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EXTRACTION, PHYTOCHEMICAL SCREENING AND TLC OF BASELLA ALBA

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Abstract:
Traditional systems of medicine continue to be widely practised on many accounts. Population rise, inadequate supply of drugs, prohibitive cost of treatments, side effects of several synthetic drugs and development of resistance to currently used drugs for infectious diseases have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments. Basella alba L. is an important green leafy vegetables found commonly in the tropical regions of the world. The plant is used as a substitute for true spinach (i. e. Spinacea oleracea L.) and also has great ethnomedicinal importance. Different studies have proved that the plant is rich in vitamin A and vitamin C along with flavonoids, saponins, carotenoids, many amino acids and organic acids. Various in vivo and in vitro studies revealed that the plants is enriched with active substances/principles having medicinal potential. Major biological activities exhibited by Basella alba is androgenic, antidiabetic, anti-inflammatory, antimicrobial, antioxidant, antiulcer, antiviral, CNS depressant, hepatoprotective and wound healing, properties. Besides these all the plant possess a valuable ethnomedicinal importance and are used to cure digestive disorders, skin diseases, bleeding piles, pimples, urticaria, irritation, anemia, whooping cough, leprosy, aphthae, insomnia, cancer, gonorrhea, burns, headache, ulcers, diarrhea, liver disorders. This study deals with phytochemical analysis of Basella alba. The leaves of the plant were collected & subjected phytochemical screening. Further total flavonoid content and TLC was performed to analyse the phytoconstituents . The results showed that yields were found to be (6.32% w/w of crude drug) of hydroalcoholic extract with dark brown colour semisolid mass, for Basella alba. Phytochemical screening was revealed for the presence of alkaloids, glycosides, carbohydrates, tannins, resins, flavonoids, steroids, proteins and amino acids. Total flavonoid content in Hydroalcoholic extract of Basella alba was found to be 0.518 mcg/ml. The RT, area & % assay for Hydroalcoholic extract of Basella was found to be 2.826, 1131.26 & 0.013 respectively.

Keywords: *Basella alba, TLC, Phytochemicals, Herbal medicine, Flavonoids*

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INTRODUCTION:

Medicinal plants are considered as a rich resource of ingredients which can be used in drug development either pharmacopeial, non- pharmacopeial or synthetic drugs. A part from that, these plants play a critical role in the development of human cultures around the whole world. Moreover, some plants are considered as important source of nutrition and as a result of that they are recommended for their therapeutic values. Plants have been used for medicinal purposes long before prehistoric period. Indigenous cultures such as Rome, Egypt, Iran, Africa and America used herbs in their healing rituals, while other developed traditional medical systems such as Unani, Ayurveda and Chinese Medicine in which herbal therapies were used systematically [1,2].

Traditional systems of medicine continue to be widely practised on many accounts. Population rise, inadequate supply of drugs, prohibitive cost of treatments, side effects of several synthetic drugs and development of resistance to currently used drugs for infectious diseases have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments. Now a days medicinal herbs are important sources for pharmaceutical manufacturing. Recipes for the treatment of common ailments such as diarrhoea, constipation, hypertension, low sperm count, dysentery and weak penile erection, piles, coated tongue, menstrual disorders, bronchial asthma, leucorrhoea and fevers are given by the traditional medicine practitioners very effectively. Over the past two decades, there has been a tremendous increase in the use of herbal medicine; however, there is still a significant lack of research data in this field [3,4]

Basella alba is an edible perennial vine in the family Basellaceae. It is found in tropical Asia and Africa where it is widely used as a leaf vegetable. It is native to the Indian subcontinent, Southeast Asia and New Guinea. It is naturalized in China, tropical Africa, Brazil, Belize, Colombia, Philippines, the West Indies, Fiji and French Polynesia *Basella alba* has been used for many of its useful product from ancient times *Basella alba* has been used for many of its useful product from ancient times Daily consumption of *Basella alba* has a positive effect on total-body vitamin A stores in men. The paste of root of red B. alba along with rice washed water is taken in the morning in empty stomach for one month to cure irregular periods by the rural people of Orissa, India. Leaves of *B. alba* is used for the treatment of hypertension by Nigerians in Lagos, and malaria in cameroonian folk medicine. The plant has been reported for its antifungal, anticonvulsant, analgesic, anti-inflammatory and androgenic activities and for the treatment of anemia [5,6].

A paste of the root is applied to swellings and is also used as a rubefacient. Sap is applied to acne eruptions to reduce inflammation. Decoction of leaves used for its mild laxative effects. Pulped leaves applied to boils and ulcers to hasten suppuration. Sugared juice of leaves is useful for catarrhal afflictions. Leaf-juice mixed with butter, is soothing and cooling when applied to burns and scalds. In Ayurveda, it is used for haemorrhages, skin diseases, sexual weakness, ulcers and as laxative in children and pregnant women. The plant is febrifuge, its juice is a safe aperient for pregnant women and a decoction has been used to alleviate labour. It is also an astringent and the cooked roots are used in the treatment of diarrhea. The leaf juice is a demulcent, used in cases of dysentery. In India, it has been used for antipruritis and burn and has been used in Bangladesh for acne and freckle treatment. The Ayurvedic treatment in India has been used B. alba leaves and stem for anticancer such as melanoma, leukemia and oral cancer Knowing that plants have a large number of chemical substances, which have several pharmacological actions, we should exploit more natural products, which in the future could show the cure for many illnesses [7,8].

