

PRELIMINARY PHYTOCHEMICAL SCREENING OF SOME INDIGENOUS MEDICINAL PLANT LEAVES EXTRACT IN REGULATION OF ANTIDIABETIC ACTIVITY

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ABSTRACT

In the present study, preliminary phytochemical screening using following *Aegle marmelos* (Bael), *Annona squamosa* (Sitaphal), *Ficus racemosa* (Gular), *Hibiscus rosa sinenses* (Jaswand) and *Psidium guajava* (Guava) five plant leaves extracts was done for the qualitative analysis of various phytochemical studies such as alkaloids, coumarins, saponins, flavonoids and steroids. *Aegle marmelos* (leaves) extract exhibited positive reactions to aromatic odour and filter paper test for coumarins. *Annona squamosa* (leaves) extract exhibited positive reactions to Mayer's and Wagner's test for alkaloids and Shinoda test for flavonoids. *Ficus racemosa* (leaves) extract exhibited positive reactions to Mayer's and Wagner's test for alkaloids and Salkowaski and Liberman-Buchard reactions for steroids. *Hibiscus rosa sinenses* (leaves) extract shown positive reactions to Shinoda test for flavonoids. *Psidium guajava* (leaves) extract exhibited positive reactions to Foam test and Haemolytic test for saponins, Shinoda test for flavonoids and Salkowaski and Liberman-Buchard reactions for steroids, which are popular phytochemical constituents. It gives further idea for detailed study to provide some biochemical basis for ethno pharmacological uses of these plants in the treatment of diabetes.

Keywords: Phytochemicals, Diabetes, Medicinal plants.

INTRODUCTION

In India, diabetes is a proving measure health problem, especially in urban areas. Plant derived medicines have been part of traditional health care in most of the world for thousands of years (Modak *et al.*, 2007). Arising from plant biodiversity and the rich complement of phytochemicals and secondary metabolites, plants have from antiquity will used as a source of medicament against various ailments. Medicinal plants with proven antidiabetic and related beneficial effects are used in treatment of diabetes (Atangwho *et al.*, 2007).

Diabetes mellitus is a carbohydrate metabolism disorder of endocrine system due to an absolute or relative deficiency of insulin secretion, action or both (Alberti and Zimmet, 1998). The disorder affects more than 100 million people worldwide and by 2030 it is predicted to reach 366 million. The most prevalent form both in the global and Indian scenario is the noninsulin dependent diabetes mellitus (NIDDM type 2) which is associated with elevated postprandial hyperglycemia (WHO, 2006). Hypoglycemic agents

like acarbose, miglitol and voglibose have their limitations and are known to produce serious side effects. Therefore, the search for more safer, specific, and effective hypoglycemic agents has continued to be an important area of investigation with natural extracts from readily available traditional medicinal plants offering great potential for discovery of new antidiabetic drugs (Patwardhan and Vaidya, 2004).

India is blessed with rich heritage of plant kingdom. In ancient Indian system of medicine, a number of indigenous plants have been described for antidiabetic VIZ. *Acacia arabica* or *nilotica* (Babul), *Aegle marmelos* (Bael tree), *Allium cepa* (Pyaj), *Allium sativum* (Lahasun), *Aloe vera* or *Aloe barbadensis* (Kumar panthu), *Annona squamosa* (Sitaphal), *Azadirachta indica* (Neem), *Beta vulgaris* (Chukkander), *Ficus bengalensis* (Indian Banyan tree), *Ficus racemosa* (Gular), *Hibiscus rosa sinenses* (Jaswand), *Musa sapientum* (Kela) *Nelumbo nucifera* (Kamal), *Phyllanthus niruri* (Jangli Amla), *Psidium guajava* (Gauva), *Punica granatum* (Anar), *Ocimum sanctum* (Tulsi), *Vinca rosea* (Sadabahar), etc (Grover *et al.*, 2002).

