PRELIMINARY STUDY AND PHYTOCHEMICAL SCREENING OF LIQUORICE POWDER

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ABSTRACT

INTRODUCTION

Since the beginning of human cultivation practices, the role of plants in medicine has been of huge importance[1]. *Glycyrrhiza glabra* is one of the most popular medicinal plants belonging to the *Fabaceae* family. Members of this family now commonly used as feed and food[2]. The genus Glycyrrhiza is derived from the Greek words glykos (sweet) and rhiza (root)[3]. The medicinal value of these plants lies in some chemical substances that produce a definite physiological action on the human body[4]. The most important of these bioactive constituents of plants are triterpenoid, saponin, flavonoids, tannins, alkaloids and phenolic compounds[5]. Many of these indigenous medicinal plants are used as spices and food plants[6]. They are also sometimes added to foods meant for pregnant and nursing mothers for medicinal purposes[7]. *G. glabra* has been used for medicinal purposes including indigestion and stomach inflammation[8]. Some other medicinal uses are cough suppression, ulcer treatment, and as a laxative. Salts of *G. glabra* can also be used in many products as sweeteners and aromatizers[9].

MATERIALS AND METHOD

Collection of plant material: Fresh root of Liquorice were purchased in the month of January 2023 from the market Bhopal. The collected materials were brought to the laboratory on the same day.

Drying and size reduction of Liquorice: Drug samples were washed with water and air–dried in hot air oven for 1 hour. Oven – dried at 40 °C to remove the residual moisture. The dried roots were powdered using a mixer grinder and stored in air-tight container for future use.

Extraction of *Glycyrrhiza glabra*: plant extracted by using decoction method:

Decoction is a method of extraction by boiling herbal or plant material (which may include stems, roots, bark and rhizomes) to dissolve the chemicals of the material. It is the most common preparation method in various herbal-medicine systems. Decoction involves first drying the plant material then mashing, slicing, or cutting the material to allow for maximum dissolution; and finally boiling in water to extract oils, volatile organic compounds and other various chemical substances. Occasionally, aqueous ethanol or glycerol may be used instead of water.

Distilled water was used for extraction. About 100 gm of the plant samples were added respectively into the round bottom flask containing 250 ml distilled water, extracted on heating mental at 60 ^{O}C for 6 hours.

The extract was filtered and evaporated the solvent then the dried extract was collected and stored in cool and dried place.

Figure 1: Procedure of extraction

Phytochemical Screening

The extract of Liquorice powder was tested for the presence of biological compounds following standard methods.

Qualitative estimation of Phytochemicals: Qualitative analysis of phytochemicals was done for carbohydrates, phenols, tannins, flavonoids, saponins, glycosides, cardiac glycosides and Alkaloids

Test for Carbohydrates:

Fehling's test: Equal volume of Fehling A and Fehling B reagents were mixed together and 2ml of it was added to crude extract and gently boiled. A brick red precipitate appeared at the bottom of the test tube indicated the presence of reducing sugars.

Benedict's test: Crude extract when mixed with 2ml of Benedict‟s reagent and boiled, a reddishBrown precipitate formed which indicated the presence of the carbohydrates.

Iodine test: Crude extract was mixed with 2ml of iodine solution. A dark blue or purpleColoration indicated the presence of the carbohydrate.

Test for Phenols and Tannins:

Crude extracts were mixed with 2ml of 2% solution of FeCl3. A blue–green or black coloration indicated the presence of phenols and tannin

Test for Flavonoid:

Alkaline reagent test: Crude extracts were mixed with 2ml of 2% solution of NaOH. An Intense yellow color was formed which turned colorless on addition of few drops of diluted Acid which indicated the presence of flavonoids.

Test for Saponins (Frothing test): Crude extracts were mixed with 5ml of distilled water in Test tube and it was shaken vigorously. The formation of stable foam was taken as an indication for the presence of saponin.

