Nutraceutical Analysis of *Tinospora cordifolia* Dried leaves Powder

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Abstract: Heart leaved moonseed plant in English, botanical name is Tinospora cordifolia, Guduchi in Sanskrit and Giloy in Hindi; richest source of many nutrients and phytochemical. The work mainly focuses on the nutraceuticals potential of *Tinospora cordifolia*. Leaves of this plant are rich in carbohydrate, protein and fiber. It also contains calcium, iron and vitamin C in little amount. The aqueous extract of leaves of *Tinospora cordifolia* showed presence of steroids, alkaloids, tannins and saponins. Leaves of this plant are rich in carbohydrate, protein, fiber and are fairly rich in vitamin C, iron and calcium. The protecting cause of plant is due to the presence of numerous elements such as vitamins, carotenoids, flavonoids and phenolic compounds. It owns to anti-spasmodic, anti-inflammatory, anti-allergic, anti-diabetic, anti-oxidant,anti-cancer, anti-neoplastic, anti-pyretic and anti-malarial properties. The nutraceuticals screening of the leaf extract was determined by various methods. The results record that leaves powder contains different types of nutrients and phytochemicals in it.

Keywords: - Tinospora cardifolia; nutraceuticals; tannins; screening; medicinal properties.

1. INTRODUCTION

Large numbers of plants are used as remedy for medicinal purposes. The health-giving properties of medicinal plants are credited due to the existence of active components such as alkaloids, flavonoids, glycosides and tannins [1, 2]. *Tinospora cordifolia* belongs to the family of Menispermaceae. *Tinospora cordifolia* is a large, climbing plant found throughout India. It is also known as heart leaved moonseed plant in English, Guduchi in Sanskrit and Giloy in Hindi. *Tinospora cordifolia* has been established medicinally important plant have traditional significant and natural compounds for the synthesis of drugs such as tubocurarine, colchicine, nicotine, quinine etc. *Tinospora cordifolia* has been used to treat general weakness, fever [3], dyspepsia [4], dysentery, vaginal and urethral discharges [5], secondary syphilis, urinary diseases [6], impotency [7], gout [8], viral hepatitis [9], skin diseases and anaemia [10, 11]. In compound formulations *Tinospora cordifolia* is used clinically to treat jaundice, rheumatoid arthritis and diabetes [12-13]. It's all parts like leaves, stem, fruits and roots are being used since antiquities and all are rich in nutraceuticals. The starch obtained from the stem known as 'Gudichi - Satva' is highly nutritive and digestive as well as used in curing many diseases [14]. The defending properties of plant products are due to the presence of macro and micro nutrients, antioxidants and phytochemicals.

2. MATERIALS AND METHODS:

2.1. Collection of plant materials: Leaves of *Tinospora cordifolia* leaves were collected from different places of Banasthali Vidhyarthi campus, Rajasthan, India.

2.2. Preparation of leaves powder: *Tinospora cordifolia* fresh leaves were washed under the running tap water and then dried under the shade at room temperature. Dried leaves were powdered in electronic grinder and stored in air tight container for further use.

2.3. Nutrient Analysis: Nutrients were analysis by various methods like estimation of carbohydrates by Difference method [15], estimation of fat by Soxhelt method [16], estimation of protein by Microkjeldhal method [17], estimation of vitamin C by Titrimetric method [18]. Estimation of moisture content [19], crude fiber [20] and ash [21] were also determined. Preparation of aliquot from ash for the estimation of iron by Wong’s method [22] and estimation of calcium by Titrimetric method [17].

