Preparation And Standardization of Tulsi Leaf Tablet

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Abstract— Oscium sanctum as sacred and medicinal plant in ancient literature, commonly known as Tulsi is derived from 'Sanskrit' which means "the incomparable one". This plant belongs to the family Lamiacea which is native throughout the old world topics and cultivated for religious and medicinal purposes. Several medicinal properties have been attributed to the plant in Ayurveda, siddhaa, Greek,Roman and unani. Ayurveda is a science of life from the ancient time and Ayurvedic formulations are safe and effective but adulteration of lower cost material in it reduces the quality of the drug, hence the standardization of herbal drugs is necessary. Tulsi tablets are an Ayurvedic formulation used for cold and cough. In the Ayurveda system tulsi is often referred to as an "Elixir of Life" for its healing power and has been known to treat many different common health conditions.in the Indian materia Medica tulsi leaf extracts are described for treatment of bronchitis, rheumatism and pyrexia.other reported therapeutic uses include treatment of epilepsy, asthma or dyspena ,cough,skin and hematological disease, parasitic infection,neurolgia, headache, inflammation and oral condition.

Index Terms— Tulsi, Holy basil, Oscium sanctum.

I. INTRODUCTION

Tulsi is vital symbol of the Hindu religious tradition.Tulsi also known as"Holy Basil" has been revered in India for thousands of years,it has been by many cultures round the world to bestow a tremendous number of health benefits as a healing balm for body mind and spirit.generally there sort of tulsi has been found

1. Rama or light tulsi(ocimum sanctum)
2. Shyama or dark tulsi(ocium Sanctum)
3. Vana tulsi (Gratissium)

Each form of tulsi leads its own distinct characteristics.tulsi is extremely flavored, bitter,light,dry,and contains a heating quality it balances kapha and vata doshas,but slightly increase the pitta dosha.the holy basil is additionally an herbal remedy for a plenty of common ailments. It's heating qualities help liquefy mucus, making it beneficial for the cough ,the systema respiratorium and therefore the body's natural response to allergens.Many researchers reported that Tulsi provides an expensive supply of antioxidants and other nutrients. It reduces stress, regulates cholesterol, , reduces temperature in fever , decrease inflammation, restrains peptic ulceration and enhances body stamina. The leaves of tulsi are utilised in temples for the worship purpose and also on several social functions like marriage, death, decoration etc.According to one story,it was a "gopi" who fell crazy with krishna and then had a curse laid on her by her consort Radha.she was very dear to vishnu.Tulsi is additionally mentioned within the stories of mira and Radha immortalized in Jayadeva's gita govinda

A hindu home is considered incomplete without the tulsi plant within the courtyard. In india ,it is worshipped in an exceedingly month in " kartik" which begins after sharad poornima and also called as"Tulsi Vivah"(merrige).on this present day ,it is

ornamented and beneficial as a bride.women water the plant, illumine the diya near it and worship it daily. The leaves,stems,seeds,and even the soil are thought to be Tulsi is necessary ingredient within the preparation of Ayurvedic cough syrup hot water leaf extracts is very useful in eliminate cold and flu.the decoction prepared by mixing honey,ginger,and tulsi leaves is sort of helpful in combating bronchitis,influenza and asthma.A hot concoction of tulsi leaves is found extremely beneficial during the season and supply immediate relief in cold, sneezing nose,cough, malaria,and dengue.The juice extracted from tulsi leaves are widely used to their following Power . –

Genus oscium has various species like:

1. Ocimum sanctum L. (Tulsi)
2. O.grtissium (Ram Tulsi)
3. O. canum (Dulal Tulsi)
4. O.bascilicum (Ban Tulsi)
5. O. kilimandschricum
6. O. americanum

Scientific classification:

Kingdom : plantae
Division : Magnoliophyta
Class : Magnoliopsida
Order : Lamiales
Family : Lamiaceae
Genus : Ocimum
Species : Sanctum
Binomial name: Ocimum Sanctum L.

II. VERNACULAR NAMES

LANGUAGE	VERNACULAR NAMES
Hindi	Kalatulasi, Tulasi
English	Holy Basil
Telugu	Tulasi, Gaggera – chettu
Tamil	Tulaci.Karuttulaci
Bengali	Tulasi, Krishna tulasi
Gujarati	Tulasi, Talasi
Punjab	Bantulsi, Tulsi
Marathi	Tulasa, Tulasi
Konkani	Tulsi

III. MORPHOLOGY

Figure: Different varieties of Tulsi plant

It consists of

Root: It is a Thin, wiry, branched, hairy, soft, blackish-brown externally and pale violeinternally.

