



## **PRELIMINARY PHYTOCHEMICAL ANALYSIS OF ASHODHITA AND GOKSHEERA SHODHITA DATURA BEEJA (DATURA ALBA LINN)**

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### **ABSTRACT**

*In Ayurveda, datura is a well-known and commonly used medicine. Ayurveda recommends a series of steps called Shodhana (purification operations) in order to transform the seeds of this plant into a safe therapeutic medication because they are thought to be extremely hazardous. Datura, also known as Datura alba Linn in botanical terms, is one of the upavisha Vargas. Any upavisha group, such as the drug class datura, cannot be employed in treatment very efficiently unless it has through certain purifying procedures known as shodhana. To identify the chemically active principles, a comparative examination of the phytochemical components of the ashodita and goksheera shodhita datura beeja is conducted in the current study. To determine a plant's active ingredient and determine whether it has therapeutic potential, the phytochemical analysis is very useful. The current study will analyse the phytochemical parameters in ashodita (unpurified) and shodhita datura beeja. After the evaluation, the extractive values of shodhita datura beeja as compared to the ashodita datura beeja are decreased. The extract from the samples of datura beeja was done for primary phytochemical analysis and was found to have less toxic chemical constituents compared to ashodita datura beeja and with safe and more therapeutic value.*

**KEY WORDS:** Datura beeja, phytochemical constituents, shodhana, Goksheera

### **INTRODUCTION**

Datura is a deadly toxin that is listed in the *Upavisha*. Although its seeds are extremely poisonous, during *shodhana samskara* (purification), they acquire medicinal properties and are commonly utilised in medicine. If utilised wisely, any powerful poison can be employed in Ayurveda treatment as a wonderful remedy. According to numerous animal studies<sup>6,7</sup> the seeds of datura are extremely poisonous. Tropane alkaloids, which are extremely poisonous and even lethal, are present in potentially deadly amounts in all parts of the datura plant. When ingested, it can cause symptoms such as dry mouth, nausea, vomiting, dysphasia, dysarthria, diplopic delirium, hallucination, dry and hot skin (due to inhibition of sweat secretion), red skin (due to dilation of cutaneous blood vessels), skin especially on the face and chest, drowsiness, and later on, intoxication.

To lessen a harmful drug's toxicity before transforming an ingredient into a secure therapeutic medicine, Ayurveda discusses a *samskara* (process) known as *shodhana* (purification).<sup>9</sup>It is the procedure by which unwelcome contaminants are eliminated from the medicine, thereby enhancing its potency and effectiveness.<sup>10</sup>

Greek word 'phyto' is a synonym for plant. Phytochemicals, also called phytonutrients, are inert, non-essential chemical substances that are naturally present in plants. Vegetables, grains, legumes, beans, fruits, herbs, nuts, roots, leaves, and seeds are all sources of them. These substances are responsible for the colour, flavour, and smell of the plant. These are in charge of giving medicinal herbs their



therapeutic qualities and positive health effects. Additionally, phytochemicals also contain hazardous and dangerous substances that are present in plants<sup>11</sup>. *Goksheera* is mentioned as *shresta* under *ksheera varga*. It is of *snigdha guna*, *sheeta virya* and *madura vipaka*.<sup>12</sup>

## MATERIALS AND METHODS

The drug is collected and authenticated. *Goksheera shodana* was done for one sample. Later the extraction of *ashodita* and *goksheera shodita datura beej*a was done and phytochemical analysis is performed.

### Preliminary Phytochemical Tests<sup>13</sup>

#### Test for alkaloids

**Wagner's Test:** About 1ml of leaf extract and 1ml of Wagner's reagent (dilute iodine solution) were added and mixed. Formation of reddish brown precipitates indicates the presence of alkaloids.

**Dragendroff's Test:** To a few milligrams of extract dissolved in alcohol, a few drops of acetic acid and dragendroff's reagent were added and shaken well. An orange red precipitate formed indicates the presence of alkaloids.

**Mayer's test:** To a few milligrams of extract dissolved in acetic acid, a few drops of mayer's reagent was added. A dull white precipitate formed indicates the presence of alkaloids.

#### Test for Carbohydrates

**Fehling's Test:** A few milligrams of extract were mixed with equal quantities of Fehling's solution A and B. The mixture was warmed on a water bath. The formation of a brick red precipitate indicates the presence of carbohydrates.

**Benedict's Test:** To 5 ml of Benedict's reagent, a few milligrams of extract was added, and boiled for two minutes and cooled. Formation of a red precipitate indicates the presence of carbohydrates

#### Test for Steroids

**Liebermann Burchard Test:** To the extract dissolved in chloroform, 1 ml of acetic acid and 1 ml of acetic anhydride were added, then heated on a water bath and cooled. Few drops of con.H<sub>2</sub>SO<sub>4</sub> were added along the sides of the test tube. Appearance of bluish green color indicates the presence of steroids.

#### Salkowski Test

The extract was dissolved in chloroform and equal volume of con. H<sub>2</sub>SO<sub>4</sub> was added. Formation of bluish red to cheery red colour in chloroform layer and green fluorescence in the acid layer indicates the presence of steroids.

#### Test for Saponins

To a few milligrams of extract, distilled water was added and shaken. Stable froth formation indicates the presence of saponin.

#### Test for tannin

To the extract a few drops of dilute solution of ferric chloride were added, formation of dark blue colour shows the presence of tannins.

