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Review Article

Lallemantia royleana Benth. (Balangu): A Compendious Review on Phytochemistry, Pharmacology and Ethnomedicinal Uses

Afshan Khan¹, Aisha Siddiqui^{2*}, Anwar Jamal³, Gulnar Fatima⁴^{1,2,4} Dept. of Ilmul Advia, School of Unani Medical Education and Research, Jamia Hamdard, New Delhi. India.³ Research Officer (Unani)-SL-III, RRIUM, Bhadrak, Odisha-756100.

ABSTRACT

Lallemantia royleana Benth. is an annual, biennial or perennial herb, belonging to the family *Lamiaceae*, commonly known as Balangu. It is cultivated throughout Western Asia, India, Pakistan and Northern of Iraq. In Unani system of medicine it act as a *Mudire Baul* (Diuretic), *Muqawwi Qalb* (Cardiotonic), *Musakkin* (Sedative) etc and used for treatment of *Nazla wa Zukam* (Common cold), *Humma* (Fever), *Dard Mafasil* (Joint pain), *Hudar* (Rheumatism), *Amraze Gurda* (Renal disorder), *Zofe Qalb* (Weakness of heart) etc. Traditional observation reports that this plant retains potential to cure infectious diseases. Nowadays, it is receiving substantial consideration by scientist and pharmaceutical research industries with the aim to explore for more effective substitute. The seeds contain linoleic, oleic, betasitosterol, palmitic and stearic acids, its gums are composed of L-rhamnose, L-arabinose, D-galactose, protein, uronic anhydride and are generally used for the treatment of abscesses, inflammation and respiratory problems, also used in drinks due to its sedative effects. This plant seems to possess many undiscovered pharmacological properties which have to be explored.

Keywords: *Lallemantia royleana* Benth, Unani medicine, Traditional medicine.

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*Address for Correspondence:

Aisha Siddiqui, Assistant Professor, Dept. of Ilmul Advia, School of Unani Medical Education and Research, Jamia Hamdard, New Delhi. India.

INTRODUCTION

Balangu (*Lallemantia royleana* Benth.) belongs to the family of *Lamiaceae* or *Labiataeae*. This medicinally valuable plant is native to tropical Asia, India, Afghanistan and Pakistan. Its seeds are tremendously grown in different regions of Pakistan such as Chishtian, Attock and Layyah etc^{1,2,3,4}. The plant is also found in different regions of Middle Eastern and European countries particularly Turkey, Iran and in Siberian regions of Russian Federation i.e. in Western Siberia⁵. Due to the presence of high mucilage content, Balangu seeds adsorb water rapidly by hydration process and produce a sticky, turbid and tasteless liquid, which can be used as a new source of hydrocolloid in food formulations, and also used in a wide range of traditional or industrial products in Turkey and Iran⁶. Its seed gum contains 0.87% proteins, 61.74% carbohydrates, 8.33% ash and 29.66% crude fibre⁷. The mucilaginous seeds are customary used as restorative agents against various diseases. The roots of the plant are known to cure coughing and the poultices of moistened seeds are found to be useful in boils, abscesses and inflammations. In

Chinese medicine, *L. royleana* is one of the main ingredients of an ointment used in the treatment of skin tumours. The plant seeds are also used as sedative and considered to be cephalic astringent, cardiac tonic, carminative and act as soothing agent for intestinal troubles and stomach warmth¹³. The leaf and root decoctions are used to treat pneumonia. The plant is also used in preparation of herbal brain tonics in India⁴¹. Its seeds are used for the treatment of inflammation, cold, fever, abscesses and respiratory problems and mixed in drinks due to its sedative effects^{14,16}. The compounds such as Linoleic acid, oleic acid, palmitic acid, stearic acid and beta-sitosterol are present in the seeds. The gums of the seeds are composed of L-arabinose, D-galactose, L-rhamnose, pentosans, proteins, uronic anhydride. It also contains all the amino acids which are present in plant¹⁶. The studies had showed the presence of carbohydrates, fibre, oil, protein and tannins^{6,13,20,21}. Other studies toward natural remedies confirmed the fact that plant and food medicine are good source of natural and safe healing therapies^{11,17}. Nowadays, these ethnomedicines have been receiving substantial attention by scientist and

pharmaceutical research industries with the aim to investigate for more efficient substitute^{10,11,19}.

TABLE-1 SCIENTIFIC CLASSIFICATION: (UNITED STATE DEPARTMENT OF AGRICULTURE)

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Lamiales
Family	Lamiaceae
Genus	Lallemantia
Species	royleana
Botanical name	<i>Lallemantia royleana</i> Benth.

TABLE- 2 VERNACULAR NAME: ^{10,24,25}

Language	Name
English	Lady's mantle, Balangu
Hindi	Tukhme balanga, Tukhm lealanga
Arabic	Habb-ul-Balango
Persian	Tukhme Balango
Kashmiri	Tukhmibalangu
Punjabi	Ghareikashamalu, Tukhmbalangu, Tukhmmalanga
Marathi	Tukhmi Balangu
Urdu	Balangu, Tukhum malanga, Balangu shirazi, Balanga

HABITAT AND DISTRIBUTION:

It is a native of Asia, found in northern regions, mostly found in the hills of Punjab and Kumaon upto 900m. Extensively found in Pakistan Forest Institute (PFI), exclusively in the areas of Peshawar⁴². Also, found in temperate and tropical region, in some European regions of the world, mainly eastern part of Europe which comes under the Russian Federation^{26,27}. It is distributed in Afghanistan, Syria, Iran, Kazakhstan, Tajikistan and Kyrgyzstan.

