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Phytochemical study of Hydroalcoholic extract of *Mansoa alliacea* (Lam.) Leaf

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ABSTRACT

Today's era of science in which everyone is busy to get luxurious life style, here the people of India have not much knowledge about actual effect of this plant. Today normally *Mansoa alliacea* (Lam.) used in many part of the world, but this plant is also found in Chattishgarh in India. *Lahsun Bel* or *Jangali Lahsun* are a very important folk medicine in India. *Mansoa alliacea* (Lam.) is an important drug is not namely mentioned in the traditional medicinal texts. It is a very efficacious plant remedy for the pain and inflammatory conditions like arthritis and rheumatism as well as it also can be used in cold, flu and fever. Generally leaves are used in form of infusion or decoction. Roots are used in the preparation of cold maceration and tincture andgenerally taken as a whole body tonic. The plant has antibacterial,anti-cholesterolemic, antifungal, anti-inflammatory, antioxidant, anti-rheumatic, antispasmodic, antitussive and antiviral used traditionally. Whole part of *Jangali Lahsun* or *Lahsun Bel* are used for medicinal purpose. Pharmacognostic study or phytochemical investigation of these leaves has not been performed yet. The present work deals with the qualitative phytochemical evaluation of the leaf of *Mansoa alliacea* (Lam.) and establishment of its quality parameters.

Key words: *Mansoa alliacea, Lahsun Bel, Jangali Lahsun.*

INTRODUCTION

Mansoa alliacea is a native plant to South America, exactly from the Amazonian basin and has been recollected in Bolivia, Brazil, several Caribbean Islands, Colombia, Costa Rica, Ecuador, French Guiana, Guyana, Nicaragua, Panama, Peru and Suriname.[1] *M. alliacea* is a native Amazonian plant belonging to the family of Bignoniaceae, its scientific name is *Mansoa alliacea* (Lam.) A. Gentry, but has been classified with several synonyms.[2] *M. alliacea* is well known with several common names in different countries, in Ecuador and Peru it is denominated ajo de monte or sachaajo, in Brazil cipo-d'alho, cipo-alho, cipó-de-Alho, alho-damata, in Venezuela bejuco de ajo. *M. alliacea* grows in tropical areas of primary forest with rainfalls from 1800 to 3500 mm/year, in clay or sandy soils rich in organic matter, shaded or poorly shaded areas, temperatures between 20 to 26°C, away from puddles because it is not resistant to foods. The name ajo sacha means 'false garlic', due to the characteristic garlic smell molecules present into the leaves.[3] As many other plants cited in traditional medicine.[4-6]

Bignoniaceae is a family of flowering plants.[7] Nearly all of the *Bignoniaceae* are woody plants, but a few are subwoody, either as vines or sub-shrubs. *Bignoniaceae* are most noted for ornamentals growns for their conspicuous, tubular flowers.[8] A great many species are known in cultivation.[9] According to different accounts, the number of species in the family is about 810[10] or about 860.[11] The last monograph of the entire family was published in

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2004.[11] In the work 104 genera were recognized. Many species of *Bignoniaceae* have some use, either commercially or ethno botanically but the most important by far, are those planted as ornamentals, especially the flowering trees**.**

Normaly *Mansoa alliacea* (Lam.) is commonly used in many parts of the world but this plant is also found in Chhattisgarh state of India and here the peoples don't have much knowledge about the actual effect of this plant.

Common Name

Aboeja-midia, ah-kah-pota, ajo macho, ajo sacha, ajos sacha, ajosacha, ajos de monte, Amazonian garlic bush, ayotete, be'o-ja pasanga, bejuco de ajo, boens, cipo alho, cipo d'alho, false garlic, garlic rope, garlic vine, gonofroe-tite, ilay kamwi, ka ale, knof-looklian, knoflook liaan, koenofrokoetite, kwi-po-kan, liane-ali, niaboens, nisi boains, posatalu, sacha ajo, sucho ajo, shansque boains, tingi-tite, vova, wild garlic, woe-ipole.[12]

Aims and Objectives

The present study deals with physicochemical and phytochemical study of Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaf.