All above mentioned plants has been traditionally claimed to be useful in diabetes condition but no scientific reports are available in this regard. Hence, *Aegle marmelos* (Bael tree), *Annona squamosa* (Sitaphal), *Ficus racemosa* (Gular), *Hibiscus rosa sinenses* (Jaswand), *Psidium guajava* (Gauva) has been selected to investigate and to establish scientific data for its traditional claim.

MATERIALS AND METHODS

Fresh samples of *Aegle marmelos* (Bael tree), *Annona squamosa* (Sitaphal), *Ficus racemosa* (Gular), *Hibiscus rosa sinenses* (Jaswand), *Psidium guajava* (Gauva) leaves which were used for the study; were collected from the local areas of Nagpur region, Maharashtra, India. The plants were identified and authenticated at the P. G. Dept. of Botany, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (MS).

Sample preparation:

The ethanolic extracts of the leaves were prepared according to the method of Viera (2001). Fresh samples (500g) of *Aegle marmelos* (Bael tree), *Annona squamosa* (Sitaphal), *Ficus racemosa* (Gular), *Hibiscus rosa sinenses* (Jaswand), *Psidium guajava* (Gauva) leaves were air dried and ground into powder. The ground sample was soaked in

ethanol and water in the ratio 8:2 (v/v) and left for 24 h. The mixture was filtered and the filtrate was concentrated by evaporation at 40°C.

Phytochemical Screening:

Phytochemical screening of active plant extracts was done by following the standard method of Khandelwal (2000), for the qualitative analysis of various phytochemical studies such as alkaloids, coumarins, saponins, flavonoids and steroids which could be responsible for antidiabetic activity (Results summarized in Table 1).

RESULTS AND DISCUSSION

The phytochemical screening demonstrated the presence of different types of compounds like alkaloids, coumarins, flavonoids and steroids which could be responsible for the antidiabetic activities. *Aegle marmelos* (leaves) extract exhibited a positive reaction to aromatic odour and filter paper test for coumarins. *Annona squamosa* (leaves) extract exhibited positive reactions to Mayer's and Wagner's test for alkaloids and Shinoda test for flavonoids. *Ficus racemosa* (leaves) extract exhibited positive reactions to Mayer's and Wagner's test for alkaloids and Salkowaski and Lieberman-Buchard reactions for steroids.

Table 1: Preliminary phytochemical screening of active plant leaves extract

No .	Plant constituents/ phytochemicals and testing methods	Aegle marmelos (Bael tree)	Annona squamosa (Sitaphal)	Ficus racemosa (Gular)	Hibiscus rosa sinenses (Jaswand)	Psidium guajava (Guava)
1.	Alkaloids: Mayer's test- Wagner's test	- -	+ +	+ +	- -	- -
2.	Coumarins: Aromatic odour- Filter paper test-	+ +	- -	- -	- -	- -
3.	Saponins: Foam test - Haemolytic test-	- -	- -	- -	- -	+ +
4.	Flavonoids: Shinoda test-	-	+	-	+	+
5.	Steroids: Salkowaski reaction- Lieberman-Buchard reaction-	- -	- -	+ +	- -	+ +

+ Positive test and - Negative test

Hibiscus rosa sinenses (leaves) extract show positive reactions to Shinoda test for flavonoids. *Psidium guajava* (leaves) extract exhibited positive reactions to Foam test and Haemolytic test for saponins, Shinoda test for flavonoids and Salkowaski and Lieberman-Buchard reactions for steroids. These results were well in accordance with the earlier antidiabetic potential of several plants (Patil RN, 2010). Similarly, Antidiabetic potential of ethanolic leaf extract and fractions of

Melanthera scandens (Enomfon, 2012) was reported.

The phytochemical screening demonstrated the presence of different types of compounds like alkaloids, coumarins, flavonoids and steroids which could be responsible for the antidiabetic activities. It gives further idea for detailed study to provide some biochemical basis for ethno pharmacological uses of these plants in the treatment of diabetes.

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