#### Test for Flavonoids

**Shinoda's Test:** To the extract in alcohol, a few magnesium turnings and few drops of conc. H<sub>2</sub>SO<sub>4</sub> were added and heated on a water bath. Formation of red red to pink colour indicates the presence of flavonoids.

**Test for Glycoside:** Keller Killiani test. A solution of 0.5 mL, containing glacial acetic acid and 2-3 drops of ferric chloride, was mixed with 2 mL of extract. Later, 1 mL of concentrated H<sub>2</sub>SO<sub>4</sub>, was added along the walls of the test tube. The appearance of deep blue colour at the junction of two liquids indicated the presence of cardiac glycosides.

**ASHODITA DATURA BEEJA (table 1)**

TEST	AQUEOUS	ALCOHOL
<b>ALKALOID</b>		
DRAGENDORFF'S TEST	-	+
MAYER'S TEST	-	+
WAGNER'S TEST	-	+
<b>CARBOHYDRATE</b>		
BENEDICT'S TEST	+	-
FEHLING'S TEST	-	-
<b>TANNIN</b>		
BROMINE	+	-
LEAD ACETATE SOLUTION	-	+
ACETIC ACID		
<b>GLYCOSIDE</b>		
LIEBERMANN'S BURCHRD REACTION	-	-
BORNTRAGER'S TEST	-	-
<b>STEROID</b>		
SALKOWSKI REATION AND IEBERMANN'S	-	-
<b>SAPONIN-FOAM TEST</b>	-	-
<b>FLAVANOIDS</b>	-	-
<b>MUCILAGE</b>	-	-

**GOKSHEERA SHODITA DATURA (table 2)**

TEST	AQUEOUS	ALCOHOL
<b>ALKALOID</b>		
DRAGENDORFF'S TEST		+
MAYER'S TEST		+
WAGNER'S TEST		+
<b>CARBOHYDRATE</b>		
BENEDICT'S TEST	+	
FEHLING'S TEST		+
<b>TANNIN</b>		
BROMINE		
LEAD ACETATE SOLUTION	+	+
ACETIC ACID		
<b>GLYCOSIDE</b>		
LIEBERMANN'S BURCHRD REACTION		
BORNTRAGER'S TEST		
<b>STEROID</b>		
SALKOWSKI REATION AND IEBERMANN'S		
<b>SAPONIN-FOAM TEST</b>	+	
<b>FLAVANOIDS</b>		
<b>MUCILAGE</b>	+	

**RESULT**

Extraction of two different samples of datura *beeja* was done. Preliminary phytoconstituents screening of two sample extracts showed the presence of various phytoconstituents. The chemical constituents like alkaloids which are present in alcohol solution of *ashodita*



*datura beeja* were absent in *goksheera shodhita datura beeja*. Carbohydrates and tannins like bromine which were present in *ashodita datura beeja* are absent in *goksheera shodhita datura beeja*. Saponin foam test and mucilage test are positive for *goksheera shodhita datura beeja* which were negative in *ashodita datura beeja*.

## DISCUSSION

In Ayurveda, *datura* is a well-known and commonly prescribed medicine. Ayurveda recommends particular procedures since its seeds are thought to be particularly poisonous. This plant's main uses are as a narcotic and hallucinogen<sup>14</sup>. The entire plant, particularly the leaves and seeds, is used to cure a variety of conditions, including aesthetic, antispasmodic, anodyne, antiasthmatic, antitussive, bronchodilator, animal bites, hallucinogenic, hypnotic, and mydriatic<sup>15</sup>. It is well-known and frequently used in India to cure conditions including epilepsy, hysteria, heart illness, insanity, fever with catarrh, cough, convulsion, diarrhoea, and skin problems, among others<sup>16</sup>. The broad category of glycosides known as saponins is found in many plant families. Inhibiting protozoa (defaunation) appears to be saponins' main impact in the rumen, which may improve the efficiency of microbial protein synthesis and protein flow to the duodenum.<sup>17</sup> According to published research, saponins have biological functions and therapeutic qualities such hemolytic factor<sup>18</sup>, anti-inflammatory<sup>19</sup>, antibacterial<sup>20</sup>, antifungal<sup>21</sup>, antiviral<sup>22</sup>, insecticidal<sup>23</sup>, anticancer<sup>24</sup>, cytotoxic<sup>25</sup>, and molluscicidal activity.<sup>26</sup> Additionally, saponins are said to decrease cholesterol in both humans and animals.<sup>27,28,29</sup> The mucilage might be useful in a variety of situations. Among them, it serves as a healing agent, either sporadically or in the context of conventional or traditional treatment. Pharmacologists have examined the mucilage of some of these plants and discovered that it contains biologically active components. However, they all share a curative impact on diarrhoea and dysentery as well as burns, wounds, ulcers, external and internal inflammations and irritations.<sup>30</sup> When applied externally, mucilage hydrates and protects the skin in addition to having anti-cancer, anti-diabetic, anti-cancer, and anti-decomposition properties when taken internally.<sup>31</sup>

## CONCLUSION

The purpose of the current study was to conduct a preliminary phytochemical analysis and assess how *shodhana* affected the drug's toxicity. Based on the analysis's findings, it can be concluded that *goksheera shodhana of datura beeja*, which removes some chemical components that were highly toxic and fatal, has more therapeutic benefits and safety than *ashodita* (unpurified) *datura beeja*. Additionally, there were chemical components like saponins and mucilage present that were not present in *ashodita datura beeja* yet had greater medicinal benefit. Therefore, the current investigation demonstrates that the *shodhana* treatment aids in lowering drug toxicity and also confers other features that are more advantageous therapeutically.

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