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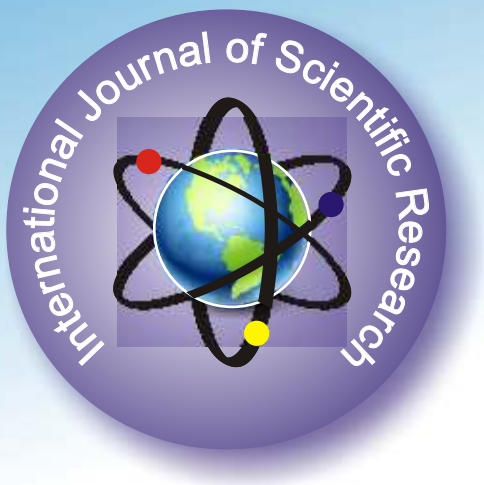

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Bioactive Polyphenols Of Bombax Ceiba

* K.Shakila ** D. Sukumar *** R. Priya **** R.Rajaselvi

Abstract

Fresh flowers of Bombax malabaricum of Bombacaceae is found contain quercetin and isoquercitrin. The glycoside has been found to contain considerable bactereostatic property. The HRBC membrane stabilisation studies showed that the isolated drug has stabilised the membrane at 100 µg of the drug.

Keywords : Bombax ceiba, Quercetin, Isoquercitrin, antimicrobial activity and HRBC membrane Stabilization

Introduction

Bombax Malabaricum1 (Dc), Merr.[Syn. Bombax Ceiba Linn., Salmalia malabaricum Schoot and Endl]2 is popularly known as Mullilavau and Illavam in Tamil, belongs to Bombacaceae family. It is a lofty deciduous, buttressed tree with deep red flowers. Young leaves and flower buds are edible3. Many reports are available with respect to pharmacognostic characters of the plant5,6.

The bark exudes a gum, known as semul gum or mocharus. The gum is edible. It is credited with astringent,tonic, and demulcent properties and is used for dysentery, haemoptysis in pulmonary tuberculosis, influenza and menorrhagia .

The young fruits are reported to be used as expectorant, stimulant and diuretic and are considered beneficial in calculus affections, chronic inflammation and ulceration of the bladder and kidneys. The seeds are fed to cattle. Besides oil, they yielded moisture, 6.2; crude protein, 28.51; pentonsans, 8.9; and mucilage, 2.0%. The seeds also contain n-hexacosaol, palmitic, gallic and tannic acids, octy1 palmitate, 1-galloy1- β -glucose, ethyl-gallate, α- β- and γ-tocopherols, carotenoids, and an unidentified terpene.

The fresh petals on analysis, gave orage- red anthocyanin, pelargonidin-5-β-D- glucopyranoside (m.p. 300°C) and cyanidin7 methyl ether3βglucopyranoside (m.p. 300°C). The alcoholic extract of the flowers contains hentriacontane, hentriacontanol, β-sitosterol and its β-D-glucoside, quercetin, kaempferol and an essential oil. A new polysaccharide consisting of D-galactose, L-araboinose and L-rhamnose in the molecular ratio of 5:4:3 has been isolated from the dried stamens.

The rootbark contains lupeol, β-sitosterol, 8-formyl 7-hydroxyl-5-isopropyl-2-methoxy-3 methyl-1,4-naphthaquinone (m.p. 82°C) , isohemigossypol-1-methyl ether (m.p. 153°C), isohemigossypol-1,2-dimethyl ether (m.p. 101-02°C), 7-hydroxy cadalene (m.p. 113-14°C) and an unidentified compound33. With a view to locating additional flavonoids, the fresh flowers of B. ceiba have been investigated and the results are presented hereunder.

Experimental

2.1 Extraction and Fractionation

Fresh flowers(1kg)of B. ceiba collected from the banks of cauvery in Kumbakonam, Thanjavur District, Tamilnadu, India, during March were extracted with 90% MeOH (4×500 ml) under reflux. The methanolic extract was concentrated in vacuo. The aq. concentrate was fractionated with petroleum ether (b.p. 60-80○C) (3×250 ml), peroxide-free Et2O (3×250ml) and EtOAc (4×250ml). The petroleum ether fraction did not yield any isolable material.

