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A Study on Physico Chemical and Antimicrobial Assay of *Fegonia Cretica*

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Abstract

According to the conventional knowledge, *Fegonia cretica* has medicinal potential, especially the present study was under taken to evaluate physico chemical and anti microbial assay of crude macerated extracts of fresh plant of *Fegonia cretica* Linn Fam zygophyllaceae. Crude macerated extract of hexane, methanolic, ethanolic extract were used for the physico chemical and anti microbial assay activity. The physico chemical investigation reveals the presence of yield, pH and Specific gravity. Column Separation was carried by various concentrations (100,200,300,400µg/ml) of crude extract which determines the number of compounds present. Anti microbial assay was studied by using *Bacillus subtilis*, *Enterococcus faecalis*, *Staphylococcus aerus* and *Proteus mirabilis*. Further studies are in progress to purification, characterization and Spectral analysis of *Fegonia Cretica*.

Keywords: *Fegonia Cretica*, zygophyllaceae, Microbeal, Physico chemical investigation, Anti microbial assay.

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1. Introduction

Screening program for biologically active natural products require the right bioassay. Recognition of compound with the desired activity in complex plant extracts depends on the reliability and sensitivity of the test systems used. Thus, bioassays are essential for monitoring the required effects throughout activity-guided fractionation [1] and purification until the active mono substances are obtained.

Fegonia cretica L., a member of the family zygophyllaceae, is a small spiny undershrub (Fig.1), mostly found in dry calcareous rocks throughout Anantapur, India. It is a unanimous plant to be a medicinal value and folk literature, and its medicinal values were demonstrated. The taxonomy of *Fegonia Cretica* is astringent febrifuge and prophylactic against small pox. The plant is bitter and used for the treatment of fever, thirst, vomiting, dysentery, asthma, urinary discharges, liver trouble, typhoid, toothache, stomach problems and skin diseases.

Considering the medicinal activity of *Fegonia cretica* based on traditional value, the present study was conducted to evaluate, methanolic extract and ethanolic extract of *fegonia cretica* for its antimicrobial and anti microbeal assay analysis.



Figure 1: *Fegonia cretica*

2. Materials and Methods

2.1 Plant material

Fegonia cretica was collected from Anantapur district, India in August-September 2010, the plant was identified and authenticated by Dr. Moula Ali, Reader and Head, Dept. of Botany, Government Degree College, Anantapur, Andhra Pradesh. Fresh areal plant of *Fegonia cretica* were rinsed with distilled water and shade dried.

2.2. Preparation of extract

Extraction was carried out by maceration process. Areal part of *Fegonia* (1kg) was powdered and sohxlation extraction [2] was carried out as shown in fig.2 by taking 250g of the plant powder with 500ml methanol. Homogenate was kept for 4 weeks at room temperature (25+20C). Later the mixer was filtered by using muslin cloth or whatman filter paper 1. The extract was concentrated keeping on water bath, dried and weigh both the extracts. The collected extracts were dark greenish in colour and pungent powder. The percentage yield of methanolic extract and ethanolic extract were 0.938% w/w and 1.02% w/w respectively.



Figure 2: Methanol extract of *Fegonia* by sohxlet apparatus

Physico Chemical Properties of Extract

Physico chemical properties of extract were evaluated the yield, color, pH and specific gravity of crude extract [3] were determined by following standard procedure.

Colour and yield determination

The physical property that is color, percentage yield of the extract were also observed and reported.

Determination of pH

The individual extract solution was filtered by using whatman filter paper and the pH were recorded by using Elico digital pH meter.

Determination of Specific Gravity

The weight of an empty pycnometer (W_p) was recorded. Above 10 g of sample was placed in the pycnometer and weight (W_{ps}) was taken. Half or 3/4th of pycnometer was filled with distilled water and was soaked for 15min. Partial volume was applied to remove entrapped air. And then pycnometer filled with distilled water up to the mark. Exterior surface of the pycnometer was clean properly and the weight (W_b) was determine [4]. After removing the content the pycnometer was cleaned, filled with distilled water and weight (W_a) was measured again. Specific gravity was determined by using the following formulae.

