.7 macrophages. Additionally, we found ethyl caffeate maybe via suppressed NF-?辣 pathway to down regulated mRNA expressions of inducible nitric oxide synthase (iNOS), IL-1β, and IL-10 production in RAW264.7 macrophages. In anti-tumor activity, quercetin (IC50 = 83, >100, >100, and 99 μM) and ethyl caffeate (IC50 = 79, 90, 81, and 76 μM) showed cytotoxic activities against NCI-H838, MCF-7, HCT-116, and MES-SA cancer cell lines in vitro.