ABSTRACT

Dhatura Stramonium L. is belongs to the family solanaceae. The leaves were collected and shade dried. The extract were prepared from petroleum ether, chloroform, methanol, 95% ethanol and distilled water with cold percolation method and found glycosides, saponins, phenol, lignins, sterols, tannins etc. These metabolites are highly affective against different types of diseases as ant-diabetic, antiviral, etc. According to their characteristics, they can be involved into medicinal plant category.

Keywords: Glycosides, Saponin, Lignin, Sterols, Dhatura stramonium L.

INTRODUCTION

In ancient times, herbs and plants that grew in the environment were used in the treatment of various diseases. In different diseases, parts of plants are used in the treatment for life. Near about 80% plant species compounds are used as medicine [WHO, 1993]. In India, 45,000 plant species are officially recorded and 7500 medicinal plant species growing in its 16 agro-climatic zones under 63.7 million hectares of forest coverage [H. Tag, 2007].

It also shows medicinal activities by primary and secondary metabolites. When a plant shows medicinal properties it will be categorized into medicinal plant. Primary metabolites are directly involved into metabolic activities while secondary metabolites are supporting part means they do not involve directly but their presence is compulsory. Medicinal plants are used in the treatment of different types of diseases as asthma, diabetes, cancer etc.

Dhatura stramonium L. belongs to the solanaceae family. It has been applied as an analgesic plant in Iranian folk medicine [Zargari A., 1998]. It has been used as a narcotic and local anesthetic drug. [Schulman M. L and Bolton L. A., 1998, Abena A.A. et al, 2003, Arouko H, et al. 2003]. Dhatura is an annual herb and forming a bush up to 1.5m tall. The flowers are white to creamy or violet and length is 6-9 cm long [Stace, Clive, 1997].

It is used in the treatment of asthmatic problem [Muller, 1998, Weitz, 2003 & Ertekin et al., 2005]. D. stramonium is also used in the treatment of asthma, burns, ulcers, sinus infection, headaches [Mitchell & MH Ahmad, 2006].

MATERIAL AND METHODS

Collection of Plant Material

Dhatura Stramonium L. is found all over the world. I had collected the leaves from Mandsaur district, Madhya Pradesh. Mandsaur District forms the northern projection of Madhya Pradesh. It lies between the parallels of latitude 23° 45’ 50” North and 25° 2’ 55” North, and between the meridians of longitude 74° 42’ 30” East and 75° 5’ 20” East.

Preliminary Screening of Secondary Metabolites

The leaves were shade dried and powdered using mixer grinder, and subjected to cold percolation process for 48 hours with petroleum ether, chloroform, methanol, 95% ethanol and distilled water. After this process, the extracts were filtered and used for preliminary phytochemical screening such as alkaloids (Iodine, Wagner, and Dragendorff’s test), flavonoids (Pew’s, Shinoda and NaOH tests), glycosides (Keller-Killani, Conc. HSO₄, and Molisch tests), lignin (Labat and Lignin tests), phenols (Ellagic acid and Phenol tests), saponins (Foam and Haemolysis test), sterols (Libermann-Burchard, and Salkowski tests), tannins (Gelatin and Lead acetate tests) were carried out [Shashank Bhatt et al, 2011].

Preliminary Screening of Phytochemical Test

Phytochemical Screening

The filtrate obtained was subjected to preliminary phytochemical screening.

Test for Alkaloids

Iodine Test: A few drops of dilute iodine solution were added into 3 ml test solution added. Blue colour appeared; and disappeared on boiling and reappeared on cooling [Khandelwal K.R., 2008].

Wagner’s Test: Few drops of Wagner’s reagent were added into 2 to 3 ml extract. Formation of reddish brown precipitate indicates the presence of alkaloids [Kokate C. K. et al, 2001].

Dragendorff’s Tests: Few drops Dragendorff’s reagent were added into 2 to 3 ml extract. Formation of orange brown precipitate indicates the presence of alkaloids [Kokate C. K. et al, 2001].

Test for Flavonoids

Pew’s Tests: Zinc powder was added into 2-3 ml extract, followed by drop wise addition of con. HCl. Formation of purple red or cherry
colour indicates the presence of flavonoids [Peach K, Tracey MV. 1956].

**Shinoda Tests:** 2-3 ml extract and few fragments of magnesium metal were added into a test tube, followed by dropwise addition of concentrated HCl. Magenta colour indicates the presence of flavonoids [Kokate C. K. et al; 2001].

**NaOH Tests:** 2-3 ml of extract and few drops of sodium hydroxide solution were added into a test tube. Formation of intense yellow colour that became colourless on addition of a few drops of dilute HCl indicates the presence of flavonoids [Khandewal K.R., 2008].

**Test for Glycosides**

**Keller-Killani Test:** Glacial acetic acid was added into 2 ml extract and one drop 5% FeCl₃ and conc. H₂SO₄. Reddish brown color appears at the junction of the two liquid layers and the upper layer of bluish green indicates the presence of glycosides [Kokate C. K. et al; 2001].

**Glycosides test:** 1 ml water was added into the small amount of extract and shook well. Then aqueous solution of NaOH was added. The appearance of yellow colour indicates the presence of glycosides [Treare GE, Evans WC. 1985].

**Concentrate H₂SO₄ Test:** 2ml glacial acetic acid, one drop of 5% FeCl₃ and conc. H₂SO₄ were added into 5ml extract, the appearance of brown ring indicates the presence of glycosides [Khandewal KR., 2008].