Stem: It is an Erect, herbaceous, woody, branched, subquadrangular, externally purplish brown to black in colour and, internally cream coloured; fracture, fibrous in bark.

Leaf: 2.5-5 cm long, 1.6-3.2 cm wide, the shape is elliptic oblong, acute, about 1.5-3 cm long hairy and the test is pungent and odour is characteristic.

Flower:- It is an purplish in colour ,the pedicels longer than calyx and the calyxis ovoid or campanulas, corolla about 4 mm long and the test is pungent or odour is aromatic.

Fruit:- It consist of a group of four nutlets, each with one seed and enclosed in an enlarged, membranous veined calyx, slightly compressed, and the colour is ; pale brown or reddish.

Seed: It is an Rounded to oval in shape and brown in colour and the test is pungent and no odour.

IV. REVIEW OF LITERATURE

Since, ancient time, phytochemicals from medicinal plants are studied and used for curing various human diseases. Their side effects are negligible as compared to modern allopathic drugs. Tulsi (Ocimum sanctum L.) is such crucial medicinal plant, whose phytochemicals are very useful for mankind. Tulsi is mentioned in Padam Purana - "Just half a leaf of Tulsi is as useful in keep a dy healthy and removed from diseases, as all the things and medicines made of all the flowers and leaves of the world".

In Ayurvedic medicine Tulsi could be a common item, which is employed for many diseases, including treating tumor growth. It's used for first- aid treatment, to convey relief from pain caused by cuts, burns and skin problems. In Hindu culture the plant is taken into

account as sacred and is daily prayed by offering flowers and water. Antimicrobial activity of Tulsi leaves extract was evaluated and therefor the results shown that E. coli, E. faecalis were mostly prone to methanol extract than S. aureus and A. hydrophila. It may be suggested that S. aureus was the Foremost resistant organisms to the concentrations of 20 and 40 mg/ml of the methanol extract of Ocimum. The heavy metal deposition and phytochemical characterization, carboxylic acid profiles and antimicrobial activity, antibacterial and antioxidant activity of the leaves extract of Ocimum sanctum plant evaluated by – Sandip Vidhani, Vijay Vyas (2016),Kang Zhi Xia (2018) "The anti-flu property of Tulsi has been discovered by doctors across the globe quite recently. Tulsi improves the body's overall defence mechanism including its ability to fight viral diseases. Tulsi is extremely beneficial in treating conditions like cardiovascular disease, headaches, stomach disorders, hepatitis, malaria, tuberculosis, dengue, and swine flu- R. K. Upadhyay (2017), KP Sampath Kumar et al (2010). The phytochemical screening revealed that the extracts of Ocimum sanctum contain alkaloids, flavonoids, terpenes, saponins, glycosides, and tannins, phenols were absent. Studies suggest that these compounds are answerable for the potent antimicrobial effects of this plant. Tannins are accountable for the haemostatic and antidiaorrheal properties. Saponins act as anti-hyperlipedemic, hypotensive and cardiodepessive properties. Cardiac glycosides can act as cardiostimulants in cases of cardiac failure. Flavonoids are chargeable for antioxidant properties. The immunostimulant property makes it an efficient adaptogen to fret. Immunomodulatory effects of Tulsi (Ocimum sanctum linn.) on healthy human subjects was studied by- Dr. S.C. MAHAPATRA (2011), Dr. Rajesh H. (2013), Borah R., Biswas S. P. (2018), Subir Das, Damodaran Vasudevan (2006), Sumit Summy et.al (2016), Subhash Chandra, Pradeep Dwivedi (2016).