2.2 Et_2O fraction (Flavonol:Quercetin)

The Et_2O fraction was concentrated ***in vacuo*** and left in an ice chest for a week. A yellow solid that separated was filtered and studied. On crystallization from MeOH, pale yellow needles were obtained [m.p.313-15°C]. It was readily soluble in organic solvents and sparingly in hot water. It gave a red colour with Mg-HCl, Olive-green colour with alc.Fe^{3+}, golden-yellow colour with NH_3 and NaOH, yellow solution with a pale green fluorescence with conc.H_2SO_4 and appeared yellow under UV and UV / NH_3. It reduced ammoniacal $AgNO_3$ in the cold and Fehling's solution on heating. It answered the Horhammer Hansel[7], Wilson's boric acid[8] ,and Gibb's[9] tests. It had 255, 269sh, 370; +NaOMe 262sh, 322, 420 (dec.); +$AlCl_3$ 267, 303,458; +($AlCl_3$ HCl) 267, 303, 351, 428; +NaOAc 275, 328, 390 and +(NaOAc H_3BO_3) 262, 303sh, 386 and had Rf values as depicted in Table 1. The ^{1}H-NMR of the flavonol is appended (fig. I-I). It was identified as quercetin and the identity was confirmed by co-and mixed-PC with an authentic sample of quercetin from **Physalis minima**[10].

2.3 EtOAc Fraction: (flavonol glycoside quercetin 3-O glucoside)

The residue from EtOAc fraction afforded yellow needles on recrystallisation from MeOH, m.p.184-86°C. It was soluble in Me_2CO but insoluble in water, Et_2O and $CHCl_3$. It developed a red colour with Mg-HCl; brown colour with alc. Fe^{3+}; developed a yellow colour when viewed under UV with and without NH_3; answered the Horhammer Hansel and Molisch's tests but did not respond to the Wilson's boric acid test. It had 261,269,365; +NaOMe 275, 305sh, 329sh, 405; +$AlCl_3$ (with and without HCl) 269, 309sh, 361; +NaOAc 271, 405 and +(NaOAc H3BO3) 263, 370 nm and had Rf values as depicted in table I-2. The ^{1}H and ^{13}C-NMR Spectra of the glycoside are appended (fig.I-I and I-2).

2.4. Hydrolysis of the glycoside:

The glycoside (0.05 g) dissolved in hot aq. MeOH (2 ml,5%) was hydrolysed with H_2SO_4 (7%) at 100°C for about 1 h and the hydrolytic products were identified as follows.

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2.5. Identification of the Sugar: (glucose)

The aq. hydrolysate after the removal of the aglycone was cautiously neutralized with $BaCO_3$ and filtered. The concentrated filtrate on PC gave Rf values corresponding to those of glucose . The identity of the sugar was further confirmed by direct comparison with an authentic sample of glucose as also by preparation of its osazone and recording its m.p. A quantitative hydrolysis of the same by the Folin Wu's micro method revealed it to be a monoside. It had Rf values as depicted in Table 1-3.

Determination Of Anti-bacterial Activity

The flavonoid glycoside isoloated from ***Bombax ceiba*** has been investigated for their anti-bacterial activity.

A standard volume (2.5ml) of Mueller-Hinton agar medium that would support the test organisms was added to several labeled, sterile, stoppered and indentical petri dishes. Solution of the test compound at two different concentration viz, 25, 50 µg / ml in sterile water were prepared standards containing concentration of 100, 200, 400 µg / ml and a control containing no drug were prepared.

A standard inoculum of a Suspension of turbidity equal to Mc Farland Standard 0.5 of the test organism was added to all the petri-dishes.

The small amount of the drug that is carried over with this inoculum is easily removed by diffusion into the agar and the effect is negated by spreading the inoculum over large area. All these manipulation were carried out with most care under aseptic conditions. After inoculation, the plates were immediately incubated at 37ºC and minimum inhibitory concentration (MIC) is found out after 24 h of incubation.

Table I-5 : Bacteriostatic Effect Of Isolated Isoquercitrin

Compound	Dose µg/ml	Percentage Protection	
		Staphylococcus aureus	E.Coli
1	50	59	48
	100	68	57
	200	77	66
Streptomycin	50	65	54
	100	68	56
	200	73	60
Benzyl penicillin	50	76	60
	100	89	65
	200	92	71

Determination of HRBC Membrane Stabilization

Solution of different concentration of flavonoid are prepared. Assay mixture contained the drug (flavonoid in concentration are mentioned in Table I-6). 1ml of phosphate buffer (0.5% P^H -7.4) 2ml of hyposaline (0.25%)and 0.5ml of 10% HRBC suspension. In another tube, instead of 2ml of hyposaline , 2ml distilled water was taken and this served as the control. All the tubes were incubated at 37ºC for 30 minutes. Then they were centrifuged and the haemoglobin content in the supernatant was estimated using a photoelectric colorimeter at 560nm.

HRBC Membrane Stabilisation Of Isoquercitrin

S.No.	Concentration of drug in µg	% Transmittance
1	10	39.8
2	25	46.1
3	50	56
4	100	68.9
5	200	51.2

Results And Discussion

The fresh flowers of ***B. ceiba*** have been found to contain quercetin and Isoquercitrin.

