Steroids, Alkaloids, and Coumarins from Gelsemium Sempervirens (Abstract)

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The 95% ethanol extract of Gelsemium sempervirens showed inhibitory activity against human DNA topoisomerase I (Topo I). Phytochemical investigations of this active extract resulted in the isolation and identification of three new steroids (1-3), together with eight known compounds 12 beta-hydroxy-5 alpha-pregn-16-ene-3,20-dione (4), gelsemine (5), sempervirine (6), scopoletin (7), 7-O-beta-D-glucopyranosylscopoletin (8), 7-O-beta-D-apiofuranosyl-(1-->6)-beta-D-glucopyranosylscopoletin (9), uvaol (10), and 2-(4-hydroxyphenyl)ethyl heptadecanoate (11). The structures of the new steroids were determined by extensive NMR and HR-ESI-MS analyses as 21-hydroxy-5 alpha-pregn-16-ene-3,20-dione (1), 3-oxoandrosta-16-ene-17-carboxylic acid (2), and 3-oxoandrosta-4,16-diene-17-carboxylic acid (3). This study suggests that sempervirine (6) intercalates to DNA and also inhibits Topo I through modulating the enzyme activity with an IC(50) of 54.5 +/- 15.9 muM.