**Molisch’s Test:** 2 drops of Molisch’s regent was added into 1 ml of extract, and 2 ml of concentrate H₂SO₄ was added carefully into above solution. Formation of violet ring at the junction indicates the presence of glycosides [Kokate C. K. et al; 2001].

**Test for Phenols**

**Ellagic Acid Test:** The test solution was treated with few drops of 5% (w/v) glacial acetic acid and 5% (w/v) NaNO₂ solution. The solution turned muddy or niger brown precipitate occurred in the extract. It indicates the presence of phenols solution [Gibbs R.D., 1974].

**Phenol Tests:** 0.5 ml of FeCl₃ (w/v) solution was added into 2 ml of test solution, formation of an intense colour indicates the presence of phenols [Gibbs R.D., 1974].

**Test for Lignins**

**Lignin test:** 2 ml of 2% (w/v) furfuraldehyde was added into the test solution. Formation of red colour indicates the presence of lignin [Gibbs R.D., 1974].

**Labat test:** The test solution was mixed with gallic acid; it developed olive green colour indicating the positive reaction for lignins [Gibbs R.D., 1974].

**Test for Saponins**

**Foam Test:** The extract was diluted with 20 ml of distilled water and was shaken in a graduated cylinder for 15 minutes. A 1 cm. layer of foam, indicates the presence of saponins [Kokate C. K. et al; 2001].

**Haemolysis Tests:** One drop of extract and one drop of blood was placed on the glass slide. Hemolytic zone appeared [Kokate C.K., 1994].

**Test for Sterols**

**Liebermann-Burchard Test:** Chloroform was mixed into 2ml extract. 1-2 ml acetric anhydride and 2 drops of concentrated H₂SO₄ were dropped into the test tube. First red, then blue and finally green colour indicates the presence of sterols [Kokate C. K. et al; 2001].

**Salkowski’s Test:** 2ml chloroform and 2 ml concentrated H₂SO₄ were added into the 2 ml extract and shook well. The layer of red chloroform and acid shows greenish yellow fluorescence. It indicates the presence of sterols [Kokate C. K. et al; 2001].

**Test for Tannins**

**Gelatin Test:** Gelatin (gelatin dissolves in warm water immediately) solution was added into the extract. Formation of white precipitate indicates the presence of tannins [Treare GE, Evans WC. 1985].

**Lead acetate test:** Few drops of 10% lead acetate solution were added into 5 ml of extract. Formation of yellow or red precipitate indicates the presence of tannins [Treare GE, Evans WC. 1985].

---

**Table 1: Phytochemical Screening of Dhatura Stramonium L. Leaves**

<table>
<thead>
<tr>
<th>Test</th>
<th>Petroleum Ether</th>
<th>Chloroform</th>
<th>Methanol</th>
<th>95% Ethanol</th>
<th>Distilled water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Iodine Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wagners Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dragendorff’s Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Pews Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shinoda Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NaOH Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glycosides</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Keller- Killani Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glycidoses</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Conc. H₂SO₄</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Molish Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Phenol</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Ellagic Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Phenol Test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Lignin</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Lignin Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Labat Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Saponins</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Foam Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Haemolysis Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Sterols</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Libermann- Burchard Test</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Salkowski Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Tannins</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Gelatin Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Lead Acetate Test</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

[+Presence, - Absent]
RESULT AND DISCUSSION

The plant leaves were powdered and subjected to cold percolation with petroleum ether, chloroform, methanol, 95% ethanol and distilled water for 48 hours. The results of the phytochemical screening of leaves extract of *Dhatura stramonium* were present in Table-1. Different types of secondary metabolites such as glycosides, phenol, lignins, saponins, sterols and tannins were presented. *Dhatura stramonium* L. is very effective compared to other part because most parts of secondary metabolites are present in it [Table-1]. Tannins have general antimicrobial and antioxidant activities [Rievere et. al., 2009].

Current reports show that tannins may have potential value such as cytotoxic and antineoplastic agents [Aguinaldo et. al., 2005]. Saponins have antifungal properties [Aboada and Efuwape, 2001]. These contents are shown in different types of activities against different pathogens. Therefore, it can be used in the treatment of diseases.

Saponins are used in hypercholesterolemia, hyperglycemia, antioxidant, anticancer, anti-inflammatory, and weight loss etc. according to medical field. It is a bioactive antibacterial agents of plants [Mandal et. al., 2005: Manjunatha, 2006].

Plant steroids have cardiotoxic activity, possess insecticidal and antimicrobial properties. It is generally used in herbal medicines and cosmetic products (Callow; 1936).

Phenolic compounds have anti-oxidative, anti-diabetic, anti-carcinogenic, anti-mutagenic and anti-inflammatory [Arts and Hollman; 2005; Scalbert et. al.; 2005].

CONCLUSION

*Dhatura stramonium* L. has different types of medicinal properties. Medicinal properties depend on different types of secondary metabolites that have been presented in my phytochemical secondary metabolites study. These secondary metabolites were glycosides, saponin, lignin, phenol, sterols and tannins. These secondary metabolites have anti-bacterial, anti-viral, anti-fever, anti-diabetes, anti-cancerous activities etc. Therefore, it can involve in medicinal plant categories.

ACKNOWLEDGEMENT

I pray and dedicate my research article to Maa Saraswati, the goddess of knowledge & wisdom. Research work would have been a dream, had it not been enlightened, by my well wishers and the above respectable. Kind assistance of Bharti Sharma and my dear father shri Krishna Kumar Bhatt, is unforgettable. Last but not least the Almighty God is unforgettable without whose kindness and grace, nothing could have happened.

REFERENCES