Datura metel Linn.

Family : Solanaceae
Parts Used : Whole plant
Vernacular Names
English : Datura
Malayalam : Neela Ummam
Hindi : Kaladhatura
Sanskrit : Dhustura
Bengali : Dhatura
Kannada : Dattura
Tamil : Vellummattai
Telungu : Tellavummetta

Distribution and Habitat: Common in India.

Botany:

• It is an erect succulent branched under shrub reaches a height of about 1.5 m with purplish branches and ovate pubescent leaves which are oblique at the base of lamina.

• Flowers are large, solitary, short pedicelled, purplish outside and white inside.

• Fruits are sub-globose, capsules covered all over with numerous, fleshy prickles, irregularly breaking when mature. Seeds are numerous, smooth, yellowish brown.

Properties: The plant and fruit are spasmolytic, anticancerous and anthelmintic. Leaf is antitumour, antirheumatic and vermicide. Flower is antiasthmatic and anaesthetic.

Chemical constituents:-

1. *D. metel* Linn. (var. *alba*, and var, *fastuosa*) are the drug plants, rich in hyoscine.
2. The alkaloids hyoscyamine and hyoscine (scopolamine) and meteloidine are found in all parts of the plant.
3. The total alkaloid content is 0.26 - 0.42 %
4. Fruits contain daturanolone and daturadiol, while roots contain additionally ditigloyloxy tropane derivatives, tigloidine, apohyoscine, norhyoscine, norhyoscine, cuscohygrine and tropine.
5. The physiological effects of hyoscyamine are qualitatively the same as those of its recemic derivative atropine. This is relatively more active in its paralysing affect on nerve endings and less active in its stimulant action on the central nervous system. The sedative and hypnotic action of hyoscyamine is weaker than that of hyoscine.

Uses:

• Intoxicating and narcotic properties have been made use of by man from ancient time. The plant and fruit are spasmolytic, anticancerous and anthelmintic.

• Leaves and seeds are inhaled in whooping cough, asthma and other respiratory diseases. For the rheumatic swellings of joints, lumbago, sciatica and neuralgia, warm leaf smeared with an oil is used as a bandage or sometimes the leaf is made into a poultice and applied

• Root, leaf and seed are febrifuge, antidiarrhoeal, anticatarrhal and are used in insanity, cerebral complications and skin diseases.

• Flower is antiasthmatic, anaesthetic and is employed in swellings and eruptions on face.

• Fruit juice is used in earache and seed decoction in ophthalmia. .

• The alkaloids of pharmaceutical interest present in the plant are hyoscyamine, hyoscine and meteloidine.

• Datura is the chief commercial source of hyoscine available from natural source. Hyoscine, in the form of hyoscine hydrobromide, is used as a pre-anaesthetic in surgery, child birth, ophthalmology and prevention of motion sickness. It is also employed in the relief of withdrawal symptoms in morphine and alcoholic addiction, paralysis agitans, post-encephaletic parkinsonianism and to allay sexual excitement.

• Hyoscyamine and its salt hyoscyamine sulphate and hyoscyamine hydrobromide are used in delerium, tremour, menia and parkinsonianism

Formulations: Roghan dhatura, Kanak-asav, dugdha-vati, etc,

Agrotechnology

Soil and climate: Datura grows on majority of soils, however, alkaline or neutral clay loam soil or those tending to saline-alkaline reaction rich in organic matter are ideal for vigorous growth. The clayey, acidic, water-logged or moisture deficient soils do not suit this crop.

It grows well in a wide range of climate from tropical to temperate conditions. The plant thrives best in areas of low rainfall where winter and monsoon rains are followed by long dry periods. Areas with annual rainfall below 1000 mm with mean temperature of 10-15oC in winter and 27 - 28oC in May-June are ideal. The crop can not stand frost, high rainfall or high temperature in the plains in May-June.

***Propagation*:** The plant is propagated by seeds but it is characterized by poor and often erratic seed germination which can be improved either by leaching out the inhibitor from the seeds or by alternate freezing and thawing of seeds. The optimum season for raising the crop is Rabi in tropical and subtropical areas while *Kharif* in temperate areas. The seeds can be broadcast -sown or seedlings can be raised in nursery and then transplanted.

Seed rate is 7-8 kg/ha for broadcasting and 2-3 kg/ha for transplanting. The field is ploughed and tilled adequately to produce fine seed bed. In the case of direct seeding, seeds are drilled in rows taken 45-60 cm apart. The plants are thinned to keep a spacing of 30-45 cm at the time of first weeding. In the case of transplanting 4-6 weeks old seedlings are planted at 45-60 x 30-45 cm spacing.

Manuring:- Application of organic manure at 10-15 t/ha and fertilisers at 60:40:40 kg N, P2O5 and K2O/ha is recommended for the crop for better growth and yield N may be applied in 3-4 equal split doses at planting and after each weeding which is required 2-3 times during the growing season. Application of micronutrients is reported to improve the alkaloid contents.

Irrigation: Field should be irrigated immediately after sowing or planting if soil moisture is inadequate. Thereafter 3-4 irrigations may be given if sufficient rainfall is not received.

Plant protection: No major insect pest is known to attack this crop. However, leaf spot, wilt and mosaic diseases cause damage to this crop.

• Leaf spot is caused by *Alternaria tennuissima* and is characterised by brown round to oval spots, becoming necrotic at later stage which leads to withering and drooping of leaves.

• Wilt is caused by *Sclerotium rolfsii* and it starts with dropping of leaves and finally wilting of the entire plant.

• Root and foot wilt, caused by *Corticium solani,* appears as damping off of seedlings and mature plants.

• Datura distortion mosaic is characterised by yellowing of the veins followed by inward rolling and distortion of leaves with a reduction in plant size. For reducing the impact of these diseases, field sanitation, use of resistant varieties, crop rotation for 3-4 years and fungicide application should be resorted to.

Harvesting: For the purpose of leaf and top, harvesting is done as soon as flowering starts. Entire top containing leaves and twigs is cut, dried in shade and stored in gunny bags. For seed and fruit, fully grown fruits, still green are picked 2-3 times before final harvest when the entire plant is cut from the base and dried in the open. The dried fruits are then thrashed with a stick to separate the seeds. The seed yield is 1-1.5 t/ha.