The UV spectrum of the glycoside showed two major absorption peaks at 362 nm (band I) and 257 nm (band II) showing a flavonol skeleton. A bathochromic shift of 47 nm in band I observed in its NaOMe spectrum indicated the presence of a free 4′ OH group . The $AlCl_3$ HCl spectrum of the glycoside as well as its aglycone showed 3 absorption peaks and a shoulder indicating a free 5 OH group in both. The glycoside as well as its aglycone did not exhibit any intense UV fluorescence ascertaining the presence of a free hydroxyl group at C-5. A bathochromic shift of 39 nm and 58 nm respectively in $AlCl_3$ HCl spectra was yet another evidence for the same. The presence of a C-7 OH group is evident from a shift of +14 nm in the case of the glycoside and +19 nm in the case of the aglycone on addition of NaOAc. The presence of a o-dihydroxyl group in the B-ring could be inferred from a shift of +10 nm noticed in the glycoside and +18 nm noticed in case of the aglycone on the addition of H3BO3. In the AlCl3 spectrum, an absorption peak was noticed at 343 nm (band I) which on addition of HCl reduced by 329 nm. This is another evidence for the presence of a catechol type di-OH group in the B-ring.

In the ^{1}H-NMR (400 MHz, DMSO-d6, TMS) the protons at C-6 and C-8 appear, as doublets at δ 6.815 [J=2.5Hz] and 6.835 [J=3.1Hz] ppm. The 5-OH proton resonates at δ12.541 ppm as a distinct singlet. The C-5′ proton appears at δ 6.8541 ppm . The H-1″ signal of isoquercitrin resonates at δ 5.48 ppm [J=7.2Hz]. The C-3′ and C-4′ protons show at δ 9.30 and 9.80 ppm respectively. The 7-OH proton appear as a distinct singlet at δ 10.9 ppm. The signal located at δ 7.56 ppm represents the overlapping protons at C-2′ and C-6′. All the other sugar protons appear between δ 3.55 ppm to 3.63 ppm.

Supporting evidence for the structure of the isoquercitrin was provided by the analysis of ^{13}C-NMR (100 MHz, DMSO-d6, TMS) data and a complete assignment is given (Table I-4). Due to glycoslation at 3-position, C-2 and C-4 carbons absorb at δ156.374 and 177.274 ppm respectively. C-I″, absorbs at δ101.169 ppm. The rest of the carbons of the sugar unit appear between δ 77.625 and 61.044 ppm.

Based on this the glycoside has been characterized as isoquercitrin (Quercetin 3-O-glucoside).

The bacteriostatic effect of the isolated drug was examined with a Gram positive organism namely ***Staphylococcus aureus*** and a Gram negative organism namely ***Escherichia coli*** (Table I-5). Two standard drugs namely streptomycin and benzyl penicillin were used for comparison. The drug concentration has been increased from 50 µg to 200 µg . While examining the Gram positive organism the percentage inhibition increased from 59% to 77%. From literature it was observed that the Gram positive organisms are reasonably destroyed due to their thin cell walls. While the Gram negative were examined with 50 µg only 48% of protection is noted. This protection is enhanced with increase in concentration to only 66%. The may be due to the walls of the organism.

The ***in vitro*** study of HRBC membrane stabilization showed a biphasic property with a maximum at 100 µg of the isolated drug. Beyond the concentration of 100 µg the curve once again decline to reach to reach a lower value of 200 µg . Such kind of biphasic property is frequently encounted in literature. It has been observed at the optimum concentration of 100 µg the isolated beyond the concentration the pigments losses its efficiency.

References

1 . J.D. Hooker, 'The flora of British India' , L. Reeve and Co., London, 1954, 1, 349. | 2. S.G. Joshi, Medicinal Plants, Oxford & IBH publishing Co. Pvt. Ltd., New Delhi, 2003, 101. | 3. Wlth India , Raw Materials, C.S.I.R., New Delhi, 1972, 9, 177. | 4. P.N. Nehra and C.R.Karnik, Indian J. Pharm, 1968, 30, 284. | 5. H.N.R. Chaudhuri, Bull. Bot. Soc. Bengal, 1971, 25, 37. | 6. The Wealth of India, Publications & Information Directorate, Council of Scientific and Industrial Research, New Delhi, 1988, 2:B, 176. | 7. L. Horhammer and R. Hansel, Arch. Pharm. Berl., 1955, 288, 315. | 8. C.W. Wilson, J. Amer. Chem.. Soc., 1939, 61, 2303. | 9. F.E. King, T.J.King and L.C. Manning, J. Chem. Soc., 1957, 563. | 10.V.Sethuraman and N. Sulochana, Fitoterapia, 1988, 59, 335.



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