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PHYTOCHEMICAL INVESTIGATION AND ANTIBACTERIAL ACTIVITY OF LEAF EXTRACTS OF *CLITORIA TERNATEA*

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ABSTRACT

The research was conducted to investigate the phyto components present in *Clitoria ternatea* by using water and ethanol as solvents. Carbohydrate, alkaloid, phenolic compound and flavonoid compounds were observed in water extract, where as in ethanol extract, all the above said components were observed along with steroids. Both aqueous and alcoholic extracts were used in the antimicrobial activity on *Staphlococcus aureus* – Gram- positive bacteria. Water extract showed maximum inhibitory zone when compared to alcoholic extract. This Bio - active variations determined that alcoholic extract had more phyto components than water extract.

Key words: *Clitoria Ternatea*, Phytochemicals, *Staphylococcus aureus*, antibacteraial activity.

1. INTRODUCTION

India is famous for Siddha medicine from ancient days. In Siddha, the drugs have been derived from phyto chemicals from Herbal components such as *Curcumin, Ocimum basilicum, Piperbetle, Alpinia galangal Ficusnervosa cymbopogan citrates and Clitoria ternatea.*Among theseprevious literature studyhad shown interesting applications of *Clitoria ternatea*.Nur Faezah *et.al* (2018) used the flower extract of CT *(Clitoria ternatea*) as an indicator in acid - base titrations. Analitical applications of leaf extract of *C.Ternatea* were explained by Chang*et.al* (2002). Phytochemical screening of medicinal plants is very important in

identifying new sources of therapeutical and industrial importance (Salhan *et al.* 2011). S. Vijayalakshmi, *et al* (2012) explained about antimicrobial activity of clitoriaternatea plant extract incorporated biopolymer Anti inflammatory, Analgesic and antipyretic properties of *clitoria ternatea* root was explored by Devi*et.al* (2003). A comparative study was performed in 2000 to examine the effectiveness of alcoholic extracts of the stems and leaves versus root parts of clitoriaternatea at 300 and 500 mg/kg doses administered orally in rats. So we are interested on the phytochemical investigation of *C.Ternatea* plant.

Figure 1.1 *C.Ternatea*

2. MATERIALS AND METHODS

The following chemicals were used for phytochemical investigations of *C.Ternatea*.

C.Ternatea plant leaf powder, water, ethanol, Wagner's reagent, Molisch's reagent, Ferric chloride, Liebermanburchard'reagent, Agar-agarand*Staphlococcus aureus.* IR spectroscopy.

2.1 Preparation of leaf extracts:

Dried leaves of *C.Ternatea* were ground into fine powder. 5g of two powder samples were dissolved in 100 mL of DD water and 70 mL of ethanol solution. The flasks were kept in rotary shaker in 100 rpm for 72 h. The extracts were filtered and stored in refrigerator. Then the two samples were used for the following phytochemical investigations.

2.2 Phytochemical investigations

Test for alkaloids: About 0.5 mL of leaf extract was treated with five drops of wagner's reagent.The formation of reddish precipitate confirmed the alkaloids. Both the extracts were answered for the alkaloids.

Test for carbohydrates: Molisch's test was carried out for both extracts. Both were confirmed the presence of carbohydrates.

Test for flavonoids: 2mL of the samples were treated with alkaline reagents. Formation of intense yellow colour confirmed the presence of flavonoid.

Test for phenol: A few drops of the extract were treated with neutral ferric chloride.

Deep blue colour was observed and confirmed the presence of phenolic compound.

Test for sterols: 2 mL of the extracts were treated with Liebermaan- Burchard reagent. Only ethanol extract was answered this test. In aqueous extract dark pink colour was not observed. This difference showed the absence of sterol in aqueous extract.

2.3 IR spectral study:

IR spectral study was used to identify the functional groups present in the samples. IR spectra confirmed the main phytochemical component of *Clitorin.*

2.4 Antibacterial activity:

Both the extracts were used to find the *MIZ* on *Staphlococcus aureus* – Gram- positive bacteria by well diffusion method.

