



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

International Journal of Recent Scientific Research
Vol. 7, Issue, 12, pp. 14538-14540, December, 2016

**International Journal of
Recent Scientific
Research**

Research Article

PHYTOCHEMICAL ANALYSIS OF THE LEAVES OF *MORUS ALBA* L

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ARTICLE INFO

Article History:

Received 06th September, 2015

Received in revised form 14th

October, 2016

Accepted 23rd November, 2016

Published online 28th December, 2016

Key Words:

Morus alba, leaves, ethanol extract, phytochemicals

ABSTRACT

Mulberry (*Morus alba*) belongs to family *Moraceae* is a perennial tree. It is used as a traditional medicine and modern drug preparation, mainly constitutes diet for the silk worm. The preliminary phytochemical screening of three extracts (ethanolic, and aqueous) of mulberry leaves revealed that it contains alkaloids, phenols, quinones, phlobatannins, cardiac glycosides, carotenoids, reducing sugars and volatile oils etc. which give the medicines several healing properties. The aqueous extract of leaf samples were used for the phytochemical analysis to find out the phytochemical constituents in the plants. The main objective of the research work was to check the presence or absence of the phytochemical constituents in leaf extract of *Morus alba*. The results of the phytochemical analysis of *Morus alba* leaf extract showed that the phlobatannins, reducing sugar, quinones, cardiac glycosides, carotenoids, and volatile oils etc. were found to be present in the above mentioned medicinal plant.

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INTRODUCTION

Medicinal plants are the back bone of traditional systems of medicine in India. Pharmacological studies have acknowledged the value of medicinal plants as a potential source of bioactive compounds (Prusti *et al.*, 2008). Over the years, medicinal plants have been found useful in the treatment of various health problems. About 80% of the world population relies on the use of traditional medicine, which is predominantly based on plant material (WHO, 1993). Scientific studies available on a good number of medicinal plants indicate that promising phytochemicals can be developed for many health problems (Gupta *et al.*, 1994). Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds.

Morus alba Linnaeus, 1753 is one of the numerous species in the family *Moraceae*, which comprises trees, bushes and herbs. Most of the species are native to Asia with warm climate. These plants are characterized with milky sap in shoots. They are both monoecious and dioecious, their flowers are inconspicuous and odorless and the small, sweet fruits are multiple: drupelets or nuts. The leaves are alternately arranged, simple, often lobed and serrated on the margin (Litwińczuk 1993; Butt *et al.* 2008). This medicinal plant has shown strong

anti-fungal activities. *M. alba* has garnered great attention for its antioxidative and antidiabetic effects and is an important ingredient of herbal tea (Lokegaonkar and Nabar, 2011). Recent studies have shown *M.alba* has antioxidant, antibacterial, antiviral and anti-inflammatory properties (El-Beshbishy *et al.*, 2006; Chung *et al.*, 2003). The plant is reported to contain the main active principles phytoconstituents like; tannins, phytosterols, sitosterols, saponins, triterpenes, flavanoids, benzofuran derivatives, morusimic acid, anthocyanins, anthroquinones, glycosides and oleanolic acid as the (Chen *et al.*, 2005). Some phenolic compounds (flavonoids, stilbenes and 2-arylbenzofurans) have been reported from *M. Alba* and have been known to show antimicrobial (Yogisha and Raveesha, 2009).

MATERIALS AND METHODS

Plant materials

The present study included *Morus alba* plant species.

Sample collection

The plant material were collected locally from the district Hoshangabad M.P. (India). The plants collected were identified botanically in the department of Botany Safia Science Collage Bhopal. Fresh and tender leaves of selected plants were used for phytochemical analysis.

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Preparation of samples

Leaf samples collected were washed thoroughly with tap water followed by distilled water, then wiped and dried under shade followed by oven drying at 60° C-65° C till constant weight was attained. Completely dried leaf samples were ground using an electric blender to obtain a fine powder. The powder was further passed through successive cycles using Soxhlet's apparatus using all the three solvents 200 ml each with 20 gms of dried plant material. The resulting extract is filtered and concentrated in vacuum evaporator (Roteva: Medica Instrument Mfg.Co.). The concentrated extract is then used to determine the presence of phytoconstituents.

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Phytochemical screening

The phytochemical test of leaves of *Morus alba* were analysed after extraction by two solvents (ethanolic and aqueous). We characterized the different chemical groups with reference to the technical described in the work of Harborne 1983, Trease and Evans 1985.

Test for Alkaloids

3 ml of extract was stirred with 3 ml of 1% HCl on steam bath. 1 ml of mixture was taken separately in two test tubes. Few drops of Dragendorff's reagent were added in one tube and occurrence of orange red precipitated was taken as positive. Two the second tube Mayer's reagent was added and appearance of buff colored precipitate was taken as positive test for presence of alkaloids.

Test for phlobatannins

About 2ml of aqueous extract was added to 2ml of 1% HCl and the mixture was boiled. Deposition of a red precipitate was taken as an evidence for the presence of phlobatannins.

Test for Phenols (Ferric chloride test)

To test the Phenol phytochemical presence, in a test tube 1ml of extract and 2 ml of distilled water were added followed by few drops of 10% ferric chloride (FeCl₃). Appearance of blue or green colour indicates presence of phenols.

Test for Quinones

To test the quinone phytochemical presence, in a test tube 1ml of extract and 1ml of concentrated sulphuric acid (H₂SO₄) was added. Formation of red colour shows the presence of quinones. The results are depicted in table

Test for Cardiac Glycosides (Keller Kelliani's test)

5ml of extract was treated with 2ml of glacial acetic acid containing one drop of ferric chloride solution. This was underplayed with 1ml of concentrated sulphuric acid. A brown ring at the interface indicated the deoxysugarcharacteristics of cardenolides. A violet ring may appear below the ring while in the acetic acid layer, a greenishring may form.