Specific Gravity (G_s)= $W_0 / W_0 - (W_a - W_b)$

W_0 = weight of the sample ($W_{ps} - W_p$)

W_a = weight of pycnometer filled with water

W_b = weight of pycnometer filled with water and sample.

Antimicrobial activity of Fegonia Cretica

The extract obtain from the whole plant of fegonia Cretica were tested for antimicrobial activity against the growth of microorganisms. The methanol and ethanol extracts have exhibited significant antimicrobial activity against all tested microorganisms [5]. Micrococcus Luteous klebsiella pneumonia and Escherichia coli [6] were resistant to methanol extract. The minimum inhibitory concentration for active extracts against each pathogen were determine and represented in the table I. The extracts of methanol exhibited prominent antimicrobial activity against their micro organisms used for study. The zone of inhibitory exhibited by bacillus subtilis [7] most sensitive to chloroform. Other organisms exhibited moderate zone for all extracts in between 9 to 12mm. The methanol extract exhibited MIC values of 100mg/ml against micrococcus luteous and candida tropicales and 150mg/ml each against bacilla subtilis entero coccus faecalis [8], staphylococcus aureus and proteus mirabilis. In the Table.1 it has been given the MIC of methanol extract with different microorganism with comparatively different extracts.

Table 1: Antimicrobial activity of Fagonia Cretica(Whole Plant)

S.No	Name of the Micro Organism	P.ether		Chloroform		Methanol		Standard Antibiotics
		ZI	MIC	ZI	MIC	ZI	MIC	
1	Bacillus subtilis(GP)	12	100	13	150	11	150	22a
2	Enterococcus faecalis(GP)	11	100	11	100	12	150	24a
3	Micrococcus	-	-	11	100	12	100	24a
4	luteous(GP)	-	-	11	100	12	100	24a
5	Staphylococcus	10	100	12	100	12	150	22b
	aureus(GP)	-	-	12	100	-	-	22b
6	Escherichia coli(GN)	11	150	-	100	-	-	28b
	Klebsiella	12	100	11	100	12	150	20c
7	pneumonia(GN)	12	100	11	100	12	150	20c
	Proteus mirabiis(GN)	11	100	10	150	12	100	20c
8	Candida tropicalis(FS)							

ZI: Zone of inhibition (10mg/ml);

(MIC): Minimum inhibitory concentration(μ g/ml)

a: Ampicillin 10 μ g/disc;

b:Tetracyclin 30 μ g/disc

c: Vancomycin 30 μ g/disc;

GP:Gram negative

FS: Fungal species;'-resistant;

μ g: micrograms

P.ether: Petroleum ether.

3. Results and Discussion

Extracts of Fegonia cretica are deep green to greenish black in color. The yield of ethanolic extract, methanolic extract was 3.56, 3.89 % w/w respectively. The pH of ethanolic extract, methanolic extract was 6.4, 6.8 respectively. The specific gravity of ethanolic extract, methanolic extract was 0.751, 0.769 respectively [9]. The extracts exhibited antimicrobial activity against the microorganisms used for study. Maximum inhibitory zone was observed for methanolic extract against micrococcus luteous and candida tropicales [10], the MIC value 100 mg/ml, 150 mg/ml respectively against bacillus subtilis, entero coccus faecalis, staphylococcus aureus and proteus mirabilis.

4. Conclusion

It can be concluded that the present report confirms that the methanolic extract was extracted by Soxhlet apparatus where yield, specific gravity, pH was determined. The antimicrobial activity shown by various micro organisms, where maximum inhibitory zone was observed for methanolic extract. For that plan of work includes purification, characterization and Spectral analysis of *Fegonia Cretica*.

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