Original Article

Evaluation of Bioactive Phytochemical Constituents from Sugarcane Bagasse

R Devika 1, * , P Parameswari 2

1 Department of Biotechnology, AarupadaiVeedu Institute of Technology, Paiyanoor, India
2 Research scholar, Sathyabama University, Chennai, India.

ARTICLE INFO

Received: 16 Sep 2017
Accepted: 19 Oct 2017

ABSTRACT

Herbs are considered to be the backbone of traditional medicines from the immemorial time. India has 15 agroclimatic zones containing 1700-18000 species of flowering plants out of which 6000-7000 are estimated to have medicinal usage in Ayurveda, Siddha, Unani and Homeopathy. In the present investigation, bagasse (Sugarcane waste fibre) has been analyzed for qualitative phytochemicals. About fifteen phytochemical analysis were conducted and recorded for their presences in three different solvents (Methanol, Ethanol and Chloroform). Carbohydrate, saponins, cardiac glycosides and steroids were recorded in all the three solvents. From the above investigation it was found that bagasse registered bioactive compounds like alkaloids, flavonoids, terpenoids, steroids, tannins, quinones etc. which proved that bagasse has high therapeutic value in near medical world.

Keywords: Bagasse, bioactive, phytochemicals, therapeutic, alkaloids, saponins.

1. INTRODUCTION

Plant origin biomolecules are known to have various applications in food commodities, plant protection, medicinal additives, antibiotic resistant etc. Generally, the plants produces two types of metabolites (Primary and secondary), out which the secondary metabolites plays an important role and highly potential in the medicine from

Hispanic era. Globally, the traditional system of medicine has taken importance and the plant metabolites forms the basic source in the pharmaceutical industries. About 25 years period prior to 2007, one half of the licensed drug were from plant based natural products. The classification of secondary metabolites are on the basis of chemical structures, composition, solubility and the path of synthesis and they are categorized into three major groups. Ozaliscarniculata Linn. is a medicinal herb and is known for its good appetizer, better for piles, dysentery, diarrhea and various skin diseases. Artemisina known for its antimalarial drug is abundant in Artemisia annua (0.5-1.16%) from the aerial parts. Saponins are steroids are highly known for its health beneficial effects such as enhancement of immunity, reduction in blood glucose, ant diabetic effects and reduction in blood cholesterol etc. The secondary metabolites such as phenols, terpenes, volatile oils, steroids, flavonoids, alkaloids, tannins etc. proved to be a natural antioxidants, inhibits oxidation of food and reduce the risk of age dependent diseases. Tagetes genus has a strong historic evidence for its religious and therapeutic values as astringent, epileptic fits and cosmetics, food additives, pest control. The essential oils extracted from cinnamom, thyme, clover, lavender, citral, geraniol, linalool, thymol are highly potent as antiseptic against microbes and the oils are employed in number of ointment, creams and gels which have pain relieving capacities.

In the present investigation, the bagasse from sugarcane (Saccharumofficinarum) was identified for phytochemical analysis since the bagasse forms the raw material in paper industries and are found as waste in the road side. Saccharumofficinarum belongs to grass variety and it has originated from Southeast Asia and are cultivated from tropical and subtropical countries. The juice of sugarcane has a medicinal value in increasing the lactation in nursing mothers and it instantly energizes in our body and provides strength keeping in mind the value of the species, the bagasse were subjected for qualitative phytochemical analysis.

2. MATERIALS AND METHODS

In the present investigation, the bagasse was collected from sugarcane juice shop (maintain hygienic). The bagasse was cut into very small pieces and was air dried for three weeks. The dried bagasse was ground into powder by using sterile electric blender. The powdered sample was stored in a air tight container for future investigations. The powdered bagasse was subjected to extraction with three different solvents (Methanol, chloroform and ethanol) and the extracts were stored in air tight bottles for further investigations. Qualitative phytochemical analysis of the three solvents were carried out such as carbohydrates, tannins, saponins, flavonoids, alkaloids, quinones, glycosides, cardiac glycosides, terpenoids, phenols and coumarins, steroids, phlobatannins and anthraquinone.

3. RESULTS AND DISCUSSION

The powdered bagasse was subjected to extraction with three different solvents like methanol, ethanol and chloroform. After a period of incubation the extracts where filtered with Whatman filter paper and the pure crude extracts were stored in different air tight containers and stored for further investigations. A known amount of the extracts were taken in test tubes and was subjected to qualitative phytochemical analysis and the presence of them are tabulated in the Table. In the present investigation it was found that the waste bagasse is found to have phytochemicals (secondary metabolites) and confirms that the bagasse can be used for medicinal investigations after clinical trail isolation of particular components from the waste. From the above investigation it was found that all the three solvents recorded positive results for carbohydrates, cardiac glycosides and saponins.

The chloroform solvent was found to be less effective than the other two solvents. The tannins, alkaloids, cardiac glycosides and phenols showed positive results in the chloroform extracts. In both ethanol and methanol extracts showed common presence of phytochemicals throughout the study. The phytochemicals registered in methanol and ethanol were carbohydrate, saponins, flavonoids, cardiac glycosides, terpenoids, coumarins and steroids. Coumarins are found to be the precursor in the synthesis of anticoagulant, as edema modifier and even they act as vitamin K antagonists. Terpenoids are evidence of anti cancer properties and maintenance of oxidation / antioxidation balance. Cardiac glycosides are found in all the three solvents which indicates that the bagasse can be utilized for the treatment of cardiac failure and it also inhibits the sodium potassium pump by stabilizing E2-P transition state. The bioactive alkaloids can be employed in the treatment of ear inflammation, antihelminthic and carminative.

<table>
<thead>
<tr>
<th>S.No</th>
<th>PHYTOCHEMICALS</th>
<th>SUGARCANE BAGASSE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Methanol</td>
</tr>
<tr>
<td>1.</td>
<td>Carbohydrates</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Tannins</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Saponins</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Flavonoids</td>
<td>+</td>
</tr>
<tr>
<td>5.</td>
<td>Alkaloids</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Quinones</td>
<td>+</td>
</tr>
<tr>
<td>7.</td>
<td>Glycosides</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Cardioglycosides</td>
<td>+</td>
</tr>
<tr>
<td>9.</td>
<td>Terpenoids</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Phenols</td>
<td>+</td>
</tr>
<tr>
<td>11.</td>
<td>Coumarins</td>
<td>+</td>
</tr>
<tr>
<td>12.</td>
<td>Proteins</td>
<td>+</td>
</tr>
<tr>
<td>13.</td>
<td>Steroids</td>
<td>-</td>
</tr>
<tr>
<td>14.</td>
<td>Phlobatannins</td>
<td>+</td>
</tr>
<tr>
<td>15.</td>
<td>Anthraquinones</td>
<td>-</td>
</tr>
</tbody>
</table>
4. CONCLUSION

From the present investigation it has been revealed that a waste bagasse can be recycled for the isolation of bioactive constituents of the high therapeutic value. Further investigation in terms of specific phytochemical and in depth study with the cell lines will prove that the waste bagasse can be reused for human welfare which will pave a way for less cost medicine in near future.

5. REFERENCES


**Conflict of Interest: None**

**Source of Funding: Nil**