

## Pharmacological effects and Traditionally uses of *leptadenia pyrotechnica*. A Review

Heena sharma\*<sup>1</sup>, Dr Jai singh vaghela\*<sup>2</sup>

\*<sup>1</sup>PG Scholar, Department of Pharmacology, Bhupal Nobles College of Pharmacy, Udaipur, Rajasthan, India

\*<sup>2</sup> Associate Professor, Department of Pharmacology, Bhupal Nobles College of Pharmacy, Udaipur, Rajasthan, India

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### ABSTRACT

From ancient times, medicinal plants, sometimes referred to as medicinal herbs, have been employed in a variety of traditional medical procedures, *Leptadenia pyrotechnica* is a plant which is commonly known as *khimp*. It is traditionally use in rural areas for curing many diseases like antifungal, antibacterial, anticancer, antioxidant, wound healing, anthelmintic, antiatherosclerotic, hypolipidemic, diuretics, antidiabetic and hepatoprotective. In rural areas people use this plant as medicine and vegetable also, first they dry the plants and make powder and use it as paste for ringworm, antifungal, wound healing and extract of these plants used for many other diseases.

**KEYWORDS:** *leptadenia pyrotechnica*, Chemical Constituents, Traditional uses of plant, pharmacological effect of plant.

### I. INTRODUCTION;

Medicinal plants, often known as medicinal herbs, have been used in a number of conventional medical practises since ancient times. A wide range of compounds that provide protection against pathogens, fungi, and insects are produced during plant synthesis. Plant medicines are used in both conventional and modern medicine to maintain health. Several drugs derived from medicinal plants have been tried on patients. The WHO developed a traditional medicine approach in 1991. Since then, several monographs on commonly used herbal remedies have been created, along with the accompanying instructions. *Leptadenia pyrotechnica* (Forsk), a member of the Asclepiadaceae family of plants, is known by the common name "Khimp. With a green stem and widely spread branches that are yellowish green in hue, it is an upright, ascending, leafless shrub. It may grow as tall as 0.6 to 2.6 metres. It is frequently used in conventional medicine.

Traditional uses for *leptadenia pyrotechnica* and its parts are many. Expectorant and antihistaminic properties are employed using *leptadenia pyrotechnica* fibre. Yemenis use the whole plant to heal wounds since it has been shown to be effective against *Bacillus subtilis* and *Staphylococcus aureus*. With the plant's fresh juice, an abortion is conceivable. Eczema and other skin conditions can be treated with plant sap, which is also administered to diabetics. To remove the thorns, latex or leaf paste is applied to the wound. In the Sariska region of Rajasthan, whole plant infusion is combined with buttermilk and used as a therapy for digestive issues and uterine prolapse. It is used to treat constipation in the Rajasthan city of Bikaner and is regarded as healthy. In the sudanodeccanian area of the central Desert, it has a long history of use for ailments including fever, cough, renal illness, stones, and urinary problems.

### DIVERSITY GEOLOGICAL

Throughout the whole state of Rajasthan, *leptadenia pyrotechnica* may be found in dry habitats, notably in desert regions. Punjab, Banswara, Palod, Dungarpur, Kota, and Western Uttar Pradesh are frequent locations in India where it may be found.

### SYNONYMS

Khimp, Kheep, and Khimp in India and In Pakistan - Kip, Khip, Kheep Sudan - Kalumbo, Saabe, and Kalimbo.

### SPECIES OF LEPTADENIA

*Leptadenia abyssinica*, *Leptadenia spartum*, *Leptadenia arborea*, and *Leptadenia hastate* *Leptadenia heterophylla* - *Leptadenia delilei* *Leptadenia jacquemontiana* and *Leptadenia ephedriiformis* *Leptadenia lancifolia* and *Leptadenia forskalli* *Leptadenia madagascariensis* and

Leptadenia gracilis Leptadenia pyrotechnica and Leptadenia pallid Leptadenia spartium - Leptadenia reticulata.

## II. MORPHOLOGY

*Leptadenia pyrotechnica* is an upright, climbing shrub that grows to a height of 0.5 to 2.6 metres. It has a light green sap-filled fluid stem, bushy branches that alternate, and a green stem. The leaves are sessile, narrowly linear to linear lanceolate, and measure 2.6 to 6.5 cm by 0.2 to 0.3 cm when they are present. The flowers are greenish yellow in hue and are arranged in lateral umbellate cymes. The stamina corona is made up of five-scaled outer corona, elevated, undulating fleshy ring, and valuate corolla lobes. Actinomorphic, bisexual, pentamerous, and having sympetalous corollas and sepals that are only attached at the base, each flower has these characteristics. Follicles are glabrous, terete, lanceolate, and measure 7.0-14.0X0.5-0.8 cm. The 5-7 mm long, ovatelanceolate, glabrous, hairy seeds feature tufts of hair that are between 2.6 and 3.7 cm long. Between August and January, flowers bloom and fruit bears.

