

**Research Article****PHYTOCHEMICALS ANALYSIS OF ACTIVE COMPOUNDS FROM THE LEAF EXTRACTS OF *MORINGA OLEIFERA*****K.J. Kamble * and R.S. Dubal**

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ABSTRACT

Secondary metabolites of plants are beneficial for getting relief from various diseases in human being and different animals. It has been reported that *Moringa oleifera* extract contains variety of bioactive compounds. Present study was aimed at a detailed investigation on secondary metabolites present in the leaf of *Moringa oleifera*. The samples were extracted in 70 % ethanol, acetone and distilled water using Soxhlet apparatus, collected and stored at 40C. The extracts were evaporated and dried at 600C. The phytochemicals were screened following standard protocol. Extract contained alkaloids, flavonoids, tannins, cardiac glycosides, carbohydrate, proteins and steroids. The findings of the study concluded that moringa leaf extracts have potential bioactive compounds that are used to overcome the problem of disease resistance.

KEYWORDS: Alkaloids, Metabolites, Soxhlet apparatus, Water.**INTRODUCTION**

India is known for its Ayurvedic treatment. In Ayurveda various plants are used for treatment of diseases from ancient era. According to the World Health Organization (WHO) more than 80% of world population depends on traditional medicine for their primary health care needs [2]. Plant possesses medicinal properties due to presence of secondary metabolites. Plants contain many active compounds such as alkaloids, steroids, tannins, glycosides, volatile oils, phenols and flavonoids which are found in their specific parts such as leaves, flowers, barks, seeds, fruits, roots etc. Secondary metabolites play beneficial role in treatment of diseases [6].

Many organic constituents are widely used in the human therapy, veterinary, agriculture, scientific research etc [7]. *Moringa oleifera* is also known as Moringa. Moringa is a valuable tree for traditional, medicinal and industrial use [4]. In the present investigation, qualitative and quantitative phytochemical analysis was carried out in three extracts of *Moringa oleifera*.

MATERIAL AND METHODSFresh leaves of *Moringa oleifera* were collected from*** Corresponding author:****K.J. Kamble**

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local gardens of Satara city. The plant materials were taxonomically identified and authenticated by the Department of Botany, Yashwantrao Chavan Institute of Science, Satara. The collected leaves were washed well, shade dried and powdered by using mixer grinder. About 20gm of powdered material were extracted in Soxhlet apparatus with 200ml of each of following solvents; 70% ethanol, acetone and distilled water. Extracts obtained concentrated and allowed to dried at 60°C. The filtrates were used for phytochemical analysis as per the standard prescribed methods.

Preliminary Phytochemical Screening:**Test for Alkaloids:**

Hager's Test: Treat 2-3ml extract with few drops of Hager's reagent. Formation of yellow precipitate indicates the presence of alkaloids.

Wagner's Test: Treat 2-3ml extract with few drops of Wagner's reagent. Formation of reddish brown precipitate indicates the presence of alkaloids.

Test for Carbohydrates:

Molisch Test: The solution was treated with few drops of alcoholic alpha-naphthol. Add 0.2 ml concentrated sulphuric acid slowly along the sides of test tube, purple to violet colour ring appears at junction.

Test for Flavonoids:

Pew's Test: To the 2-3 ml extract, added zinc powder in a test tube, followed by drop wise addition of concentrate HCl. Formation of purple red or cherry colour indicates the presence of flavonoids.

Shinoda Test: To the 2-3 ml extract, few fragments of magnesium metal were added in a test tube, followed by drop wise addition of concentrate HCl. Formation of magenta colour indicates the presence of flavonoids.

Test for Fats and Oils:

Pore test solution on slide, treat with few drops of Sudan Red III. Then wash slide with the help of 50% alcohol. Mount in glycerine, observed under microscope. During microscopic observation red oil globules appears.

Tests for Glycosides:

Test for Cardiac Glycosides:

Baljets' Test: The test solution was treated with few drops of Sodium picrate. Formation of yellow colour indicates the presence of cardiac glycosides.

Test for Saponin glycosides:

Foam Test: Vigorous shaking of test solution was done in this test. Observation of foam indicates saponin glycosides in solution.

Test for Proteins:

The test solution was treated with 4% of NaOH solution. Then add 1% CuSO₄ solution, violet colour appears indicates presence of proteins.

Test for Phenols:

Ellagic Acid Test: The test solution was treated with few drops of 5% glacial acetic acid and 5% NaNO₂ solution. The solution turned muddy or Niger brown precipitate.

Test for Steroids:

Salkowski Test: Mix 2ml of extract with chloroform. Add 2ml concentrated H₂SO₄ and was shaken well. Chloroform layer appeared red and acid layer showed greenish yellow florescence indicated the presence of steroids.

Test for Tannins:

Lead acetate Test: To the extract, lead acetate was added. Formation of white precipitate indicates the presence of tannins.

Braymer's Test: Mix 2 ml extract with 2 ml water, then add 2 to 3 drops of 5% FeCl₃. The solution turned Green precipitate.