Materials and Methods

Collection of plant samples

Mansoa alliacea (Lam.) leaves were collected from Herbal Garden of Govt. Ayurved College Raipur (C.G.) in India. Fresh leaves were collected from garden and washed; shade dried and packed in a paper bag for further physico-chemical and phytochemical analyses.

Preparation of plant materials

The freshly collected sample were washed with distilled water and air-dried under shade at room temperature for 10-12 days. After drying, the samples was grounded into fine powder. Powdered samples were then stored in air tight containers for further use.

Preparation of the plant extracts

The coarse powder (500 gms) of leaf of *Mansoa alliacea* (Lam.) was used for extraction process following Maceration method. Coarsely ground powder of the *Mansoa alliacea* (Lam.) leaf was placed in one large glass container and approximately 1550 ml of 80% Ethanol was added to it for maceration in order to get a hydro-alcoholic extract. The glass container was closed with a glass lid to prevent evaporation of the menstruum and this system was allowed to stand for 7 days with occasional stirring. The liquid i.e. the menstruum was then strained and the solid residue, called marc, was pressed to recover as much occluded solution as possible. The strained and expressed liquid thus obtained was mixed and clarified by filtration. The filtration was carried out in a beaker using a Whatman's filter paper no 1. China dishes was used for evaporation of the menstruum. The china dishes containing the menstruum was placed on a water bath. After evaporation of the menstruum of the hydro-alcoholic extract was collected. The extract was stored in a dark colored pre-sterilized airtight container. It was then stored in a refrigerator at 4°C in a dark colored pre-sterilized airtight container until its further use.

A. Phytochemical Study

Physico-Chemical Tests[13]

Foreign Matter

The sample shall be free from visible signs of mold growth, sliminess, stones, rodent excreta, insects or any other noxious foreign matter when examined as given below. Take a representative portion from a large container, or remove the entire contents of the packing if 100g or less and spread in a thin layer in a suitable dish or tray. Examine in daylight with unaided eye. Transfer suspected particles, if any, to a petri dish and examine with 10x lens in daylight.

Determination of Total Ash

Incinerate about 2 to 3g accurately weighed, of the ground drug in a tared platinum or silica dish at a temperature not exceeding 4500 until free from carbon, cool and weigh. If a carbon free ash cannot be obtained in this way, exhaust the charred mass with hot water, collect the residue on an ashless filter paper, incinerate the residue and filter paper, add the filtrate, evaporate to dryness and ignite at a

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temperature not exceeding 4500. Calculate the percentage of ash with reference to the air-dried drug.

Determination of Acid-Insoluble Ash

To the crucible containing total ash, add 25 ml of dilute hydrochloric acid. Collect the insoluble matter on an ash less filter paper (Whatman 41) and wash with hot water until the filtrate is neutral. Transfer the filter paper containing the insoluble matter to the original crucible, dry on a hot-plate and ignite to constant weight. Allow the residue to cool in a suitable desiccator for 30 minutes and weigh without delay. Calculate the content of acid-insoluble ash with reference to the air-dried drug.

Determination of Water Soluble Ash

Boil the ash for 5 minutes with 25 ml of water, collect insoluble matter in a Gooch crucible or on an ash less filter paper, wash with hot water and ignite for 15 minutes at a temperature not exceeding 450. Subtract the weight of the insoluble matter from the weight of the ash; the difference in weight represents the water-soluble ash. Calculate the percentage of water-soluble ash with reference to the air-dried drug.

