

Phytochemical Screening & Evaluation of Antimicrobial Activity of Glycyrrhiza Glabra Linn

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ABSTRACT

The present study was undertaken to explore the phytochemical screening & antimicrobial activity of stems of Glycyrrhiza Glabra L. (Leguminaceae). Glycyrrhiza Glabra L. were screened for their antimicrobial activity by agar well diffusion method, standard screening method & disc diffusion method. In the phytochemical screening showed presence of secondary metabolites, flavonoides, glycosides & terpenoids. It is also showed potent against almost all the test organism.

Study indicate that Glycyrrhiza Glabra has antibacterial, antioxidant, antimalarial, antispasmodic, anti-inflammatory and anti-hyper glycemc properties. Various other effects like antiulcer, antiviral, antihapatotoxic, antifungal and herpes simplex have also been studies. One of the most commonly reported side effects with licorice supplementation is elevated blood pressure.

Keywords:Antimicrobial, phytochemical screening, Glycyrrhiza Glabra, microorganism

INTRODUCTION

India enjoys the privilege of having time tested traditional systems of medicines based on natural products^[1]. Plant based natural products have been in use for medicinal, therapeutic or other purposes right from the dawn of history^[2]. Traditional system of ultimately shows us that plants have provided humanity a large variety of patent drugs to alleviate suffering from diseases^[3,4]. However, drugs used in traditional systems of medicine are all crude drugs in their natural state or their preparations^[1,6]. Until 19th century, even western medicine (allopathic) depends largely on crude drugs. During 20th century the progress in chemical techniques and with the growth of pharmaceutical industry. Chemical (synthetic) drugs replaced crude drugs gradually. Thus; synthetic drugs can produce remarkable lifesaving result in acute diseases but cannot be

used often in treatment of chronic diseases^[5,7,8].

Phytochemical Screening- In the phytochemical screening showed presence of secondary metabolites, flavonoids, saponins, glycosides & terpenoids. It also showed potent against almost all the test organism^[9].

Microorganism- A microorganism is a microscopic organism that comprises either a single cell or no cell at all. The study of MO is called as microbiology. It include^[10]-

- 1. Bacteria-** They are practically invisible to the naked eye. It can grow double in every 10 mins.
- 2. Fungi-** They have several unicellular species, such as Baker's yeast.
- 3. Viruses-** They can replicate only inside the cell.
- 4. Prokaryotes-** They are lack of cell nucleus.

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Antimicrobial activity- The activity which work against MO is called as antimicrobial activity & those agents which is helps in this activity is called as antimicrobial agents ^[11].

PLANT DESCRIPTION- *Glycyrrhiza Glabra* L. ^[12]

Synonym- Liquorice, Mulethi.

Biological source- Liquorice is consist of dried root of *Glycyrrhiza Glabra* L

Family- Laguminaceae.

Uses-

1. As expectorant.
2. As antispasmodic.
3. As flavoring agent.

MATERIAL & METHOD

1. Collection & drying of plant ^[13]

Glycyrrhiza Glabra collected in August, dried, made into coarse powder & extracted by using petrololium ether or acetone in soxlet apparatus for 72hrs.

2. Extraction of plant ^[4,14]

The coarse powder of shade dried stem of *G. glabra* (1.5 kg) was extracted with ethanol (95%) in a Soxhlet extractor. The ethanolic extract was then concentrated on rotary flash evaporator to 1/10th volume. The concentrated ethanolic extract was then fractionated with n-butanol, ethyl acetate, solvent ether and petroleum ether (40-60°C) in succession.

An aqueous extract was also prepared by maceration method using chloroform water I.P. as vehicle. The aqueous extract was concentrated to dryness under vacuum using rotary flash evaporator. An attempt was also made to observe the presence and absence of different phytochemical constituents, viz. alkaloids (Dragendorff's test), anthraquinones, saponins (foam formation), flavonoids (using magnesium and dil. HCl), sesquiterpenes and terpenes (Liebermann-Burchard's test) according to standard methods.

