



PHYTOCHEMICAL STUDY OF ANTIDIABETIC PLANT ON GYMNEMA SYLVESTRE

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ABSTRACT

Traditional systems of medicinal plants involves the use of different plant extracts or the bioactive constituents of vital importance in the health application at an affordable cost and study of such medicinal plants keenly represents one of the best avenues in searching new economic plants for medicine. *Gymnema sylvestre* R. Br. (Asclepiadaceae) is a herb distributed throughout the world. In keeping this view in mind the present investigation is carried out in *Gymnema sylvestre*, leaves collected from Karanja, Washim district. Maharashtra, India. Qualitative phytochemical analysis of this plant confirms the presence of various phytochemicals like alkaloids, flavonoids, tannins, saponins, terpenoids and Quinone. The bioactive compounds from different solvent extracts suspected of anti-diabetic properties.

KEYWORDS: *Gymnema sylvestre*, Phytochemical analysis, Antidiabetic activity.

INTRODUCTION

Gymnema Sylvestre R. Br. is a valuable herb belonging to the family Asclepiadaceae, and widely distributed in India, Malaysia, Srilanka, Australia, Indonesia, Japan, Vietnam, tropical Africa and the southwestern region of the People's Republic of China. The plant is commonly known as *Periploca* of the woods (English); *Gurmar* (Hindi); *Meshashringi*, *madhunashini* (Sanskrit); *Kavali*, *kalikardori* (Marathi); *Dhuleti*, *mardashingi* (Gujrathi); *Adigam*, *cherukurinja* (Tamil); *Podapatri* (Telgu) and *Sannagerasehambu* (Kannada).^[1-5] The word "Gymnema" is derived from a Hindu word "Gurmar" meaning "destroyer of sugar" and it is believed that it might neutralize the excess of sugar present in the body in Diabetes mellitus.^[6] The taxonomy of the plant is described in table 1.^[7]

Diabetes is now becoming a common disease through the world and a lot of new drugs are being synthesized for the same. Many Indian herbs are being used in traditional practices to cure diabetes.

Gymnema sylvestre, has an important place among such antidiabetic medicinal plants, it can also be used in treating dyspepsia, constipation and jaundice, haemorrhoids, renal and vesicle calculi, cardiopathy, asthma, bronchitis, amenorrhoea, conjunctivitis and leucoderma. Furthermore, in future study, the isolated principles from *Gurmar* needs to be evaluated in scientific manner using various innovative experimental models and clinical trials to understand its mechanism of

action, in search of other active constituents, so that its other therapeutic uses can be widely explored.

Taxonomy of *Gymnema sylvestre*

Kingdom	Plantae
Subkingdom	Tracheobionta
Division	Magnoliophyta
Superdivision	Spermatophyta
Class	Magnoliopsida
Subclass	Asteridae
Order	Gentianales
Family	Asclepiadaceae
Genus	<i>Gymnema</i>
Species	<i>sylvestre</i>

MATERIALS AND METHODS

Plant Materials

The fully mature leaves of *Gymnema sylvestre*, was collected from Karanja, Washim District. Maharashtra, India. And was washed thoroughly and shade dried.

Extraction of Plant Material

The dried leaves were grounded into a fine powder and the total mass was subjected for extraction by a hot percolation method with water, ethanol and Methanol in soxhlet apparatus for 72 hrs. Each solvent extraction step was carried out for 24 hrs. and after extraction the extracts were concentrated by evaporation and stored at 4°C for further study.^[8] Preliminary Phytochemical Screening: The phytochemical screening of the extracts was done using standard procedure as described.^[8] The following qualitative tests were carried out as follows.

1) Steroids and Terpenoids

10mg of the extract was dissolved in chloroform. Few drops of acetic anhydride were added followed by 1 ml of conc Sulphuric acid. Blue colour in chloroform layer which changes to green shows the presence of steroids, whereas the appearance of pink colour in chloroform layer shows the presence of terpenoids.

2) Alkaloids

10mg of the extract was dissolved in conc HCL and filtered. A few drops of solution are poured into the center of watch glass. Mayer reagent is added along the sides of the watch glass with the help of a glass rod. Formation of a gelatinous white precipitate at the junction of two liquid shows the presence of alkaloids.

3) Flavonoids

10mg of the extract was dissolved in methanol. Magnesium turnings were added into this followed by conc HCL. A magenta colour shows the presence of Flavonoids.

4) Saponins

Extract was dissolved in water and shaken well. Froth which last for a long time shows the presence of saponins

5) Tannins

10 mg of the extract was boiled with 1 ml water for 30 min. The extract is filtered clear and to this 0.5 ml 2% gelatin was added. A curdy white precipitate indicates the presence of tannin.

6) Phenolic compounds

Extract was dissolved in alcohol and 1 drop of neutral ferric chloride was added to this. The intense colour indicates the presence of phenolic compound.

7) Quinone

Few mg of the substrate in alcohol is treated with sulphuric acid. The colour developed indicates the presence of Quinone.

RESULT**Table 1: Phytochemical screening of *Gymnema sylvestre* plants extracts**

Phyto compounds	<i>Gymnema sylvestre</i>		
	Water extract	Ethanol extract	Methanol extract
Steroids	-	-	-
Terpenoids	+	-	+
Alkaloids	+	+	+
Flavanoids	+	-	-
Saponnins	+	-	+
Tannins	+	+	-
Phenol	-	-	-
Quinone	+	+	+

The present study carried out on the plant samples revealed the presence of medicinally important bioactive compounds. The phytochemical characters of plant medicine investigated is summarized in the Table: 1. The water extracts of *Gymnema sylvestre* exhibit terpenoids, alkaloids, flavonoids, saponins, tannins, and quinine's. Whereas methanol extracts exhibits terpenoids, alkaloids, saponins and quinones.

DISCUSSION

The phytochemical screening and qualitative estimation reveals leaves were rich in phenol, quinones and little tannins. *Gymnema sylvestre* exhibits rich alkaloids in all solvent extract flavonoids found only in water extracts in all plants. Saponins were noticed in water and methanol extracts of *Gymnema sylvestre*. The plant studied here can be such as a potential source of useful drugs. Further studies are required to detect the antibiotic activity of the plants were used as a traditional medicine to treat diabetes mellitus and studies required to characterize bioactive compounds useful in treating diabetes mellitus.

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