



Certain Medicinal Plants of Solanaceae and Their Alkaloids Screening

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Available online at: www.isca.in, www.isca.me

Received 25th December 2013, revised 7th January 2014, accepted 18th January 2014

Abstract

Solanaceae is known as nightshade or potato family consisting of 102 genera and 2500 species. Most of solanaceous members contain Tropane and Glycoalkaloids. Present work observes seven genera of solanaceae as alkaloid positive members of which *Solanum xanthocarpum* and *Nicotiana plumbaginifolia* show highest alkaloid value. Maximum number of alkaloid containing parts found in *Solanum xanthocarpum*. Plants species of solanaceae are enumerated with their medicinal property and uses.

Keywords: Solanaceae family, phytochemicals, alkaloids, screening.

Introduction

Several phytochemicals begin a wide range of activities, which helps to give immunity against long term disease. The phytochemicals like alkaloids, flavonoides, tannins, saponins, phlobatanins terpenoids etc are known to show medicinal activity as well as exhibit physiological activity¹.

Phytochemical such as flavonoids, tannins, steroid and alkaloids have antiinflammatory effects². Phytochemical study of medicinal plants is essential to determine the presence active principles in them. The active principles have specific affect on metabolic activities. The biodynamic phytochemical include alkaloids, glycosides, essential oils, fatty acids, resin, tannins and many other substances. Alkaloids, the largest single class of plant principle, are the most important from medicinal point of view. Some of the common alkaloids are Cocaine, Atropine, Quinine, Vinaistine and Nicotine. Under natural condition alkaloid yield of plants is very meagre, these being present in small quantities, (0.612% to 0.498%).

An important feature of phytochemical studies is the operation of a number of alkaloid surveys ranging from searches for alkaloid containing plants to investigate plants in a particular order³. Approximately 2000 alkaloids have been isolated from more than 100 plant families. Some of the families are specially noted for their alkaloid positive members, for example- Solanaceae, Papaveraceae and Apocynaceae,. Alkaloids are generally specific for a particular genus, family or order, but there are exceptions too.

Alkaloids are found in those parts of plants where there is great vitality and growth. From these location alkaloids are often transferred to parts like seed hulls and bark.

Maiti and Mookherjee⁴ screened 43 species of Solanaceae from India for steroidal alkaloids especially salasodine. Sobti studied Indian species of *Datura* (10 species), for their alkaloids content.

Methodology

Collected plants were studied in detail under required, magnification. Different parts of dried plants (root, stem, leaf, flower, fruit and seed) were separated and finely powered. These were tested separately. Testing was done by customary method^{5,6}.

For a clear understanding of total alkaloidal value, following formula was applied.

$$\text{Total alkaloidal value} = 4 (H) + 2 (P) + 1 (T)$$

Where= H= Number of highly positive parts, P=Number of positive parts, T= Number of parts with traces.

Datura innoxia. Minu and Datura-Metel Linn

Plant: All parts are strongly intoxicating, narcotic, aphrodisiac, toxic, antispasmodic, and anodyne.

Juice: With the roots of *Boerhaavia diffusa* and opium it is used as an application for the relief from rheumatism.

Leaf: Young leaves are antispasmodic, anodyne and narcotic. Roasted leaves are applied to enlarged testicles, in growing toe nails and sciatica.

Seed: Astringent, antispasmodic, aphrodisiac, anodyne, narcotic, powerfully intoxicating, bitter, carminative, stomachic. Paste used on decaying teeth, piles.

Alkaloid scopoline obtained from *D. Metel Linn* is used as preanaesthetic in surgery.

Physalis minima Linn

Leaf: Asperient, diuretic, used in gonorrhoe

Physalin: Isolated from this plant.

***Withania Somnifera* Dunal**

Root: Diuretic, deobstruent, stimulant, alternative and narcotic. Used in rheumatism, dyspepsia⁽⁸⁾, cough and dropsy. Warm paste used over serofulous and other glandular swellings.

Leaf: Narcotic and bitter.

Infusion: Febrifuge and anthelmintic. Used in application to tumour and tubercular glands.

***Solanum nigrum* Linn**

Plant: Cardiac tonic, sedative, expectorant, diaphoretic, and anodyne.

Dicocation: Given in dropsy, jaundice and chronic enlargement of liver.

Root bark: Laxative, used in diseases of ear.

Leaf: Hot leaves are applied over swollen and painful scrotum and testicles, swollen legs⁷.

Fruit: Aphrodisiac, diuretic, bitter tonic, laxative and stomachic. Paste of green fruit is applied on ringworm.

