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TOTAL ANTIOXIDANT CAPACITY OF LEAF, STEM, ROOT AND FLOWER OF DATURA METEL

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ABSTRACT
In Srilanka it Datura metel is used in Ayurveda and Siddha treatment systems for treating bronchial asthma and chronic wound healing respectively. It is also used to maintain heath as a rejuvenating herb. The purpose of the study was to investigate the Total antioxidant capacity of the different parts of Datura metel plant. The plant was obtained from Government herbal garden, and taxonomically authenticated by officer In charge of medicinal plants division, Unit of Siddha Medicine, University of Jaffna. The collected plants were washed thoroughly with running tap water and separated into leaf, flower, stem, and root immediately. Separated parts were dried in sun shade. The dried parts were powdered and stored in air tight containers. Cold and hot water extract were prepared. Total antioxidant capacity (TAC) was measured by the ferric reducing antioxidant power expressed as µmol/g dry weight (DW). TAC values of cold water extract were 450.3 ± 31.99 to 647.2 ± 32.93 and values of hot water extracts were 499.1 ± 42.49 to 702.7 ± 45.15µmol/g DW. Datura metel leaf contained the highest amount of TAC in both hot and cold water extracts. TAC values were higher in hot water extract than cold water extract. Flower sample showed the lowest TAC. However all plant parts showed moderate level of Anti-oxidant capacity.

KEYWORDS: Datura metel, Antioxidant.

INTRODUCTION AND LITERATURE REVIEW

Plants are the source of medication for preventive, curative, protective or promotive purposes (Sidhu et al., 2007). Several constituents in plants have been identified as potentially health promoting in animal studies including cholesterol lowering factors, anti-oxidants, enzyme inducers and others. Many of these herbal medicines are finding their way into the world market as alternatives to prescribed allopathic drugs currently available to treat various disorders and ailments. The rapid increase in the consumption of traditional herbal remedies worldwide has been stimulated by several observations, which have shown their use as an alternative medicine. In particular cancer patients are reported to benefit from treatment with herbal medicine and survivability in many cases is significantly increased. These observations show herbal product to be safe, harmless, effective, and free from side effect. Jeyachithra, Krithiga, 2012).

Herbal medicine is frequently a part of a larger therapeutic system such as traditional and folk medicine. It is necessary to evaluate in a scientific base the potential use of folk medicine for the treatment of various diseases. The search and use of drugs and dietary supplements derived from plants have been accelerated in recent years.

Several medicinal plants have been extensively studied in order to find more effective and less toxic compounds. Pure extract of herbs active component are more reliable and safer than administration of the herb itself. Many herbs are now in use whose therapeutic properties and active principle are as yet not well under stood.

Antioxidants are chemicals that interact with and neutralize free radicals, thus preventing them from causing damage. The body makes some of the antioxidants to neutralize free radicals. These antioxidants are called endogenous antioxidants. However the body relies on external (exogenous) sources, primarily the diet, to obtain the rest of the antioxidants it needs. These exogenous antioxidants are commonly called dietary antioxidants. Fruits, vegetables, and grains are rich sources of dietary antioxidants. Some dietary antioxidants are also available as dietary supplements.

Antioxidants have been shown to play an important role in preventing many diseases like cancer, inflammation and brain dysfunction. Apart from their role of health

benefactors, antioxidants are added in foods to prevent or delay oxidation of food initiated by free radicals formed during their exposure to environmental factors such as air, light, and temperature. At present most of the antioxidants are manufactured synthetically. They belong to the class of synthetic antioxidants. The main disadvantage with the synthetic antioxidant is the side effects when taken in vivo. Strict governmental rules regarding the safety of the food has necessitated the search for alternatives as food preservatives.

