CHAKSINI (PERISTROPHE BICALYCU LATA (RETZ) NEES.: A COMPREHENSIVE REVIEW ON A LESSER-KNOWN HERB OF UNANI MEDICINE

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ABSTRACT

Peristrophe bicalylculata (Retz.) Nees. family Acanthaceae is a lesser-known drug of Unani Medicine but commonly used drug in Ayurvedic medicine. The plant is found throughout India. In Aligarh and around it is locally called as “Chaksini”. In Unani medicine it is mentioned by the name of “Massi” and “Kakajangha”. The most relevant description of the plant is mentioned as “Massi”. It is used for the treatment of different ailments e.g. fever, cold, cough, insomnia, headache, leucorrea etc. and also for snake poison and sprain. Preliminary neuropharmacological screening e.g. anticonvulsant, narcotic, CNS depressant activities of the plant have been done. The plant has also evaluated for its antibacterial, antidiabetic and anti-lipidaemic activities. This review is prepared to explore the identifying characteristics, ethnomedicinal importance and therapeutic uses of lesser known herb of Unani Medicine.

Keywords: Peristrophe bicalylculata, Chaksini, anticonvulsant, antibacterial, Ethnomedicinal.

INTRODUCTION

Unani medicine is one of the oldest traditional system of medicine practiced in Indian subcontinent. It is based on the theory of Hippocrates (c. 460-c. 370 BC) and Galen (129 AD-c.160 AD) and practiced in India since 8th century. Three sources of drugs Plant, Mineral and substances from animal origin are used for medicinal purpose. In the beginning, the drugs from Greek, Rome, Spain, Iran and Arab were utilized but when this traditional system was introduced in India several other drugs were also included by renowned scholars of the System i.e. Hakim Azam Khan and Najmul Ghani. Some of them are Babchi (Psoralea corylifolia)11, Bukan Booti (Lippia nodiflora)11, Bisahri Booti (Aerva lanata)11, Papda11, Asgand (Withania somnifera)11 and many more. Some of them are lesser known among Unani physicians due to their unavailability or lack of identification. So it is essential to introduce such drugs which are available but not identified properly. Massi or Chaksini (Peristrophe
Peristrophe bicalyculata (Retz) Nees is one of the herbs which introduced in Unani Tib in India. It belongs to the family Acanthaceae, synonymously it is also known as Dicliptera paniculata and Justicia bicalyculata Vahl. The plant is propagated by seeds and cuttings. This weed is used commonly in and around Aligarh, UP, India, and locally known as “Chaksini”.[4] In Indore District of India, its local name is ‘Chotihaarjori’[5,6]. It is found throughout India in waste places. It is a sub-tropic species of Asia and Africa[7]. It is called ‘Tubabin dawaki’ by Hausas in Northern Nigeria, meaning flour of the horse. In ‘Serer’ and ‘Wolof’ languages of Senegal, it is called ‘Buben’ and ‘Mōto’ respectively[8].

In Unani literature it is mentioned by the name of “Massi” and “Kakjangha” which is consider to be beneficial in psychosomatic disorders, gynecological and lung diseases[9,10,11,12,13]. Some controversy existed regarding the correct identity of Kakjangha and besides Peristrophe bicalyculata, the other plants also described under this common name, they are: Leea hirta, Leea acrophylla (Vitaceae) and Vitex penduncularis (Verbenaceae) [14],[15], Atrilal (Ammi majus) [16,17], but according to the description mentioned by Khan and Ghani it is much relevant to the drug Massi which is mentioned under the heading Kakjangha.[1,8]

It is one of the traditional herbs recommended in cases of tuberculosis[11]. In Madhya Pradesh, it is used to treat snake bite.[12] It is said to be a good substitute for Shahatra (Fumaria parviflora) which is one of the reputed drug employed in cases of fever and skin diseases[12,13]. Number of formulations containing either root, seed or entire herb, have been mentioned in Ayurvedic Formulary.[14]. Moreover, the medicinal plant wealth are our nation heritage and it seems to be the first and foremost line of defense for the treatment of various diseases mostly in tribal and rural communities. So, this review is prepared to collect all the evidence regarding the use of “Chaksini” in Unani Medicine, in other traditional medicine and folklores along with recent scientific studies.