***Solanum xanthocarpum* S and W**

Plant: Expectorant, bitter, aperients, stomachic, anthelmintic, diuretic.

Decoction of plant is used in gonorrhoea and costiveness.

Root: Diuretic, Stomachic, febrifuge, bitter, anthelmintic, exception anodyne.

Decotion used in cough with long pepper and honey.

Seed: Anthelmintic; paste is used for boils.

Results and Discussion

Seven plants species of solanaceae are enumerated with their medicinal property and uses. Alkaloid value has been observed highest in *Nicotiana Plumbaginifolia* (09) and *solanum Xanthocarpum* (09).

It is evident from Table (01) that *Nicotiana plumbaginifolia* and *Solanum xanthocarpum* top the list with the total alkaloidal value of 09 (nine). Maximum number of alkaloid containing parts observed in *Solanum Xanthocarpum* (figure-2).

Table-1
Alkalodial studies of different plants of solanaceae

Sr. NO	Name of plant	Alkaloid highly positive	Containing positive	Parts trace	Alkalodial value
1.	<i>Datura innoxia</i> . Minu	Sd.	Lf.Fl.	-	08
2.	<i>Datura metel</i> Linn.	Sd.	Lf.Fl.	-	08
3.	<i>Nicotiana plumbaginifolia</i> viv.	Lf.	Rt.	St. Fl. Fr.	09
4.	<i>Physalis minima</i> Linn	-	-	St. Lf	02
5.	<i>Solanum nigrum</i> Linn.	-	Fr (Unr.)	Rt. Lf	04
6.	<i>Solanum xanthocarpum</i> SandW	-	St. Lf. Fl.Fr.	Rtb.	09
7.	<i>Withania somnifera</i> Dunal		Lf.	Rtb.	05

Rt. = Root, Rtb. = Root bark, Lf. =Leaf, St. = Steam, Fl. = Root, Fr. = Fruit, Unr. = Unirpe.

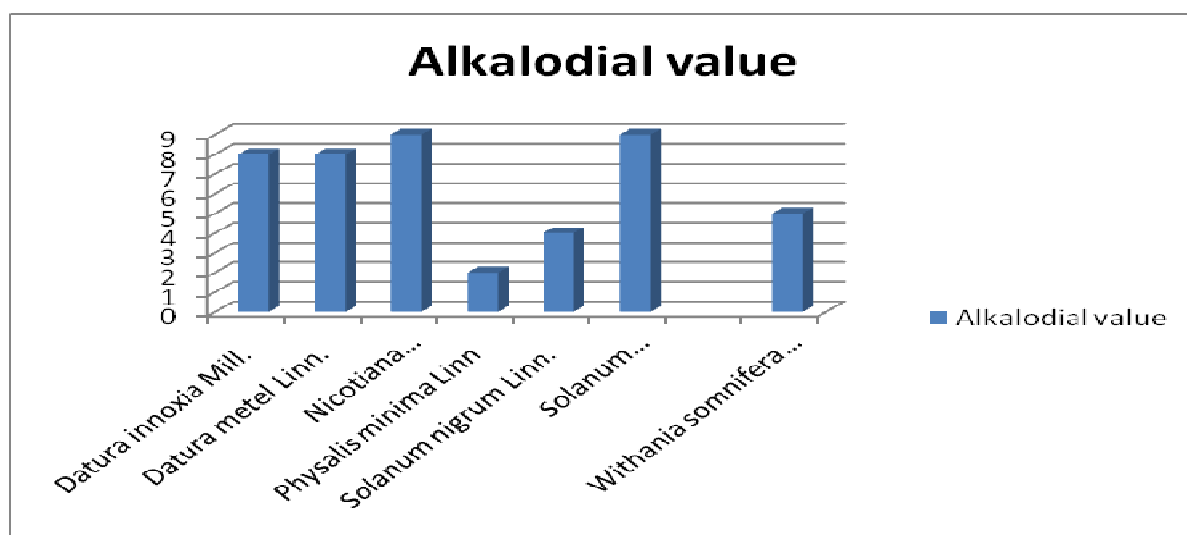


Figure-1
Alkalodial value of different medicinal plants of solanaceae

Conclusion

Alkaloids are significance for defense and survival of plants. The significance of medicinal plants is directly associated with the wide range of chemical compounds produced by different biochemical pathway. High alkaloid value of *Solanum xanthocarpum* and *Nicotiana plumbaginifolia* justify the wide use in traditional system of medicine.

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