Determination of Alcohol Soluble Extractive

Macerate 5g of the air dried drug, coarsely powdered, with 100 ml of alcohol to the specified strength in a closed flask for twenty-four hours, shaking frequently during six hours and allowing to stand for eighteen hours. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filtrate to dryness in a tared flat bottomed shallow dish and dry at 1050, to constant weight and weigh. Calculate the percentage of alcohol-soluble extractive with reference to the air-dried drug for determination of methanol soluble extractive use methanol on place of alcohol.

Determination of Water Soluble Extractive

Proceed as directed for the determination of alcohol-soluble extractive, using chloroform-water instead of ethanol.

Determination of Moisture Content (LOD)

Procedure set forth here determines the amount of volatile matter (i.e., water drying off from the drug). For substances appearing to contain water as the only volatile constituent, the procedure given below, is appropriately used. Place about 10g of drug (without preliminary drying) after accurately weighing (accurately weighed to within 0.01g) it in a tared evaporating dish. For example, for unground or unpowered drug, prepare about 10g of the sample by cutting shredding so that the parts are about 3mm in thickness. Avoid the use of high speed mills in preparing the samples and exercise care that no appreciable amount of moisture is lost during preparation and that the portion taken is representative of the official sample. After placing the above said amount of the drug in the tared evaporating dish, dry at 1050 for 5 hours and weigh. Continue the drying and weighing at one hour interval until difference between two successive weighing corresponds to not more than 0.25 per cent. Constant weight is reached when two consecutive weighing after drying for 30 minutes and cooling for 30 minutes in a desiccator, show not more than 0.01g difference.

Determination of pH Values

The pH value of an aqueous liquid may be defined as the common logarithm of the reciprocal of the hydrogen ion concentration expressed in gm per litre. Although this definition provides a useful practical means for the quantitative indication of the acidity or alkalinity of a solution, it is less satisfactory from a strictly theoretical point of view. No definition of pH as a measurable quantity can have a simple meaning, which is also fundamental and exact. The pH value of a liquid can be determined potentiometrically by means of the glass electrode, a reference electrode and a pH meter either of the digital or analogue type.

B. Preliminary Phytochemical Screening[14]

Hydroalcoholic extract of *M. alliacea* leaf was screened for the presence of alkaloids, carbohydrates, reducing sugar, saponins, phytosteroids, phenol, flavonoids, proteins, amino acid, terpenoids, fixed oil and fats, gums and mucilage, cardiac glycoside.

Test for Alkaloids

Dragendorff's test

Extract was treated with Dragendorff's reagent (potassium bismuth iodide solution) - orange precipitate shows the presence of alkaloids.

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Test for Carbohydrates

Molisch test - To 2-3 ml Hydroalcoholic extract, few drops of alpha naphthol solution and alcohol was added and shaken well. Then concentrated H_2SO_4 was added from sides of test tube and observed for violet ring which was formed at the junction of 2 liquids.

Test for Reducing Sugar

Benedict test - Mixed equal volume of Benedict's reagent and test solution in the test tube heated in boiling water bath for 5 min. Observed for change in colour of solution which appears green, yellow or red depending upon amount of reducing sugar present in test solution.

Test for Saponins

Foam Test - 1 ml of extract was diluted with 10 ml of distilled water and shaken in a graduated cylinder for 15 min. Formation of 1 cm layer of foam indicates the presence of saponins.

Test for Phytosterols

Salkowski reaction - To 2ml of extract, 2ml of chloroform and 2ml concentration.

Test for Phenols

Ferric chloride test - 5 ml of extract was allowed to react with 1 ml of 5% Ferric chloride solution. Bluish black coloration indicated the presence of phenolic compounds and Tannins.

Test for Flavonoids

Ferric chloride test - To the extract few drops of neutral ferric chloride solution was added. Blackish red color formation shows the presence of flavonoids.

Test for Proteins

Biuret test - Two ml of extract dissolved in methanol was added to the Biuret reagent (2 ml). The contents were shaken well and warmed on water bath. Appearance of red or violet color indicates presence of proteins.

