Abstract

"Phytochemical and Biological Studies of Some Plants Belonging to Family Fabaceae growing in Egypt"

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Fractionation and chemical investigation of *Colvillea racemosa* stems led to identification of two new *α, β*-dihydroxydihydrochalcones, colveol A (**C4**) and colveol B (**C5**) along with fifteen known compounds that were isolated for the first time from the genus *Colvillea* and identified as lantibeside C (**C1**), lantibeside (**C2**), vicenin-2 (**C3**), vitexin (**C6**), isovitexin (**C7**), *R*-liquiritigenin (**C8**), *R*,*R*-aromadendrin (**C9**), 2*S*-7,3´,5´-trihydroxyflavanone (**C10**), fisetin (**C11**), genkwanin (**C12**), *S*-naringenin (**C13**), kaempferol (**C14**), isoliquiritigenin (**C15**), lup-20(29)-ene (**C16**), and lupeol (**C17**), while chemical investigation of *Brownea ariza* leaves led to the isolation of one new fatty acid ester, *(E)* 3´,7´,9´,10´-tetramethylundec-2´-enylpalmitate (**B1**) together with nine known compounds that were isolated for the first time from the genus *Brownea* and they were identified as *β*-hydroxypropiovanillin (**B2**), (-)- syringaresinol (**B3**), (+)-lariciresinol (**B4**), (3*R*, 5*R*, 6*S*, 7*E*)-3,5,6-trihydroxy-7-megastigmen-9-one (**B5**), (3*S*,5*S*,6*S*,7*E*,9*R*)-3,5,6,9-tetrahydroxy-7-megastigmene (**B6**), apigenin-8-*C*-*β*-L-rhamnopyranose (**B7**), kaempferol-3-*O*-*α*-L-rhamnopyranose (**B8**), isovitexin (**B9**), and vitexin (**B10**). The isolated compounds were evaluated for their inhibition activity toward recombinant human monoamine oxidases (rhMAO-A and -B). Compound **C4** demonstrated preferential inhibition against hMAO-A isoenzyme (IC_{50} 0.62 μM, SIA/B 0.02) while *S*-naringenin (**C13**) and isoliquiritigein (**C15**) demonstrated preferential hMAO-B inhibition (IC_{50} 0.27 and 0.51 μM, SIA/B 31.77 and 44.69, respectively). Fisetin (**C11**) showed inhibition against hMAO-A with IC_{50} value of 4.62 μM and no inhibitory activity toward hMAO-B up to 100 μM. Molecular docking studies for the most active compounds were conducted to demonstrate the putative binding modes. It suggested that **C4** interacts with Gln215, Ala111, Phe352, and Phe208 amino acid residues which have a role in the orientation and stabilization of the inhibitor binding to hMAO-A, while S-naringenin (**C13**) occupies both entrance and substrate cavities and interacts with Tyr326, a critical residue in inhibitor recognition in hMAO-B.