MATERIAL AND METHODS:

Collection of Plant:

The leaves of selected plant namely *Basella alba* was collected from local market of Bhopal, Madhya Pradesh. The collected plant drug was cleaned, shade dried, pulverized into moderately coarse powder and stored in airtight container for further use.

Extraction of *Basella alba* by maceration:

The Collected plant drug was cleaned properly and washed with distilled water to remove any kind of dust particles. Cleaned and dried plant drug was converted into moderately coarse powder in hand grinder. Maceration was carried out in a closed conical flask for 72 h. (42.86 g) powdered plant drug sample and methanol as the extraction solvent was used. The solvent free hydroalcoholic extract obtained was evaluated. The extracts obtained with each solvent were weighed to a constant weight and percentage w/w basis was calculated.

Preliminary phytochemical screening:

Preliminary phytochemical screening means to investigate the plant material in terms of its active constituents. In order to detect the various constituents present in the methanolic extract of

Basella alba, was subjected to the phytochemical tests as per standard methods.

Estimation of total flavonoids content by Aluminum Chloride Colorimetric Method:
In this method, quercetin was used to make the calibration curve. 10 mg of quercetin was dissolved in methanol and then diluted to 5,10,15,20 and 25 µg/ml. A calibration curve was made by measuring the absorbance of the dilutions at 420 nm (λmax of quercetin) with a lab science UV-1800 spectrophotometer. Aluminum chloride, 1% and potassium acetate, 1M solutions were prepared**.** 100 mg of the plant extract was accurately weighed and transferred to 10 ml volumetric flask and made up the volume with methanol. 0.5ml of each extract stock solution, 1.5 ml methanol, 0.1 ml aluminum chloride, 0.1 ml potassium acetate solution and 2.8 ml distilled water were added and mixed well. Sample blank was prepared in similar way by replacing aluminum chloride with distilled water. Sample and sample blank of all four extracts were prepared and their absorbance was measured at 420 nm. All prepared solutions were filtered through whatmann filter paper before measuring.

Thin layer chromatography:

TLC was produced with the aim of identifying the individual substances in a mixture and also testing for purity or for separation of mixtures. The height of the solvent front and center of spots were measured in the form of R_f value. The R_f value indicates the position the position at which a substance was located in the chromatogram. The chromatographic analysis was performed at ambient temperature on a RP-C18 analytical column with a mobile phase composed of Acetonitrile: Methanol (50:50 v/v) and was isocratically eluted at a flow rate of 1 mL min-1. A small sample volume of 20 µL was used for each sample run, being injected into the HPLC system. The chromatogram was monitored with UV detection at a wavelength of 256 nm.

RESULTS & DISCUSSION:

The yields were found to be (6.32% w/w of crude drug) of hydroalcoholic extract with dark brown colour semisolid mass, for *Basella alba.* Phytochemical screening was revealed for the presence of alkaloids, glycosides, carbohydrates, tannins, resins, flavonoids, steroids, proteins and amino acids. Total flavonoid content in Hydroalcoholic extract of *Basella alba* was found to be 0.518 mcg/ml. The RT, area & % assay for Hydroalcoholic extract of *Basella* was found to be 2.826, 1131.26 & 0.013 respectively.

Table 1: Extractive values obtained from *Basella alba*

S. No.	Time of extraction (Hours)	Color of extract	% Yield
1	24	Brown	6.32%

Table 2: Preliminary phytochemical screening of *Basella alba*

S. No.	Phytoconstituents	Test Name	Extract
1	Alkaloids	Hanger's Test	**Present**
2	Saponins	Froth test	**Present**
3	Diterpines	Copper Acetate test	**Present**
4	Phenols	Ferric chloride test	Absent
5	Carbohydrates	Gelatin Test	**Present**
6	Flavonoids (I)	Lead acetate	**Present**
7	Flavanoids (II)	Alkaline Test	**Present**
8	Proteins & Amino acids	Precipitation test	Absent

Table 6.4: Total flavonoids content in extract of *Basella alba*

S. N.	Extracts 100µg/ml	Flavonoid content Quercetin equivalent mcg/ml
1	**Hydroalcoholic extract of *Basella alba***	0.518

Results of TLC

Short UV:

Table 3: R*f* value of various sports

Sport	R*f* value(cm)
1.	0.54
2.	0.82
Standard	0.54

Long UV:

Table 4: R*f* value of various sports

Sport	R*f* value(cm)
1.	0.58
2.	0.68
3.	0.82
Standard	0.54

Visible light:

Table 5: R*f* value of various sports

Sport	R*f* value(cm)
1.	0.62
2.	0.88
Standard	0.54

Table 6: Characteristics of analytical method derived from the standard calibration curve

Compound	Linearity range µg/ml	Correlation co-efficient	Slope	Intercept
Quercetin	5-25	0.999	94.39	-30.43

Table 7: Quantitative estimation of Quercetin in extract

S. No.	Extract	RT	Area	% Assay
			Basella alba	
1.	Hydroalcoholic extract	2.826	1131.26	0.013

CONCLUSION:

From the result of proximate phytochemical analysis, Concluded that the *Basella alba* plant were found to contain phytoconstituents like alkaloids, flavonoids, saponins and tannins which are reported clinically to combat various diseases and disorders in human beings. This study prompted us for the identification, isolation, characterization and investigation novel bioactive compounds. From the above study, it is concluded that a number of Phytoconstituents are identified in the Hydroalcoholic extract of *Basella alba* such as Flavonoids, Alkaloids and Diterpenes. The TLC profile has revealed that presence of flavonoids in the tested plant extract.

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