## EFFECTS OF LEPTADENIA PYROTECHNICA ON THE HUMAN BODY.

According to Moustafa et al. (2009c), the methanolic extract made from *Leptadenia pyrotechnica's* aerial parts possesses **anticancer** properties. In order to evaluate the antioxidant capabilities of the methanol extract of *Leptadenia pyrotechnica's* aerial parts, hydrogen peroxide radical scavenging and the 1, 1-diphenyl-2-picryl hydrazyl test technique were used.

According to Tewari et al. (2014), there was a strong association between the concentration of the extract and the percentage inhibition of free radicals. When given to cholesterol-fed rabbits, a methanol extract of *Leptadenia pyrotechnica's* aerial portions has **hypolipidemic** and **anti-atherosclerotic** properties. To considerably reduce the rise in blood total cholesterol, low-density lipoprotein cholesterol, triglycerides, very-low-density lipoprotein cholesterol, and atherogenic index, methanolic extract of *L. pyrotechnica* (250 mg/kg body weight per day orally) was administered. Triglycerides, lipid peroxidation, and hepatic and aortic total cholesterol were all significantly reduced in the rabbits given the extract.

Additionally, the plant extracts successfully stopped plaque development and atheromatic alterations in the. Triglycerides, lipid peroxidation,

and hepatic and aortic total cholesterol were all significantly reduced in the rabbits given the extract.

According to Jain et al. (2007), the aorta and favour increased faecal cholesterol production. Researchers have investigated the anti-diabetic potential of a methanol extract from *Leptadenia pyrotechnica's* aerial parts in diabetic rats produced by streptozotocin. In diabetic rats, the extract showed a dose-dependent decrease of **blood glucose levels** (Chaudhary et al., 2011).

When *L. pyrotechnica* aerial portions were extracted in ethanol, the results of tests on the extract's **antioxidant** and **anti-inflammatory** effects were favourable. The extract significantly reduced the carrageenan-induced paw edoema in rats and had positive effects on the ulcerative colitis they developed when exposed to acetic acid (Saleh et al., 2011). The aqueous ethanol extract of the aerial portions of *L. pyrotechnica* was investigated for **antioxidant, cytotoxic, and anti-lipoxygenase activity**. It included polyphenolic chemicals having antioxidant effects. It was established that there is a linear relationship between a plant extract's ability to reduce free radicals and its overall phenolic content. The ethyl acetate component also demonstrated much higher antioxidant capacities. The ethyl acetate fraction and crude ethanol had higher lipoxygenase inhibitory activity (IC<sub>50</sub> = 2.75 g/ml).

According to Khasawneh et al. (2011), *L. pyrotechnica's* increased cytotoxicity was caused by its **antioxidant capability**. Extracts from the roots and fruit of *Leptadenia pyrotechnica* were tested for their ability to inhibit the growth of *Staphylococcus aureus* and *Staphylococcus epidermidis*, two pathogens. This study employed the agar-well diffusion test technique, and n-hexane, chloroform, acetone, ethyl alcohol, butanol, methanol, and water were the extraction solvents. All of the solvent extracts were shown to be extremely effective against *Staphylococcus aureus*. Both of the infections' development was efficiently suppressed by these plant components, however root extracts stood out slightly more in this regard. The greatest outcomes were obtained by preventing the development of both infections using the methanol extract of both components (Munaziret et al., 2012). The **anthelmintic activity** of the entire plant of *L. pyrotechnica* in methanol extract against *Pheretima posthuma* was assessed. It was determined that compared to the conventional treatment, it required less time for *Pheretima posthuma* to become paralysed and die. *L.*

*pyrotechnica* therefore had dose-dependent anthelmintic action (50 and 100 mg/kg) (Kumaret al., 2011). Using the disc diffusion method, *L. pyrotechnica* leaf extracts were tested for their ability to inhibit the growth of *Aspergillus flavus*, *Aspergillus niger*, *Fusarium oxysporium*, and *Fusarium moniliformis*. The inhibition zones for n-hexane and ethyl acetate extracts against *Aspergillus niger* were 15 mm and 12.2 mm, respectively. With inhibition zones of 13.0 mm and 15 mm, respectively, methanol extract had the highest efficacy against *Fusarium oxysporium* and *Aspergillus flavus*, whereas aqueous extract demonstrated maximal activity with a 9.6 mm inhibition zone against *Fusarium moniliformis* (Rekha et al., 2013). Dichloromethane, methanol, and an aqueous extract of the whole *L. pyrotechnica* plant were used in an **antibacterial** experiment. Maximum antibacterial activity against *Staphylococcus aureus* (15 mm), *Bacillus subtilis* (10 mm), and *Pseudomonas aeruginosa* (10 mm) was demonstrated by the methanol extract. *S. aureus* had an inhibition zone of 10 mm and *B. subtilis* had an inhibition zone of 8 mm for dichloromethane, whereas aqueous extract only inhibited *S. aureus* with an inhibition zone of 8 mm (Al-Fatimi et al., 2007).