Test for Carotenoids

Concentrated hydrochloric acid and phenol (1:1 ml) was added to the petroleum ether extract. Development of blue/green colour indicate the presence of carotenoids

Test for Reducing sugars

Two methods were used to test for reducing sugars. First, the ethanol extract (1 ml) was added to 1ml of water and 20 drops of boiling Fehling's solution (A and B) in a test tube was added too. The formation of a precipitate red-brick in the bottom of the tube indicates the presence of reducing sugars. Second, added to 2 ml of aqueous solution, 5-8 drops of boiling Fehling's solution. A red-brick precipitate showed the presence of reducing sugars.

Test for volatile oils

To 1ml of plant extract, 1ml of 90% ethanol was added followed by the addition of few drops of FeCl₂. A green color formation indicates the presence of volatile oils in the given sample

RESULTS AND DISCUSSION**Results of Phytochemical Screening**

Table 1 Evaluation of different phyto-constituents in *Morus alba*

S.No.	Constituents	Ethanol	Aqueous
1	Alkaloids	+	-
2	Phlobatannins	-	-
3	Phenols	+	+
4	Quinones	+	-
5	Cardiac Glycosides	+	-
6	Carotenoids	-	-
7	Reducing sugars	-	-
8	Volatile oils	+	-

The different solvent extracts of the *Morus alba* L. leaves were subjected to preliminary qualitative assessment for the presence of alkaloids, phlobatannins, phenols, quinines, cardiac glycosides, carotenoids, reducing sugars and volatile oils according to Harborne 1983, Trease and Evans 1985 methods. The results of phytochemical analysis are discussed in the above table. From the results, it is clear that the ethanolic leaves extract of *Morus alba* (L.) shows the presence of alkaloids, phlobatannins, phenolsquinonescardiac glycosides carotenoids reducing sugars volatile oils when extracted with different solvents using soxhlet extraction procedure.

CONCLUSION

Phytochemicals found in leaf extracts of *Morus alba* indicates its potential as an important source of medicine and also to improve the health of its users as a result of the presence of various compounds that are vital for good health. Phytochemical screening test has revealed the presence of the

substances like alkaloids, phlobatannins, phenols, quinones, cardiac glycosides, carotenoids, reducing sugars and volatile oils etc. The alkaloids contained in plants are used in medicine as anaesthetic agents (Tshibangu *et al.*2003). Isolation, purification and characterization of the phytochemicals found in moraceae family tree should be studied.

Reference

- Butt M.S., Nazir A., Sultan M. T. & Schoën K., 2008, *Morus alba* L. nature's functional tonic, Trends in FoodScience & Technology 19: 505–512
- Chen, C.-C., Liu, L.-K., Hsu, J.-D., Huang, H.-P, Yang, M.-Y. and Wang, C.-J. (2005), "Mulberry extract inhibits the development of atherosclerosis in cholesterol fed rabbits", *Food Chemistry*, Vol. 91, pp. 601–607.
- Chung, K.O., Kim, B.Y., Lee, M.H. Kim, Y.R., Chung, H.Y., Park, J.H. and Moon, J.O. (2003), "In-vitro and in-vivo anti-inflammatory effect of oxyresveratrol from *Morus alba* L.", *Journal of Pharmacy and Pharmacology*, Vol. 55, pp.1695–700
- El-Beshbishy, H.A., Singab, A.N., Sinkkonen, J. and Pihlaja, K. (2006), "Hypolipidemic and antioxidant effects of *Morus alba* L. (Egyptian mulberry) root bark fractions supplementation in cholesterol-fed rats", *Life Sciences*, Vol. 78, pp. 2724–33.
- Gupta SS (1994). Prospects and perspectives of natural plant products in medicine. *Indian J. Pharmacol.* 26:1-12.
- Harborne JB. Phytochemical methods A guide to modern techniques of plant analysis. 1973(1st Ed.), 1983(2nd Ed.), 1998(3rd Ed.). Chapman and Hall. Madras.
- Litwińczuk W., 1993, Charakterystyka, rozmnażaniei wykorzystanie morwy białej (*Morus alba* L.) [Characteristic, propagation and use of white mulberry (*Morus alba* L.)], *Biuletyn Ogródów Botanicznych* 2: 27–35 (in Polish).
- Lokegaonkar, S.P. and Nabar, B.M. (2011), "In-vitro assessment of the antiplaque properties of crude *M. Alba* leaf extract", *Journal of Herbal Medicine and Toxicology*, Vol. 5, pp. 71–77.
- Prusti A. *Ethnobotanical Leaflets*, 1(27), 2008, 34-36. Trease GE, Evans WC. Pharmacognosy 12thEd.1985. Aldeh Press Great Britain
- Tshibangu JN, AD Wright and GM Konig. HPLC isolation of the anti-plasmodically active bibenzylisoquinone alkaloids present in roots of *Cissampelos mucronata* phytochem Anal. 2003; 14(1): 13-22.
- WHO (1993). Regional office for Western Pacific Research guidelines for evaluating safety and efficacy of herbal medicines, Manila p.94.
- Yogisha, S. and Raveesha, K.A. (2009), "In-vitro antibacterial effect of selected medicinal plant extracts", *Journal of Natural Products*, Vol. 2, pp. 64–69.

How to cite this article:

Sabira Mushtaq and Shail Bala Sanghi.2016, Phytochemical Analysis of the Leaves of *Morus Alba* L. *Int J Recent Sci Res.* 7(12), pp. 14538-14540.