Plants are the potential source of natural antioxidants. Natural antioxidants or phytochemical antioxidants are the secondary metabolites of plants. Carotenoids, flavonoids, cinnamic acids, benzoic acids, ascorbic acids, tocopherol, tocotrieols etc., are some of the antioxidants produced by the plant for their sustenance. Beta-carotene, ascorbic acid and alpha tocopherol are the widely used antioxidants. Plant derived natural products such as flavonoids, terpenoids and steroids have received considerable attention in recent years due to their diverse pharmacological properties including antioxidant and antitumor activity.

Datura metel is a primarily annual herbaceous plant, though it is occasionally biannuall. It grows more than twelve feet in height and develops numerous branches. The soft leaves are a light, matte green colour with slightly serrated edges. The plant has smooth, violet or dark purple branches and the funnel-shaped, fragrant flowers are either white, yellow, or violet, depending on variety, and jut upward at an angle (Ratsch 1998).

Datura metel is mentioned as rejuvenating herb and which is used by Siddhas for maintain their health. Mean time Datura metel can identify in any part of Srilanka. Hence collection of Datura metel will not so difficult. The objective of the study was to estimate Trincmalee Internatinal Cnferance (TRInCo-2016) Health care science the antioxidant activity, total phenolic and Flavanoid content in different parts of Datura metel.

MATERIALS AND METHOD

Collection of Sample

The plant *Datura metel* was obtained from Government herbal garden, Navakkiri, Jaffna, and taxonomically authenticated by Officer In charge of medicinal plants division, Unit of Siddha Medicine, University of Jaffna. The collected plants were washed thoroughly in running tap water and separated into leaf, flower, stem, and root immediately. Separated parts were dried in sun shade for two weeks. The dried parts were powdered by multi – fine grinder, mess number 20. Then powders were stored in labeled air tight dry plastic containers.

Preparation of cold water extract

Ten mg of dried sample was crushed with 10ml of distilled water using a motor and pestle. Crushed sample was centrifuged for ten minutes at 10000 rpm. After centrifugation the supernatant was transferred carefully to a test tube.

Preparation of hot water extract

Ten mg of dried sample was crushed with 10ml of distilled water using a motor and pestle. The crushed sample was kept in a water bath at 100^0C for 10 minutes. Then it was centrifuged for ten minutes at 10000 rpm. The supernatant was carefully transferred to a test tube.

Assay methods

The FRAP assay will be done according to the procedure described by Benzie and Strain (1996). FRAP reagent was prepared by mixing 1 mL of (10mmol/L) TPTZ solution in 40 mmol/L HCl, 1 mL of $FeCl_3$ (20mmol/L) and 10 mL of acetate buffer, (0.3 mol/L, pH=3.6). Twenty microliters of 1g/L sample was mixed with 1 ml FRAP reagent and the absorbance at 593 nm measured spectrophotometrically after incubating at room temperature for 4 minutes, against the FRAP reagent as the blank. $FeSO_4$ (1000 µM) was used as the standard. The ferric reducing antioxidant power was expressed in µmol/g dry weight (DW).

RESULTS AND DISCUSSION

Total Anti-oxidant capacity of both cold and hot water extract of different parts of *Datura metel*

Sample	FRAP Cold extract (µmol/g DW)	FRAP ₹ Hot extract (µmol/g DW)
Stem	455.7 ± 37.90	499.1 ± 42.49
Leaf	647.2 ± 32.93	702.7 ± 45.15
Root	465.81 ± 36.91	511.2 ± 53.29
Flower	450.3 ± 31.99	500 ± 43.26

The assay was done with six different samples. The TAC (µmol/g DW) values of cold water extract ranged from 450.3 ± 31.99 to 647.2 ± 32.93 and in hot water extracts from 499.1 ± 42.49 to 702.7 ± 45.15 µmol/g DW. Datura metal leaf contained the highest amount of rich TAC in both hot and cold water extracts. TAC values were higher in hot water extract than cold water extract. Flower sample showed the lowest TAC.

IV CONCLUSIONS

Datura metel possess moderate level of anti – oxidant capacity.

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