#### **Leptadenia pyrotechnica: Traditional Uses.**

A seed maceration is used as an eye ointment and eye wash in the Sahel region. For the treatment of dermatitis and smallpox, plant sap is applied to the skin. For the treatment of renal diseases, kidney stones, and cough, aerial portions are infused. To alleviate urinary retention, twigs are macerated in the Hoggar area, and the resulting liquid is consumed. A root infusion is used in Sudan to cure colic and constipation. Rheumatism is treated by inhaling the smoke from burned stems.

Crushed stems are used to halt bleeding on wounds in Yemen. A stem decoction is used as an expectorant and antihistaminic in Pakistan. The roots are further utilised for similar reasons and used as a diuretic to cure sexual infections and to treat sterility, stomachaches, spontaneous abortions, and other conditions. Headaches can be treated by inhaling burning plant smoke. Gout and rheumatism in India are treated with a stem decoction. Donkeys, horses, and cattle are given a root infusion to relieve flatulence. Young shoots and leaves are frequently used as vegetables or as a seasoning. We consume young, slimy fruits. The nectar of flowers is consumed by shepherds in Niger. All livestock, but notably camels, graze the plant to some extent since it is an essential source of feed. In Pakistan, it is

constantly cut for use as cattle feed and planted between trees in reforested regions. Firewood is made from the wood. The stem pith serves fire tinder, while the twigs also function as an indestructible slow-match. Twigs are frequently used as chewing gum for oral hygiene. The bark produces a superb, non-rotting fibre (known as "khip" or "khimp" in India) that may be used to make cordage, fishing lines, and snares for capturing small animals and birds. In Somalia, twigs are made into wickerwork milk and water containers, which are then covered in latex. The stems are used as thatch and to make carpets and containers in India. The facility has the ability to produce commercial fibre, particularly for ropes and wool-based textile blends. Additionally, the cellulose acetate and paper industries may find usage for it.

Retting is the greatest method for removing the fibre, yet as branches are traditionally hammered to remove the pith in the desert since water is a scarce resource. However, the quality suffers as a result of this procedure.

*Leptadenia pyrotechnica* has been extensively tested for stabilising sand dunes. Additionally, it has been planted for shelterbelts and as fence. In overgrazed rangelands, where it is less appealing than other species, it tends to spread.

Different uses for *leptadenia pyrotechnica* have been documented throughout history. A stem decoction is used to cure gout and rheumatism in India while it is utilised as an antihistaminic and expectorant in Pakistan. Crushed stems are used to halt bleeding on wounds in Yemen. To treat renal diseases, an infusion of the aerial portions is used as a diuretic. To cure urinary retention, twigs are macerated, and the resulting liquid is consumed. For uterine prolapse and gastrointestinal problems, the whole plant is infused with buttermilk. Folk treatments for cutaneous, musculoskeletal, and gynaecological disorders employ all sections of *L. pyrotechnica*. In Pakistan and Sudan, rheumatism is treated using the smoke from a burned plant. Smallpox, psoriasis, eczema, and dermatitis are all treated by applying plant sap to the skin (Gulshan et al., 2012; Schmeizer & Gurib-fakim, 2013; Niaz et al., 2013; Verma et al., 2014). The leaves' juice is historically used to cure infantile diarrhoea, rheumatism, and asthma. Leaf paste is produced and applied to the thorn lesion to eliminate it (Gulshan et al., 2012; Verma). Earaches and persistent renal issues are treated with the fruit and stem decoction.

In addition, it has purgative and carminative properties (Ahmad et al., 2014). The roots are used to cure gastrointestinal issues, constipation, and asthma. Additionally, roots are used as a diuretic to cure sexual infections as well as to treat sterility, stop spontaneous abortion, and prevent it. The root bark is used as a purgative when combined with cow's milk (Gulshan et al., 2012; Schmeizer&Gurib-fakim, 2013).

### III. Conclusion

Plants are a fundamental component of all traditional treatment systems across the world and are a potential source of therapeutic substances. Researchers are examining the bioactive components found in medicinal plants that are responsible for the pharmacological activity all over the world. Further research is required to fully assess the medicinal value of *Leptadenia pyrotechnica*, and the results of such studies may aid with the usage of some of its bioactive components in contemporary medicine.

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