MATERIAL AND METHODS
For the preparation of this review, classical books of Unani medicine and printed and electronic publications were taken into account. The materials were searched by the key words, Peristrophe bicalyculata (Retz) Nees, Chaksini, Massi and Kakajangha for its description, pharmacognostical characteristics, phytochemistry, pharmacological studies, etc. All relevant articles up to 2022 were referred including 03, Unani books, 14 English books on herbals, 05 websites, 01 proceeding and 17 research papers and articles published in PubMed, Science Direct, Google Scholar and Research gate. Appropriate Unani Terminologies were taken from Standard Unani Medical Terminology Published by Central Council for Research in Unani Medicine in collaboration with the World Health Organization (WHO). Images of various parts of Peristrophe bicalyculata (Retz) Nees. were collected from websites mentioned in the references. The illustration was sketched by the author (Mohd Afsahul Kalam), according to the figure available in the book Indian Medicinal Plants.

Botanical description
Peristrophe bicalyculata (Retz) Nees is a small, erect, hairy, spreading annual herb, reaches up to 20-90 cm in height.[14] Young shoots are usually 4 sided, adult shoots 6 sided having white, spreading bristle hairy. Leaves are ovate, opposite, equal or unequal,[15] acuminate, 2.5-7.5x2.0-4.0 cm long, entire, hairy more on lower surface, petiole 6-12mm long.[14] Flowers are pink, 1cm, 2 lipped, lower lip spreading, upper lip erect, born at branch ends or in leaf axils, with leaves forming a large lax panicle. Stamens 2; filaments distinct, Up to 5 mm, white hairy.[15] Bracts are 2, opposite, unequal longer than the calyx; bracteoles 4, smaller. Corolla, is pink, about 12mm long, pubescent outside. Capsule are about 8 mm long and 2 mm broad, ellipitoid, narrowed, into a cylindrical stalk, pointed, pubescent. Seeds are 4, flattened and covered with minute papillae. Flowering and fruiting occur in August to September.[16]
Taxonomical Classification:
Kingdom: Plantae
Phylum: Magnoliophyta
Class: Magnoliopsida
Order: Lamiales
Family: Acanthaceae
Genus: Peristrophe
Species: bicalyculata

Distribution
The plant is found almost throughout India, Afghanistan and Africa.

Description of drug in Unani literature
Chaksini or Massi grows up to a Zara’ (gaz)/yard in height. It has delicate, twisted and six-sided branches. The leaves are rough and hairy, similar to those of the Sahadevi (Vernonia cinerea Linn) plant. The leaves of the plant fall down when it became mature. It has little blue flowers that resemble Banafsa (Viola odorata) and Gaozaban (Borago officinalis), but smaller in size and has a red pinched appearance. Fruits look like Foeniculum vulgare seeds. When a slit is formed, little insects emerged from the nodes of branches. After consuming these insects, Bulbul (Nightingale) becomes inebriated. Deers are very fond of this plant. This plant can be found in both the forest and deserted areas.

Mutaradifat (vernacular name)
English: The goddess of Mercy, Panicled foldwing, Panicled peristrophe, Lady Flower
Assamese: Kakajangha, Naka Bhanga
Bengali: Nasabhanga
Gujrati: Bodi Aghadi, Kali Aghadi, Kakajangha
Hindi: Kali Aghari, Kakajangha, Kakanadi, Nasbhanga, Massi, Gha, Kaadi
Kannad: Cheebee Gida, Sibi Gida
Malayalam: Kattupuzhukkolli
Marathi: Rankirayat, Kakajangha, Pit Papda
Sanskrit: Kakajanga, Kakatikta, Nadikanta, Prachibala, Sulomasha
Sindhi: Nazpat, Wilma
Sinhalese: Mahanelu
Tamil: Kara-k-Kanchiram
Telugu: Chebira

Parts medicinally used
Entire plant is used medicinally

Mizaj (temperament)
The temperament of Massi or Kakajangha is cold and dry but according to some scholars it is hot and dry. Vaidyas also considered it hot and dry.