2.4. Phytochemicals: The aqueous extract of betel leaves were extracted for the phytochemical screening like alkaloids by Mayer’s test [18], glycosides by Modified Borntrager’s test [19], terpenoids by Salkowski test [18], Saponins by Foam test [19], Tannins by Gelatin test [18], phytosterol by Libermann Burchard’s test [19], flavonoids by Alkaline Reagent test [19], phenolic compound by Ferric Chloride test [19], Steroids [20] and catechins [21] were also determined.
3. RESULTS and DISCUSSION:

3.1. Table No. – 1 Nutrients Analysis of Tinospora cordifolia Leaves Powder

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Nutrients</th>
<th>Tinospora cordifolia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Carbohydrate</td>
<td>65.31%</td>
</tr>
<tr>
<td>2.</td>
<td>Moisture</td>
<td>7.78%</td>
</tr>
<tr>
<td>3.</td>
<td>Protein</td>
<td>8.74%</td>
</tr>
<tr>
<td>4.</td>
<td>Fat</td>
<td>2.80%</td>
</tr>
<tr>
<td>5.</td>
<td>Fiber</td>
<td>8.25%</td>
</tr>
<tr>
<td>6.</td>
<td>Ash</td>
<td>7.12%</td>
</tr>
<tr>
<td>7.</td>
<td>Iron</td>
<td>1.53%</td>
</tr>
<tr>
<td>8.</td>
<td>Calcium</td>
<td>0.11%</td>
</tr>
<tr>
<td>9.</td>
<td>Vitamin C</td>
<td>1.24%</td>
</tr>
</tbody>
</table>

In Table No.: 1, showed that nutrient composition in the dried betel leaves powder in which contain of macro nutrient are carbohydrate (65.31%), moisture (7.78%), protein (8.74%), fat (2.80%), fiber (8.25%) and ash (7.12%). Micro nutrient are also present in Tinospora cordifolia such as vitamin C, iron and calcium (1.24%), (1.53%) and (0.11%), respectively.

3.2. Table No. – 2 Phytochemical Analysis of Tinospora cordifolia Leaves Powder Extract

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Phytochemical</th>
<th>Tinospora cordifolia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alkaloids</td>
<td>(+)</td>
</tr>
<tr>
<td>2.</td>
<td>Glycosides</td>
<td>(+)</td>
</tr>
<tr>
<td>3.</td>
<td>Tannins</td>
<td>(+)</td>
</tr>
<tr>
<td>4.</td>
<td>Phytosterol</td>
<td>(+)</td>
</tr>
<tr>
<td>5.</td>
<td>Saponins</td>
<td>(+)</td>
</tr>
<tr>
<td>6.</td>
<td>Terpenoids</td>
<td>(-)</td>
</tr>
<tr>
<td>7.</td>
<td>Steroids</td>
<td>(+)</td>
</tr>
<tr>
<td>8.</td>
<td>Phenolic Compounds</td>
<td>(+)</td>
</tr>
<tr>
<td>9.</td>
<td>Flavonoids</td>
<td>(+)</td>
</tr>
<tr>
<td>10.</td>
<td>Catechins</td>
<td>(-)</td>
</tr>
</tbody>
</table>

Key :- (+) = present
(-) = absent

In Table No.: 2 showed that Tinospora cordifolia leaves are enclose with alkaloids, phytosterol, phenols, tannins, glycosides, saponins, steroids and flavonoids. Whereas deficient in terpenoids and catechins.

Different- different studies had showed that Giloy’s all parts helped in cognitive enhancement by immune stimulation and synthesis of acetylcholine. Tinospora cordifolia are beneficial in the treatment of urolithiasis, general weakness, dyspepsia, dysentery, gonorrhea, syphilis, urinary diseases, impotency, gout, rheumatoid arthritis, viral hepatitis, skin diseases and anemia. As well as in leprosy, leucoderma, fever, asthma, anorexia, jaundice, diabetes, chronic diarrhea, allergy, malaria, menstrual problems, helmenthiasis, heart diseases, aphrodisiac are cured by its whole part. Leaves are used in the treatment of gout and ulcer. Leaf extract showed inhibition of E. coli. Extraction of leaves improves fertility and decoction of leaves cures malarial fever.

5. CONCLUSION

Uses of herbal plants are there since ancient times but they are more in limelight these days. Tinospora cordifolia is one of the famous climbers used for treating numerous diseases. Richest source of nutrients and phytochemicals its all parts are used as medicine for animals as well as humans. Immunomodulating properties, hepatosuppression, anti-inflammatory, antipyretic, antispasmodic and memory boosting properties also present in Tinospora cordifolia due to owing many nutraceuticals.

6. ACKNOWLEDGMENT:

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