3. Preliminary phytochemical screening ^[15,16]

The extracts were subjected to Preliminary phytochemical screening in order to identify the nature of chemical compounds presenting stem.

a). Detection of alkaloids- Small portion of plant extracts + dil.HCl add, tasted with Mayers reagent, Tannic acid to detect the presence of alkaloids.

b). Detection of carbohydrate- Small quantities of extracts were subjected to Molish test, Fehlings test, Benedict test, Iodine, Barford test, and Bial test.

c). Detection of steroids- Small portion of plant extracts were subjected to Salkowaski test, add chloroform & conc. Sulphuric acid, Chloroform layer gives Greenish yellow fluorescence.

d). Detection of saponins- Small amount of extricates shaken with water to check foam formation and its time of stability.

e). Detection of tanins- Small quantity of extraction were placed between two filter papers and pressed. Oil stain on filter paper indicates the presence of fats.

4. Preparation of agar plate ^[17]

a). Dissolved all chemicals in 1000ml. diss. Water.

b). Find out the pH of the solution by pH paper.

c). Adjust pH by NaOH or HCl solution drop by drop to pH 7.0.

d). Now, put cotton in the mouth of the conical flask & cover it with Al foil.

e). Then sterilize it in the autoclave.

5. Antimicrobial screening method ^[18,19]

Agar well diffusion method- antimicrobial activity was tested by Agar well diffusion method. The extracts were freshly reconstituted with suitable solvent & tested at various concentrations. Each ex. was carried out in triplicated and the mean diameter of the inhibitor zone was recorded.

$$\% \text{ of Zone of inhibition} = \frac{\text{Inhibition zone of the sample}}{\text{Inhibition zone of the standard}} * 100$$

RESULTS

1. Percentage yield of extracts-

% yield of different extracts obtain by successive solvent extraction were determined & were found to be, Pet. Ether- 0.5%. Acetone- 2.0%, Ethanol- 3.5% & Aqueous- 3.6%

Table 1- Determination of % yield of extracts-

Plant name	Extracts			
	Petroleum ether	Acetone	Ethanol	Aqueous
<i>Glycyrrhiza Glabra</i>	0.5%	2.0%	3.5%	3.6%

Table 1.

2. Phytochemical studies-

Phytochemical studies showed the presence of alkaloids, saponins, tannins, carbohydrates, flavonoids & fats. (Table 2)

Table 2- Phytochemical studies-

Plant name	Extracts			
	Petroleum Ether	Acetone	Ethanol	Aqueous
<i>Glycyrrhiza Glabra</i>	Steroids Fats	Tannins Flavonoids	Alkaloids Tannins Saponins	Carbohydrates Alkaloids Tannins Saponins Flavonoids

Table 2.

3. Antimicrobial activity-

Antimicrobial activity of various extracts of *Glycyrrhiza Glabra* was studied by measuring the zone of inhibition formed around the well & result is given at table no. 3.

Table 3- Zone of inhibition in cm

Strain of microorganism	Diameter of zone inhibition								
	5 mg/ml				10 mg/ml				3mg/ml
	Pet. Ether	Acetone	Ethanol	Aqueous	Pet. Ether	Acetone	Ethanol	Aqueous	Std.
Staphylococcus	12	11	12	11	13	14	17	12	33

Table 3.

4. Qualitative chemical evaluation

The qualitative chemical examination showed the presence of alkaloid, steroid, fates, flavonoids, tannins, sterols, carbohydrates and saponins.

CONCLUSION

The plant (*Glycyrrhiza Glabra* Linn.) tested for antimicrobial activity was very good. In present investigation phytochemical screening showed

the presence of secondary metabolites, flavonoids, saponins, glycosides & terpenoids. It also showed potent against almost all the test organism.

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