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A Review Study on *Leucaena leucocephala* : A *Multipurpose Tree*

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ABSTRACT

Leucaena leucocephala is a long lived perennial legume tree. It is non-climbing, erect, thornless shrub or small tree, grow in arid and semi-arid areas. It is a multipurpose tree, young leaves and seed used as a vegetable. It is used as soil fertility improvement. Various parts of *L. leucocephala* have been reported to have medicinal properties. In present paper detailed taxonomic description, photographs, botanical description and its uses are discussed.

Keywords: Leucaena Leucocephala, Mycorrhiza, Seedling Development, Anticancer Activity, Anti-Proliferative Activities

I. INTRODUCTION

Leucaena leucocephala is one of the fastest-growing trees in arid and semi-arid area. It is a long-lived perennial legume tree. It is also known as subabool. It is a multipurpose tree, valuable for its wood, which is used to make good quality charcoal, small furniture and paper pulp. Its young shoots, young leaves and seeds may be used as a vegetable in human nutrition. Seeds can also be used as a substitute of coffee or as pieces of jewellery [5]. It is planted as a shade tree for coffee, cacao, and other cash crops; for soil fertility improvement; erosion control; site preparation in reforestation [12]. The protein-rich leaves and legumes are widely used as fodder for cattle, water buffalo, and goats [13].

II. METHODS AND MATERIAL

A. Classification

Kingdom	:	Plantae
Order	:	Fabales
Family	:	Fabaceae
Sub family	:	Mimosoideae
Tribe	:	Mimoseae
Genus	:	Leucaena
Species	:	L. leucocephala
Hindi name	:	Subabool

B. Habitat

Leucaena lecocephala is essentially a tropical species requiring warm temperatures (25–30^{o}C) for optimum growth, with poor cold tolerance and significantly reduced growth during cool winter months in subtropical areas [7]. Shading reduces the growth of leucaena although this plant has moderate tolerance of reduced light when compared with other tree legumes [1]. *Leucaena* grows well in subhumid or humid climates with rainfalls between 650 mm and 3000 mm, although it can tolerate moderate dry seasons of up to 4–6 months [10]. *Leucaena* is known to be intolerant to soils with low pH (below pH 5.5), low potassium, low calcium, high salinity, high aluminium and waterlogging [3].

Figure 1 : *Leucaena leucocephala* (Subabool) Plant with pods

III. RESULTS AND DISCUSSION

A. Botanical Characters

Leucaena leucocephala is a perennial, non-limbing, erect, thornless shrub or small tree, 5–10 m (rarely 20 m) tall. Fast-growing, with a trunk 5–50 cm in diameter, the bark on young branches is mid grey-brown with shallow orange vertical fissures, while older branches and bole are rougher, dark grey-brown with a deep red inner bark [7]. Trees can live from 20 years to more than 50 [8].

The evergreen bipinnate leaves are arranged alternately along the stem. Leaf petioles are 10–25 cm long, with 4–9 pairs of pinnae per leaf, and 13–21 pairs of leaflets per pinnae. This species is facultatively deciduous, it can prematurely shed leaflets in response to environmental stress [11]. The taproot is long, up to 5 m, strong and well developed. In shallow soils, roots have been observed to branch and grow laterally at 30 cm, due to clay layers [3]. Root hairs are poorly developed, and the plant appears to rely heavily on mycorrhizal associations for nutrient uptake, vesicular/arbuscular mycorrhiza and nodulation with Rhizobia, at least during seedling development [2]. *Leucaena leucocephala* is distinguished from other species in the genus by its intermediate sized leaflets and large pods in crowded clusters. Most species in the genus have only 1–4 pods per flower head [7]. The inflorescence is a globular shape, cream in colour, producing clusters of flat brown pods, 12 to 17 mm long containing 12-28 seeds.

B. USES

Various parts of *L. leucocephala* have been reported to have medicinal properties ranging from control of stomach diseases to contraception and abortion and the seed gum has been reported to be useful as a binder in tablet formulation [15]. Mimosine, an amino acid from the seeds was reported to possess anticancer activity and to inhibit the growth of hair [4]. Sulfated glycosylated form of polysaccharides from the seeds was reported to possess significant cancer chemo-preventive and anti-proliferative activities [6]. Other studies on the extracts of the seeds had shown varying activities including central nervous system depressant, anthelmintic and antidiabetic activities [14]. Of recent, the seed oil was used in engineering a novel bio-device useful in biomembrane modeling in lipophilicity determination of drugs and xenobiotics [9].

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