The subject of herbal drug standardization is massively wide and deep. There are various factors necessary for standardization of herbal drugs. Here, the drug Tulsi was analyzed by basic standardization techniques which are easily available least bit Ayurvedic setups. Ayurvedic formulations are safe and effective but adulteration of lower cost material in it reduces the standard of the drug, hence the standardization of herbal drugs is necessary- Tukaram Namdev Mane, Dr. Manish S Kondawar (2018), Vimal, Charmi (2012), Herbal medicines are natural products and their phytoconstituents betting on time and region, processing and storage. Variations within the collection, processing or storage of an herb could impact its efficacy profile. Since prior knowledge regarding appropriate collection and usage of most medicinal plants exists in tradition, it will be used as a guide to quality standardization. The parameters of testing the standard of materials (dravya) in traditional medicines, like rasa (taste), guna (properties), (potency), vipaka (post digestion effects) and karma (action) are very different from the western methods- Kataria Sahil et al (2011), Kunle, Oluyemisi Folashade (2012), Chemical fingerprints obtained by chromatographic and electrophoretic techniques, especially by hyphenated chromatographies, are strongly recommended for the aim of internal control of herbal medicines, since they may represent appropriately the "chemical integrities" of the herbal medicines and therefore be used for authentication and identification of the herbal products. Supported the conception of phytoequivalence, the chromatographic fingerprints of herbal medicines may well be utilized for addressing the matter of quality. Y.-Z. Liang et al. (2004).

In-process quality control (IPQC) tests are strongly associated with final product quality because checks performed during production so as to observe and if necessary to regulate the method to make sure that the product conforms to its specification are the key permanently for good quality pharmaceutical tablets. Inprocess quality control test is critical to insure the security of finished herbal material-Teja Dasari, Sai Lakshmi (2017), Md. Sahab Uddin (2015)

V. MATERIAL AND METHODS

A) Collection, identification and authentication of raw materials

Tulsi plant collected from the local region, and plant Authenticated from the botany department. The collected plant was shade-dried. The leaves were separated, washed with sterile water, dried in shade and then the samples were powered in mechanical grinder. The powder was stored in a very clean closed container up to further use. Four different

manufacturers of Tulsi were purchased from local Ayurvedic medicinal shop from the Nilanga, they're Sample A: Himalaya Tulasi tablets, B: Patanjali Tulasi tablets, C: Shree- Shree Tulasi tablets, D: Chaitanya Tulasi tablets.

B) Method of preparation of Tulsi Tablets

Leaves of tulsi were dried and ground into the mixer, and a fine powder was formed. This powder is used for the preparation of granule. All the desired ingredients were soak up a mortar pestle and mixed well with the assistance of starch paste. The formed damp mass was passed via sieve no. 12. The obtained granules were kept for drying at 65ºC within the oven. Proper drying is required.

Sr	Ingredient	Quantity	Uses
1	Tulsi powder	250 mg	Drug
2	Potassium sorbate	1.2mg	Preservative
3	Starch paste	5%	Excipient
4	Talc	5mg	Flow property

Table 1: The Formula of Tulsi table

- Procedure for the preparation of tablet

Prepared Tulsi granules were mixed with magnesium stearate and talc thoroughly and at last compressed by using 8mm punch and ten stations rotator tablet punching machine.

C) Evaluation of Tablet

a) Organoleptic evaluation

The general appearance of a tablet, its identity and general elegance is crucial for consumer acceptance, for control of lot-to-lot uniformity and tablet-to-tablet uniformity. The control of general appearance involves the measurement of size, shape, color, presence or absence of odour, taste etc.

b) Physicochemical evaluation :-

Physicochemical evaluation of laboratory prepared and marketed formulation of Tulsi tablets was performed in keeping with the standardization parameters for the ash values, extractive values, foaming index, swelling index and loss on drying, microbial test, determination of arsenic and in keeping with Pharmacopoeia of India for weight variation, hardness, friability and disintegration.

Ash Values: It's criteria to judge the identity and purity of crude drug – Total ash, sulfated ash, water soluble ash and acid insoluble ash etc.

SOXHLET EXTRACTION:

The dried powder of Tulsi (100g) was placed within the thimble of Soxhlet apparatus.500 ml of distilled H_2O was used as a solvent. The extraction was continued till clear solvent was seen in the thimble. The extract was concentrated using Rotavapor. Then the extract was dried in an exceedingly digital water bath till a dark green residue was obtained. The percentage yield of the extract was calculated using the subsequent formula

$$\text{Percentage yield} = \frac{\text{Final weight of the dried extract}}{\text{Initial weight of the powder}} \times 100$$

The percentage yield was 8% W/W. The extracts were kept within the refrigerator till further use.

