Certain Medicinal Plants of Solanaceae and Their Alkaloids Screening

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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 activity.

Phytochemical such as flavonoids, tannins, steroid and alkaloids have antiinflamatory effects. Phytochemical study of medicinal plants is essential to determine the presence of 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 order. Approximately 2000 alkaloids have been isolated from more than 100 plant families. Some of the families are especially 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 Mookherjee 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.

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

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 duffusa and opium it is used as an application for the relief from rheumatism.

Leaf: Young leaves are antispasmodic, anodyne, narcotic, powerfully intoxicating, bitter, carminative, stomachic. Paste used on decaying teeth, piles.

Alkaloid scopaline 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 Dunnal

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

**Leaf:** Narcotic and bitter.

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

*Solanum nigrum* Linn

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

**Decocation:** 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 legs.

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

<table>
<thead>
<tr>
<th>Sr. NO</th>
<th>Name of plant</th>
<th>Alkaloid highly positive</th>
<th>Containing positive</th>
<th>Parts trace</th>
<th>Alkalodial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>Datura innoxia.</em> Minu</td>
<td>Sd.</td>
<td>Lf.Fl.</td>
<td>-</td>
<td>08</td>
</tr>
<tr>
<td>2.</td>
<td><em>Datura metel</em> Linn.</td>
<td>Sd.</td>
<td>Lf.Fl.</td>
<td>-</td>
<td>08</td>
</tr>
<tr>
<td>4.</td>
<td><em>Physalis minima</em> Linn.</td>
<td>-</td>
<td>-</td>
<td>St. Lf</td>
<td>02</td>
</tr>
<tr>
<td>5.</td>
<td><em>Solanum nigrum</em> Linn.</td>
<td>-</td>
<td>Fr (Unr.)</td>
<td>Rt. Lf</td>
<td>04</td>
</tr>
<tr>
<td>7.</td>
<td><em>Withania somnifera</em> Dunnal</td>
<td>Lf.</td>
<td>Rtb.</td>
<td></td>
<td>05</td>
</tr>
</tbody>
</table>


### Results and Discussion

Seven plants species of solanceae are enumerated with their medicinal property and uses. Alkaloid value has been observed highest in *Nicotiana Plumbaginifolia* (09) and *Solanum Xanthocardum* (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 Xanthocardum* (figure-2).
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.

References