MORPHOLOGY

Macroscopic:

The plants of *Lallemantia royleana* are annual, biennial or perennial, glabrous or white hairy, herbaceous in nature. Leaves are petiolated or sessile, sub-entire. Flowers are verticillasters axillary having 6 petals, bracts ciliate or waned crenate. Pedicel is erect, rigid, flattened. Calyx is tubular, 15-veined, straight, throat closed after anthesis having 5 teeth which are subequal, posterior tooth wider than other teeth, tooth sinus with a thickened fold. Corolla has a slender slightly exerted tube dilated at apex into throat which is bilipped, where upper lip is straight, slightly concave; apex is emarginated, with 2 longitudinal folds inside. The lower lip is spreads out as 3-lobed, middle lobe is reniform, lateral lobes are minute and semi-circular. There are 4 stamens present, the 2 posterior are longer having pilose filaments and anthers are divaricate having 2 cells. The style is present at the apex having 2 clefts and subulate lobes. Nutlets are dark brown, oblong. Adaxially ribbed, and become mucilaginous when soaked in water. Length of seeds are about 1/12 inches and 1/16 inches in breadth, dark brown to black in colour, smooth, three angled and tapering towards the umbilicus which is marked by a tiny white spot. When moistened with water the seeds become coated with voluminous and translucent mucilage. Odour of seeds is mildly spicy. However, seeds do not impart any odour when suspended or moistened in water. Taste of mucilaginous seeds is mild and somewhat spicy⁴².

Microscopic:

Cross section of seed is more or less triangular in outline and externally it is densely covered with long mucilaginous hairs. While in L.S it looks oblong elliptical. Seed coat is very thin and reduced to just few layers of cells. The outer epidermis comprise of single layer of radially elongated, compactly arranged tabular cells which show bar like thickening on the inner tangential wall. Sometimes, such thickenings are also present on the lateral walls and the adjacent parts. The mesophyll of the seed coat comprises of few layers of only crushed mass but this region is rich in blackish pigment. The endosperm forms a thin layer outside the embryo which is made up of parenchymatous cells. The embryo is also parenchymatous but the cells of cotyledons show great variation in shape and size. The cells lying at the inner surface of the cotyledons are elongated like palisade while others are almost isodiametric. The cells of cotyledons are rich in aleurone grains and oil droplets⁴².

PARTS USED: Seeds⁴²

TEMPERAMENT (*Mizaj*): Cold and Moist⁴²

DOSES (*Miqdar Khurak*): 5-7g⁴²

3-5g⁴²

upto 9g⁴²

ADVERSE EFFECTS (*Muzir Asrat*): Meda (stomach)²⁹

SUBSTITUTE (*Badal*): Rehan (*Ocimum basilicum* Linn.)⁴²

CORRECTIVES (*Musleh*): Misree (Sugar candy) and Aabe Rehan⁴²

COMPOUND FORMULATIONS (*Murakkab*): Sharbat Ahmad Shahi, Khameera Gaozuban Ambari Jawahir Wala and Khameera Gaozuban Sada⁴².

PHARMACOLOGICAL ACTIONS:

- *Mudire Baul* (Diuretic)^{8,31}
- *Stimulant* (Tonic)^{8,31}
- *Muqawwi Bah* (Aphrodisiac)^{8,31}
- *Musakkin* (Sedative)⁴²
- *Muqawwi Qalb* (Cardiotonic)⁴²
- *Dafe Zaheer* (Antidysentric)⁴²

THERAPEUTIC USES:

- *Amraze Jigar* (Hepatic disorder)^{8,31}
- *Amraze Gurda* (Renal disorder)^{8,31}
- *Amraze Aasab* (Nervous disorder)^{8,31}
- *Amraze Nafsani* (Psychotic disease)³³
- *Hudar* (Rheumatism)³⁴
- *Dard Mafasil* (Joint pain)³⁴
- *Wajaul Mafasil* (Osteoarthritis)³⁴
- *Humma* (Fever)¹³
- *Nazla wa Zukam* (Common cold)¹³
- *Munaffis Balgham* (Expectorant)¹³
- *Zofe Qalb* (Weakness of heart)⁴²
- *Darde Shikam* (Abdominal pain)⁴²

PHYTOCHEMICAL CONSTITUENTS: 42

Organic: Steroids, phenols, glycosides and carbohydrates are present.

Inorganic: Aluminium, Iron, Magnesium and Potassium.

PHARMACOLOGICAL STUDIES:

- Antibacterial activity ³⁶
- Hypocholesterolemic effect ³⁷
- Suspending agent ³⁸
- Thickening agent ³⁸
- Anesthetic activity ³⁹

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