INTRODUCTION

In India the use of medicinal herbs is as old as 1500 BC, understanding the method culture of India, both folk traditions as well as condified knowledge system is a deep understanding of medicinal value of the plants starting with the reference in the Ayurveda. The use of medicinal plants that is more than three thousand years old (Bonde, 2001). Ayurveda is the ancient Indian holistic medical system, based on achieving physical and mental harmony with nature, which has been practised for more than 5000 years. Ayurveda means "science of life" ("Ayu" meaning life and "Veda" meaning science), and was first recorded in the Vedas the world's oldest surviving literature.

There are around 5,00,00 licenced registered medicinal practitioners of condified system of Indian medicine like Ayurveda, Shiddha, Unani and Tibetan system of medicine. There are also texts on subjects like Vriksha Ayurveda and Krishri Shastra that deal with use of plants for controlling pest treating plant diseases and biofertilizer. The knowledge of Indian people about plants and plant products is based on indigenous knowledge called Dravyaguna Shastra.

Over 8500 species of flowering plants are estimated to be used by 4635 ethonic communities for human and veterinary health care thought the country. In Ayurvedic literature about 1800 species of plants that are fully documented in terms of their biological properties, action and drug formulation for health.

Plants belonging to family solanaceae are distributed world wide, which includes 85 genera and about 2,800 species in the world. There are approximately 25 different species of Datura thought the world, they are often called as Jimson weed or ‘Thornapple’. The name Datura comes from the early Sanskrit Dustara (Mann, 1996) or dahatura. Common names of Datura are numerous some of the most common ones being reving nightshade Thron apple, Stink weed, Devil’s apple, Jimson weed and angel’s trumpet (Heiser, 1969 & Avery, 1959).
Datura is one of the most interesting plants with hallucinogenic properties. Despite having a reputation as one of the darker hallucinogens, it has been widely used by society historically in both the old world and the new, and continues to be today for those interested in ethanobotanical uses of this plant worldwide. Datura is fascinating topic, while being limited in its uses economically, the alkaloids contained in the plant have been demand in the past and its application as a subject for botanical research in vast. It is a genus of contrasts from smelly weeds to lovely ornamentals (Heiser, 1969).

Other plants of the family with narcotic properties are mandrake (Mandrogra), belladonna (Atropa), henbane (Hyoscyamus) and tobacco (Nicotiana), appropriately called the paradoxical plants (Heiser, 1969), this family also includes such common food plants as the tomato, potato and egg plant (Safford, 1922). There seems to be some disagreement as to how many sections and species belonging to the genus. Datura contains about 10 different herbaceous species, the most important ones being D. stramonium, D. inoxia, D. metel and D. ceratocaula (Schultes 1979), but Bhattacharjee (1998) reported fifteen species in Handbook of Medicinal plants.

In the East Indies as an aphrodisiac and also the seeds were highly prized treasures by Hindu enomorades, who ground them in to a powder to be added to wine or some other medium. Herbalist Li Shi-Chen, in a work on Chinese medicines entitled Peu ts’ao Kangmu (1590), explained the origin of the Chinese name of Datura. Man t’o lo h-ua is said to be taken from the famous Buddhist sutra ‘Fahuo Ching’, which states that when Lord Buddha preaches a sermon from heaven dew froms on the petals of Datura from rain drops (Bonde, 2001).

Since so many species exist around the world, most cultures have some sort of historical account or religious use for the Datura. It has been used in Mexico to ease the pain of child birth, and in Africa to alleviate asthma and lung problems. Generally Datura is either smoked or mode in to an fusion, but the leaves of some species can be eaten for similar effect.
**Datura** can provide feelings of euphoria, stimulation and invoke hallucinations, other effects may include loss of co-ordination, confusion and visual distortions. Anticholinergic poisoning may occur from the use of *Datura* and can manifest itself through dermal and mucous dehydration, dyhydration, dysphagia, dysarthria, photophobia, blurred vision, increased heart rate, hyperthermia, agitation confusion, aggressivity, seizures, coma and death. Chronic use of *Datura* has been linked with development of schizophrenic symptoms in an anecdotal case. Heart damage death are likely in chronic users of *Datura*.

*Datura* exists in ancient records from Eurasia (e.g. China and India) for example, in India the Sadhus and Yogis smoked the leaves and seeds mixed with *ganja* (*Cannabis sativa* L. cannabinaceae). The plant was highly revered as a powerful aphrodisiac (Lewis *et al* 1977 & Grieves 2005).

The Indians mixed the powdered seeds with butter and ingested it orally for importance or applied to topically to invigorate the male genitalia. The leaves were also smoked to relieve asthma (Lewis *et al*, 1977). *Datura* was also used to treat colds and nervous conditions (Grieves, 2005).

