

An Assessment of Anti-Diabetic Activity in *Ficus species* plants leaves

ABSTRACT:

Conventional medicines existed from ancient times, is estimated by “World Health Organization (WHO) to be in use by up to 80% of the population in most of the developing countries mostly based on plants and plant materials.” These are very easy to select applicable dose of standardized herbal drug to produce effective therapeutic response to element. The standardization is technique by which we can determine the amount of quantity, quality & therapeutic outcome of ingredients in every dose. Herbal drugs are scientifically accepted when its complete study has been done precisely or as per compendium. The results of products should be reproducibility. Additionally, any side effect or adverse effect observed during study it should be mentioned or any interaction with other ingredient. The active constituents present in the crude drug are responsible for imparting therapeutic efficacy. The development of analytical method which can measure the phytochemicals, including quantitative and qualitative properties of compounds and other major constituents, is great challenges to researchers.

INTRODUCTION:

Diabetes mellitus is a ‘Metabolic disorder that is characterized by high blood glucose and either insufficient or ineffective insulin.’ 2.2% people of the population in the world has diabetes, and it is the seventh leading source of death in world population.

Worldwide scenario: ¹⁻⁵

It is spreading worldwide rapidly. The data shows that in the following year the prevalence of diabetes (International Diabetes Federation: Retrieved April 4, 2014).

1985----- 30 million cases

2010----- 177 million cases

2030----- 438 million cases (Expected)

2035----- 592 million cases (Expected)

NEED FOR THE STUDY:

Apart from their pharmacological profile of the herbs and the isolated phytoconstituents may influence the pharmacokinetic profile of other drug and can increase the potency by many folds which are also called as Bioenhancers.

On the basis of leads available from folk usage and recent experimental studies *Ficus benghalensis* Linn and *Ficus religiosa* Linn⁶ (Moraceae) has been selected. Present paper orients toward chemoprotective potential of different extracts of selected medicinal plants. It is reported that flavonoids and phenolic components possess significant chemoprotective potential. Alkaloids are in general cytotoxic still in some of the cases they are reported to possess significant protective effect against pernicious effect of drugs. Similarly, many other components in medicinal plants are reported for chemoprotective activity. The phytochemical investigation was performed to ascertain potentiality of various bioactive components in extracts.

METHODS AND MATERIALS⁷

- 1) Collection and recognition of the Selected Plants.

- 2) To prepare the herbal extract from the leaves of *Ficus Benghalensis*, *Ficus Religiosa*.
- 3) To carry out Primary phytochemical investigations.
- 4) TLC & HPTLC analysis of Selected plant extract
- 5) To carry out pathogenic toxicity study of prepared herbal extract using OECD 423 guideline.
- 6) To find out the Possible Mechanism for the Protective Activity.

PLANT PROFILE

Phytochemical ingredients are plant substances, which protect our cells and support conviviality of the enzyme system. Nutrition and medical science are continuing to identify and study new phytochemical. Studies evaluating the relevance of these isolated phytochemicals reveal that all of these are not beneficial and some reveals negative results.

Generally, the medicinal preparation was derived from plants, whether in the native form of plant parts or in more complex form e.g. crude extracts or crude mixtures. Today considerable derivatives of active drugs are developed from herbal plant parts. The mainstay of these involve the isolation of key ingredients contains in investigated medicinal plants and its subsequent modification. A semi synthetic analogue of such a compound could typically be useful pharmaceutical products.

Undoubtedly, 'plant kingdom still holds many species of plants containing substances of medicinal value, which have yet to be discovered; large numbers of plants are constantly being screened for their possible pharmacological value particularly for their protective properties.'

FICUS BENGHALENSIS⁸



Fig No: 1 *Ficus Benghalensis* Leaves

***FICUS RELIGIOSA* Linn**⁸



Fig No: 2 *Ficus Religiosa* leaves

PARTS USED

a. Leaves⁸

The leaves are the most useful part of the *Ficus religiosa*. It can be used for the fresh juice which is extracted from the leaves and the leaves that is put in powdered form. Both

plantsleaves can be used to alleviate fevers, bleeding wounds, constipation, dysentery, bruises, boils and parotitis.

Instruments:^{7,8,9,10}

HPTLC Spectrophotometer (Analytical Systems, Model No: AUV 2060)

Electronic Balance (Shimadzu Model No: DS- 852 J)

Centrifuge (Remi Model No: KKLO- 9013).

Autoanalyser (ARTOS versatile Analyser)

RESULT AND DISCUSSION

PERCENTAGE YIELD OF THE EXTRACTS

The dried extracts of the herbs were weighed and the percentage yields of extracts from both the plants were calculated. The %age yield of extracts was tabulated in Table No 1 & 2.

