



## Phytochemical Studies and Anti Bacterial Acitivity Of *Morinda Citrifolia*

### KEYWORDS

*morinda citrifolia*, Anti- Bacterial, Kampferol – 7 – O -glucoside, styphylococcus aureus, E-Coli

### V.ANU

Lecturer, PG and Research Department of Chemistry, Government College for Women (Autonomous), Kumbakonam. 612001. Tamilnadu.

### Dr.A.JOHN MERINA

Principal, Government College for Women (Autonomous), Kumbakonam. 612001. Tamilnadu

### ABSTRACT

The fresh flowers of *morinda citrifolia* belongs to rubiaceae family have been found to contain Kampferol – 7 – O – Glucoside. The isolated compound is characterized by chromatography and UV sepctral techniques. The glycoside isolated from the flowers of *morinda citrifolia* showed highest anti -bacterial activity against gram positive organism *styphylococcus aureus* and gram negative organism *Escherichia coli*.

### 1. Introduction

*Morinda citrifolia* is belonging to Rubiaceae family. It is used in ayurveda and yuinani. *Morinda citrifolia*, fruit powder contains carbohydrates and dietary fibre in moderately amounts. *morinda citrifolia*, juice has nutrient content the macro nutrients of *morinda citrifolia*, pulp powder include vitamin A, C, B<sub>3</sub>, iron, Pottassium calcium and sodium are present in moderate amounts. The fresh flowers contain Kampferol – 7 – O – Glucoside. The white flowers from *morinda citrifolia* were chosan for phytochemical investigation and anti bacterial activity.

### 2. Experimental methods

#### 2.1 Extraction and fractionation

The fresh flowers of *morinda citrifolia*, were collected from Kumbakonam at thanjavur district during the month of June. They were extracted with 85% methanol [4 X 500 ml]. The alcoholic extract was concentrated in vauco and the aqueous extract was fractionated with Benzene, (2 X 250ml), peroxide free dieithyl ether (3 X 250ml) and ethyl acetate (4 X 250ml). Only ethyl acetate fraction was taken up for further studies.

#### 2.2 Characterization

**Kampferol:** Yellow solid M.P. 276-278° C .In UV spectroscopy it had  $\lambda$  max MeOH 263,290,332, NaOMe 268,322,384 + AlCl<sub>3</sub> 277,332, 381, AlCl<sub>3</sub>/HCl 278, 344, 387 + NaOAc 264, 296, 335. It appeared deep purple under UV and turned yellowish green when fused with NH<sub>3</sub>. It gave positive Wilson's boric acid Molish test and Harmmer – Hansel test and also it gave a bluish green solution in Gibb's test. It was homogenous on PC and Rf values are depicted in Tab – I

#### **Kampferol – 7 – O – Glucoside:**

Yellow solid M.P. 224-226°C. It had  $\lambda$  max MeOH 268, 283, 345 + NaOMe 277, 281, 380, + NaOAc 270, 285,356, + NaOAc/H<sub>3</sub>BO<sub>3</sub> 268, 306, 338 nm and had Rf values are recorded in Tab – II and was identified as kampferol and the identity confirmed by mixed PC.

### 3. Anti Bacterial activity of kaempferol – 7 – O – glucoside

#### Experimental methods:

An antimicrobial is a substance that kills or inhibits the growth of microbes such as bacteria, fungi or viruses. An-

timicrobial drugs either kill microbes (microbial) or prevent the growth of microbes (microbistatic). The history of antimicrobials begins with the observations of Pasteur and joubert

Who discovered that one of type of bacteria could prevent the growth of another. They did not know that time the reason one bacteria failed to growth was that the other bacteria was producing an antibiotic.

The mechanism of antimicrobials action of the flavonoids by inhibition of respiration and reproduction of microbes has been proved by powers. The phytocomponent identified from the alcoholic extract of *morinda citrifolia* chosen for the investigation of their antibacterial effect of Gram positive and Gram negative strains.

#### DISC DIFFUSION METHOD

Antibacterial activity of the plant extract is tested using disc diffusion method. This disc was prepared by using whatmann No.1 filter paper. Then the filter paper disc 6 mm diameter were sterilized and soaked in the ethanolic plant extract.