Preparation of crude extract:

Preparation of aqueous extract of ocimum sanctum (leaves) - The extract of leaves were obtained in sufficient quantity by using distilled H_2O. During this process firstly 20 g powdered leaves of ocimum sanctum were placed in 200 ml of beaker and 100 ml of distilled was poured into beaker after addition of water kept for overnight at the room temperature approximately 22 hrs for thorough mixing and also complete elucidation of active materials to dissolve within the respective solvent then, extract was filtered by using muslin cloth followed by Whatman no 1 paper filter paper then the green colour filtrate was obtained, after done this process filtrate was dried. Finally, the residues were collected and used for the experiment.

c) Qualitative phytochemical analysis :-

Test for alkaloids:

2ml of 1% HCl was mixed with crude extract and heated gently. After heating, Mayer's and Wagner's reagents were added to the mixture. If precipitate was observed within the reaction mixture which indicated the presence of alkaloids

Test for glycoside:
Salkowski's test: 2ml of chloroform was mixed with crude extract. Then 2ml of concentrated H2SO4 was added carefully and shaken gently. A sepia colour indicated the presence of glycoside.

Test for flavonoids:
Shinoda test: Crude extract was mixed with bit of magnesium and concentrated HCl was added drop wise. Appearance of pink scarlet colour after couple of minutes indicated the presence of flavonoids.

Test for saponins : 1ml of crude extract was mixed with 5ml of distilled H_2O in a test tube and it absolutely was shaken vigorously. The formation of stable foam was taken as a sign for the presence of saponins.

Test for tannin: 1 ml of distilled H_2O and 2-3 drops of ferric chloride solution was added to 0.5 ml of crude extract. A black coluration indicated the presence of tannin.

Test for carbohydrate:
Iodine test: 2ml of iodine solution was mixed with 0.5 to 1 ml of crude extract. A nevy or purple coloration indicated the presence of the carbohydrate.
Test for phenol: 2 ml of alcohol and 2-3 drops of ferric chloride solution was added to 1 ml of crude extract, blue green or black coloration indicated the presence of phenols.

d) Qualitative test for tablet :-
Hardness:
Hardness generally increases with normal storage of tablets and depends on the form, chemical properties, binding agent and pressure applied during compression. It's non official quality control method. Hardness generally measures the tablet crushing strength. Various method used for test crushing strength- Pfizer tester, Monsanto tester.
Friability:
Friability test the tablets are vulnerable to abrasion hence enabling us to test for the tablet strength under application of force in different manner. Compress tablet that lose but 0.1 to 0.5 % you look after the Tablet weigh are consider acceptable.
Friability = (Iw – Fw)/Iw □ 100%
Where, Iw = Total Initial weight of tablets; Fw = Total final weight of tablets
Weight Variation test (U.S.P.):
Uniformity of weight is an in process test parameter which ensures consistency of dosage units during compression. Take 20 tablets and weighed individually. Calculate average weight and compare the individual tablet weight to the average. The following formula is used-
Weight Variation = (Iw – Aw)/Aw □ 100%
Where, Iw = Individual weight of tablet; Aw = Average weight of tablet.

Content Uniformity Test:
The content uniformity test is employed to make sure that each tablet contains the amount of drug substance. Randomly select 30 tablets. 10 of those assayed individually. The Tablet pass the test if 9 of the 10 tablets must contain not less than 85% and not more than 115% of the labeled drug content and the 10^{th} tablet may not contain less than 75% and more than 125% of the labeled content.

Disintegration Test (U.S.P.):
The time of disintegration is a measure of the standard. The U.S.P. device to check disintegration uses 6 glass tubes that are 3" long; open at the highest and 10 mesh screens at the underside end. Standard disintegration time for uncoated tablet is 15 min.

e) Chromatographic analysis :-
Identification of Eugenol from extract:
For the identification, the sample was subjected to qualitative test i.e. Thin Layer Chromatography. The extract was compared with the quality Eugenol.

Sample preparation:
a. Preparation of working standard solution of Eugenol:
A standard stock solution of Eugenol was prepared by dissolving 1ml of Eugenol up to 10 ml of Methanol, to induce a stock solution containing 100 µg/ml of Eugenol.

b. Preparation of sample solution of Eugenol:
The extracted solution of Tulasi tablet was taken 10mg/10ml. It absolutely was in methanol so volume adjusted up to 10ml by methanol, this solution containing 1000 µg/ml.

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