Table No 1: Percentage yields of the leaf extract of *Ficus benghalensis*

S. No	Name of the extract	Percentage yield (%w/v)
1.	Hexane	0.78
2.	Chloroform	2.52
3.	Ethyl Acetate	1.82
4.	Methanol	3.20

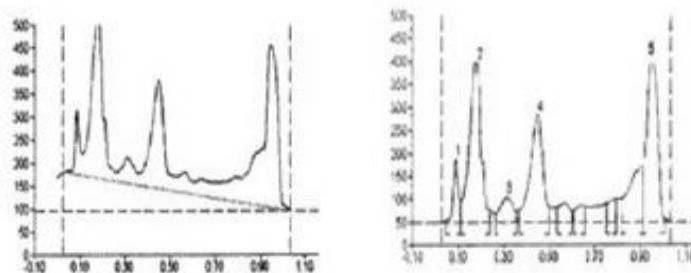
Table No 2: Percentage yields of the leaf extract of *Ficus Religiosa*

S. No	Name of the extract	Percentage yield (%w/v)
1.	Hexane	2.00
2.	Chloroform	1.00
3.	Ethyl Acetate	4.75
4.	Methanol	5.25

Table No 3: R_f value for leaf extracts

Leaves	Extract	R _f Value	No. of Compounds
Ficus benghalensis	Methanol	0.86	1
Ficus religiosa	Methanol	0.22,0.38,0.60	3

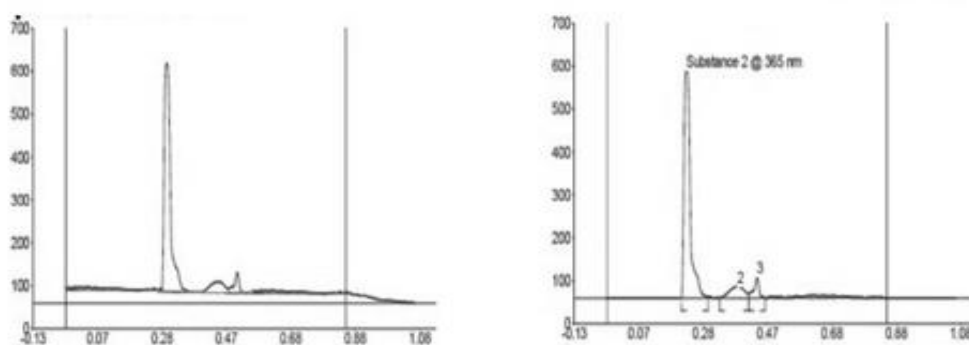
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WinCATS Planar Chromatography Manager

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned Substance
1	0.05	5.4	0.09	139.1	10.05	0.11	49.01	254.6	4.14	Unknown*
2	0.11	49.3	0.19	347.7	25.12	0.24	26.04	16690.2	27.14	Unknown*
3	0.26	19.5	0.31	55.8	4.03	0.36	24.02	2938.9	4.75	Unknown*
4	0.37	27.0	0.45	233.8	18.89	0.50	33.01	11887.5	19.33	Unknown*
5	0.82	122.2	0.95	349.1	25.23	1.01	8.6	15366.1	50.99	Unknown*

Fig No: 3 HPTLC for Methanolic extracts of *Ficus benghalensis* leaves



WinCATS Planar Chromatography Manager

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned Substance
1	0.26	1.3	0.01	531.2	87.48	0.08	2.3	9813.2	84.04	Substance 2
2	0.42	0.1	0.17	26.7	4.40	0.20	9.4	115.1	9.89	Unknown*
3	0.48	9.8	0.23	49.3	8.12	0.26	0.5	708.6	6.07	Unknown*

Fig No: 4. HPTLC for Methanolic extracts of *Ficus religiosa* leaves

The outcomes of research work has been summarized and recommended in a brief informative way in which, two medicinal plants of *Ficus* species were utilized from ancient times to treat different ailments, The findings and its ethnopharmacology in the field of Diabetes, the secondary complications has been proved to some extent.

Ficus benghalensis and *Ficus religiosa* administered for a period of 28 days showed a very good protective action against induced diabetes and its secondary complications, as evidenced by the physical parameters, biochemical status findings. Alkaloid, flavanoid, polyphenols are highly polar compounds present in both the plants is mainly responsible for its protective activity in diabetic Nephropathy.

CONCLUSION AND RECOMMENDATION

Future work is recommended is to isolate a lead molecule from both the plants and investigate the pharmacokinetical properties for isolated compounds in order to be available for evidence-based clinical therapy. All the plant materials of *Ficus benghalensis* and *Ficus religiosa* are very common in natural occurrence and their availability for commercial exploitation will not be any problem. Hence, these plants along with the standard drug will be useful in preventing the complications associated with Diabetes when subjected to prolonged treatment. In future further study is required to ascertain path of action for mentioned activities of test samples. Isolation of most probable bioactive components for the medicinal activity also needs to be performed. This research in a form of hypothesis can be done as a clinical trial to strengthen the facts and to give it a final shape so that a new arena of pharmacotherapy can be validated for the treatment of the most challenging disorder i.e. diabetes mellitus.

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