RESULTS AND DISCUSSION

The preliminary phytochemical analysis of ethanolic, acetic and aqueous extracts of leaves of *Moringa oleifera* revealed the presence of phytochemicals in Table No.1. A considerable amount of alkaloids, flavonoids, tannins, cardiac glycosides, carbohydrate, proteins, steroids and oil and fat were found in 70% ethanol and aqueous extract while in less amount of phytochemical were found in acetone leaf extract.

Table No. 1: Qualitative analysis of phytochemicals in leaf extract of *M. oleifera*

Phytochemicals	Ethanolic Extract	Acetonic Extract	Aqueous Extract
Alkaloids	+++	+	++
Carbohydrates	++	+	+++
Flavonoids	+++	-	+
Fat and oil	-	++	-
Cardiac Glycosides	+++	+	++
Proteins	+++	+	++
Phenols	+++	+	++
Steroids	++	-	+
Tannins	++	-	+++

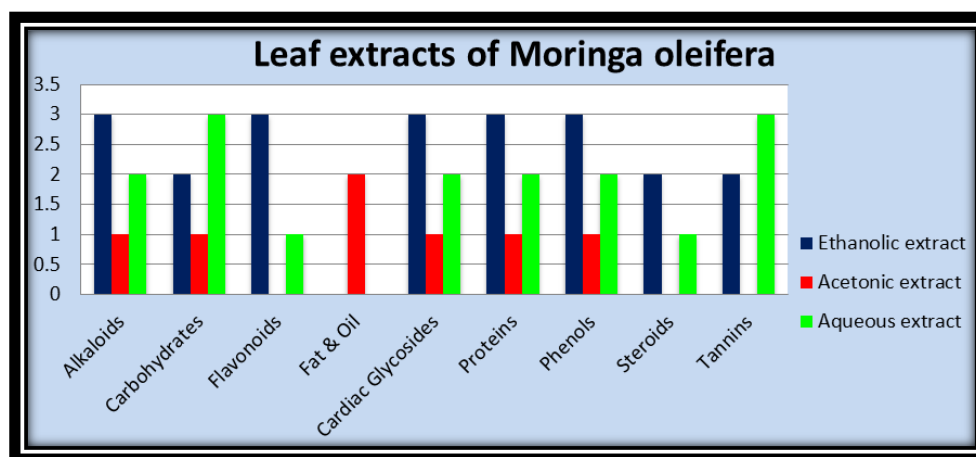


Fig. 1: Graphical representation of secondary metabolites distribution in the leaf extracts of *M. oleifera*

Secondary metabolites are main medicinal constituents found in plants. The secondary metabolites which were found in leaf extracts of *Moringa oleifera* as showed in Fig. No.1. The presence of alkaloids has been observed in 70% alcoholic, acetonic and aqueous extract. Alkaloids are one of the diverse group of secondary metabolites found to have antimicrobial activity. Carbohydrate and protein which constitutes major edible part of the plant were present in all extracts. The presence of steroids has been reported in alcoholic and aqueous extract but absent in acetone extract. Glycosides and Tannins were present in varying proportion in alcoholic and aqueous extract. Cardiac glycosides have indicating strong positive result for 70% ethanol and aqueous extract as compared to acetonic leave extract.

Phenols were present almost in all the three extracts. The presence of flavonoids has been seen in all the extracts except acetonic leave extract.

CONCLUSION

The results revealed the presence of secondary metabolites in the plant extracts studied. Moringa leaf extracts have potential bioactive compounds that are used to overcome the problem of disease resistance.

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REFERENCES:

1. Aiyegrero OA. and Okoh AI. Preliminary phytochemical screening and in vitro antioxidant activities of aqueous extract of *Helichrysum longifolium* DC. BMC compl & Alt Med **2010**;10:21.
2. Arunkumar S. and Muthuselvam. Analysis of phytochemical constituents and antimicrobial activities of aloe vera L. against clinical pathogens. World J. Agril. Sc **2009**;5(5):572-576.
3. Parekh J. and Chanda S. Antibacterial and phytochemical studies on twelve species of Indian medicinal plants. Afr J Biomed Res **2007**;10:175-181.
4. Ramesh Kumar Saini, Iyyakkannu Sivanesan and Young Soo-Keum. Phytochemicals of *Moringa oleifera* : a review of their nutritional therapeutic and industrial significance. 3 Biotech **2016**;6(203):1-14.
5. Singh R, Singh SK, Arora S. Evaluation of antioxidant potential of ethyl acetate extract/fractions of *Acacia auriculiformis* A. Cunn Fod Chem Toxicol **2007**;45:1216-1223.
6. Tonthubthimthong P, Chuaprasert S, Douglas P, Luewisuttichat W. Supercritical CO₂ extraction of nimbin from neem seeds an experimental study. J Food Eng **2001**;47:289-293.
7. Vasu K, Goud JV, Suryam A, Singara Chary MA. Biomolecular and phytochemical analyses of three aquatic angiosperms. Afr J Microbiol Res **2009**;3(8):418-421.

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