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C-Glucoside xanthone from the stem bark extract of Bersama engleriana

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ABSTRACT

Background The genus Bersama belongs to the Melianthaceae family and comprises of four species (B. swinnyi, B. yangambiensis, B. abyssinica, and B. engleriana) all of which are very high trees; the latter two detected species are found in Cameroon. Previous phytochemical investigation on B. yangambiensis, B. swinnyi, and B. abyssinica led to the isolation of triterpenes, saponins, flavonoids, and xanthones. Method The stem bark of B. engleriana were collected in the village, Baham near Bafoussam city, Cameroon in August 2003 and identifi ed by Dr. Onana National Herbaruim, Yaounde, Cameroon. The air dried and powdered stem bark of B. engleriana (1 kg) was extracted at room temperature with CH2Cl2-MeOH (1:1) 5 L for 48 hours. The mixture of the solvent was removed by evaporation to yield 200 g of crude extract. The latter was then dissolved in CH2Cl2 to give the CH2Cl2 soluble fraction of 5 g and a remaining gum of 195 g. Part of the remaining gum (22 g) was dissolved in water and extracted four times with butanol to give 12 g of red oil; which was then separated by paper chromatography, with butanol-acetic acid-water (4:1:5), to give 3 g of orange gum; purification was carried out on HPLC with MeOH (100%) to yield 2 g of mangiferin (1) as red oil. The CH2Cl2 soluble extract was eluted on silica gel n-hexane-CH2Cl2 gradient ratio and Sephadex LH-20 (n-hexane -CH2Cl2 -MeOH, (7:4:0.5) to afford compounds swinniol (2), Delta4-stigmaster-3b-ol (3), 4-methylstigmaster-5,23-dien-3b-ol(4). Results Herein, we carried out a phytochemical study of the stem bark of B. engleriana, and we report herein the isolation and structural elucidation of mangiferin, in addition to three triterpenes, previously reported from other species of the genus.[3,5] The assignment of the signals of mangiferin was determined using 1H, 13C-NMR, and 2D-NMR spectral data (HMQC, COSY, HMBC). The terpenoids were identifi ed by comparison of their 1H and 13C-NMR spectra with the literature data. Fractionation of the CH2Cl2-MeOH (1:1) extract of the stem bark of B. engleriana Guike gave mangiferin (1), in addition to three previously reported triterpenes, swinniol (2), Delta4-stigmaster-3b-ol (3), and 4-methylstigmaster-5,23-dien-3-b-ol (4). Conclusions A chemical investigation of the CH2Cl2-MeOH extract of the stem bark of Bersama engleriana afforded a xanthone C-glucoside (mangiferin) and fi rst isolation of three terpenoids from this species: swinniol (2), Delta4-stigmaster-3b-ol (3), and 4-methylstigmaster-5,23-dien-3-b-ol (4). The complete 1H and 13C chemical shift assignments of mangiferin were determined using 1D and 2D NMR spectroscopic data (COSY, HMQC, HMBC, DEPT). The structures of the terpenoids were determined from their 1H and 13C NMR data and compared with the literature data.

KEYWORDS

Bersama engleriana . melianthaceae . terpenoids . xanthone . mangiferin

REFERENCES