#### PROCEDURE

10ml of sterilized agar medium for E-coli and *Styphylococcus* were poured into the each sterile petri dishes. After solidification the sterile cotton swap dipped into the culture or both of E-coli and *Styphylococcus*. The entire agar surface of each plate was incubated with this swap first in a horizontal direction and then in a vertical direction which ensure the distribution of organism over the agar surface. The filter paper disc soaked in plant extract is placed on the surface of the bacteria seeded agar plate and then the plate was incubated for 16 to 18 hours at 37° C. The anti bacterial activity was recorded by measuring the width of the clear zone around each disc.

#### Result:

The isolated compound Kampferol – 7 – O – Glucoside from *morinda citrifolia* was screened for their antibacterial activity against E-coli and *styphylococcus*. Table shows the zone of inhibition of the growth of the organism used by comparing with the standard antibiotic namely ciprofloxacin and chloramphenicol against the bacteria. The zone of inhibition was calculated by considering the standard drug.

Table shows 8nm & 10nm and 08nm & 09 nm for E-coli and styphylococcus which implies the effect of the drug was maximum at the lower concerntration against that bacterias. The result observed in the present study indicated that the *morinda citrifolia* possess antibacterial activity. This conclusion is supported by many of the earlier reports which suggest that the flavonoid glucoside of plant origin selective toxicity against micro organism.

#### Discussion:

The flowers of *morinda citrifolia* were found to contain Kaempferol and its glucoside. The structure of the compounds have been ascertained by chemical reactions, chromatography, PC and UV spectroscopic values. The results observed in the present study indicates the anti bacteriostatic activity of Kaempferol – 7 - O – glucoside was a dose dependent one. This conclusion is supported by many of the earlier reports. Which suggest that the flavonoid glucoside exhibit selective toxicity against micro organisms.

**Table I**

Rf values of aglycone from the white flowers of *morinda citrifolia* (whatmann No 1 Ascending 30± 2° C)

Compound	Developing Solvents							
	a	b	c	d	e	f	g	h
Glycoside	32	42	50	63	65	53	52	75
Kaempferol-7-O-glucoside	33	43	54	62	66	54	51	73
Aglycone	04	02	06	18	54	92	93	63
Kaempferol (Authentic)	03	02	04	17	53	94	95	65

#### Solvent Key

a= 5% aq. HOAC, b= 15 % aq. HOAC, c = 30% aq. HOAC, d = 60% aq. HOAC, f = n. BuOH: HOAC: H<sub>2</sub>O = 4:1:5 (upper phase), g = Phenol saturated with water, h = HOAC : Conc. HCl: H<sub>2</sub>O = 30:3:10

**Table II**

Rf (X100) values of the sugar from the glycoside from *chrysanthemum dendranthema* (whatmann No 1 Ascending 30± 2° C)

Compound	Developing Solvents			
	e	f	g	h
Glucose	77	09	39	90
Sugar from Glycoside	73	10	40	92

**Spray reagent** : Aniline hydrogen phthalate

#### Solvent key

e = 60% aq. HOAC, f = n. BuOH: HOAC: H<sub>2</sub>O = 4:1:5 (upper phase),

g = Phenol saturated with water, h = HOAC : Conc. HCl: H<sub>2</sub>O = 30:3:10

**Table III**

S.No	Species	Standard		Zone of inhibition	
		Ciprofloxacin	Chloramphenicol	25µl	50µl
1.	Staphylococcus	-	16nm	08nm	09nm
2.	E-coli	14nm	-	08nm	10nm

#### REFERENCE

1. K.R. Marham "Techniques of flavonoids identification " Acad press London., 1982;1.
2. L.S.R. Aranbewela, A.Perera and R.L.C. Wijesundra, Antibacterial activity of Kaempferia galangal, 1999,70.
3. J.B. Harbone, J.Bio-chem., 1962,84,100.
4. T.Swain and E.C.Bate Smith, comparative phytochemistry Eds.M.flarkin and M.S.Asan Acad.press.,1962,3,755
5. A.John merina, studies of flavonoids of Indian medicinal plants ,Ph.d Thesis,Bharathidasan univ.,2003,41
6. K.E.Swingle in'Anti-inflammatory agents –Chemistry and pharmacology 'M.W. white house Ed.,Acad press ,London,1974,2,33
7. K.Trnasty in'Anti-inflammatory agents –Chemistry and pharmacology,'M.W.White house,E.d.,acad press,london 1974,2,33
8. M.Gahor',Anti-inflammatory Action of flavonoids 'Academicals Kiado,Bidapest,1972,33
9. M.A.Rao and E.V.Rao, Indian drugs,1985,22,324
10. D.J.Harford M.J.H. Swimth ,J.pharmacol 1970,22,57