Af’al (action)
It has bitter, astringent, analgesic, antipyretic, antitussive, siccative, wound healing etc. properties.

Iste’malat (uses)
The herb is useful in the treatment of infection, snake poisoning, mercury poisoning, sprain, boils, fever, cold, cough, insomnia, headache, leucorrhrea, bone fracture and ear and eyes diseases. It also used to treat wounds of animals.

ETHNO MEDICINAL USES
The ethnic and rural people of India have preserved a large bulk of traditional knowledge of medicinal uses of plant growing around them. This knowledge is handed down to generations through word of mouth and is extensively used for the treatment of common diseases and conditions. It is evident that many valuable herbal drugs have discovered by knowing that particular plant was used by the ancient folk healers for the treatment of some kind of ailments. P. bicalyculata is one of the important herbs which has ethnomedical importance. Indian tribes have been using the plant in the treatment of liver disorders, rheumatism, and gout. It is also used as antidote for snakebite, anti-nematode and pesticide. Various Ethnomedicinal uses of this plant is mentioned as below:

Headache
Vaporization of Massi (Peristrophe bicalyculata) is taken after boiling in water, it cures headache

Snakebite
Entire plant is macerated in the infusion of rice and administered orally in snakebite.

Sprain and Bone fracture
In Uttar Pradesh, the paste of the plant is used for sprain and bone fracture.

Glandular swelling
It is used for fever, dyspepsia, swellings and bronchitis, juice of the leaves is applied on glandular swellings.

Cardiovascular diseases
The plant P. bicalyculata is used in South West Nigeria in the treatment of hypertension and other cardiovascular related diseases.

SCIENTIFIC STUDIES
Chemical constituents
Flower contains Pentunidine-3rhamnoglucoside. Root and
stem contain Alkaloids, coumarins, and potassium chloride and Saponins and a free sugar were found in the root.[31] Stem contains sterols, fatty acids (stem and root), free amino acids and free sugars.[32] A yellowish brown essential oil obtained by steam distillation of the plant[33]. Essential oils present in *Peristrophe bicalyculata* are α-Pinene, β-Pinene, α-Phellandrene, p-Cymene, 1,8-Cineole, Linalool, Naphthalene, β-Cyclocitrал, α-Cubebebe, α-Copaene, β-Bourbonene, β-Cubebebe, γ-Caryophyllene, α-cis-Bergamotene, β-Caryophyllene, α-Ionone, β-Gurjunene, α-trans-Bergamotene, Aromadendrene, α-Humulene, trans-β-Farnesene, Alloaromadendrene, γ-Murolene, Germacrene D, ar-Curcumene, β-Ionone, α-Zingiberene, Germacrene A, β-Bisabolene, γ-Cadinene, δ-Cadinene, Cadina-1,4-diene, α-Cadinene, α-Calacorene, Elemol, trans-Nerolidol, Spathulenol, Globulol, 1-epi-Cubenol, γ-Cadinol, Torreyol, α-Cadinol, epi-α-Bisabolol, (2Z,6E)-Farnesol, Heptadecane, Octadecane, 6,10,14-Trimethyl-1-2 pentadecanone, Nonadecane, Farnesyl acetone, Eicosane, Heneicosane, (E)-Phytol, Docosane, Tricosane, Pentacosane, Heptacosane, Nonacosane and Hentriacontane.