It was also regarded as one of the most ancient healing herbs. It is thought that the ancient Peruvian healer and shamans employed *Datura*’s hallucinogenic properties when performing rituals or medical operations (e.g. Skull trepanations- the process of cutting a hole in the skull) (Heiser, 1969). In what is present day Chile, the Auruks still use *Datura* as Shamanic plant and as medicine in much the same way as their ancestors (Avery 1959).

The use of *Datura* as an anesthetic for ‘bone setting’ to treat wounds, bruises and hemorrhoids and to ‘freshen the blood’. The psychoactive properties of the plant would desensitize the pain receptors to reduce stress in the patient, thereby promoting speedy healing (Baker, 1994). Among the Navajo the dried roots were chewed in ceremonies as a febrifuge (to stop fever). While a leaf infusion was used vulnerary (wound healing agent) to wash the wound of castration in sleep (Kluckhohn, 1994). *Datura* cigarettes have been prescribed
to asthma sufferers for the anti spasmodic / bronchodilating effect of atropine in the respiratory system (Charpin, 1979).

One of the first medical investigations to uncover the therapeutic potential of *Datura* in mental health was undertaken in 1762 by Anton Stock. His investigations led him to report that *Datura* had ability to make ‘unsound minds sane and sane minds mad’ (Wood, 1990). In 1886, August sohrt of Torty is said to have utilized *Datura* isolates for the ‘mentally ill’, possibly on recommendation of one his teachers who claimed that hyoscine was an extremely valuable medicine for psychiatric treatment (Muler, 1998). It has been suggested that the period following the comatose state induced by *Datura* may be ideal for psychotherapeutic efforts (Baker 1994).

In Marathwada region about 10 genera and 30 species belonging the family solanaceae has been reported (Naik, 1998), most of these are wild while some are cultivated as vegetable crops. *Datura* is the most neglected genus in this region. It is represented by 4 species, these are *Datura inoxia* Mill, *Datura ferox* L., *Datura metel* L., and *Datura stramonium* L. Almost all species grow wide under natural conditions.

Present study is undertaken on *Datura* for following lines.

1) **Morphology**: - The gross morphological characters plant.
2) **Anatomy**: - Anatomical studies included observations of transverse sections of root, stem, leaf and petiole.
3) **Biochemical studies**: -
   A) **Qualitative**: Tannins, Saponins, Alkaloids, Amino acids
   B) **Quantitative**: Nitrogen (N), Water soluble nitrogen (WSN), Crude proteins (CP), Crude fat (CFat), Crude fibre (CF), Total ash (TA), Water soluble ash (WSA), Water insoluble ash (WIA), Acid insoluble ash (AIA), Acid soluble ash (ASA), Calcium (Ca), Phosphorus (P), Potassium (K), Total carbohydrates (TC), Cellulose, Reducing sugar, Non reducing sugar, Total sugar, Gross energy (GE), Extractive values, Tannins, Phenols, Total free amino acids, Alkaloids.
4) **Pharmacognocy:-** The plant parts (e.g. root, stem leaves, seeds, fruit, coat etc.) of the species with medicinal value will be separated and employed for analysis of secondary metabolites viz. phenolic compounds, alkaloids etc.

Attempts are made to find out the active components with chemotaxonomical approach. It is felt that the investigation will enlighten the importance of much neglected species of *Datura* and its taxonomic significance along with its exploitation as a medicinal plant. The above parameters were used to compare samples and to determine authenticity of the material. These combinations are expected to accurately determine the species.

The thesis is divided into following chapters:

Chapter I: **Introduction and Review of literature.**

This includes the introduction about the information of *Datura* plant and the review of literature.

Chapter II: **Material and Methods.**

The chapter deals with the plant material which was used for the experimental work as well as it gives the details information about the methods of anatomy and chemical analysis.

Chapter III: **Morphology and medicinal uses of plants.**

Gives the information about the morphological features of plants and its medicinal properties and uses.

Chapter IV: **Anatomy of plants.**

Gives the detail information about the anatomical features of root, stem, leaf and petiole of the plant.

Chapter V: **Biochemical studies of plants.**

Gives the detail information about the chemicals which are present in the plant in the form of tables and graphs.

Chapter VI: **Antimicrobial activity of plants.**

It gives the antimicrobial activity of the plant against the human pathogenic bacteria.

Chapter VII: **Discussion.**

Gives information about the result obtained and discussion.
Chapter VIII: **References and Bibliography.**

It gives the references and bibliography.

**REVIEW OF LITERATURE**