3. RESULTS AND DISCUSSION

3.1 Phytochemical investigations for both aqueous and ethanolic extracts have shown in the table 1.

Table-3.1 Results for phytochemicals of leaf extracts

	Phytochemicals	Aqueous extract	Ethanolic extract
1	Carbohydrate	+	+
2	Phenols	+	+
3	Alkaloid	+	+
4	Flavonoid	+	+
5	Strerol	-	+

3.2 IR spectral study

The structure of Clitorin was showed in figure -3.1. Basic Flavonoid structure was confirmed by IR spectra. The stretching frequencies as showed in the IR spectra (fig.3. 2) confirmed the main phytochemical component of *Clitorin*. The stretching frequencies as showed in the IR The spectral values at wavenumbers cm^{-1}879, 951, 1044, 1087, 1274, 1318, 1381and 1652 (finger print region) confirmed the presence of ortho and para substitutions, ether linkages,-C=H (Aromatic and aliphatic)

–C-H in hexa cyclic compound.

The Spectral values (functional group region) at Wavenumbers (cm^{-1}) 1921, 1969, 2323, 2349, 2885, 2972, 3222, 3341, 3332 confirmed the presence of –C=O, C-O, O-H Stretching, Hydrogen bonding,O-C-H cyclic and acyclic structures.

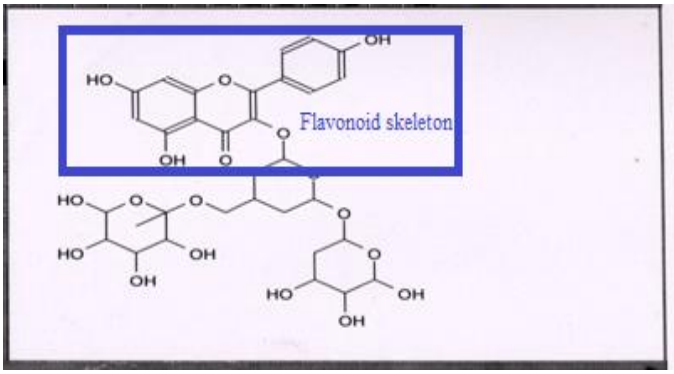

Figure – 3.1 Structure of Clitorin

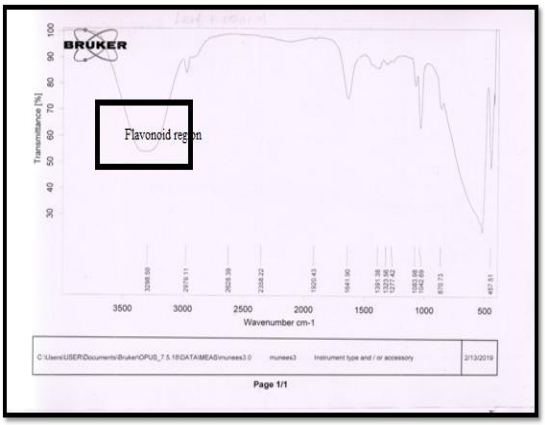

Figure 3.2 IR spectra for Leaf Extract of *Clitoria ternatea*

3.3 Antibacterial activity.

For water extract (1) MIZ was observed as 1.5 mm. but for ethanol MIZ was as 0.9 mm. It was shown in figure-3.3. This property confirmed the medicinal potential effect of *Clitoria ternatea* extracts.

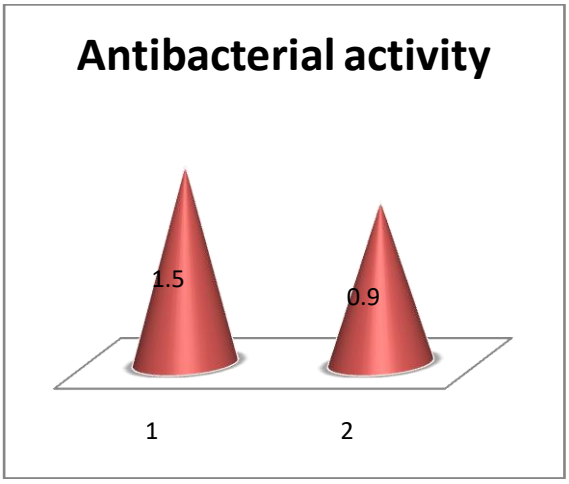

Figure3.3 Antibacterial activity of leaf extracts of *Clitoria ternatea* (1-water extract, 2-Ethanol extract)

CONCLUSION

Experimental research carried out on *Clitoria ternatea* showed that ethanol extract of C. *ternatea* consists of more phytochemical components than water extract of C. *ternatea*. Antimicrobial property of water extract of C. *ternatea* showed high potential than ethanol extract of C. *ternatea*.

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