Test for Amino acid

Ninhydrin test - Heat 3 ml T.S. and mix with 3 drops 5% Ninhydrin solution in boiling water for 10 min. Purple or bluish color appear.

Test for Fixed oil and fats

Filter Paper test - Filter paper gets permanently stained with oils.

Test for Gums and Mucilage

Aq. Potassium hydroxide test - Powdered drug swells in water or aqueous KOH.

Test for Cardiac Glycoside

Keller Killiani test - 2ml. extract, glacial acetic acid, one drop $Fecl_3$ and conc. H_2SO_4 were added and observed for reddish brown color which appears at junction of the two liquid layers and appears bluish green.

Results and Discussion

A. Physico-chemical study

Physico-chemical parameters are important analytic features during standardization. The Physico-chemical result of the powdered leaf is shown in Table 1.

Table 1: Physico-chemical parameters of the leaf

Parameters	Result (Average value)
Foreign matter	Nil
Loss on Drying	Not more than 10.44 present
Total Ash	Not more than 6.12 present
Acid –insoluble ash	Not more than 0.56 present
Alcohol soluble extractive	Not less than 31.47 present
Water soluble extractive	Not less than 16.92 present

Physico-chemical parameters are important analytic features during standardization. Foreign matter is directly related with the presence of impurities. If foreign matter is very high which may be affected its treatment. Foreign matter value obtain are Nil. The Ash value of a drug gives an idea of the earthly matter or the inorganic composition and other impurities present along with the drug. Hence the average Total Ash Value obtain are 6.12 % in sample. Acid insoluble ash which are important parameter for detecting the

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presence of inorganic substances were found to be 0.56%. Alchohol soluble extractive were found to be 31.47%. Water extractive was found to be 16.92% and alchohol soluble extractive value found to be 31.47%. Water soluble extractive (W.S.E.) and alcohol soluble extractive (A.S.E.) value are indication of the solubility of active principle of the plant.

B. Preliminary phytochemical study - It is shown in Table 2.

Table 2: Phytochemical analysis of *Mansoa alliacea* (Lam.) leaf

Tests	Hydro-Alcoholic Extract
Alkaloid	Positive
Carbohydrates	Positive
Reducing sugars	Positive
Saponins	Positive
Phytosteroid	Positive
Phenols	Positive
Flavonoids	Positive
Protiens	Negative
Amino acid	Positive
Terpenoids	Negative
Fixed oils and fats	Negative
Gums and Mucilage	Positive
Cardiac Gycoside	Negative

Alkaloids have very bitter taste. It shows mydriatic, antimalarial, strong analgesic, hypotensive, antimitotic, oxytosic muscle relaxant etc. pharmacological activity. Carbohydrates give us the energy for metabolism and regulation of Blood glucose. As they are main source of fuel of body, needed for physical activity, brain function. All the cells and tissues in our body need carbohydrates and they are also important for intestinal health and waste elimination. Building macromolecules are Sparing protien, lipid and carbohydrates. Saponins shows hydrocholesterolaemic, immunostimulant, anticarcinogenic and antioxidant properties. Saponin reduce risk of heart disease. Phytosteroids shows anti-bacterial and insecticidal activity. Phenolic compound shows anti-ulcer, anti-inflammatory, antioxidant, anti-tumour, anti-spasmodic, anti-depressant activity. Flavonoids shows anti-inflammatory and antimicrobial activity. Amino acid are used as a way to provide a concentrated specific and efficient intake of requried nutrient components in medical foods for malnourished proteins elderly people with lower digestive capabilities as well another use. Gums and mucilage provides protective demulscent and nutritive action on the body.

CONCLUSION

All these indicate *Mansoa alliacea* shows the medicinal properties. Phytochemical analysis and physicochemical properties that proved that the plant having some properties like phytosteroids, alkaloids, carbohydrates, saponins, phenol, flavonoids, gums and mucilage present in sample. Which are responsible for various pharmacological activities.

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