Test for Glycosides:

Liebermann's test: Crude extracts were mixed with each of 2ml of chloroform and 2ml of acetic acid. The mixture was cooled in ice. Carefully concentrated H2SO4 was added. A color changefrom violet to blue to green indicated the presence of steroidal nucleus, i.e., glycone portion of glycoside.

Salkowski's test: Crude extracts were mixed with 2ml of chloroform. Then 2ml of concentrated H2SO4 was added carefully and shaken gently. A reddish brown color indicated the presence of Steroidal ring, i.e., glycone portion of the glycoside.

Test for Alkaloids:

Alkaloids content was measured by method suggested by Harbored. A Suspension was prepared by dispersing 5 gm of the dried leaves in 10% acetic acid solution in ethanol and kept at $28^{O}C$ for 4 hrs which was further filtered through Whatman No. 42. Thereafter alkaloid was precipitated by concentrating the filtrate to one quarter of its Original volume and drops of conc. Aqueous NH_4OH were added. Finally, the precipitate was washed with 1% ammonia solution and dried at 800C in the oven. The content of Alkaloid was calculated and expressed as mg/g of sample.

RESULT AND DISCUSSION

Preliminary Studies

Table No. 1: Morphological characteristics of *Glycyrrhiza glabra* Root

S. No.	Character	Root
1	Color	Dark brown
2	Odor	Characteristics
3	Shape	Cylindrical shaped
4	Size	5-12 mm in Diameter, 20-25 mm in diameter
5	Texture	Rough
6	Taste	Sweet

Figure 2: Dried roots of *Glycyrrhiza glabra*

Microscopic Studies

The transverse section reveals several yellow-brown cork layers and a layer of phelloderm that is 1 to 3 cells thick. The cortex exhibits medullary rays and obliterated sieve portions radiate alternately. The phloem exhibits groups of phloem fibers which are surrounded by crystal cells, with thick but incompletely lignified walls. The vessels are accompanied by xylem fibers, which

are surrounded by crystal cells, and by xylem parenchyma cells. The parenchyma cells contain starch grains and often contain single crystals of calcium oxalate.

Table No. 2:- Consistency and color of *Glycyrrhiza glabra* extract

Extract	Color	Consistency	Percentage yield
Water	Dark Brown	Powder	16.43%

Table No 3: Phytochemicals Screening of Liquorice Root

Phytoconsituents	Test performed	Results
Carbohydrates	Fehling's test ,	+
	Benedict test	+
	Iodine test	+
Phenol and Tenins	--	+
Flavonoids	Alkaline reagent test	+
Saponin	Frothing test	+
Glycoside	Lieberman test	+
	Salkowskis test	+
Alkaloids	Whatman test	+

CONCLUSION

The preliminary study and phytochemical screening of liquorice powder revealed the Presence of various phytochemical constituents such as carbohydrates, flavonoids, saponins, glycosides, Alkaloids, phenolic and tenins compounds. The Powder microscopy showed the presence of

prismatic crystals of calcium oxalate, Tracheids, fibers, and vessels. These findings suggest that liquorice powder can be a potential source of bioactive compounds and may have various Medicinal and therapeutic applications. The present work can serve as a valuable source of information and provide appropriate standards. To establish the quality of this plant material in future prospective study. From the results it is evident that the roots of Liquorice contain a significant amount of phytochemicals viz. alkaloid, flavonoids, phenolic, saponins and tannin. The root of Liquorice contained relatively higher amounts of phytochemicals than leaves. The comparative analysis of phytochemicals viz. Total alkaloids, flavonoids, phenols, saponins and Tannins in water extracts from powder liquorice has been presented. In all the extracts it was found that the root of Liquorice contained significant amount of phytochemicals. The isolations of various photochemicals were seen to be more effectively done when acetone is used as solvents.

CONFLICTS OF INTEREST

Authors have no conflict of interest.

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