Isolation of Phytoconstituents from the aerial parts of Cocculus hirsutus Linn.

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ABSTRACT

Fractionation of crude aqueous extract of the aerial parts of Cocculus hirsutus lead to the isolation of b-sitosterol (1) and 28-acetyl betulin (F1). Their structures were elucidated by spectroscopic methods such as UV, IR, NMR and LCMS. Compound F1 were isolated for the first time from this plant.

Keywords: Cocculus hirsutus, b-sitosterol, and 28-acetyl betulin (F1), spectroscopic method.

INTRODUCTION

The major alkaloidal phytoconstituents present in Cocculus hirsutus are Cоhirsine, 3 Cоhirsinine,4 Cоhristine, Hirustine, Sheahenine, Haiderie, Syringassesinol,5 Isotriboline, Triboline6,6 and Jamtistine.7 The other phytoconstituents like triterpenoid alcohol Hirsudiol,8 essential oil, b-sitosterol and gineol9 are also been reported. The aqueous extract of aerial parts showed significant diuretic activity and laxative effect in rats.9 The juice of leaves used externally as cooling and smoothing agent in prurigo, eczema and impetigo.10 The roots of Cocculus hirsutus possess anti-inflammatory and analgesic properties.11 The aqueous extract of leaves showed significant anti-hyperglycemic activity in alloxan induced diabetic mice.12,13 In the present work, we have isolated b-sitosterol (1), and 28-acetyl betulin (F1) from the aqueous extract of dried aerial parts of Cocculus hirsutus. Compound F1 were isolated for the first time from this plant.

MATERIAL and METHODS

Plant material

Aerial parts of Cocculus hirsutus were collected, shade dried and authenticated by Dr. Shiddamallayya. N, (RRI/BNG/SM/Drug authentication/2007-08/247) Central Council for Research in Ayurveda and Siddha, Bangalore.

General instrument details

UV: Shimadzu UV VIS-1700; IR: JASCO FTIR 5300; LCMS: Agilent 1100 LC-MSD APCI; 1H-NMR (500 MHz) and 13C-NMR (125MHz): Bruker Avance 500.

Extraction and isolation procedure

Coarsely powdered aerial parts (350 gm) were extracted with petroleum ether followed by benzene, chloroform and methanol by the process of successive flash evaporator. Crude aqueous extract was subjected to partition with ethyl alcohol, benzene, chloroform and methanol by the process of successive flash evaporator. Crude aqueous extract was subjected to Partition with ethyl acetate and distill water (1:3). The mixture was aloud to stand overnight and further the ethyl acetate fraction was separated and concentrated which resulted in a reddish brown mass. This was further purified and studied for TLC pattern by using solvent system Ethyl acetate: Formic acid: Glacial acetic acid: water (1:4: 0.2: 0.1: 0.3) based on trial and error method showing single spot.

RESULTS AND DISCUSSION

The structures of compound isolated were elucidated on the basis of spectral data. Compound 1 was isolated as white amorphous powder, m.p.: 139-142°C. Positive test for Liebermann Burchardt test indicated the presence of tetracyclic triterpenoid compound. Its IR spectrum exhibited characteristic bands at 3288 cm-1 for hydroxyl group. The 1H NMR as well as 13C-NMR data were found to be identical with the spectrum of those already reported earlier for beta-sitosterol (Sethi et al., 1978). It was further confirmed by TLC and CO-TLC method with the reference standard of b-sitosterol. Compound F1 was isolated as reddish brown lumpy mass. The IR spectrum of the compound F1 exhibited hydroxyl group at 3400 cm-1 and carbonyl group at 1660 cm-1 absorption. The compound had molecular weight 484 has determine by LC-MS m/z 484 (m:t). Apart from the molecular ion peak the intense mass peaks at m/z 424, 385, 464, 191, 149, 121, 217,259, 179, 165, etc supports that the structure of compound F1 is 28-acetyl betulin. The melting point of compound F1 is 244 °C.

REFERENCES

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