**Pharmacological studies**

Various pharmacological studies have been done as follows:

**Tuberculostatic activity**

The essential oil obtained from the plant shows Tuberculostatic activity *in vitro* against the growth of various strains of *Mycobacterium tuberculosis*.[34]

**Toxicity study**

Acute toxicity study on Swiss albino mice and chronic toxicity study on Albino Wistar rats were carried out by Pradeep et al. (2008) in this study aqueous and methanol extracts of *P. paniculata*, administered in the dose range of 50-2000 mg/kg b.wt (p.o) to mice. During the experiment no significant changes in the behavioral or autonomic responses were observed. In chronic toxicity studies at the dose of 200 mg/kg/day for 90 days in Albino Wistar rats, no significant alteration in behavioral, neurological and autonomic responses were seen, when compared to control group. No evidence of toxicity was found in rats as evidenced by biochemical and histopathological investigations.[35]

**Anticonvulsant activity**

For the study of anticonvulsant effect, aqueous extract of Chaksini (*Peristrophe bicalyculata* (Retz) Nees) Nees was given orally in a dose of 25mg/100g of body weight to albino Wistar rats of either sex. Supra Maximal Electroshock model was used in this study. A significant reduction or total abolition of the extensor phase indicates anti-convulsive action and it was found that the duration of the extensor phase of the convulsions in the control group was 10.2 ± 0.17 seconds while in the test drug group, the duration of extensor phase was drastically reduced to 6.95 ± 0.39 seconds. There was a significant decrease (P < 0.01) in the extensor phase. It was found that in supramaximal electric seizure test, the results were significant as in grand mal epilepsy produced in animals.[36]

**Narcotic effect**

An in vivo study was done to confirm the central depressant action of the aqueous extract of Chaksini (*Peristrophe bicalyculata* (Retz) Nees in a dose of 25mg/100 g of body weight on pentobarbitone sodium induced narcosis in rats. The result was found to be significant for central depressive activity.[37]

**Anti-diabetic effect**

An in vivo study was conducted to determine the effect of *Peristrophe bicalyculata* powder on diabetic and lipid parameters in stomach of rats. Treatment group not only showed marked reduction in the stomach weight of animals, but also reduce significantly (p<0.05) levels of glucose, insulin, protein, cholesterol and triglycerides.[38]

**Anti-bacterial study**

An *in vitro* study revealed that ethanolic extract of *Peristrophe bicalyculata* was more effective against *E. coli*, *B. cereus* and *S. typhi*. Highest zone of inhibition (18±0.8 mm) was observed against *E. coli*. [37] Another study conducted by Giwa OE et al. found that ethanolic extract of *Peristrophe bicalyculata* leaves inhibited growth of *Staphylococcus aureus*, *Klebsiella spp.*, *Pseudomonas aeruginosa*, *Aspergillus niger*, *Aspergillus clavatus* and *Rhizopus stolonifer*.[39] Chloroform extract of *Peristrophe bicalyculata* also demonstrated and was found significant anti-bacterial property against *Staphylococcus aureus* (MTCC 1144) (26±0.66 mm) and lowest inhibition against *K. pneumonia* (MTCC 4030)(18.3±0.79 mm) [39]

**Antioxidant activity**

A study conducted by Arya P (2018) showed that methanolic leaves extract of *Peristrophe bicalyculata* has potent DPPH free radical scavenging ability in comparison to other extracts[39]. Victor DS et al. performed a comparative *in vitro* study regarding antioxidant properties between *Ocimum gratissimum*, *Vitex doniana*, *Carica papaya* and *Peristrophe bicalyculata* using DPHH free radical scavenging activity. The results of the study showed *Peristrophe bicalyculata* has the highest antioxidant activities (75.7±2.60%) [40].

**CONCLUSION**

Chaksini is one of the less known drugs of Unani System of Medicine, which is used for the treatment of fever, cold, cough, insomnia, headache, cough, leukorrhea etc. Mostly *P. bicalyculata* is used by the ethnic tribal communities and Vaidyas of Ayurvedic Medicine since long times for the treatment of various ailments, but scientific information remains primarily anecdotal. However, the plant has been
screened for some pharmacological activities e.g. Anticonvulsant, narcotic, CNS depressant, antibacterial, antidiabetic, anti-lipidaemic but more studies are required for scientific validation of the claims of Unani and Ayurvedic physicians.

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