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A NEW GLYCOSIDE FROM THE BUDS OF CLOVE GROWN IN NORTH INDIAN PLAINS

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ABSTRACT

A new glycoside gallic -7-O-β-D-glucopyranoside has been isolated first time from the methanolic extract of *Syzygium aromaticum*. The structure was elucidated by spectroscopic methods and acid hydrolysis.

Keywords : *Syzygium aromaticum*, Gallic-7-O-β-D-glucopyranoside,clove buds.

INTRODUCTION

***S**yzygium aromaticum* belongs to the family Myrtaceae. It is used as flavoring material whole or in ground form. In India it is cultivated in Kerela, Tamil Nadu, Karnataka and Andaman and Nicobar Islands. A large number of compounds have been reported from clove like aglycone-quercetin,kaempferol,rhmnetin [2],terpenoids like β-caryphyllene,its oxides,α-humulene epoxide and eugenol [5] and ellagitannins.This genus shows many activities also like antioxidant [4,6,8],insecticidal [5],and antimicrobial [9] .

The present paper describes the isolation and structural elucidation of a new compound(1) (first time report from this plant) , gallic -7-O- β-D-glucopyranoside.

EXPERIMENTAL

Plant Material:

The buds of *Syzygium aromaticum* were purchased from local market in December 2008 and specimen voucher have been deposited in University's herbarium.

Extraction and isolation:

The dried buds of *Syzygium aromaticum* (1.5 Kg) were extracted with n-hexane, chloroform and methanol.The solvents were removed in vacuo to give three fractions weighing 113 g, 102g and 195g respectively. Fifty grams of methano fractionl extract was loaded on column on silica gel using n-hexane, hexane-ethylacetate, ethylacetate-methanol as solvents. Different compounds which were obtained are oleonolic acid (1g),cratagolic acid (30mg), Orsellinic 2-O- β-D-glucopyranoside (40 mg) (a new compound [1] and compound no.1 (28mg),which was obtained at Rf 0.45 in $CHCl_3$:MeOH (3:1).

Spectral data:

Gallic-7-O-β-D-glucopyranoside (1) - colourless,crystalline [MeOH],M.P 250^0-252^0C ,IR$[\nu]_{max}$ nm:3380, 1670,1618, 1541, 1444, 1300, 1258, 1210, 1100,1020 cm^{-1},H^1-NMR (200MHz, CD_3OD);δ 8.5 (3H,m,Ph-OH),4.0(1H,dd,J=7,12 Hz,H-2' to 5'),4.2(2H,d,J=7Hz,H-1'),7.88(2H,s,H-2 & 6). C^{13}-NMR (50MHz,CD_3OD) δ 62.6(C-6'), 72.7(C-4'),75.5(C-2'), 77.8 (C-5'),79.6(C-3'), 104.2(C-1')110.3(C-2,6)121.9(C-1),139.5(C-4),146.3(C-3,5),169(C-7). EI/MS,m/z,70eV,rel,int.-332[M^+] (40),170 (50),152 (48),126 (35),102 (35),77 (40), 44(100).

Hydrolysis : Compound 1 (30 mg) in MeOH was refluxed with 5% HCl (2ml) for 4 hr. on water bath. After cooling, the reaction mixture is processed for aglycone as usual method and it was dried over $MgSO_4$ and concentrated under vacuum. The aglycone was recrystallized from MeOH to give a compound (12 mg) mp-240^0-241^0C which was identified as gallic acid by Tlc, mp,mmp. The aqueous layer was processed for

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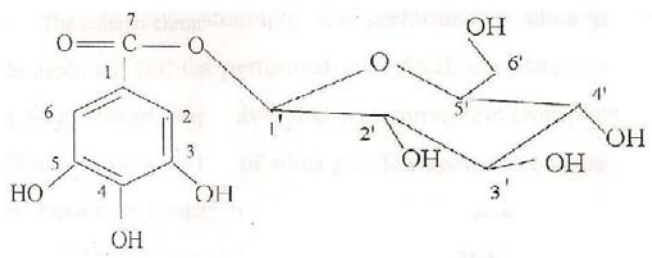
sugar. The sugar was identified as glucose by co-comparison with a standard sample on paper chromatography (BuOH-HOAc-H_2O;4:1:5) using aniline hydrogen phthalate as spray reagent [1].

RESULTS AND DISCUSSIONS

Mass (M^+ 332) and C^{13}-NMR spectra (13 carbons) leads to molecular formula $C_{13}H_{16}O_{10}$. IR absorption band 3380 $cm^{-1}$and positive Gibb's test indicated the phenolic nature of the compound, which was further supported by a broad single at δ 8.5 in ^{1}H-NMR,which disappeared on addition of D_2O. The ^{1}H-NMR spectrum revealed the presence of two proton as singlet at δ 7.88 attributed to aromatic proton H-2 and H-6.Further signals in ^{1}H-NMR and C^{13}-NMR clearly indicated the presence of glucose moiey supported by mass fragment at m/z 170 (M^+-Gl) in the mass spectrum.A one proton doublet at δ 4.2 (J=7Hz) could be assigned to β-anomeric proton [3,10,11,13] which was further supported by a signal in C^{13}-NMR at δ104.2.Hydrolysis of the compound with methanolic HCl afforded two products, a sugar which was identified as glucose by paper chromatography and an aglycone identical to gallic acid (mp,mmp,tlc) [12].Thus from the above spectroscopic and chemical data the compound was concluded as gallic -7-O- β-D-glucopyranoside .This is a first time report from this plant.



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